THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 965-2016

FERRY ROAD AND RIVERBEND COMBINED SEWER RELIEF CONTRACT 5 EAST STAGE 1

TABLE OF CONTENTS

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 FERRY ROAD AND RIVERBEND COMBINED SEWER RELIEF CONTRACT 5 EAST STAGE 1

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, November 17, 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. SITE INVESTIGATION

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

B4. ENQUIRIES

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

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

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

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

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

B5. CONFIDENTIALITY

B5.1 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.

B5.2 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.

B6. ADDENDA

B6.1 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.

B6.2 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.

B6.2.1 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

B6.2.2 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.

B6.3 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.

B7. SUBSTITUTES

B7.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B7.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (4) Business Days prior to the Submission Deadline.

B7.4 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.

B7.5 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.

B7.6 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.

B7.6.1 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.

B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B7.8 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 B17.

B7.9 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.

B8. BID COMPONENTS

B8.1 The Bid shall consist of the following components:

(a) Form A: Bid;

(b) Form B: Prices;

(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;

B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.

B8.3 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.

B8.4 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.

B8.4.1 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.

B8.5 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.

B8.6 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 B17.1(a).

B8.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B8.8 Bids shall be submitted to:

The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B9. BID

B9.1 The Bidder shall complete Form A: Bid, making all required entries.

B9.2 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.

B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

B9.3 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.

B9.4 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, should 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.

B9.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B9.5 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.

B10. PRICES

B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B10.2 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.

B10.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B11. DISCLOSURE

B11.1 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.

B11.2 The Persons are:

(a) N/A

B12. QUALIFICATION

B12.1 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.

B12.2 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

B12.3 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);

(d) upon request of the Contract Administrator, obtain Security Clearances in accordance with PART F - Security Clearance ;

B12.4 Further to B12.3(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/.

B12.5 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.

B12.6 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.

B13. BID SECURITY

B13.1 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.

B13.1.1 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.

B13.1.2 All signatures on bid securities shall be original.

B13.1.3 The Bidder shall sign the Bid Bond.

B13.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B13.2 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.

B13.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B13.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B13.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B13.3 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.

B14. OPENING OF BIDS AND RELEASE OF INFORMATION

B14.1 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.

B14.1.1 Bidders or their representatives may attend.

B14.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B13 will not be read out.

B14.2 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/

B14.3 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/

B14.4 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.

B15. IRREVOCABLE BID

B15.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.

B15.2 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.

B16. WITHDRAWAL OF BIDS

B16.1 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.

B16.1.1 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.

B16.1.2 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.

B16.1.3 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 B16.1.3(b), declare the Bid withdrawn.

B16.2 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 B15.2 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.

B17. EVALUATION OF BIDS

B17.1 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 there from (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to B7.

B17.2 Further to B17.1(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.

B17.3 Further to B17.1(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.

B17.4 Further to B17.1(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.

B17.4.1 Further to B17.1(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.

B18. AWARD OF CONTRACT

B18.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B18.2 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.

B18.2.1 Without limiting the generality of B18.2, 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.

B18.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B17.

B18.3.1 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 construction of land drainage sewers and a river outfall.

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

(a) Construction of land drainage sewers ranging in size from 750mm to 1050mm diameter, by trenchless and open cut methods

(b) Construction of a 1200mm diameter outfall into the Assiniboine River at Jae Eadie Park.

(c) Installation of new connections to existing catch basin and catch basin leads to new Land Drainage Sewer, abandonment of existing catch basin leads to combined sewers, and replacement of deteriorated catch basins.

(d) Surface restoration and related works.

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Tetra Tech, represented by:

Gord Steiss C.E.T.
Project Coordinator

Telephone No. 204 954-6800
Facsimile No. 204 988-0546
Email gord.steiss@tetratech.com

D3.2 At the pre-construction meeting, Mr. Steiss 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 B8.8

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.

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, D6.4 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 Notwithstanding C21, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg
Chief Financial Officer

Facsimile No.: 204 949-1174

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

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

Facsimile No.: 204 947-9155

D6.5 Bids Submissions must be submitted to the address in B8.8

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 should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management 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 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 B13.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D12. SUBCONTRACTOR LIST

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

D13. DETAILED WORK SCHEDULE

D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13.2 The detailed work schedule shall consist of the following:

(a) a critical path method (C.P.M.) schedule for the Work; and

(b) a Gantt chart for the Work based on the C.P.M. schedule;

all acceptable to the Contract Administrator.

D13.3 Further to D13.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

(a) Commencement Date.

(b) Installation of Land Drainage Sewers on a street by street basis.

(c) Surface restoration.

(d) Substantial Performance.

(e) Total Performance.

D13.4 Further to D13.2(b), 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.

D13.5 The Contractor shall update the construction schedule prior to each bi-weekly construction site meeting for review and discussion at the meetings.

SCHEDULE OF WORK

D14. COMMENCEMENT

D14.1 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.

D14.2 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 Safe Work Plan specified in D9;

(iv) evidence of the insurance specified in D10;

(v) the performance security specified in D11; and

(vi) the Subcontractor list specified in D12.

(vii) the detail work schedule specified in D13

(b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

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

D15. WORKING DAYS

D15.1 Further to C1.1(gg), the Contract Administrator's determination of whether or not atmospheric and Site conditions are such that a Working Day is deemed to have elapsed may be based at one time on one type of work while at another time a Working Day may be based on another type of work. When more than one type of major work is involved, the quantity of equipment that must be able to work in order to meet the requirements of a Working Day may vary considerably from that specified in the General Conditions.

D15.2 In the event that incidental work is behind schedule which, in the opinion of the Contract Administrator, should have been or could have been carried out by the Contractor in conjunction with or immediately following work of a major type, the City hereby reserves the right to charge Working Days on the incidental work until such time as it is up to schedule.

D15.3 When the major type of work involves restoration of the site to the condition it was prior to rainfall, Working Days shall not be charged.

D15.4 The Contract Administrator will furnish the Contractor with a bi-weekly record for each major type of work and Working Days charged. This record will be provided at regular site meetings.

D16. SPRINGTIME WORKING CONDITIONS

D16.1 Further to D15.1, the operation of machinery for the construction of sewers on existing streets in fair or poor condition during the spring thaw and drying period has the potential to cause considerable damage to these streets. If the Work has commenced and is underway, but in the opinion of the Contract Administrator the working conditions are detrimental to pavements or other infrastructure, the works shall be temporarily stopped and deferred to a later time of year.

D16.2 No Working Days will be charged during the temporary work stoppage period.

D16.3 No demobilization, remobilization or standby equipment costs may be charged due to the temporary work stoppage period.

D16.4 The Contract Administrator will monitor the working conditions during the temporary stoppage and provide notice to the Contractor that site conditions are suitable to resume work. The Contractor shall resume work within seven (7) days of receipt of notice, after which time Working Days shall be charged.

D17. CRITICAL STAGES

D17.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) Installation of outfall, sewer works, rip rap and all river works in Jae Eadie Park and Installation of new flap gate at Ness Avenue and Alcott Street gate chamber completed before completed before March 15, 2017.

(b) Installation of new flap gate at Ness Avenue and Alcott Street completed before March 15, 2017. Testing of gate may occur after the spring flood has passed.

D18. SUBSTANTIAL PERFORMANCE

D18.1 The Contractor shall achieve Substantial Performance within sixty fifty (65) consecutive Working Days of the commencement of the Work as specified in D14 or by May 1, 2017.

D18.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D18.3 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.

D19. TOTAL PERFORMANCE

D19.1 The Contractor shall achieve Total Performance within eighty (80) consecutive Working Days of the commencement of the Work as specified in D14 or by June 15, 2017.

D19.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D19.3 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.

D20. LIQUIDATED DAMAGES

D20.1 If the Contractor fails to achieve Substantial Performance or Total Performance in accordance with the Contract by the day fixed herein, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the day fixed herein for same during which such failure continues

(a) Critical Stages (Jae Eadie Park) – two thousand dollars ($2,000.00);

(b) Substantial Performance – two thousand dollars ($2,000.00);

(c) Total Performance – one thousand dollars ($1,000.00).

D20.2 The amount specified for liquidated damages in D20.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.

D20.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D21. SCHEDULED MAINTENANCE

D21.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) Maintenance of temporary cold mix asphalt patches and sacrificial concrete slabs as specified in E17;

(b) Sodding as specified in CW 3510;

(c) Seeding as specified in CW 3520 and E35;

(d) Tree Planting as specified in E36;

(e) Further to D16 restoration works that cannot be completed due to working conditions all restoration to be completed by June 15, 2017. as specified in D19,

D21.2 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

D22. JOB MEETINGS

D22.1 Regular bi-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.

D22.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D23. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D23.1 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).

D24. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

D24.1 Further to B12.4, 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 B12.4.

D25. ENVIRONMENTAL PROTECTION PLAN

D25.1 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.

D25.2 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 (CEPA) c.16;
  (iii) Fisheries Act, 1985 c.F-14;
  (iv) Transportation of Dangerous Goods Act and Regulations, c.34;
  (v) Transportation Association of Canada's Transportation Association of Canada National Guide to Erosion and Sediment Control on Roadway Projects, 2005;
  (vi) Navigable Waters Protection Act; and
  (vii) 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 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; and
(vi) Any other applicable Acts, Regulations, and By-laws.

D25.3 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) In accordance with Section 2.5 (Construction: General Guidelines) of the Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, (DFO and DNR, 1996), the Contractor shall ensure that any temporary fuel storage areas established for construction of the project are contained by an impermeable dike and are located a minimum distance of 100 metres away from the high water line of the Red River. Dikes 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 dikes shall be constructed of clay or similar impervious material. If this type of material is not available, the dike 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.

(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) 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.

(xi) Machinery shall arrive on Site in a clean condition and shall be maintained to be free to fluid leaks.

(xii) 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. fuelling) 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) Waste storage areas shall not be located so as to block natural drainage.

(ix) Runoff from a waste storage area shall not be allowed to cause siltation of a watercourse.

(x) 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.

(xi) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.

(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 with in-house resources without formal notification to Manitoba Environment.

(viii) City emergency response, 9-1-1, shall be used if other means are not available.

(v) The on-site emergency response coordinator shall contact The Canadian Coast Guard, Selkirk (204) 785-6030, if the spill material reaches and is on or in the Red or Assiniboine Rivers.

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	1 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)		

Source: Environmental Accident Reporting Regulation M.R. 439/87

(f) Red and Assiniboine Rivers Navigation Protection

(i) The Red and Assiniboine Rivers are open to navigation from approximately mid April to mid November, annually. During this period, it will be the responsibility of the Contractor to fully ensure the safety of river users.

(ii) The Contractor shall provide, install, and maintain adequate warning signs and lighting on any structure beyond the water's edge to notify boats and other craft navigating on the Red or Assiniboine Rivers that construction is underway. These warnings shall meet the requirements of the City of Winnipeg Waterways Authority and of the Canadian Coast Guard.

(iii) Prior to commencing any applicable operations over the Red or Assiniboine Rivers, the Contractor shall provide to the Contract Administrator a copy of all necessary approvals received by the Contractor.

(g) Noise and Vibration

(i) Noise-generating activities shall be limited to the hours indicated in the City of Winnipeg Noise Bylaw, and the Province of Manitoba Environment Act Licence, unless otherwise accepted in advance by the Contract Administrator.

(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 as stated in the Licence 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.

(h) 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.

(i) Erosion Control

(i) The Contractor shall develop a sediment control plan prior to beginning construction 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.

(j) Runoff Control

(i) Measures shall be undertaken to ensure that runoff containing suspended soil particles is minimized from entering the land drainage system to the extent possible, to the satisfaction of the Contract Administrator.

(ii) Areas that are heavily disturbed and vulnerable to erosion or gullying 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.

(k) 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 carte professionals; viable trees damaged during construction activities shall be pruned according to good practise by bonded tree care professionals.

(viii) Damaged trees which are not viable shall be replaced at the expense of the Contractor.

(l) 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.

(m) 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.

D26. TRAFFIC CONTROL AND MAINTENANCE OF ACCESS

D26.1 Further to clauses 3.6 and 3.7 of CW 1130:

(a) Where directed, the Contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions such as manholes and planning drop-offs to the satisfaction of the Contract Administrator. Payment shall be in accordance with CW 3410.

(b) In accordance with the Manual of Temporary Traffic Control in Work Areas on City Streets, the Contractor ("Agency" in the manual) shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place all temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by the Traffic Services Branch of the City of Winnipeg in connection with the works undertaken by the Contractor.

D26.2 Further to Section 3.7 of CW 1130 of the Site Requirements the Contractor shall be responsible to redirect and maintain traffic with appropriate signing in accordance with The City of Winnipeg "Manual of Temporary Traffic Control in Work Areas on City Streets" at all times during construction as follows:

(a) Residential Streets including Parkside Drive and Winston Drive:

(i) Maintain one lane of traffic with streets signed as "Road Closed – Local Traffic Only".

(ii) Maintain access for School Bus traffic including access to the Winston Drive school bus loop between the hours of 07:30 and 16:30.

(iii) Maintain access to the Ecole Assiniboine parking lot on Parkside Drive at all times.

(b) Other Residential Streets including Assiniboine Avenue:

(i) Maintain full access;

(c) Intersecting streets, private approach and lane access shall be maintained at all times.

(d) Active Transportation Pathways

(i) Install "Jae Eadie Park Pathway Closed" sign in westbound sidewalk at Riverbend Crescent East Leg and Portage Avenue.

