



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 135-2011

DUCHARME AND BALDRY CREEK FLOOD PROTECTION WORKS

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 DUCHARME AND BALDRY CREEK FLOOD PROTECTION WORKS

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, March 1, 2011.

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 D4.1.

B4.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least one (1) Business Day prior to the Submission Deadline.

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

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

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

B5. ADDENDA

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

B5.2 The Contract Administrator will issue each addendum at least one (1) Business Day prior to the Submission Deadline, or provide at least one (1) Business Days by extending the Submission Deadline.

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

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

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

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least one (1) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least one (1) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B15.1(a).

B7. BID COMPONENTS

- B7.1 The Bid shall consist of the following components:

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

B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.

B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.

B7.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B7.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.

B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.

B7.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B15.1(a).

B7.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.8 Bids shall be submitted to:
The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B8. BID

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

B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
- (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
- (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B9.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. QUALIFICATION

B10.1 The Bidder shall:

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

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

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

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

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

- (d) have experienced personnel operating the HDD and tracking equipment who have successfully completed at least two (2) projects of similar pipe size and length.

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

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

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

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

B11. BID SECURITY

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

- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
- (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
- (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

B11.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B11.1.2 All signatures on bid securities shall be original, and shall be witnessed or sealed as required.

B11.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B11.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

B12.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.

B12.1.1 Bidders or their representatives may attend.

B12.1.2 Bids determined by the Manager of Materials, or his designate, to not include the bid security specified in B10 will not be read out.

B12.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/default.stm>

B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/default.stm>

B12.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B13. IRREVOCABLE BID

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

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

B14. WITHDRAWAL OF BIDS

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

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

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

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

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

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

B15. EVALUATION OF BIDS

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

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

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

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

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

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

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

B16. AWARD OF CONTRACT

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

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

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

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

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

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

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

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

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the construction and installation of HDPE pressure pipes beneath the roadways of Pembina Highway at Ducharme Avenue and the Perimeter Highway at Baldry Creek for use as flood control devices in the event of a major spring flood event.

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

- (a) Installation of three (3) approximately 60 meter long each pipes consisting of 350 millimetre diameter (IPS) DR 17 HDPE beneath the Perimeter Highway at Baldry Creek using the horizontal directional drilling method (HDD).
- (b) Installation of three (3) approximately 50 meter long each pipes consisting of 350 millimetre diameter (IPS) DR 17 HDPE beneath Pembina Highway at Ducharme Avenue using the horizontal directional drilling method (HDD).
- (c) Installation of all related fittings and appurtenances related to the Work.

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "**HDPE**" means High Density Polyethylene Pipe;
- (b) "**HDD**" means Horizontal Directional Drilling;

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is AECOM Canada Ltd., represented by:

Andy Nagy, P. Eng.
Senior Engineer, Urban Infrastructure
99 Commerce Drive, Winnipeg, MB R3P 0Y7
Telephone No. (204) 477-5381
Facsimile No. (204) 284-2040

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

D5. CONTRACTOR'S SUPERVISOR

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

D6. NOTICES

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

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

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

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

Facsimile No.: (204) 947-9155

D7. FURNISHING OF DOCUMENTS

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

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

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

D9. SAFE WORK PLAN

D9.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D9.2 The Safe Work Plan 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 and products and completed

operations, to remain in place at all times during the performance of the Work and throughout the warranty period;

- (b) automobile liability insurance for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00) at all times during the performance of the Work and until the date of Total Performance;

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 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. DETAILED WORK SCHEDULE

D12.1 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.

D12.2 The detailed work schedule shall consist of the following:

- (a) a critical path method (C.P.M.) schedule for the Work;
 - (b) a Gantt chart for the Work based on the C.P.M. schedule;
- all acceptable to the Contract Administrator.

D12.3 Further to D12.2(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:

D12.4 Further to D12.2(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.