(ii) Barricade park pathway access at southwest corner of Riverbend Crescent West Leg and install "Jae Eadie Park Pathway Closed" sign

(iii) Install "Jae Eadie Park Pathway Closed" sign near northeast corner of Parkside Drive near park entrance.

(iv) Install "Jae Eadie Park Pathway Closed" sign on eastbound Assiniboine Avenue at Cavell Drive.

D26.3 The Contractor shall be responsible for all signage including but not limited to lane diversions, lane divisions, and general construction barricades, except for that signage identified in the Manual of Temporary Traffic Control in Work Areas on City Streets as being the responsibility of the Public Works Department, Traffic Services Branch. The Contractor will provide the City and Contract Administrator a suitable Traffic Accommodation Strategy covering all the details for traffic management (cones and signage etc.) in each street at least seven (7) business days prior to commencement of any lane closures.

D26.4 Further to Section 3.6 of CW 1130, the Contractor shall maintain safe pedestrian crossing at intersections at all times. If possible, only one pedestrian crossing at an intersection is to be blocked by construction at any one time. If more than one pedestrian crossing is blocked by construction at an intersection at the same time the Contractor shall provide flag persons to safely escort pedestrians across the intersection. The Contractor shall leave pedestrian crossing locations safe and free of equipment that may hamper pedestrians when no construction activities are being performed at a particular crossing location

D26.5 If the Contractor is unable to maintain an existing access to a residence or business, 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.

D26.6 Pedestrian and emergency vehicle access must be maintained at all times.

D27. TRAVEL ROUTES, RESTRICTIONS AND CONTRACTOR PARKING

D27.1 Further to CW 1130 clause 3.5, equipment and truck travel routes are limited to the following streets:

(a) Portage Avenue;

(b) Winston Drive;

(c) Parkside Drive;

(d) Assiniboine Avenue between Parkside Drive and Winston Drive.

D27.2 Equipment and trucks many not travel on:

(a) Back lanes;

(b) Residential streets including Assiniboine Drive west of Winston Drive.

D27.3 Spring weight restrictions may apply to streets within the area of Work. The City shall not pay for any portion of material which results in the vehicle exceeding the maximum gross vehicle weight allowed under The City of Winnipeg Traffic By-Law, unless such vehicle is operating under special permit.

D27.4 The Contractor shall not park company or private vehicles inside the barricaded work zone in a manner that will block sightlines for vehicles and pedestrians approaching and crossing.

D28. PEDESTRIAN SAFETY

D28.1 Further to Section 3.6 of CW 1130 of the Site Requirements, the Contractor shall maintain safe pedestrian crossing at intersections at all times. If possible, only one pedestrian crossing at an intersection is to be blocked by construction at any one time. If more than one pedestrian crossing is blocked by construction at an intersection at the same time the Contractor shall provide flag persons to safely escort pedestrians across the intersection. The Contractor shall leave pedestrian crossing locations safe and free of equipment that may hamper pedestrians when no construction activities are being performed at a particular crossing location.

D29. WATER USED ON CITY OF WINNIPEG PROJECTS

D29.1 Charges incurred for the permits and water meters shall be paid for by the Contractor when taken out. The Contractor shall forward the invoice to the Contract Administrator for reimbursement. The billing for water usage sent to the Contractor shall be forwarded to the Contract Administrator for payment. The Bid Opportunity number shall be noted on each permit.

D30. CONFINED SPACE ENTRY

D30.1 The Contractor's attention is drawn to the Province of Manitoba Workplace Safety and Health Act ("the Act"), and the Regulations and Guidelines there-under pertaining to Confined Entry Work, and in particular the requirements for conducting hazard/risk assessment and providing personal protective equipment (PPE).

D30.2 The Contractor shall assist and provide Supplied Air Breathing Apparatus conforming to the requirements of the Act, Regulations and Guidelines for the use of the Contract Administrator where confined entry is required to allow for inspection of the Work.

MEASUREMENT AND PAYMENT

D31. PAYMENT

D31.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D32. WARRANTY

D32.1 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) 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.

D32.1.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See 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. 965-2016

FERRY ROAD AND RIVERBEND COMBINED SEWER RELIEF CONTRACT 5 EAST STAGE 1

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. 965-2016

FERRY ROAD AND RIVERBEND COMBINED SEWER RELIEF CONTRACT 5 EAST STAGE 1

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 J: SUBCONTRACTOR LIST
(See D12)

FERRY ROAD AND RIVERBEND COMBINED SEWER RELIEF CONTRACT 5 EAST STAGE 1

Name	Address

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:

Drawing No.	City Drawing No.	Drawing Name/Title
		Cover Sheet
C0521	LD-7978	Parkside Drive (North Leg) – Winston Drive to Parkside Drive (East Leg)
C0522	LD-7978	Jae Eadie Park – 14m East of Parkside Drive to Assiniboine River
C0523	LD-7980	Winston Drive – Parkside Drive (North Leg) to 94m North of Parkside Drive (North Leg)
C0524	LD-7981	Winston Drive – 94m North of Parkside Drive (North Leg) to Portage Avenue
C0525	LD-7982	Outfall Details

E2. MATERIALS SUPPLIED BY THE CITY

E2.1 The City will supply the following materials:

(a) One (1) 610 mm circular cast iron flap gate and mounting accessories (bolts and sealant), f.o.b. 598 Plinguet Street, Winnipeg.

E2.2 The gate supplier's representative will witness the installation and testing of the gate, and this cost will be paid for separately by the City.

E2.3 The Contract Administrator must be provided with a minimum of fourteen (14) days notice prior to installation of the gates to allow for arrangements to be made with the gate supplier for the inspection.

E3. SOILS INVESTIGATION REPORT

E3.1 Further to C3.1

E3.1.1 Test Hole logs compiled during the design process are provided in Appendix A.

E3.1.2 A Geotechnical report on riverbank stability is provided in Appendix B.

E3.1.3 Geotechnical Information is provided to supplement the Contractors evaluation of the Site conditions within the Work area. The information is considered accurate at the locations indicated and at the time of the investigation. However, considerable variations in soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally.

E3.1.4 Bidders are responsible for any interpretation they place on the supplied information and may undertake additional soils investigations at the worksite as they feel necessary to satisfy themselves. Any test borings made by the Bidder shall be done in accordance with the requirements of the appropriate authority of the City of Winnipeg. Bidders shall notify the Contract Administrator prior to starting any soil boring operation.

GENERAL REQUIREMENTS

E4. OFFICE FACILITIES

E4.1 The Contractor shall supply office facilities meeting the following requirements:

E4.1.1 The field office shall be conveniently located near the Site of the Work.

E4.1.2 The building shall have a minimum floor area of 20 square metres, with window area of 3 square metres and a door entrance with suitable lock satisfactory to the Contract Administrator.

E4.1.3 The Building shall be suitable for all-weather use. It shall be capable of maintaining a temperature range between 16°C and 25°C.

E4.1.4 The building shall be supplied with fluorescent lights and electrical wall outlets, add satisfactory to the Consultant.

E4.1.5 The building shall be supplied with a high speed internet connection.

E4.1.6 The building shall be furnished with one desk, one meeting table, one drafting table, one filing cabinet and six chairs, all satisfactory to the Contract Administrator.

E4.1.7 One holding type toilet shall be provided for the exclusive use of the Contract Administrator.

E4.1.8 The field office shall be cleaned weekly immediately prior to the Job Site Meetings to the satisfaction of the Contract Administrator.

E4.1.9 The provision of the field office with the aforementioned furnishings and equipment shall also include maintenance and removal of the field office, operating costs and any service installation costs.

E5. SITE FENCING

E5.1 Temporary 1.8 m high chain link fencing or alternative as approved by the Contract Administrator shall be installed at all laydown areas, open excavations, trench cages, cans and shafts for the project duration.

E5.2 Temporary 1.25 m high visibility snow fencing as approved by the Contract Administrator shall be installed around the worksite to divert Active Transportation pathways and School Playground users around the worksite and construction vehicles.

E5.3 The Contractor shall be responsible for installation, maintenance of the fences in proper working condition and removal following completion of the works.

E5.4 No measurement for payment shall be made for this work.

E6. PROTECTION OF EXISTING TREES

E6.1 The Contractor shall take the following precautionary steps to avoid damage from his construction activities to existing boulevard trees within and adjacent to the limits of construction:

E6.1.1 All trees will have a 2.0m radius protective zone calculated from the circumference at the base of the trunk which will remain free of digging, trenching, grade changes, stock piling of materials, parking or vehicles or equipment, or other activities that could cause soil

compaction throughout the duration of the Contract. Protective snow fencing complete with installation hardware demarking the protection zone is required.

E6.1.2 In addition to fencing, mature tree trunks shall be strapped with 25 x 150 x 2400 (1" x 6" x 8') wood planks to protect against bark damage. Smaller trees shall be similarly protected using appropriately sized wood planks.

E6.1.3 Operation of equipment within the drip line of trees shall be kept to the minimum required to perform the work. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the drip lines of trees. The drip line of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches

E6.1.4 Construction operations shall be conducted so that they do not cause flooding or sediment deposition on areas where trees are located.

E6.1.5 Work on Site shall be carried out in such a manner so as to minimize damage to existing tree branches.

E6.1.6 Repair, replace and maintain tree protection material during construction of the Work.

E6.1.7 Remove snow fencing and strapping material without harming trees as soon as the construction and restoration work is complete.

E6.2 Obtain approval from the Contract Administrator to excavate within 2.0 meters of a tree.

E6.3 Excavations shall be carried out in such a manner so as to minimize damage to existing root systems. Roots over 50mm in diameter which must be cut to facilitate an excavation shall be neatly pruned prior to excavation and coated with an appropriate wound dressing to prevent infection. Prune exposed roots with equipment such as trenchers, chain saws, root cutters or other methods acceptable to the Contract Administrator in a manner that will leave a neat, clean root end. Keep exposed roots in excavations and trenches moist or shaded.

E6.4 Take precautions to ensure tree limbs overhanging the Site are not damaged by construction equipment. Consult the Forestry Branch on pruning of overhanging or damaged limbs and branches and other unanticipated problems with trees during construction of the Works.

E6.5 All damage to existing trees caused by the Contractor's activities shall be repaired as required by the Contract Administrator and the Forestry Branch. Damages must be repaired by an individual with a Manitoba Arborist license or by the Forestry Branch.

E6.6 American elm trees are not to be pruned between April 1st and August 1st and Siberian Elm trees between April 1st and July 1st of any year under provisions of The Dutch Elm Disease Act.

E6.7 The Forestry Branch will remove and replace any trees deemed to have died or that are dying due to damage from carelessness during construction. Removal and replacement costs will be determined by size and market price. The market price will be a comparable transplantable tree of the same or different species or may be the appraised value of the existing tree, as determined by an evaluation procedure presently used by Forestry Branch in conjunction with City Claims Branch. The evaluation procedure is in accordance with current International Society of Arboriculture evaluation procedure.

E6.8 Measurement and Payment

E6.8.1 Protection of existing trees, repair of trees and pruning of damaged limbs will not be measured for payment and will be included with Underground or Surface Works. Removal and replacement of existing trees by the Forestry Branch deemed to have died or that are dying due to damage from carelessness during construction will be at the contractor's cost and will be invoiced or deducted from any payments owing.

E7. TREE REMOVAL

E7.1 This Specification shall cover the removal of living or dead trees designated for removal by the Contract Administrator.

E7.2 Construction Methods

E7.2.1 Before commencement of any work, the Contractor shall consult with the Contract Administrator as to which trees and/ or shrubs shall be removed. All other trees and shrubs shall be protected against damage from all construction activity in accordance with E6.

E7.2.2 Trees to be removed are to be felled so as to land within the limits of the works. The Contractor shall take all precautions to prevent damage to traffic, structures, pole lines, adjacent property and to trees and shrubs designated to be saved, and he shall be liable for any damages occurring in the performance of this work.

E7.2.3 The Contractor shall cut down all trees and shrubs designated for removal and grub out all stumps and roots, and remove stumps of trees felled by others.

E7.2.4 The Contractor shall load and haul all trees, stumps, roots, logs, brush, rubbish and all other surface litter from the site and dispose of these materials at dumps located by the Contractor and approved by the Contract Administrator.

E7.3 Measurement and Payment

E7.3.1 Measurement for payment for tree removal shall be based on the Diameter measured 600 mm above the ground level for trees with single trunks. On trees with double or multiple trunks, the trunk diameter will be measured 600 mm above the trunk junction. Removal of live trees or standing deadfall will be paid for at the Contract Unit Price for "Tree Removal" differentiated by trunk diameter, measured as specified herein, which price shall be payment in full for removing and disposing all tree materials and for completing all operations herein described and all other items incidental to the work included in this Specification.

E7.3.2 Measurement for payment for stump removal for trees removed by others shall be based on stump diameter measured at the cut line and paid for at the Contract Unit Price for “Stump Removal”.

E8. REFUSE AND RECYCLING COLLECTION

E8.1 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 to permit the normal collection vehicles to collect the materials. Immediately following collection, the Contractor shall return receptacles to the addresses marked on the receptacles.

E8.2 The Refuse and Recycling Collection Schedule is as follows:

(a) Winston Drive and Parkside Drive:

(i) Collection Day: Monday A

(ii) Collection Time: 07:00 – 18:00

(iii) Collection Location: Back lane where available, front street for east side of Parkside Drive east leg.

E9. SNOW CLEARING AND SPRING CLEANUP

E9.1 The Contractor will be required to perform snow clearing and sanding operations on City streets and sidewalks within the Site where access to City snow clearing and sanding crews is blocked due to construction activities or where construction activities have created unsafe, icy conditions.

E9.2 The works are within City Residential Snow Zone S. The priority for impacted streets is as follows:

(a) Winston Drive and Parkside Drive

(i) Priority P3S (Priority 3 treated as collector / bus route)

E9.3 Snow built-up on sidewalks and roadway shall be maintained to the condition of the surrounding sidewalks and roadways.

E9.4 The Contractor will be required to perform spring cleanup of wintertime road sand on local (non-regional) streets, lanes and sidewalks where access to City street sweeping crews is blocked due to construction activities.

E9.5 Measurement and Payment

E9.5.1 There will be no measurement or payment for snow clearing or spring cleanup.

E10. EXPLORATION OF EXISTING UTILITIES AND SERVICES

E10.1 Prior to construction, the Contractor shall verify the elevations of buried utilities including but not limited to sewers, watermains, large diameter fire service watermains, gas mains, power and telecommunications ducts and conduits, traffic signal conduits, street lighting and other communication cables at proposed crossing locations in accordance with CW 1120 Clause 3.3.

E10.2 Exploration of buried infrastructure should be undertaken a minimum of 5 business days prior to any construction to determine if an alternate vertical or horizontal alignment of the proposed sewer may be beneficial to minimize conflicts with the existing utilities or services.

E10.3 The Contractor shall arrange for all required utility locations, safety watches and other required notifications.

E10.4 The Contractor shall provide the Contract Administrator with a minimum of 24 hours advanced notice prior to conducting utility exposures.

E10.5 Measurement and Payment

E10.5.1 Exploration of utility locations and elevations will be incidental to the Contract.

E11. MAINTAIN EXISTING SEWER FLOWS, FLOW CONTROL, DIVERSIONS AND BYPASS PUMPING

E11.1 Maintaining Existing Sewer Flows, Flow Control, Diversions and Bypass Pumping required to complete the Works in the Contract shall be incidental to the Contract in accordance with CW 2130 Clause 4.16.

E12. SEWER CONSTRUCTION

E12.1 Pipe Classes indicated on drawings represent long term design conditions and loading. The Contractor shall verify that the pipe class, strength, reinforcing and joint design are suitable for his proposed installation methods and procedures. Design of any pipe to suit installation methods is the responsibility of the Contractor.

E12.2 Pipe Sizes indicated on drawings are based on the most efficient hydraulic design. Details of any requested pipe size revisions shall be submitted to the Contract Administrator for review, hydraulic analysis and approval. The Contract Administrator will consider other sizes for construction provided that:

(a) There is no increase in cost to the City.

(b) There is no reduction in the level of service provided by the sewer system.

(c) There is no change to the Contract duration.

E12.3 Pipe material for 450mm to 600mm diameter to be City of Winnipeg approved products for underground use. Both polyvinyl chloride SDR35 or reinforced concrete to ASTM C76 with strength class type indicated on drawings are acceptable. Note that PVC sewers will be required to undergo a repeat sewer inspection with mandrel testing at the end of the warranty period.

E12.4 Sewers indicated for open trench construction are based on the available test hole information. More information will be discovered during the excavation of the trench, and if conditions appear to be favourable for trenchless installation then this method would be accepted provided:

(a) There is no increase in overall cost to the City.

(b) There is no change to the Contract duration.

E13. EXCAVATION, BEDDING AND BACKFILL

E13.1 Disposal of Unsuitable or Surplus Excavated Material

E13.1.1 If the Contractor has not arranged for an approved disposal site, the City shall provide an optional disposal site for all surplus clean clay from the construction site. The material is not to include any refuse, concrete, metals, wood, organics, construction waste or any other deleterious materials. Any surplus soil material not meeting these requirements shall not be considered clean clay and shall not be permitted.

E13.1.2 The disposal location provided by the City will be at the Brady Road Landfill Site. The Contract Administrator will make arrangements with Ed Rowinski (204-794-4590) at the landfill site for the disposal of the surplus soil material.

E13.1.3 There will be no tipping fees charged at the landfill sites to the Contractor for the disposal of surplus soil material meeting the requirements of clean clay as specified.

E13.1.4 Surplus material not meeting the requirements of clean clay may be disposed of at the Brady Road Landfill Site although tipping fees will be charged.

E13.1.5 There shall be no measurement of surplus soil material disposed of at any disposal site. No additional payment will be made for disposal of surplus soil materials. It shall be considered incidental to the cost of the Work.

E13.2 Foundation and Bedding

E13.2.1 Class A Bedding shall be used in all shafts with concrete pipe with Type 3 material for remainder of initial backfill.

E13.2.2 Class B Bedding with Type 3 material shall be used in all shafts with PVC piping.

E13.2.3 Class B Bedding with Sand material shall be used in all pipe installations in an Open Trench.

E13.3 Backfilling and Surface Restoration

E13.3.1 Initial backfilling of all excavations shall be carried out by the following methods:

(a) Class 3 backfill shall be used at all shafts for Trenchless installations.

(b) Class 3 backfill shall be used at Open Trenches. Class 2 backfill would also be acceptable but shall be undertaken at no additional cost or as indicated in E17. Class 2 and/or 3 backfill shall be placed and compacted in lifts not exceeding 600 mm.

(c) For excavation under existing pavements or sidewalks, and if restoration cannot commence within two weeks due to cold weather, construct temporary surface restoration as described in E17.

(d) The Contractor shall have personnel available for immediate repairs of settlement at shaft locations from the start of construction until final restoration is complete.

E13.3.2 Final surface restoration shall be as follows:

(a) The excavation shall be jetted and tamped twice, as per CW 2030.

(b) After the second jetting operation is completed, the excavation is to be subcut to 1.5 m below final surface elevation and recompacted in 300 mm lifts to the subgrade level using vibratory compaction methods in accordance with CW 2030 Class 2 Backfill.

(c) Pavement shall be completed in accordance with CW 3310 or CW 3410, depending on type of existing pavement surface.

(d) Boulevard restoration shall be completed in accordance with CW 3510.

(e) If final restorations cannot be completed due to cold weather, temporary surface restorations shall be completed in accordance with E17.

E13.3.3 Further to CW 2130:

(a) Trenchless Installations and Catch Basin connections: All costs associated with backfilling and surface restorations shall be incidental to the Work.

(b) Open Trench Installation: Backfilling of trenches shall be incidental to the Work, but final surface restoration including the construction of Partial Slab Patches, Curb, Sidewalk and boulevard topsoil and sod will be paid for at the Contract Unit Prices for these items of work.

E14. TRENCHLESS EXCAVATION

E14.1 Further to Clause 3.4.1 of CW 2130, all sewers to be installed by trenchless methods except as explicitly noted on the Drawings. Where necessary tie-ins to existing sewers may be through open cut methods.

E14.2 Selection of excavation equipment for installation of sewers by trenchless methods shall be the responsibility of the Contractor and shall be made based on expected soil conditions as detailed on the test hole logs. Trenchless sewer installation may be by any suitable methods including coring, pipe jacking or by tunnel boring machine that will meet the design objective and not conflict with Traffic Management.

E14.3 The Contractor shall make allowances in the choice of equipment to account for reasonable and minor deviations in ground conditions and shall have contingency plans for the removal of boulders and other minor changes in ground conditions.

E14.4 Methods for dealing with and paying for Trenchless Excavation Obstructions are described in E15.

E14.4.1 The notice shall provide details of the change in subsurface soil conditions or obstructions encountered, any proposed construction procedure revision that the Contractor intends to undertake, as well as any other relevant supporting information.

E14.4.2 The Contract Administrator shall review the notice as expeditiously as possible to assess whether the change in conditions and revised construction procedures amount to a Change in Work.

E15. TRENCHLESS EXCAVATION OBSTRUCTIONS

E15.1 Contingency plans for removal of the obstructions encountered in trenchless excavations must be approved by the Contract Administrator as follows:

E15.1.1 Drill or excavate a shaft at the location of the obstruction, drilling, splitting or breaking the obstruction into smaller components if required, and removal of the obstruction.

E15.1.2 Remove the obstruction through the jacking head or core hole following drilling, splitting or breaking the obstruction into smaller components as required.

E15.1.3 Other removal methods

E15.2 Where the Contract Administrator deems that the obstruction encountered represents a Change in Work, it shall be valued in accordance with C7.4 (c) and the following supplemental requirements:

E15.2.1 The first four (4) hours of handling obstructions for each occurrence shall be the responsibility of the Contractor.

E15.2.2 Equipment rates for equipment required in support of the obstruction removal shall be compensated at the MHCA rental rates. Equipment not listed in the MHCA rate schedule shall have their rates established by the Contractor prior to the commencement of Work in accordance with the procedure documented in the MHCA rental guide for establishing equipment rental rates and shall be subject to the approval of the Contract Administrator.

E15.2.3 Standby equipment that cannot reasonably be deployed elsewhere during the duration of the obstruction removal shall be compensated at 50% of its established rate as noted in E15.2.2 above.

E15.2.4 Labour rates and material costs associated with obstruction removal shall be compensated as per C:7.4 (c) and C7.4.1 with the provision that any removal and replacement of pavements shall be compensated at the Contract Unit Price for such Work.

E15.3 Measurement and Payment

E15.3.1 An Allowance has been provided in the Contract Unit Prices (Provisional Items) to cover costs associated with removal of trenchless excavation obstructions.

E16. TEMPORARY ACCESS TO SCHOOL

E16.1 Temporary access to the School Parking lot and south pedestrian entrance from Parkside Drive will be required to maintain access during sewer installation. These will be constructed using sacrificial concrete pavement with cement stabilized backfill underlay, constructed, measured and paid for in accordance with E17.

E17. TEMPORARY SURFACE RESTORATIONS

E17.1 Further to clause 3.3 of CW 1130, where permanent surface restorations cannot be made due to cold weather, the Contractor shall temporarily restore surfaces in accordance with current revision of the City of Winnipeg “Street Cuts Manual” found at http://winnipeg.ca/publicworks/permitsApprovals/pdf/Street-Cuts-Manual-2016.pdf and summarized as follows:

E17.1.1 Backfill and level boulevards and grassed areas to match existing surface elevations and reduce to potential for trip hazards,

E17.1.2 Cap excavations in low volume approaches and back lanes with 300 mm of compacted crushed granular material and topped with either 75 mm of hot mix asphalt or 150 mm of non-reinforced concrete meeting the requirements of CW 3310 Clause 6.6 “Concrete for Temporary Restoration of Utility Pavement Cuts” to match the existing pavement grade.

E17.1.3 Cap excavations on Local Streets, Regional streets and high volume approaches in accordance with the “Street Cuts Manual” Sacrificial concrete pavement constructed of 600 mm of Cement Stabilized Backfill to CW 2160 and a 150 mm of non-reinforced concrete meeting the requirements of CW 3310 Clause 6.6 “Concrete for Temporary Restoration of Utility Pavement Cuts”.

E17.1.4 Cap excavations in sidewalk pavement with 100 mm of compacted crushed granular material and 50 mm of cold mix asphalt to match the existing sidewalk grade.

E17.1.5 Insulate temporary concrete where required during 24 hr curing period,

E17.1.6 Where curb has been removed as part of the pavement cut pour temporary curb using “Concrete for Temporary Restoration of Utility Pavement Cuts” as specified in CW 3310.

E17.1.7 Remove all temporary pavements prior to permanent restorations.

E17.2 Backfill under temporary surface restorations to be as follows:

E17.2.1 Use Class 2 back fill in excavation under temporary street pavements and sidewalks where Class 3 backfill cannot be jetted and flooded due to cold weather.

E17.2.2 Class 2 backfill may be compacted in 500 mm lifts where backhoe operated pneumatic plate compactors are used.

E17.2.3 Jet and flood Class 2, Class 3 and Class 5 backfilled excavations in spring when ground is not frozen prior to permanent restoration.

E17.2.4 Any Sacrificial Concrete Pavement, Cement Stabilized Backfill, or temporary cold mix asphalt shall be completely removed and the remaining backfill shall be flooded, tamped and topped up prior to performing permanent pavement restorations in accordance with E19.

E17.3 All temporary pavement restorations must be completed and continuously maintained until final surface restoration can be completed.

E17.4 Further to CW 3310, all concrete used for temporary pavement restoration shall have a minimum compressive strength of 20 MPa 24 hours after placement.

E17.5 If, in the opinion of the Contract Administrator, temporarily restored surfaces are not being adequately maintained or were not properly constructed and pose a danger to the public, maintenance or reconstruction will be done by the City forces with no advance notification the Contractor. All costs associated with the maintenance or reconstruction of temporary pavement incurred by the City shall be deducted from future payments to the Contractor.

E17.6 Measurement and Payment

E17.6.1 Temporary surface restorations as described above except for sacrificial concrete pavements shall be incidental to the cost of sewer construction.

E17.6.2 No extra payment will be made for the installation of Class 2 backfill under temporary street pavements or sidewalks.

E17.6.3 Sacrificial concrete pavement shall be measured on an area basis and paid for at the Contract Unit Price (Provisional Items) per square meter for “150mm Sacrificial Concrete Pavement”.

E17.6.4 Cement Stabilized Backfill used as underlay for Sacrificial Concrete Pavement shall be measured on a volume basis and paid for at the Contract Unit Price (Provisional Items) per cubic meter for “Cement Stabilized Backfill”.