SCHEDULE OF WORK

D13. COMMENCEMENT

D13.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

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

- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D8;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D9;
 - (iv) evidence of the insurance specified in D10;
 - (v) the performance security specified in D11; and
 - (vi) Detailed Work Schedule specified in D12
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D13.3 The Contractor shall commence the Work on the Site within four (4) Working Days of receipt of he letter of intent.

D13.4 The City intends to award this Contract by March 8, 2011.

D13.4.1 If the actual date of award is later than the intended date, the dates specified for Commencement, Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D14. CRITICAL STAGES

D14.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

- (a) The following work is to be completed by April 4, 2011.
 - (i) Installation of two (2) of the three (3) 350 millimetre diameter (IPS) DR 17 HDPE crossings beneath the Perimeter Highway at Baldry Creek
 - (ii) Installation of two (2) of the three (3) 350 millimetre diameter (IPS) DR 17 HDPE beneath Pembina Highway at Ducharme Avenue.
 - (iii) Installation of pumping access box and all associated pipe, fittings, and appurtenances for two (2) of the three (3) crossing pipes at each location.

D15. SUBSTANTIAL PERFORMANCE

D15.1 The Contractor shall achieve Substantial Performance by April 11, 2011.

D15.2 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.

D15.3 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.

D16. TOTAL PERFORMANCE

- D16.1 The Contractor shall achieve Total Performance by April 18, 2011.
- D16.2 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.
- D16.3 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.
- D16.1 If the Contractor fails to achieve Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:
- (a) Critical Stages – Three Thousand Dollars (\$3,000.00)
 - (b) Substantial Performance – One Thousand Dollars (\$1,000.00);
 - (c) Total Performance – Five Hundred Dollars (\$500.00).
- D16.2 The amounts specified for liquidated damages in D16.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.
- D16.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

D17. JOB MEETINGS

- D17.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D17.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D18. TRAFFIC CONTROL AND MAINTENANCE ACCESS

- D18.1 Comply with the requirements of CW 1130 for traffic control and maintenance of access.
- D18.2 Do not park construction vehicles in a manner that will block traffic on streets at the Site.
- D18.3 Provide flag persons to direct traffic around construction vehicles that are unloading equipment and materials at the Site.
- D18.4 Do not stockpile materials in a location and manner that will obstruct the safe operation of motor vehicle past the Site.
- D18.5 Maintain two lanes of traffic in each direction on the Perimeter Highway and Pembina Highway locations. Maintain one lane of traffic on all other streets at all times.

D19. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D19.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

MEASUREMENT AND PAYMENT

D20. PAYMENT

D20.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D21. WARRANTY

D21.1 Warranty is as stated in C13.

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. 135-2011

DUCHARME AND BALDRY CREEK FLOOD PROTECTION WORKS

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

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

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

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

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

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

_____ day of _____, 20____.

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

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

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 135-2011
DUCHARME AND BALDRY CREEK FLOOD PROTECTION WORKS

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

(Name of Contractor)

(Address of Contractor)

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

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

(Address)

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

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

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

(Date)

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

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

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

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
D-1	BEAUJOLAIS COULEE DISCHARGE LINES PLAN
D-2	DUCHARME / BEAUJOLAIS COULEE DISCHARGE LINES
D-3	BALDRY CREEK DISCHARGE LINES PLAN
D-4	BALDRY CREEK DISCHARGE LINES SECTION AND DETAILS

E2. SOILS INVESTIGATION REPORT

- E2.1 Further to C3.1, a geotechnical soils investigation has been completed in the vicinity of the proposed Works at Pembina Highway and Ducharme Avenue to determine the character of the subsurface soil to facilitate the design of the Work. Soil test hole logs are included in Appendix A.
- E2.2 Bidders are responsible for any interpretation they place on the supplied information and are expected to make such additional investigation of the soil as they feel necessary to satisfy themselves.
- E2.3 Any test borings made by the Bidder shall be done in accordance with the requirements of the appropriate authorities of the City of Winnipeg. Bidders shall notify the Contract Administrator prior to starting any soil boring operation.

GENERAL REQUIREMENTS

E3. PROTECTION OF EXISTING TREES

- E3.1 Take the following precautionary steps prior to construction to avoid damage to existing trees from construction activities.
- E3.1.1 Do not stockpile materials and soil, park or operate vehicles and equipment within 2 meters of trees.
- E3.1.2 Strap mature tree trunks with 25 x 150 x 2400 wood planks. Protect smaller trees similarly using appropriately sized wood planks.
- E3.1.3 Carry out excavations in a manner to minimize damage to existing root systems. Where roots must be cut to facilitate an excavation, they shall be neatly pruned at the face of the excavation.

- E3.1.4 Carry out excavations in a manner to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch.
- E3.1.5 Do not prune American Elm trees 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.
- E3.2 All damage to existing trees due to the Contractor's construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Public Works Department, Forestry Branch.
- E3.3 No separate measurement or payment will be made for protection of trees.

E4. DANGEROUS WORK CONDITIONS

- E4.1 Further to clause GC 6.26 of the General Conditions, the Contractor shall be aware that underground chambers, manholes, sewers and pumping stations are considered a confined space and shall follow the "Guidelines for confined Entry Work" as published by the Manitoba Workplace Safety and Health Division.
- E4.2 The Contractor shall be aware of the potential hazards that can be encountered in manholes, sewers and pumping stations such as explosive gases, toxic gases and oxygen deficiency.
- E4.3 The air in a confined space must be tested before entry and continuously during the time that personnel are inside the space. Equipment for continuous monitoring of gases must be explosion-proof and equipped with a visible and audible alarm. The principal tests are for oxygen deficiency, explosion range and toxic gases. Testing equipment must be calibrated in accordance with manufacturer's specifications.
- E4.4 Ventilate all confined spaces including underground chambers, tunnels, pipes and shafts as required and approved by the Manitoba Workplace Safety and Health Act (the "Act"). If no ventilation is supplied, a worker must wear a respirator or supplied air to enter the confined space.
- E4.5 Workers must wear a respirator or supplied air at all times when entering a chamber, manhole or sewer where live sewage is present.
- E4.6 Provide a photo ionization detector (PID) on Site at all times to monitor potential hydrocarbon vapours in the confined spaces. The gas detector and safety equipment conforming to the Act shall be made available to the Contract Administrator for his use during inspections.
- E4.7 The Contract Administrator may issue a stop work order to the Contractor if the above guidelines are not being followed. The Contractor shall not resume his operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to the stop work order for not following these safety guidelines.
- E4.8 The Contractor's attention is drawn to the Province of Manitoba Workplace Safety and Health Act ("the Act"), and the Regulations and Guidelines thereunder pertaining to confined entry work, and in particular the requirements for conducting hazard/risk assessments and providing personal protective equipment (PPE).
- E4.9 Provide supplied air breathing apparatus conforming to the requirements of the Act, Regulation and Guidelines for the use of the Contract Administrator where confined entry is required to allow for inspection of the Work.

E5. SURFACE RESTORATION

- E5.1 Prior to construction, inspect the grassed, pavement and gravel surfaces within and adjacent to the Site the Contract Administrator to record the current condition. After construction and Site cleanup is complete, re-inspect the condition with the Contract Administrator.

- E5.2 Restoration of grassed areas damaged as result of construction activities are to be restored in accordance with CW 3510. Restoration of grassed areas will not be measured for payment and will be included as part of the Work being done.
- E5.3 Asphalt and concrete pavement damaged as a result of construction activities are to be restored in accordance with CW 3230 and CW 3410. Restoration of the pavement will not be measured for payment and will be included as part of the Work being done.
- E5.4 Gravel surfacing damaged as a result of construction activities are to be restored in accordance with CW 3150. Restoration of the gravel surfacing will not be measured for payment and will be included as part of the Work being done.