E18. SNOW CLEARING AND SPRING CLEANUP

E18.1 The Contractor will be required to perform snow clearing and sanding operations on City streets and sidewalks within the Site where access to City snow clearing and sanding crews is blocked due to construction activities or where construction activities have created unsafe, icy conditions.

E18.2 Snow built-up on sidewalks and roadway shall be maintained to the condition of the surrounding sidewalks and roadways.

E18.3 The Contractor will be required to perform spring cleanup of wintertime road sand on local (non-regional) streets, lanes and sidewalks where access to City street sweeping crews is blocked due to construction activities.

E18.4 Measurement and Payment

E18.4.1 There will be no measurement or payment for snow clearing or spring cleanup.

E19. STREET CONDITIONS AND PERMANENT PAVEMENT RESTORATION

E19.1 The Contractor will follow the City of Winnipeg Street By-law No. 1481/77 and Street Cuts Manual (2016) for all pavement restoration unless otherwise shown on the drawing or specifications or as directed by the Contract Administrator.

E19.2 The street material and condition within the project work area are classified as follows:

(a) Winston Drive – Concrete – Fair

(b) Parkside Drive – Concrete – Good

E19.3 Permanent pavement restoration shall be in accordance with the City of Winnipeg Street Cuts Manual (2016) pp. 17 & 18 “Pavement Restoration Guidelines”.

E19.4 Notwithstanding the restoration requirements identified in E19.3 all street segments within the work area impacted by the Work as determined by the Contract Administrator shall be maintained and restored with the following additional requirements.

(a) Review and record the condition of each street segment with the Contract Administrator and a City Representative from Public Works prior to the initiation of Work.

E19.5 Review and record the condition of each street segment with the Contract Administrator and a City Representative from Public Works prior to surface restoration. The surface restoration required for each street segment will be agreed upon at this time.

E19.6 Measurement and Payment

E19.6.1 Pavement restoration for trenchless sewer installation shall be incidental to the works.

E19.6.2 Pavement restoration for open cut sewer installation areas indicated on the drawings will be at the Contract Unit Price (Provisional Items) per square meter for “Full Slab Replacement - 150mm Concrete Pavement”.

E19.6.3 Additional pavement spot repairs to repair damage from the Geotechnical Investigation program will be undertaken at the Contract Unit Price (Provisional Items) per square meter for “Partial Slab Patches - 150mm Concrete Pavement”.

E20. CONCRETE SIDEWALK AND ASPHALT PATHWAY RENEWALS

E20.1 Construction of concrete sidewalk in accordance with CW 3110 and CW 3325. Miscellaneous concrete slab renewals for sidewalk shall be measured on an area basis and paid for at the Contract Unit Price (Provisional Items) for “Concrete Sidewalk Renewal”.

E20.2 Replacement of the Jae Eadie Park 75 mm thick asphalt pathway removed by construction in accordance with CW 3110 and CW 3410. Asphalt pathway renewal shall be measured on an area basis and paid for at the Contract Unit Price (Provisional Items) for “Asphalt Pathway Renewal”.

E21. EXISTING DRAINAGE INLET CLEANING AND INSPECTION

E21.1 Existing Catch Basins and Curb and Gutter Inlets as identified herein shall be cleaned prior to inspection in accordance with CW 2140.

E21.2 Existing Catch Basins and Curb Inlets to be connected to the new land drainage sewer system shall be cleaned prior to visual inspection in order to determine if the units need to be replaced or rehabilitated. This work should be performed on a street by street basis, and must be completed before replacement units are ordered.

E21.3 Measurement and Payment

E21.3.1 This work shall be measured on a unit basis for each Catch Basin or Curb and Gutter Inlet cleaned and paid for at the Contract Unit Price (Provisional Items) for “Drainage Inlet Cleaning”.

E22. DEFLECTION TESTING OF PVC SEWERS

E22.1 This specification amends Clause 3.22 of CW 2130 regarding the waiting time for deflection testing of PVC sewers following pipe installation.

E22.2 Deflection testing of PVC mainline sewers shall be undertaken as follows:

E22.2.1 Initial deflection testing for PVC mainline sewers shall not be performed sooner than 30 days following the installation of pipe and backfilling of shafts.

E22.2.2 Repeat deflection testing shall be performed at the end of the warranty period.

E22.3 Deflection testing is not required for catch basin leads.

E22.4 Measurement and Payment

E22.4.1 Measurement and payment for initial and repeat deflection testing will not be measured and paid separately, but will be paid for as part of sewer inspection.

E23. VIDEO INSPECTION OF SEWERS

E23.1 Sewer and manhole inspection in accordance with CW 2145 will be conducted as follows:

E23.1.1 New mainline land drainage sewers

E23.1.2 Existing mainline combined sewers where catch basin leads have been abandoned in accordance with CW 2145.

E23.1.3 New catch basin leads of 15 m length or longer, or as directed by the Contract Administrator based on complicated configuration or from a private catch basin.

E23.1.4 Extended catch basin leads that result in a total lead length of 15 m or longer.

E23.2 Measurement and payment

E23.2.1 Measurement and payment for sewer and manhole inspection including defect coding will be in accordance with CW 2145 at the Contract Unit Price for “Sewer Inspection” for each nominal diameter of sewer inspected.

E23.2.2 Cleaning of existing sewers and manholes will be required as part of inspection, and this will be measured and paid for in accordance with CW 2140 at the Contract Unit Price for “Sewer Cleaning” for each nominal diameter of sewer cleaned.

E24. CATCH BASIN RECONNECTIONS AND RENEWALS

E24.1 The design objective of the project is provide combined sewer relief through the installation of new land drainage sewers, and disconnection of catch basins and drainage inlets from the combined sewer system. The drawings and Form B quantities indicate the worst case scenario where the majority of catch basins and curb and gutter inlets are to be replaced. However, if existing catch basins and curb and gutter inlets are in good shape and generally compliant with current City of Winnipeg standards, or require only minor upgrading such as replacement of a damaged frame or cover, or replacement of a missing debris hood, then the existing catch basin or curb and gutter inlet will be repaired as necessary and reconnected to the new land drainage sewer system.

E24.2 The condition assessment of existing catch basins and curb and gutter inlets will occur following the commencement of construction. Since the reconnection of catch basins is not typically done until after the mainline pipe and manholes have been installed, the Contractor is advised not to pre-order catch basins for this project until this assessment has been completed.

E24.3 Measurement and Payment

E24.3.1 Reconnections of existing catch basins to the new land drainage sewer and miscellaneous repairs such as the replacement of broken riser rings and replacement of damaged frames and covers will be measured and paid for at the Contract Unit Prices (Provisional Items) for these various items.

E25. REPAIRS TO EXISTING SEWER OR WATER SERVICES

E25.1 Repair or replacement of existing sewer or water services that conflict with the proposed sewer installation may be necessary. To minimize the potential for damaging existing services, shafts should be located near service locations such that the service locations can be found by exploratory digging. The Contractor shall attempt to adjust the water service pipe without cutting into the pipe to reroute it around the new sewer.

E25.2 The Contract Administrator must be notified immediately if a sewer or water service is damaged by the work, so that the home or building owner may be contacted and arrangements made for the provision of temporary servicing.

E25.3 The regrading or repair of existing 100 mm or 150 mm sewer services shall be done in accordance with CW 2130.

E25.4 The repair of damaged water service pipes shall be undertaken in accordance with CW 2110. The repair shall comply with the standard City of Winnipeg practice of allowing only one union or per service, and fully renewing the remainder of the service to the main or to the curb stop (whichever is shorter). Existing corporation stops, curb stops and boxes may be reused if in good condition and if compatible with the service pipe.

E25.5 Relocation of existing water services encountered but not damaged by construction shall be incidental to the construction of sewers.

E25.6 The Contract Administrator must be notified if any of the water service piping encountered is not copper. If lead water services are encountered, these should be fully renewed with minimum 19 mm copper water services, including new saddle and corporation stop at the main, new curb stop and box. Connect new copper water service to existing lead service with a suitable flange copper to lead adapter.

E25.7 Measurement and Payment

E25.7.1 Regrading or repair of existing 100 mm or 150 mm sewer services shall be measured on a unit basis for regrading sections of sewer service up to 1.5 m long and on a lineal meter basis for regrading sections of sewer service longer than 1.5 m, and paid for at the Contract Unit Prices (Provisional Items).

E25.7.2 Replacement of water services including connections shall be measured and paid for on a lineal meter basis for size classification of 19 mm, 25 mm, 38 mm and 50 mm.

E25.7.3 Supply and installation of new corporation stops including saddles shall be measured and paid on a unit basis for the same size classifications identified for water service piping.

E25.7.4 Supply and installation of new curb stops and boxes shall be measured and paid on a unit basis for the same size classifications identified for water service piping.

E25.7.5 Connecting to existing water services will be included in the installation of water service piping.

E26. BOARD INSULATION

E26.1 Description

E26.1.1 This specification shall cover the installation of board insulation for watermain freezing prevention, in addition to CW 2110 clause 3.12 and SD-018.

E26.2 Materials

E26.2.1 Moisture resistant closed cell extruded polystyrene insulation board designed for direct burial underground.

(a) Total insulation thickness as specified on drawings.

(b) Minimum compressive strength 690 kPa (100 psi) to ASTM D1621.

E26.2.2 Adhesive (for polystyrene insulation): to CGSB 71-GP-24.

(a) Type: One part Polyurethane.

(b) VOC emission: 0.

E26.3 Construction Methods

E26.3.1 Supply and install rigid insulation at locations identified on the Drawings or where directed by the Contract Administrator. Construct as noted on Detail Drawings.

E26.3.2 Insulation to be installed in an inverted U fashion in accordance with SD-018 as follows:

(a) Maintain a minimum width of 1200 mm for horizontal insulation.

(b) Minimum of 300 mm well packed specified fill between top of the pipe and bottom of horizontal insulation.

(c) Vertical insulation on either side must extend a minimum of 150 mm below bottom of pipe. Hand pack specified fill material on either side of vertical insulation sections to ensure no warping or misalignment of vertical insulation sections.

(d) Apply horizontal section after Contract Administrator has inspected and approved installation of vertical insulation legs.

E26.3.3 Horizontal insulation under roadway excavation or below the bottom of catchbasin barrels overcrossing watermain or water service pipes in accordance with SD-018 and installed as follows:

(a) Place and compact the bedding material to provide a minimum 300 mm cover over the pipe.

(b) Place two layers of insulation to attain a thickness of 100 mm for the full trench width. Stagger joints.

(c) Place 150 mm of sand over the insulation and a minimum of 200 mm hand placed and compacted backfill prior to final backfill or installation of catch basin.

E26.3.4 Manhole or Catch basin sidewall insulation

(a) Install insulation board on exterior of manhole or catch basin structures with adhesive, extending to depth indicated below finished grade as indicated on drawings.

E26.3.5 Governed by the compaction equipment to be used, ensure that there is adequate cover on the insulation to prevent damage during compaction or subsequent construction operations.

E26.4 Measurement and Payment

(a) Pipe or pipe trench insulation installed in an inverted U configuration or in a wide horizontal configuration will be measured on an area basis based on the plan view area in square metres. The vertical sides of inverted U insulation will not be measured. Construction of insulation will be paid for at the Provisional Contract Unit Price for “Board Insulation”.

(b) Manhole or catch basin sidewall insulation will be measured on an area basis for each manhole or catch basin insulated based on the plan view extent of the insulation around the manhole or catch basin barrel multiplied by the insulation depth. Construction of manhole or catch basin sidewall insulation will be paid for at the Provisional Contract Unit Price for “Board Insulation”.

E27. PROTECTION OF WATERWAYS

E27.1 Description

E27.1.1 All work adjacent to or crossing waterways including creeks and ditches draining in waterways is regulated by Fisheries and Oceans Canada (DFO).

E27.1.2 Complete works in accordance with Fisheries and Oceans Canada "Measures to Avoid Causing Harm to Fish and Fish Habitat" available at: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html.

E27.1.3 Works within 107 metres (350 feet) of the Assiniboine River are within the jurisdiction of the City of Winnipeg Waterway By-law. The Contract Administrator will apply for the required Waterway Permit for the project, with the City paying all permit application costs. The Contractor shall adhere to restrictions imposed by the permit.

E27.1.4 Under no circumstances will stockpiling of any material be permitted within 15 metres of the top of Assiniboine River riverbank for a period longer than 4 hours.

E27.2 Construction Methods

E27.2.1 General

(a) Complete erosion control works to be in accordance with current Fisheries and Oceans Canada and Manitoba Environment guidelines.

(b) The following mitigation measures must be adhered to protect fish habitat:

(i) No in-channel construction activity shall be permitted during the time period of April 1 – June 15.

(ii) Use sediment and erosion control measures to prevent soil laden run off and silt from affecting downstream areas of the watercourse. Halt construction during periods of heavy rain or run off.

(iii) Monitor the work site to evaluate the effectiveness of erosion control measures and the physical stability of the creek bed and banks. Any problems are to be rectified immediately.

(iv) Conduct the cleaning, fuelling, and servicing of equipment a minimum of 100 m from any watercourse. Equipment operating near any watercourse should be free of external grease, oil, mud, or fluid leaks.

(v) Take necessary precautions to ensure deleterious substances, including silt, does not enter any watercourse. The deposit of deleterious substances into water frequented by fish is prohibited under the Fisheries Act.

(vi) Remove excess material from the excavation and place where it will not erode into any watercourse. Dispose all spoil materials above the high water mark and located such that they do no re-enter any watercourses.

(vii) Remove all dead vegetation, rubble, construction debris, and other materials from the creek area following the completion or works and prior to the restoration of vegetation.