E6. TEMPORARY SURFACE RESTORATIONS

- E6.1 Further to Clause 3.3 of CW 1130, the Contractor shall temporarily restore surfaces to a safe condition to the satisfaction of the Contract Administrator until permanent restoration can be completed.
- E6.1.1 Temporarily restore disturbed surfaces as follows:
- (a) Boulevards and grassed areas: backfill and level excavation to match existing surface elevation and level area.
 - (b) Asphalt and concrete pavement: 300mm thick layer of cement-stabilized fill.
- E6.1.2 Maintain temporary surface restorations until permanent surface restoration is completed.
- E6.1.3 If temporarily restored surfaces are not maintained within 24 hours of being notified to do so by the Contract Administrator, the Work may be directed to be done by City forces and the cost deducted from future payments to the Contractor.
- E6.1.4 Complete permanent surface restorations within 10 working days of being directed to do so by the Contract administrator.
- E6.1.5 If permanent surface restoration is not started within 2 working days of being notified to do so by the Contract Administrator, the Work may be directed to be done by City forces and the cost deducted from future payments to the Contractor.
- E6.2 Measurement and Payment
- E6.2.1 Costs for temporary surface restoration and maintenance will not be measured for payment and will be included with the Work being done.

E7. RED RIVER WATER LEVELS

- E7.1 Normal Red River water levels are as follows.
- (a) Normal Summer Water Level (NSWL) (normally early June to late October) – 223.70 geodetic (approximate)
 - (b) Winter Water Level (NWWL) (normally late November to late March) – 221.77 geodetic (approximate)
 - (c) Current Water Level (February 18, 2011 Fort Garry Bridge) – 223.71 geodetic
- E7.2 Red River water levels rise considerably in the spring (typically late March) due to ice break-up and snow melt. River crest elevation of 228.00 geodetic or higher are not unusual.
- E7.3 River elevation may also increase in the summer due to heavy rainfall in the areas south of Winnipeg. Summer river crests are usually lower and of shorter duration than spring crests.
- E7.4 The following web site link <http://winnipeg.ca/waterandwaste/sewage/riverlevels/pastYears.stm> lists historic Red River levels month by month back to 1999. The elevations shown are in imperial measurement and are referenced to “James Avenue Datum” which is elevation 221.76 geodetic. Red River levels at the location of this river crossing will be approximately 300

millimetres higher than the elevations listed at James Avenue Datum outside of NSWL and NWWL.

E7.5 Construct dikes around Site if required to protect against high river levels. Costs for construction of dikes to protect the Site will not be measured for separate payment and will be included with the Work being done.

E7.6 Work schedule and method of operation should take into account potential shut-down period(s) or difficulties due to high river levels. Occurrence of high river levels during construction of the Work will not be considered as a basis for claim for extra work or extra time.

E8. SILT FENCE OR CONTAINMENT BERMS OR PITS

E8.1 Install silt fencing around the designated set up area and construct a containment berm or pit inside the silt fencing satisfactory to the Contract Administrator before beginning the HDD operation to ensure drilling fluids and sediment from excavations do not enter the waterway.

E8.2 Install silt fencing around the exit location for the HDD operation and construct a containment berm or pit before inside the silt fencing satisfactory to the Contract Administrator before beginning the HDD operation to ensure drilling fluids and sediment from excavations do not enter the waterway.

E8.3 Remove silt fencing and containment berm and backfill pits after work is completed.

E8.4 Containment berms and pits will not be measured for separate payment and will be included with the Work being done.

E9. WATERWAYS PROTECTION

E9.1 Waterways

E9.1.1 All work adjacent to or crossing waterways including creeks and ditches draining in waterways is regulated by the Federal Department of Fisheries and Oceans (DFO).

E9.1.2 Complete works in accordance to DFO guidelines/regulations.

E9.2 Measurement and Payment

E9.2.1 Work performed under this Section excluding silt fencing will be incidental to work involved in Sections.

E9.2.2 Silt fencing will be measure in lineal meters and paid at the Contract Unit Price per lineal meter. Payment shall be considered full compensation for furnishing and installing silt fence, including any wire reinforcement; maintenance of silt fence; and all other work necessary or incidental thereto for which separate payment is not elsewhere provided shall be considered incidental to the works.

E9.3 Products

E9.3.1 Silt Fencing

(a) Silt fencing to be woven polypropylene synthetic fibre fabric with UV stabilizers and reinforcing mesh as per Armtec Heavy Duty or approved equal.

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

(c) Wood posts shall be minimum 50 mm x 50 mm (2" x 2") by 1.5 m in length.

E9.3.2 Erosion Control Blanket

(a) Utilize blanket consisting of 70% straw/30% coconut matrix with UV stabilized black top and photodegradable green bottom nets. Blanket to be model SC32 as manufactured by Erosion Control Blanket or approved equal.

E9.4 Execution

E9.4.1 General

- (a) Complete erosion control works to be in accordance with current DFO and Manitoba Environment guidelines.
- (b) The following mitigation measures must be adhered to protect fish habitat:
 - (i) 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.
 - (ii) Use and maintain effective sediment control measures until vegetation is established on disturbed areas to prevent soil laden run off from entering the watercourse. Disturbed areas are to be sloped, stabilized and seeded as soon as possible and reclaimed to vegetation within one growing season. Effective, long term erosion control measures must also be implemented.
 - (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 not re-enter any watercourses.
- (c) Maintain silt fences and erosion control measures throughout construction until satisfactory grass growth/re-vegetation of the trenches.

E9.4.2 Erosion Control Blanket Installation

- (a) Install erosion control blanket as per Manufacturer's recommendations. Ensure blanket is securely stapled in place to prevent movement during high flow events in drainage ditches.

E9.4.3 Silt Fence Installation

- (a) Install silt fences as per Manufacturer's recommendations.
- (b) Excavate trench to place bottom of fabric a minimum of 150 mm below existing grade and backfill with compacted soil to prevent sediment flow underneath the silt fence.
- (c) Install all supporting posts on the down slope side of the fencing. Post to extend a minimum of 0.75 m below ground or until fabric reach the bottom of the trench.
- (d) Maintain silt fences throughout construction and until placement of erosion control blanket. Complete reseeding of embankment as soon as weather conditions permit upon completion of construction.
- (e) Remove silt fences after installation of all permanent erosion control measures (including rip rap and satisfactory grass growth/re-vegetation).

E10. FRAC-OUT MONITORING AND RESPONSE PLAN

E10.1 Take all precautions to avoid the potential for drilling fluids and drill cuttings from entering the Red River because of a frac-out during horizontal directional drilling (HDD).

E10.2 Follow the requirements of the Manitoba Operational Statement Habitat Management Program for High Pressure Directional Drilling by the Department of Fisheries and Oceans.