E28. OUTFALL WORKS

E28.1 Description

E28.1.1 This Specification describes the special requirements for outfall construction, and shall amend and supplement Standard Specifications CW 2130, CW 2610 and CW 3615.

E28.2 Materials

E28.2.1 Outfall Piping

(a) The following materials are specified for use as outfall piping and ballast block connections. Locations are noted on the Construction Drawings. In addition to the requirements noted on the Drawing, the following is required:

(i) Corrugated Steel Pipe (CSP) to be Helically Corrugated Lockseam Pipe with Polymer protective film coating or approved equivalent in accordance with B7 with Diameter or cross-section, corrugation profile and wall thickness as specified on drawings. Step bevel end section to be shop constructed and to dimensions specified on drawings.

(ii) Coupling Systems for CSP to CSP connections to be Hugger Band type Couplers with Polymer protective film coating complete with O-ring Elastomeric or neoprene Gaskets, or approved equivalent in accordance with B7.

(iii) Touch-up sealant as recommended by supplier and compatible with pipe protective film coating.

E28.2.2 Bedding and Backfill Material for CSP

(a) A 300 mm thick layer of clean crushed limestone shall be installed beneath the CSP bedding to promote drainage of the riverbank in the vicinity of the pipe, conforming to Type 3 material from Table CW 2030.1.

(b) Bedding and backfill material for the CSP pipe surround shall be Class B bedding and pipe bedding and backfill with Type 3 material from Table CW 2030.1. The material shall not be frozen at the time of placement and compaction. The Contractor shall take such measures as are necessary to ensure embedment material is not placed in a frozen state.

(c) Trench backfill material above pipe surround shall be Class 4 compacted excavated material conforming to CW 2030 clause 3.8.

(d) Representative samples of all granular materials proposed for use for bedding and backfilling shall be submitted to the Contract Administrator for review as per CW 2030 clause 5.2.

E28.2.3 Geotextile

(a) Geotextile shall be a non-woven geotextile fabric, meeting or exceeding the properties specified for Separation Geotextile Fabric of CW 3130 clause 2.5.

E28.2.4 Galvanized Primer

(a) Galvanized primer for repair of coating shall be zinc rich, ready mix to CGSB-1-GP-181M.

E28.2.5 Bar Screens, Slip Joints and Bolts

(a) Shop drawings shall be submitted for outfall bar screens and slip joints, for installation at locations indicated on the drawings.

(b) Galvanizing shall be hot-dip conforming to requirements of CSA G164-N1981 to a minimum net retention of 600 g/m2. All bolts and nuts shall be typical steel, conforming to ASTM A-320 Grade B8M. All welding shall be fully approved by the Canadian Welding Bureau in conformance with CSA Standard W47.1. Welding shall be done by currently licensed welders only. Welding splatter and other fabricator burrs, where exposed, shall be ground off and/or filed smooth, and left ready for subsequent operations. All miscellaneous metal, after fabrication, shall be hot-dip galvanized. No separate measurement will be made for hot-dip galvanizing.

E28.2.6 Concrete Transition Collar and Ballast Block

(a) Concrete for the concrete transition collar shall be Type B concrete in accordance with Table CW2160.1 of CW 2160.

(b) To limit heating and hoarding requirements during cold weather, cold weather concrete shall have a minimum compressive strength of 20 MPa 24 hours after placement and be maintained at a minimum temperature of 10°C for 3 days following installation.

(c) Reinforcing steel shall conform to the requirements of CSA Standard G30.18, Grade 400W, Billet-Steel Bars for concrete reinforcement. All reinforcing steel shall be straight and free from paint, oil, mill-scale, and injurious defects. Surface seams or

surface irregularities will not be cause for rejection, provided that the minimum dimensions, cross section area, and tensile properties of a hand wire-brushed specimen are not less than the requirements of CSA Standard G30.18. If, in the opinion of the Contract Administrator, any reinforcing steel provided for the concrete works exhibits flaws in manufacture or fabrication, such material shall be immediately removed from the Site and replaced with acceptable reinforcing steel.

(d) Bar accessories including bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices shall be of a type approved by the Contract Administrator. They shall be made from a non-rusting material, and shall not stain, blemish, or spall the concreted surface for the life of the concrete.

(e) Ballast blocks complete with Corrugated Steel Pipe cradle and cast-in bolts may be constructed off-site. The Corrugated Steel Pipe cradle may be eliminated if the ballast block is constructed on-site.

E28.3 Construction Methods

E28.3.1 Shop Drawings

(a) The Contractor shall have a Shop Drawing submission prepared for the outfall pipe, slip joint and bar screen as per CW 1100 clause 3. The shop drawing submission shall be in sufficient detail to permit review of materials for compliance with this Specification and facilitate assembly in the field complete with connection details.

E28.3.2 Corrugated Steel Pipe (CSP)

(a) The CSP shall be installed as shown on the drawings and in accordance with CW 3610, and laid to the established line and grade.

E28.3.3 Bedding and Backfilling for CSP

(a) Construct the outfall underdrain layer and geotextile surround as indicated on drawings.

(b) Compact underdrain layer to 100% of Standard Proctor Maximum Dry Density.

(c) Bedding and backfill up to 300 mm above pipe crown to be hand tamped by mechanical means to a density sufficient to limit pipe deflection. Compaction to 95% of Standard Proctor Maximum Dry Density. Ensure that pipe bedding is tamped thoroughly in the haunch area.

(d) Backfill around pipe in maximum 300 mm lifts alternatively from side to side. At no time should the difference in backfill elevation on either side of the pipe be greater than 450 mm.

(e) The outfall piping may be braced internally in an approved manner to limit deflection during installation and backfilling. The struts must be removed subsequent to construction. If pipe deflects greater than 4% of internal diameter during construction or within the warranty period, the Contractor shall re-excavate to springline (or greater if required), re-establish sufficient side support and re-backfill as originally specified.

(f) Backfilling above 300 mm above the pipe shall be as per CW 2030 for Class 4 backfill. Contractor to ensure compaction equipment utilized is consistent with degree of compactive effort required and adequate protection against overloading pipe. Compact backfill over pipe perpendicular to trench. Any damage caused to the pipe as a result of construction operations will be rectified at the Contractor's expense. Only non-frozen material shall be used.

(g) The construction of clay plugs to isolate the pipe bedding from the riprap is not required for outfalls on this project.

E28.3.4 Geotextile Trench Wrap

(a) Install geotextile filter fabric to encase pipe surround above granular underdrain layer as indicated on the drawings. Install fabric between outer limits of excavation and granular bedding and backfill material. Ensure trench fully encased on top, bottom, sides, and at limits of excavation.

(b) Install long dimension of fabric perpendicular to trench overlapping joints a minimum of 600 mm.

(c) Place fabric such that the upstream or higher elevation layer overlaps the downstream or lower elevation layer.

E28.3.5 Concrete Connection Collar and Ballast Block

(a) No “stay-in-place” formwork is permitted.

E28.4 Measurement and Payment

E28.4.1 Corrugated Steel Pipe shall be measured on a length basis, measured along the invert of the pipe from the specified connection point at the concrete transition collar chamber to the end of the step bevel section. Payment will be made at Contract Unit Price for "CSP" for each pipe diameter or cross-section and wall thickness indicated, and shall include the supply and installation of pipe couplers, excavation, bedding and backfill, underdrain layer, geotextile trench wrap, and associated works.

E28.4.2 Outfall Bar Screens shall be measured on a unit basis for each size and configuration of bar screen supplied and installed. Outfall bar screens shall be paid for at the Contract Unit Price per unit, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

E28.4.3 Outfall slip joints shall be measured on a unit basis for each size and configuration of slip joint supplied and installed. Supply and installation of outfall slip joints shall be paid for at the Contract Unit Price per unit, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

E28.4.4 Concrete transition collars between concrete pipe and corrugated steel pipe shall be measured on a unit basis for each size and configuration of collar constructed. Construction of concrete transition collars shall be paid for at the Contract Unit Price per unit, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

E28.4.5 Concrete ballast blocks for CSP shall be measured on a unit basis for each size and configuration of ballast block constructed either on-site or off-site. Construction of ballast blocks shall be paid for at the Contract Unit Price per unit, measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification.

E29. RIVERBANK EXCAVATION

E29.1 Description

E29.1.1 This specification describes requirements for surface excavation near Assiniboine River including topsoil and vegetation removal, and shall amend and supplement CW 3170.

E29.2 Materials

E29.2.1 Excavation and Fill

(a) Surplus excavated material required for backfilling the outfall pipe shall be stockpiled on site at a location away from the top of the Assiniboine River bank for later use on site.

E29.3 Construction Methods

E29.3.1 Excavation of the river bank shall be to the lines and grades shown on the drawings or as required.

E29.3.2 Limited vegetation and topsoil removal may be required to facilitate the Works. Existing vegetation shall not be removed without prior approval from the Contract Administrator. The Contractor shall load and haul any removed vegetation, and dispose of the material off site.

E29.3.3 Stockpiling will not be permitted near the top of the bank. Excavated material should be removed from the vicinity of the river immediately upon excavation. No temporary material piles may remain near the river bank for longer than one hour during the excavation process, and the Contractor should pace the excavation to keep up with the removal from site.

E29.3.4 The contractor shall employ sediment control measures as outlined in E30 and E31 to control the release of sediment into the river.

E29.4 Measurement and Payment

E29.4.1 Stripping of vegetation and topsoil shall not be measured or paid for directly, but shall be included in the cost of riverbank excavation.

E29.4.2 Excavation for flattening existing slopes, subcutting for riprap installation, and course grading of the impacted area for soil amendment and revegetation will be measured on a volume basis in cubic meters and paid for at the Contract Unit Price for “Riverbank Excavation’.

E30. SILT FENCE

E30.1 Description

E30.1.1 This specification covers the erection of temporary silt fencing, which shall be installed and maintained at the locations shown on the drawings (detail drawing is attached), to control runoff and minimize the release of detrimental silt loadings to watercourses. The scope of work included in this specification is as follows:

(a) Supply and Install temporary silt fencing at locations as indicated, in accordance with the detail drawing provided, 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 cleanup 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.

E30.2 Materials

E30.2.1 Fence Posts

(a) Fence posts shall be 38x38 mm untreated wood posts, 41 mm steel Tee posts, or punched steel U posts, minimum length of 1.2 m or as specified on the drawings.

E30.2.2 Filter Fabric

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

Property	Test Method	Value
Grab Tensile Strength	ASTM D4632	0.55 kN
Grab Tensile Elongation	ASTM D4632	15%
Mullen Burst	ASTM D3786	2060 kPa
Puncture	ASTM D4833	0.285 kN
Trapezoid Tear	ASTM D4533	0.285 kN
UV Resistance	ASTM D4355	80% @ 500 hrs
Apparent Opening Size (AOS)	ASTM D4751	0.60 mm
Flow Rate	ASTM D4491	405 l/min/m²

(b) The fabric shall be inert to commonly encountered soil chemicals, hydrocarbons, mildew and bacteria.

E30.2.3 Wire Mesh

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

E30.2.4 Fencing Material Fasteners

(a) Staples or wire ties of sufficient strength and spacing to withstand a 530N (120lbf) pull test at any point on the wire mesh.

E30.3 Construction Methods

E30.3.1 Ensure that no deleterious substances are discharged into the adjacent watercourse at any time during construction activities

E30.3.2 Silt Fence Installation

(a) Excavate 150 x 150 anchor trench along alignment of silt fence as indicated.

(b) Install fence posts as indicated. Ensure that fence posts are firmly driven into undisturbed soil, or are completely and firmly backfilled if installed via auger methods.

(c) Attach wire mesh as support backing for silt fence filter fabric with specified 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.

(d) Install and compact impermeable excavated materials into anchor trench and slope as indicated. Compact to 95% of maximum dry density (ASTM D-698).

E30.3.3 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 specified installation procedure. If silt fence is found to be loose or torn, repair or replace as necessary to comply with installation procedure.

(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.

E30.3.4 Silt Fence Removal

(a) Remove silt fences following completion of all site construction activities (including final restoration and cleanup) and after installation of all permanent erosion control measures and satisfactory establishment of permanent vegetation.

(b) Restore areas disturbed, without releasing any deleterious substances to the adjacent watercourse.

E30.4 Measurement and Payment

E30.4.1 Silt fencing will be measured on a length basis, and paid for at the Contract Unit Price per lineal meter for “Supply, Install and Maintain Silt Fence”. The length of silt fencing to be paid for will be the total length of silt fencing installed and maintained in accordance with

this Specification as computed from measurements verified by the Contract Administrator. Payment for silt fencing shall be in accordance with the following schedule:

(a) Sixty percent (60%) of the quantity shall be paid following supply and installation.

(b) Forty percent (40%) shall be paid following final removal.

E30.4.2 Removal of accumulated sediment from the silt fence is considered incidental to the Work and no separate measurement or payment will be made.

E31. SEDIMENT CONTROL MEASURES

E31.1 Description

E31.1.1 This Specification covers the supply, implementation and maintenance of erosion control measures to control the release of sediments into the creek during and following construction.

E31.1.2 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.

E31.2 Materials

E31.2.1 The Contractor shall maintain a supply of erosion control products such as erosion control blankets, silt fencing, straw bales, booms or mulch on site at all times suitable for trapping and preventing sediments from entering the river.

E31.3 Construction Methods

E31.3.1 Contractor shall be responsible for maintaining sediment control measures at the site to prevent sediment releases into the river from areas disturbed as a result of his work during and following construction

E31.3.2 Sediment control measures shall be implemented to meet Fisheries and Oceans Canada guidelines identified in E27.

E31.3.3 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 measures as required in the event that there is runoff from the site.

E31.3.4 As a minimum, temporary silt fences or straw booms shall be installed along the down-slope edges of all areas where the vegetation has been disturbed, soils are exposed, or fills have been placed.

E31.3.5 The silt fences and booms shall be attached to secure stakes and trenched in to the ground such that there are no gaps and the fencing will not be undermined.

E31.3.6 The silt fences shall be inspected, maintained and repaired as required.

E31.3.7 During rain storms the Contractor shall inspect the silt fences and booms at least daily and more frequently if required. Trapped sediments shall be removed as required, during or immediately following each rainstorm. All trapped sediments shall be removed from the site.

E31.3.8 Upon completion of the construction work, all surplus or waste materials, and materials containing fine-grained sediments shall be removed from the site.

E31.3.9 The Contractor shall monitor, maintain, repair, etc. the sediment control measures until vegetation has established in restored areas and there no longer is a potential for sediment releases due to construction.

E31.4 Measurement and Payment

E31.4.1 No measurement or payment shall be made for sediment control measures during or after construction. This work shall be incidental to the Work performed under this Contract and no separate measurement or payment will be made.

E32. RIPRAP

E32.1 Description

E32.1.1 This Specification covers all operations necessary for placing riprap as shown on the drawings or determined by the Contract Administrator. This Specification amends and supplements Standard Specification CW 3615.

E32.2 Materials

E32.2.1 Random Stone Riprap

(a) Hard, durable Fieldstone that is resistant to the action of water and frost and suitable in all respects for the purpose intended, and in accordance with CW 3615.

(b) Rock for use in random stone riprap shall be well graded with rock ranging to CW 3615 clause 5.2. Select larger stones may be required if specified on the drawings.

(c) Rock to match appearance and be of same type as existing riprap on site.

(d) Rock shall be comprised of smooth, rounded, waterworn or glaciated limestone, granite, or other quality dense rock. Limestone shall be durable white crystalline limestone. Softer buff to yellow dolomite or dolostone will not be acceptable. Crushed rock will not be acceptable.

(e) Fieldstone Riprap must conform to the following physical requirements:

(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 13% (ASTM C88)

(f) Rock samples shall either be submitted to the Contract Administrator for approval ten (10) days prior to their use, or the Contract Administrator shall visit the quarry for inspection a minimum of ten (10) days prior to use. No rockfill will be permitted without providing the source and supplier. The Contract Administrator shall perform the necessary tests to determine compliance with the specified properties.

E32.2.2 Geotextile Underlay

(a) Geotextile shall be a non-woven geotextile fabric, meeting or exceeding the properties specified for Separation Geotextile Fabric of CW 3130 clause 2.5.

E32.3 Construction Methods

E32.3.1 Riprap shall be installed to the elevations, grades, thickness and dimensions as shown on the Drawings, or as directed by the Contract Administrator.

E32.3.2 Install geotextile underlay where shown on the drawings. Overlap layers a minimum of 600 mm.

E32.3.3 Riprap shall be placed in a manner that prevents damage to geotextile underlay.

E32.3.4 Riprap shall be placed in a manner such that larger pieces are uniformly distributed, smaller rocks fill the spaces between the larger rocks, and that excessive segregation of the various rock sizes does not occur.

E32.3.5 Locations requiring segregated riprap or the placement of select large stones for fish passage, sediment passage or energy dissipation as indicated on the drawings.

E32.3.6 Existing large boulders on site will be relocated onto the new riprap as directed by the Contract Administrator

E32.4 Measurement and Payment

E32.4.1 Supply and installation of rip-rap will be measured on an area basis, based on the total number of square metres for each specified depth of riprap supplied, delivered and placed in accordance with this Specification and as accepted by the Contract Administrator. Payment shall be at the Contract Unit Price for "Supply and Install Fieldstone Riprap".

E32.4.2 Reuse of existing large boulder riprap, including excavation, stockpiling, and replacement will not be measured or paid for directly, but shall be included in the cost of "Supply and Install Fieldstone Riprap".

E32.4.3 Geotextile underlay will be measured on an area basis. Based on the total number of square metres of geotextile coverage area supplied and placed in accordance with this specification, accepted and measured by the Contract Administrator. Payment shall be at the Contract Unit Price "Geotextile Underlay".

E33. SOIL AMENDMENTS AND FINISH GRADING

E33.1 Description

E33.1.1 Surface soils on the banks of Assiniboine River will be amended with peak moss and sand prior to seeding. Replacement of topsoil using imported topsoil is not desired due to the potential for introducing noxious weeds.

E33.1.2 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3540 "Topsoil and Finish Grading for Establishment of Turf Areas", and shall cover supply and installation of soil amendments including preparation of existing grade and finish grading.

E33.2 Materials

E33.2.1 Peat moss shall be decomposed plant material, fairly elastic and homogenous, free of colloidal residue, wood, sulphur and iron; containing a minimum of 60% organic material by weight, with moisture content not exceeding 15%. Shredded particles shall not exceed 6 mm in size. Minimum pH value of peat shall be 4.5; maximum 6.0.

E33.2.2 Sand shall be hard, granular, sharp sand to CSA A82.56-M1976, well-washed and free of impurities, chemicals and organic matter.

E33.2.3 Chemical Application of Roundup or similar chemical herbicides approved by Agriculture Canada shall be used only with the approval of the Contract Administrator.

E33.3 Construction Methods

E33.3.1 Soil amendment for native grass shall consist of a mix of 60% peat moss and 40% sand, loose by volume.

E33.3.2 Preparation of Existing Grade to CW 3540, section 9.2.

E33.3.3 Cross-cultivate the entire area of soil base that is to receive soil amendments to a depth of 100 mm. Redo areas where equipment used for hauling and spreading has re-compacted sub-grade.

E33.3.4 Spread 30 mm of peat moss and 20 mm sand over the area of soil amendments.

E33.3.5 Roto-till or disc the peat moss and sand into the top 100 mm of base material and mechanically roll to obtain a level surface.

E33.3.6 Grade to eliminate rough spots and low spots and to maintain positive drainage.

E33.3.7 Consolidate seedbed to required bulk density using equipment approved by the Contract Administrator. Leave surfaces smooth, uniform and firm against deep foot-printing.

E33.4 Measurement and Payment

E33.4.1 Soil amendment and finish grading shall be measured on an area basis and paid for at the Contract Unit Prices for the “Soil Amendment and Finish Grading”. The total area to be paid for shall be the number of square metres of soil amended and graded in accordance with this Specification, measured and accepted by the Contract Administrator.

E34. CHEMICAL CONTROL OF VEGETATION

E34.1 Description

E34.1.1 This specification covers the requirements for the application of herbicides for broad area weed control prior to seeding operations, or spot control of herbaceous weed species from Native Grass seeded areas.

E34.1.2 The need for broad area weed control will be assessed following soil amendment and prior to seeding, and may be omitted at the Contract Administrator’s discretion.

E34.2 Safety Requirements

E34.2.1 Comply with Federal, Provincial, pesticide control regulations. Provide Material Safety Data sheets (MSDS) for all chemicals to be used.

E34.2.2 Obtain Provincial Pesticide Applications License and any other permits and licenses necessary to complete work.

E34.2.3 Comply with label directions on the use of herbicide products.

E34.2.4 Comply with label directions as to ambient temperature ranges for application.

E34.3 Materials

E34.3.1 Delivery and Storage

(a) Deliver, store and maintain packaged materials with manufacturer's seals and labels intact.

(b) Prevent damage, adulteration and soiling of material during delivery, handling and storage.

(c) Store material in accordance with label directions, including those on maximum and minimum storage temperatures.

(d) Store herbicide products in original containers as supplied by manufacturer and keep sealed until used.

(e) Store herbicide products in sheltered, well ventilated, controlled access location.

(f) Do not store herbicides near feeds and food stuffs, agricultural plants, seeds, fungicides, insecticides, fertilizers or other agricultural chemicals.

(g) Identify storage area as pesticide storage facility for fire protection purposes.

(h) Post in a prominent place a list of medical and fire department telephone numbers.

(i) Post in a prominent location on the outside of the storage area a list of products stored. Provide a copy of this list to fire department. Keep list up to date.

E34.3.2 Herbicides

(a) Select appropriate herbicides to achieve specified control requirement. Refer to Manitoba Guide to Chemical Weed Control.

(b) Herbicide products used must be registered for such use by Agriculture Canada under Pest Control Products Act.

(c) Do not use herbicides containing sodium chlorate.

E34.3.3 Adjuvants

(a) Adjuvants shall be compatible with herbicide product used.

E34.3.4 Spray Equipment

(a) Tank Spray: Do not use air-blast, mist or fog sprayer. Sprayer unit to meet the following requirements:

(i) Sprayer shall have adjustable height boom, hose and handgun for spot treatments, strainers and nozzles to produce spray pattern compatible with job.

(ii) Tank shall be equipped with continuous agitation device.

(iii) Pressure gauge and regulator shall be capable of maintaining uniform pressure between 100 and 450 kPa (15 and 65 psi).

(b) Backpack Sprayer: Sprayer shall have hose and handgun for spot treatment.

(c) Equip spray tank loading pipe with check valve located within one metre of pump or hydrant to prevent siphoning from spray tank resulting in contamination of water source.

E34.4 Construction Methods

E34.4.1 Notice of Spray Operation

(a) Post areas to be treated with signs placed at each road access and 100 m intervals around perimeter.

(b) Indicate on signs that spray program is being implemented.

(c) Put signs in place prior to commencement of spray operation and retain in place for 24 hours after spray operation is completed for each particular area.

E34.4.2 Environmental Protection

(a) Application may continue only when wind velocities range between 2 and 10 km/h.

(b) Do not spray when air turbulence will prevent uniform application.

(c) In case of herbicide spill, notify Contract Administrator and Provincial Ministry of Environment verbally immediately and subsequently in writing.

(d) Do not allow drifting beyond target area. Use mechanical method to minimize herbicide drift.

(e) When spraying adjacent to desirable vegetation, use sprayer fitted with protective hood suitable to prevent contamination or provide protective covering for such vegetation while spray is in progress.

(f) Do not apply sterilants to slopes greater than 3 to 1 where killing vegetation would lead to erosion problems.

E34.4.3 Application of Herbicides

(a) Treat areas as indicated with appropriate herbicides.

(b) Calibrate equipment to achieve manufacturer's recommended application rates.

(c) Confine herbicide application to areas as indicated to achieve specified control requirements.

(d) Space successive passes to provide uniform coverage of treated area.

(e) Use flagmen or other aids as necessary to indicate successive passes.

(f) Where roots of desirable vegetation run under treatment area, use contact herbicides.

(g) Ensure formulation and rate of sterilant will not lead to leaching outside treatment area.

(h) Retreat areas in accordance with label directions until specified control requirements are achieved.

(i) Use flags or other aids as necessary to indicate successive passes.

E34.4.4 Given the need for weed control, the Contractor shall have in his possession a Pesticide Applicator's License and a Pesticide Use Permit for pesticide applications related to this Specification.

E34.4.5 The Contractor shall apply herbicide with spot spraying when broadleaf weeds start developing in competition with grasses. Apply herbicide in accordance with the City of Winnipeg Weed Control Standards and Procedures, manufacturer's instructions and the Manitoba Agriculture Guide to Crop Protection and Herbicide Recommendations for Landscape Applicators, latest editions and the following criteria:

(a) Use 2,4-D Amine or MCPA Amine herbicide for susceptible broadleaf weeds.

(b) Use a mixture containing 2,4-D Amine or MCPA Amine, Mecoprop and Dicamba for 2,4-D resistant plants.

(c) Do not apply to newly seeded areas.

(d) Do not water within one working day after application.

(e) Apply when winds are less than 20 km/h and air temperature is above 10° (degrees) Celsius.

(f) Avoid use of pure Dicamba solutions near trees and shrubs.

E34.4.6 The Contractor shall inform the Contract Administrator immediately of any dangerous occurrence.

E34.4.7 Control Requirements

(a) For weed control, achieve within 30 days of treatment, minimum of 90% kill of target plants without damaging installed plant material.

(b) For soil sterilization, achieve within 12 months of treatment, 100% kill of vegetation.

E34.4.8 Waste Disposal

(a) Triple rinse empty herbicide containers with dilutent and add rinsate to spray mixture in tank.

(b) Puncture and crush glass, plastic, and metal containers making them unsuitable for further use.

(c) Dispose of containers in accordance with Provincial requirements.

(d) Do not rinse or wash spray tanks and equipment on site.

E34.5 Measurement and Payment

E34.5.1 Chemical Control of Vegetation: Broad scale application of chemical herbicides following soil amendment will be paid for on an area basis at the Contract Unit Price per square metre for "Chemical Application of Herbicide". The area paid for shall be the total number of square metres sprayed in accordance with this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

E34.5.2 Spot Weed Control: Application of chemical herbicides to control excessive weed growth in seeded areas following completion of planting operations will be incidental to Seeding.

E35. NATIVE GRASS SEEDING

E35.1 Description

E35.1.1 This specification shall amend and supplement City of Winnipeg Standard Construction Specification CW 3520 "Seeding", and shall cover all aspects of supply and installation of native grass seed, including preparation of finish grade, hydro mulching, and maintenance.

E35.2 Materials

E35.2.1 Provide the Contract Administrator with Certificates of Analysis and mix compositions for all seed mixes. Include supplier's name and telephone contact information, and percentages of each species and cultivar in each mix.