- E10.3 The drilling fluid pressure shall not exceed the overburden pressure at any location within the bore hole.
- E10.4 Conduct on-site monitoring as follows.
- E10.4.1 Maintain a record of drilling progress to always know the location of the drill head relative to the point of entry.
- E10.4.2 Maintain a record of drilling component usage (type and quantity) throughout each drilling operation.
- E10.4.3 Maintain a record of drilling fluid volume used and returned to detect any significant fluid losses. Continuously monitor drilling fluid pump pressure. Cease drilling operations and immediately report abnormal loss of returned fluid or loss of fluid pressure that may be indicative of a frac-out to the Contract Administrator and to discuss the next course of action.
- E10.4.4 Continuously check the waterway for appearance of a muddy plume indicating signs of mud escapement to the watercourse. Also check for muddy plume in river when any significant loss of returns or drop in pump pressure occurs.
- E10.4.5 Use a turbidity meter with a 'down-hole' sensor where water turbidity prevents visual detection of a potential frac-out. Turbidity monitoring with the meter will only be initiated if an abnormal loss of fluid or pressure indicates that a frac-out may be occurring. Make arrangements with an external consultant familiar with turbidity measurement to use of the turbidity meter. If turbidity must be monitored, the consultant will complete a "Turbidity Monitoring Data Sheet (TMDS)", provided by the Contract Administrator.
- E10.5 Include a Loss of Fluid and Frac-out Response Plan that includes the following.
- E10.5.1 Follow the "Measures to Protect Fish and Fish Habitat when High Pressure Directional Drilling" listed in the Manitoba Operational Statement Habitat Management Program for High Pressure Directional Drilling by the Department of Fisheries and Oceans. If necessary, implement the "Measures to Protect Fish and Fish Habitat for Isolated Trenched Crossings in the Event of a Frac-Out".
- E10.5.2 Stop drilling immediately if an abnormal loss of fluid, drop in pressure, or visible plume is observed indicating a frac-out or possible frac-out.
- E10.5.3 Inform the Contract Administrator of the frac-out condition or potential condition and decide on the appropriate action as follows:
- (a) Assign a person to monitor (visual or using a turbidity meter) for the presence of a muddy plume;
 - (b) Make adjustments to the mud mixture (e.g., add lost circulation material (LCM) to the drilling fluid in an attempt to prevent further loss of fluid to the ground formation and/or the watercourse);
 - (c) Where conditions warrant and permit (i.e., readily accessible by a vacuum truck, shallow depth, clear water, potentially sensitive habitat, and low water velocity) and where a frac-out has been visually detected, attempt to isolate the fluid release using a large diameter stand-pipe such as a 45 gallon drum with both ends cut out, or a short piece of culvert. Prior to commencing any pumping to deliver LCM to plug the fracture, have the vacuum truck in position to recover any fluids that otherwise may escape to the watercourse.
- E10.5.4 Under circumstance where a frac-out has occurred (and has been confirmed visually or by turbidity meter measurements), and where conditions do not permit containment and the prevention of drilling fluids release to the watercourse, attempts to plug the fracture by pumping LCM are not to continue for more than 10 minutes of pumping time.
- E10.5.5 If the frac-out is not contained within this time, the Contract Administrator will halt any further attempts until a corrective course of action is decided upon.

E10.5.6 Frac-out Monitoring and Response Plan will not be measured for separate payment and will be included with the Work being done.

E11. HDPE PIPE CROSSING

E11.1 Description

E11.1.1 This specification covers the supply, joining, testing and installation of High Density Polyethylene (HDPE) pipe by HDD methods.

E11.2 Materials

E11.2.1 HDPE Pipe

- (a) HDPE pipe to be made from polyethylene resin compound with a minimum cell classification of PE 3608 materials in accordance with ASTM 3350.
- (b) Material to have a long term hydrostatic strength of 1600 psi when tested and analyzed by ASTM D2837 and shall be a Plastic Pipe Institute (PPI) listed compound.
- (c) The raw material shall contain a minimum of 2%, well dispersed, carbon black. Additives which can be conclusively proven not to be detrimental to the pipe may also be used, provided the pipe produced meets the requirements of the standard.
- (d) Manufacture pipe to ASTM F714.
- (e) Pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.
- (f) The following markings shall be continuously printed on the pipe spaced at 1.5m intervals.
 - (i) Name and/or trademark of the pipe manufacturer.
 - (ii) Nominal pipe size (OD).
 - (iii) Dimension Ratio.
 - (iv) The letters PE followed by the polyethylene grade per ASTM D3350, followed by the Hydrostatic Design basis in 100's of psi.
 - (v) Manufacturing reference standard ASTM F 714.
 - (vi) Production code from which the date and place of manufacture can be determined.
- (g) Finish pipe ends for joining using the butt fusion method.

E11.2.2 HDPE Fittings

- (a) Fittings are to be iron pipe sized, certified for potable water use, made in the same manner and materials as pipe. Fittings to have same certifications as piping.
- (b) Mechanical connection of the polyethylene pipe to auxiliary equipment shall be through flanged connections and shall consist of the following.
 - (i) A polyethylene "stub end" shall be thermally butt-fused to the ends of the pipe.
 - (ii) Provide ASTM A 240 Type 304 SS backup flange 56.7 kg (125 lb) for flanged connections.
 - (iii) ANSI B16.1 Standard gaskets as required by the manufacturer.
 - (iv) Open ends of pipe shall be plugged with a blind flange when not in use.