E35.2.2 Obtain Contract Administrator's approval for any proposed adjustments to the seed mix species or cultivars.

E35.2.3 Native Grass seed mix for the partly shaded riverbank area shall be a mixture of the following species and cultivars, at the percentage by weight indicated:

(a) 20% Big bluestem (Andropogon gerardii)

(b) 20% Canada wild rye (Elymus canadensis)

(c) 20% Switch grass (Panicum virgatum)

(d) 10% Awned wheatgrass (Agropyron trachycaulum)

(e) 10% Streambank wheatgrass (Elymus lanceolatus)

(f) 10% Fowl blue grass (Poa palustris)

(g) 10% Prairie cord grass (Spartina pectinata)

E35.2.4 Cover crop (Nurse Crop) shall be Oats in all seeded areas.

E35.2.5 Hydro Mulch, water and tackifier shall be in accordance with CW 3520, clause 5.6

E35.3 Construction Methods

E35.3.1 Seed Native Grass mix with a Brillion Seeder, or equal, on 100 mm compacted depth of amended soil.

E35.3.2 Sow Native Grass seed mix at a rate of 28 kg/ha.

E35.3.3 Sow cover crop at 54 kg/ha.

E35.4 Maintenance Methods

E35.4.1 Immediately after the completion of the seeding operation, to the satisfaction of the Contract Administrator, the Contractor shall commence and pay for continuous maintenance of the seeded area until the criteria specified for Termination of the Maintenance Period listed herein.

E35.4.2 Any deficient, damaged or vandalized areas shall be reseeded by the Contractor within three working days after receiving notification from the Contract Administrator and the area so reseeded, shall be further maintained until it meets the Termination of the Maintenance Period criteria.

E35.4.3 In situations where commencement of the Maintenance Period is not granted by the Contract Administrator before the end of a growing season, the Maintenance Period will commence on May 15 of the following year or such date as is mutually agreed upon by all parties.

E35.4.4 The Contractor shall water hydro mulched areas as required to obtain optimum soil moisture levels for germination and continued growth of plants. Control the watering to prevent seed washouts. Water shall be applied in sufficient quantities to saturate seeded area to a minimum depth of 100 mm. All costs to provide water for seeded areas shall be borne by the Contractor.

E35.4.5 The Contractor shall mow Native Grass areas when grasses exceed 300 mm in height, mow to 150 mm height.

E35.4.6 Additional mowing, to a height of 100 mm, shall be completed upon the direction of the Contract Administrator, as required to remove extensive weed growth and/or to maintain healthy growth of native grasses.

E35.4.7 The Contractor shall use chemical weed control, 2-4 D or Diacamba, only as required to spot remove weeds in localized areas and in accordance with E34. Use only chemicals approved by Agriculture Canada.

E35.4.8 The maintenance period shall be terminated after the following criteria have been met:

(a) The certified seed sowed meets the requirements of CW 3520;

(b) The seeded area is free of debris, including leaves;

(c) The seeded area has a firm, uniform and even surface;

(d) Seeded grasses or plants show healthy, vigorous growth;

(e) The area is free of bare and dead spots and with less than 10 noxious weeds per 50 square metres;

(f) The seeded area has sufficient growth density that bare spots do not exceed 5% of total surface area, and

(g) Seeded areas are free of damaging insects.

E35.5 Measurement and Payment

E35.5.1 Native Grass mix hand seeded or hydroseeded on amended soil shall be measured on an area basis and paid for at the Contract Unit Prices for the “Native Grass Seeding”. The total area to be paid for shall be the number of square metres of Native Grass seed mix installed and maintained in accordance with this Specification, measured and accepted by the Contract Administrator. Payment for seeding shall be in accordance with the following schedule:

(a) Sixty percent (60%) of quantity following supply and placement.

(b) Remaining forty percent (40%) of quantity following termination of the maintenance Period.

E35.5.2 There will be no separate measurement for cover crop (nurse crop) seeding. Seeding of a nurse crop will be included in payment for other seeding operations.

E35.5.3 There will be no separate measurement for materials, equipment and operations related to the use of herbicides and insecticides.

E36. EROSION CONTROL BLANKET

E36.1 Description

E36.1.1 This Specification covers supply, installation and maintenance of the biodegradable erosion control blanket for use as long-term erosion protection for the revegetated portion of the riverbank.

E36.1.2 This Specification shall amend and supplement Standard Specification CW 3130.

E36.1.3 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.

E36.2 Materials

E36.2.1 The geotextile shall be a 100% coconut fibre matrix with top and bottom net, and long-term (3 year) biodegradable net, thread and matrix and meeting or exceeding the following properties:

Erosion Control Blanket Properties			
	ASTM Test Method	**Units**	**Minimum Average Value**
PHYSICAL			

Mean Tensile Strength	D-6818	kN/m	6.5 kN/m at 10% elongation
Transverse Tensile Strength	D-6818	KN/m	4.0 kN/m at 15% elongation
Mass/Unit Area	D-6475	g/m2	300
Thickness	D-6525	mm	6.6
Light Penetration	D-6567	%	10%
Functional Longevity		years	3

Example: Erosion Control Blanket C32BD.

E36.3 Construction Methods

E36.3.1 Installation, handling and storage of blanket shall conform to the manufacturer's recommendations and specifications, and the above requirements.

E36.3.2 Spread and roto-till growing medium materials into the bank prior to installation of erosion control blanket.

E36.3.3 Erosion control blanket shall be installed on all exposed areas of the graded riverbank at or exceeding 1:2.5 (rise/run slopes) above the riprap.

E36.3.4 The geotextile shall be securely held in place in conformance with the manufacturer's recommendations and specifications.

E36.3.5 The geotextile shall be placed in accordance with CW 3130, with following exceptions:

(a) The joints shall be overlapped 0.6m in a shingle pattern, with the up-slope pieces overlapping the down-slope pieces.

E36.3.6 Tears or other damage in the geotextile erosion control blanket shall be repaired with a piece of geotextile fabric placed over the damaged area and extending 1.0 m in all directions beyond the damaged area.

E36.3.7 Geotextile erosion control blanket shall be installed following the spring thaw and flooding, and shall be maintained until the end of the vegetation maintenance period.

E36.4 Measurement and Payment

E36.4.1 Geotextile erosion control blanket will be measured on an area basis and measured as the area covered by erosion control blanket. The area to be paid for shall be the total number of square metres (s.m.) of geotextile supplied and installed in accordance with this Specification as computed from measurements made by the Contract Administrator. Payment shall be at the Contract Unit Price for "Supply, Install and Maintain Biodegradable Erosion Control Blanket".

E37. TREES AND SHRUBS

E37.1 Description

E37.1.1 General

(a) This specification covers the supply and installation of nursery-grown trees and shrubs plantings in areas to be determined by the Contract Administrator, including preparation, digging, transport and planting, and maintenance.

E37.1.2 Nomenclature

(a) Nomenclature of specified nursery stock shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the names accepted in the nursery trade.

E37.1.3 Source Quality Control

(a) All nursery stock supplied shall be nursery grown and of species and sizes as indicated on the Drawings. Nursery stock shall be No. 1 Grade material in accordance with the current edition of Landscape Canada's (CNTA) "Guide Specifications for Nursery Stock".

(b) Any nursery stock dug from native stands, wood lots, orchards, or neglected nurseries, which have not received proper cultural maintenance, shall be designated as "collected plants". Obtain permission of the Contract Administrator to use collected plants.

(c) The Contractor shall notify Contract Administrator of source of plant material at least seven (7) days in advance of shipment.

(d) Acceptance of plant material at source does not prevent rejection of same plant material on site prior to or after planting operations.

(e) Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

E37.1.4 Shipment and Pre-Planting Care

(a) Coordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.

(b) Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire, which would damage bark, break branches or destroy natural shape of plant. Give full support to root balls, especially of large trees, during lifting.

(c) Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peat, saw dust or other acceptable material to prevent loss of moisture during transit and storage.

(d) Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.

(e) Keep roots moist and protect from sun and wind. Heel-in trees and shrubs that cannot be planted immediately in shaded areas; water well.

E37.1.5 Replacement

(a) During the first year following completion of planting operations, remove from site any plants that have died or failed to grow satisfactorily, as determined by the Contract Administrator. As an example, plant material installed in 2017 that has failed to grow satisfactorily and has not been replaced by October 31, 2017, would be required to be replaced in the spring of 2018.

E37.2 Materials

E37.2.1 Water

(a) Water shall be potable and free of minerals that may be detrimental to plant growth.

E37.2.2 Fertilizer

(a) Fertilizer shall be slow release organic. Fertilizer shall contain N-P-K in ratio as recommended by soil test results from an approved agricultural soil testing laboratory.

E37.2.3 Root Ball Burlap

(a) Root ball burlap shall be 150 g Hessian burlap.

E37.2.4 Anti-desiccant

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

E37.2.5 Wound Dressing

(a) Wound dressing shall be horticultural accepted non-toxic, non-hardening emulsion.

E37.2.6 Plant Material

(a) All plant material specified for this project shall be containerized and/or ball and burlap nursery stock. All plants shall be from the Winnipeg area.

(b) Comply with latest edition of the “Guide Specification for Nursery Stock”, produced by Landscape Canada (CNTA), referring to quality, size and development of nursery grown plant material and root balls.

(c) Nursery stock shall be No. 1 grade trees, shrubs and vines.

(d) All plant material shall be measured when branches are in their natural position. Height and spread dimensions specified in the Plant List in this specification, refer to the main body of the plant, and not from branch tip to root base or from branch tip to branch tip. Where trees are measured by calliper (cal.), reference is made to the diameter of the trunk measured at 300 mm above ground as the tree stands properly planted in the nursery.

(e) Material sources are to be approved by Contract Administrator prior to ordering. The Contractor shall provide all of the necessary nursery certificates to ensure that the plant species comply with this specification.

(f) All trees shall have one, only, sturdy, reasonably straight and vertical trunk, and a well-balanced crown with fully developed leader, unless designated “multi-stem”. All evergreens shall be symmetrically grown and branched from ground level, up.

(g) Use trees and shrubs with structurally sound, strong fibrous root systems, and free of disease, insects, defects or injuries, including rodent damage, sun scald, frost cracks, abrasions or scars to the bark. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.

(h) All parts of the plants shall be moist and show live, green cambium tissue when cut. (i) At least one (1) plant of each variety supplied shall bear a tag showing both the botanical and common name of the plant.

E37.2.7 Additional Plant Material Qualifications:

(a) Imported Plant Material

(i) Plant material obtained from areas with milder climatic conditions from those of site acceptable only when moved to site prior to the breaking of buds in their original location and heeled-in in a protected area or placed in cold storage until conditions suitable for planting. Obtain Contract Administrator’s approval to use imported plant material.

(b) Cold Storage

(i) Approval required for plant material that has been held in cold storage.

(c) Container-Grown Stock

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

(d) Balled and Burlapped Plant Material

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

(e) Tree Spade Dug Material

(i) Obtain approval of the Contract Administrator for digging plant material with mechanized digging equipment, hydraulic spade or clam-shell type. This type of digging is typically not acceptable for boulevard tree plantings. Dig root balls to

satisfy Landscape Canada (CNTA) standards. Lift root ball from hole, place in wire basket designed for purpose, line with burlap. Tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.

(f) Substitutions

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

E37.2.8 Plant List

(a) Deciduous Trees (Balled and Burlapped or Container)

(i) *Acer negundo* (Manitoba Maple) / 60-70mm calliper.

(ii) *Populus deltoides occidentalis* (Plains Cottonwood) / Whip 1.0 Ht.

(iii) *Tilia americana* (American Basswood) / 60-70mm calliper.

(iv) *Tilia americana* (American Basswood) Whip 1.0 Ht.

(v) *Ulmas americana* (American Elm) / 60-70mm calliper.

(vi) *Ulmas americana* (American Elm) Whip 1.0 Ht.

E37.3 Construction Methods

E37.3.1 Workmanship

(a) The Contract Administrator shall stake out location of trees prior to excavating.

(b) The Contractor shall obtain clearances from all utilities, with respect to underground lines located in the areas to be excavated, prior to commencing planting operations.

(c) The Contractor shall apply anti-desiccant in accordance with material manufacturer's instructions.

(d) The Contractor shall coordinate planting operations; keep the site clean and planting holes drained, and immediately remove soil or debris spilled onto pavement.

E37.3.2 Planting Time

(a) The Contractor shall plant deciduous plant material during dormant period before buds have broken. Plant material noted for spring planting only must be planted in dormant stage.

(b) Plant material imported from region with warmer climatic conditions may only be planted in early spring.

(c) When permission has been obtained to plant deciduous plant material after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.

(d) When permission has been obtained, trees, shrubs and ground covers growing in containers may be planted throughout growing season.

(e) Plant only under conditions that are conducive to health and physical conditions of plants.

(f) The Contractor shall advise the Contract Administrator about the planting schedule at least three (3) days prior to planting operations.

E37.3.3 Excavations

(a) Trees: excavate to depth such that the top of the root ball is even with existing grade, with a surface width of two times the diameter of the root ball. Backfill around trees with planting soil mixture.

(b) The sides of all tree pits shall be scarified to the depth of one shovel blade.

(c) Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved by Contract Administrator.

(d) Protect the bottoms of excavations against freezing.

(e) Remove water that enters excavations prior to planting. Ensure source of water is not ground water.

E37.3.4 Planting

(a) Trees shall be placed on undisturbed soil and to a depth equal to that at which they were originally growing at the nursery.

(b) For shrubs, loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum of 150 mm of planting soil mixture.

(c) Plant trees and shrubs vertically, with roots placed straight out in hole. Orient plant material to give best appearance in relation to structures, roads and walkways.

(d) Place plant material to depth equal to depth they were originally growing in nursery or in locations collected.

(e) Ball and burlap root balls: loosen burlap and cut away minimum top 1/3 without disturbing root ball. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non-biodegradable wrappings must be removed.

(f) Tree spade excavated materials:

(i) Tree spade planting shall be permitted only by approval of the Contract Administrator.

(ii) Dig tree pit with same mechanical equipment as used to dig plant material. Ensure hole dug is upright as possible. Place in hole a mixture of 40 L of planting soil and fertilizer mixed with water to soupy consistency. This will be forced up sides of ball as root ball is placed in hole.

(iii) Loosen bottom of planting hole to depth of 150 to 200 mm. Cover bottom of each excavation with minimum 150 mm topsoil mixture.

(g) Tamp planting soil mixture around root system in layers of 150 mm eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has been completely penetrated into soil, complete backfilling.

(h) Excavate 200 mm depth an additional 600 mm beyond planting pits around the perimeter of all tree planting pits, and fill with planting soil mixture.

(i) Construct 100 mm deep saucers around the outer edge of planting pits to assist with maintenance watering.

(j) When planting is completed apply slow release organic fertilizer at minimum rate of 12 kg/100 m for shrub beds or 50 g/mm of calliper for trees, or as recommended by the soil analysis. Mix fertilizer thoroughly with top layer of planting soil and water in well.

E37.3.5 Pruning

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

E37.3.6 Standards

(a) All roots shall be cleanly cut; split roots are not acceptable.

(b) Branches and trunks shall be tied and protected; broken or abraded branches or trunks are not acceptable.

(c) Planting shall be protected from drying conditions; desiccated material not acceptable.

(d) All plants shall be free of insects and disease: galls, blight and other manifestations of insect infestation or disease not acceptable.

E37.3.7 Wood Chip Mulch

(a) Wood chip mulch shall extend under all tree limbs, but shall not be installed within 150 mm of the tree trunk.

(b) The saucers of all trees not planted in beds shall be covered with a 100 mm depth of wood chip mulch.

E37.3.8 Maintenance

(a) Watering

(i) Plant material shall be watered once a week for first four weeks following installation, and once every second week, thereafter. Ensure adequate moisture in root zone at freeze-up.

(b) Weeding

(i) Keep mulched shrub beds and tree saucers weed-free by manually removing weeds during the maintenance period.

(c) Insects and Diseases

(i) Spray plants to combat pests and diseases. Use organic chemical insecticides approved by Agriculture Canada.

(d) Adjustments

(i) Make adjustments requested by the Contract Administrator, including straightening trees, tightening guy wires and removing tree stakes.

(e) Maintenance Period

(i) Maintain plant material for a period of two years following acceptance to start maintenance period of planting operations, as determined by the Contract Administrator.

E37.4 Measurement and Payment

E37.4.1 Trees and Shrubs

(a) Supply and installation of trees and shrubs will be measured on a unit price basis for each tree and shrub listed on the Plant List and paid for at the Contract Unit Price for each species and size shown on the Plant List. The number of trees and shrubs to be paid for will be the total number of trees and shrubs installed in accordance with this specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

(b) Supply and installation of fertilizer for plant material will be included in payment for the plant material.

E38. CASH ALLOWANCE FOR PARK AMENITY REPLACEMENT AND REPAIR

E38.1 Description

E38.1.1 The Cash Allowance for Park Amenity Replacement and Repairs is intended to be used for replacement of playground equipment and repairs as directed and authorized by the Contract Administrator.

E38.1.2 The City reserves the right to delete any or all of the Cash Allowance from the Contract if the Work intended to be covered by the Cash Allowance is not required, or if the Works intended are found to be more extensive than the provisional Cash Allowance.

E38.2 Measurement and Payment

E38.2.1 Cost of repairs shall be evaluated by the methods outlined in C7.4, and a Change Order prepared by the Contract Administrator. The cost of the Change Order will be paid on the

Progress Estimate and deducted from the Cash Allowance. If the valuation of the authorized work exceeds the Value of the Cash Allowance, the Contract Value will be adjusted by the shortfall.

E39. NESS AVENUE AND ALCOTT STREET FLAP GATE REPLACEMENT

E39.1 Description

E39.1.1 This specification shall cover the delivery, installation, and testing of an epoxy coated cast iron flap gate purchased by the City of Winnipeg.

E39.1.2 The installation will require the removal of an existing circa 1979 Armco Model 20-C cast iron flap gate and reuse of the existing Wall Thimble.

E39.1.3 The gate chamber is located on the south side of Ness Avenue and west side of Sturgeon Creek, on a storm relief sewer. This is not located within the Ferry Road and Riverbend Combined Sewer District, but replacement of the gate prior to the 2017 spring flood has become a priority due to deterioration of the existing gate.

E39.1.4 The Contractor should assume that the gate will be available by February 13, 2017.

E39.2 Submittals

E39.2.1 Test Reports

(a) Provide the following information to the Contract Administrator prior to delivery of sluice gate and operator assemblies:

(i) Copies of the test reports for Performance and Leakage tests. Included on the report shall be the signature of the official who is responsible for the gate assembly and testing.

E39.3 General Design (for Contractor's information only)

E39.3.1 The flap gate shall be manufactured by Coldwell-Wilcox, Hydro Gate, Rodney Hunt-Fontaine, Waterman, or approved equivalent in accordance with B6.

E39.3.2 Gate Opening Size: 600 mm diameter (actual dimension 610 mm), circular.

E39.3.3 Type: Flange Back for mounting on a wall thimble.

E39.3.4 Mounting: to existing Armco Wall Thimble. Verify bolt pattern before gate fabrication or tap existing wall thimble to suit new gate. Original shop drawing for gate is attached, but bolt hold measurements should be confirmed by Contractor.

E39.3.5 Head: Maximum design head for all flap gates will be from centreline of the gate to the top of the gate chamber which shall be a minimum of 2.5 m to elevation 233.7 m. Actual design heads on the gate are as follows:

Flap Gate Service Elevations and Heads

Parameter	Sturgeon Creek at Ness Ave.
Gate Size	610 mm diam. (circular)
Flood Protection Level	n/a
Design Flood Level	233.71 m (100 year)
Top of Chamber (Std. Manhole Frames)	235.60 m
Gate Invert	230.85 m
Actual Head on centre gate at Design Flood	2.56 m

E39.3.6 Cover: One piece cast-iron with lifting eye for manual operation

E39.3.7 Seat(s): Machines raised bronze seat facing surface(s) and inclined to assure positive closure. Epoxy coated cast iron seating face not acceptable.

E39.3.8 Links: Complete with grease nipples at pivot points and adjusting screws to align seating faces.

E39.3.9 Pivot Lugs: One-piece ductile-iron adjustable in the horizontal plane without removal of cover, complete with grease nipples.

E39.3.10 Maximum acceptable leakage under the low head installation shall be 2.48 litres per meter of perimeter at the design flood level, as follows:

(a) 600 mm gate: 4.75 lpm, based on 2.56 m head on centre of gate and 1.916 m gate perimeter.

E39.3.11 Paint: Cast Iron surface prepared to SSPC-SP10 (near-white blast) and painted with two coats of International Paints – Intergard FP, Tnemec Series 140 F Pota- Pox Plus or Amerlock 2 Epoxy coating, 125-150 m per coat dry film thickness.

E39.4 Materials

E39.4.1 Flap Gate: Supplied by City of Winnipeg

E39.4.2 Fasteners: ASTM A276 Stainless Steel (Type 316)

E39.4.3 Sealant between Wall Thimble and Gate Frame: Polyurethane Sealant (Sikaflex 1A or equivalent) or to manufacturer's recommendations.

E39.4.4 Accessories to include: 9 mm diam. Stainless Steel Cable, fabricated lift cable guide and fabricated lift cable handle to be as indicated on the sketch in Appendix C.

E39.4.5 Delivery and Shipping

(a) The Contract Administrator will examine the flap gate and associated accessories upon delivery and will reject any equipment that is found to be damaged to the extent that, in the Contract Administrator's opinion, it cannot be put to the use for which it was intended. The City shall arrange with the gate supplier to repair any superficially damaged equipment.

(b) It shall be the responsibility of the City to negotiate any claims for damage with the supplier and to make arrangements to have any rejected equipment replaced as soon as possible.

(c) The Contractor shall be responsible for transporting the new flap gate from the supplier's address to the worksite.

E39.4.6 Shop Testing

(a) The fully assembled gate shall be shop inspected, adjusted and tested for operation and leakage at the design head before shipping.

(b) The Contract Administrator shall inspect and perform a carbon paper test for the gate on its seating face within the shop. Any adjustments and/or corrections as a result of this testing shall be made in the yard.

E39.5 Construction Methods

E39.5.1 Installation

(a) Remove chamber manhole frame and cover as riser rings as necessary for works.

(b) Remove existing sluice gate and measure position of mounting bolt holes.

(c) Load and deliver existing flap gate to the City of Winnipeg Plinquet Yard and unload at the yard as directed by City personnel.

(d) Clean existing wall thimble to remove any surface corrosion or debris that may interfere with the adhesion of sealant between the thimble and new gate mounting frame. Painting of the existing wall thimble is not required.

(e) Install cast iron flap gate on existing wall thimble in accordance with the manufacturer's recommendations, using sealant (and shims if required) between gate frame and existing wall thimble to ensure flap and frame seating surfaces mate parallel to each other to

provide a leak free seal. Fasten with bolts and uniformly tighten nuts in accordance with Manufacturer's torque and sequence requirements. {e.g.,first round - hand tighten all nuts, second round - 20% of final torque (flange sequential order), third round - 40% of final torque (flange sequential order), fourth round - 80% of final torque (flange sequential order), fifth round - 100% of final torque (flange sequential order)}.

E39.5.2 Field Testing

(a) The Contract Administrator shall coordinate and arrange for a qualified field representative of the gate supplier/manufacturer to be present prior to and during field testing. The field representative shall complete required adjustments prior to field testing.

(b) Leakage testing may occur after the spring thaw and spring flood has passed, and when rainstorms are not anticipated.

(c) Perform leakage tests in the Contract Administrator's presence once flap gate has been installed to ensure compliance with the allowable leakage rate.

(d) The leakage test will be performed by closing the downstream sluice gate, plugging the 600 mm sewer downstream of the sluice gate chamber, and filling both the flap gate chamber and sluice gate chamber to the specified design head and measuring the leakage.

(e) Water used for testing purposes must be chlorine free. Potable drinking water shall be dechlorinated if used for testing purposes.

(f) The Contractor will be responsible to pump water from the creek or supply water from a hydrant into the chamber for testing purposes.

(g) The leakage rate from west testing must be less than the current leakage rate in place for the existing sluice gate. In the event that the gate fails the target leakage rate when tested, The Contract Administrator shall be notified. The test rate will be reviewed and determined if acceptable. If further action is required to improve sealing, further adjustments, replacements shall be undertaken as extra work. This work will be measured on a time and materials basis, with logs filled out and signed on a daily basis.

(h) If a gate fails the field leakage test, the Contractor shall undertake adjustments, replacements or other modifications recommended by the gate supplier/manufacturer's field representative and repeat the test. The sequence shall be repeated until the gate passes the allowable leakage test.

(i) The gate supplier/manufacturer's field representative shall provide a written acknowledgement of satisfactory installation to the Contract Administrator following the completion of testing.

E39.6 Measurement and Payment

E39.6.1 The new flap gate and mounting accessories will be purchased directly by the City of Winnipeg.

E39.6.2 Removal of the old flap gate and delivery to the City of Winnipeg, installation of the new flap gate, manhole modifications, installation of flap gate lift cable and accessories, and field testing will be measured and paid for at the Contract Unit Price for "Install Flap Gate, 600mm", executed in accordance with this specification and accepted by the Contract Administrator.

E39.6.3 Leakage testing and corrective action during the testing program will be measured and paid for on a per-day basis at the Contract Unit Price for "Flap Gate Leakage Testing", executed in accordance with this specification and accepted by the Contract Administrator. Payment for partial days will be done on a pro-rated basis assuming a 10 hour workday.

E40. PROVISIONAL ITEMS

E40.1 The Provisional Items listed on Form B: Prices are part of the Contract.

E40.2 The Contractor shall not perform Work included in the Provisional Items without prior authorization from the Contract Administrator. All Work included in the Provisional Items will be carried out within the construction areas shown on the Drawings.

E40.3 Notwithstanding GC:7, the City reserves the right to diminish all or any portion of the items of work listed in the Provisional Items and no claim shall be made for damages on the grounds of loss of anticipated profit or for any other reason.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

F1.1 Each individual proposed to perform the following portions of the Work:

(a) any Work on private property;

(b) any Work within City facilities other than:

(i) an underground structure such as a manhole;

(ii) in areas and at times normally open to the public;

(c) communicating with residents and homeowners in person or by telephone;

F1.1.1 Each Individual shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his/her place of residence. Or

(a) BackCheck, forms to be completed can be found on the website at: http://www.backcheck.net/ ; or

(b) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: https://www.commissionaires.ca/en/manitoba/home .

F1.2 Prior to the award of Contract, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform such Work.

F1.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work specified in F1.1.

F1.4 Any Criminal Record Search Certificate obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.

F1.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform any Work specified in F1.1.