E11.2.3 Air Valve/Corporation Cock

- (a) One air release valve shall be constructed per pipe. Air valve shall be constructed of a 38 mm corp stop in conjunction with a valve that can be manually operated to release air from the HDPE pipe.

E11.3 Construction Methods

E11.3.1 Handling of HDPE Pipe

- (a) Handle pipe in a manner that will not damage or deform the pipe.
- (b) Replace at own expense pipe that has been kinked or has scratched, cuts or gouges deeper than 10% of the total wall thickness.
- (c) Lift pipe sections using at least two slings spread far enough apart to balance the load. Use pads under chains or cables if used to lift the pipe. Do not position slings on butt fused joints.
- (d) Ensure ground where pipe is placed is level and free of sharp objects that may damage the pipe. Limit stacking of pipe to a maximum height as recommended by the manufacturer to prevent excessive deformation of pipes on the bottom.
- (e) Take precautions to ensure joined sections of pipe are not damaged or over-stressed when dragging into position to install in bore hole. Do not drag pipe over sharp and cutting objects. Do not insert chains, cables and ropes into pipe ends to drag pipe.
- (f) Temporarily plug ends of pipe with suitable plugs or stoppers until pipe joined and installed.

E11.3.2 Joining of HDPE Pipe Sections

- (a) Join pipe sections into one continuous length on site following the guidelines of ASTM Standard Practice F 2620 for "Heat Fusion Joining of Polyethylene Pipe and Fittings".
- (b) Ensure that fusion machine selected for use is compatible with fusion of pipe at maximum DR's noted.
- (c) Check the temperature and uniformity of temperature over the heating surface of the heating tool with a pyrometer on the first joint of the day and periodically during the day in accordance with Section 6.3 of ASTM Standard Practice F 2620 for "Heat Fusion Joining of Polyethylene Pipe and Fittings". Select multiple checkpoints to ensure uniform surface temperature.
- (d) Use a data logging device with the hydraulic joining equipment to record fusion parameters of pressure, temperature, and time for each joint.
- (e) Fusion shall produce a joint weld with strength equal to or greater than the tensile strength of the pipe itself.
- (f) Join pipe sections together on-site and to facilitate pressure testing before installation. Do not block roadways with the full length of pipe.

E11.3.3 Installation of HDPE Pipe Using Horizontal Directional Drilling

- (a) Install HDPE pipe using the horizontal directional drilling method in general accordance with ASTM Standard Guide F 1962 for "Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit under Obstacles, including River Crossings".
- (b) Employ experienced personnel to operate the directional drilling and tracking equipment.
- (c) Provide the Contract Administrator an HDD method statement including the following information before beginning installation.
 - (i) HDD method statement.
 - (ii) Equipment specifications and capabilities.
 - (iii) Size of pilot hole.
 - (iv) Number and size of pre-reams.
 - (v) Calculations showing determination of the appropriate back-ream rate for each pre-ream and product pullback.
 - (vi) Method of suspending, supporting and direction pipe during pullback.
 - (vii) Type and capabilities of tracking system.

- (viii) Drilling fluid and cuttings management plan including type of drilling fluid, drilling fluid pressure, fluid containment storage recycling, and transport and disposal.
 - (ix) Management plan for “frac-outs” as specified herein.
 - (x) Sketch of Work Site including equipment layout, slurry containment pits and entry and exit locations.
- (d) Maintain alignment of directional drilling as close as possible to the proposed plan and profile shown on the drawings taking into account the capabilities of drilling equipment and the allowable stress of HDPE pipe and drilling rods. Advise the Contract Administrator of deviations to line and grade as they occur for discussion and approval.
 - (e) Provide electronic survey equipment in the drill head to continuously monitor and track the drill bore in the pilot hole. The electronic survey equipment shall transmit the azimuth, vertical inclination and orientation of the drill head to a computer that can convert this information to UTM coordinates.
 - (f) Record the depth to the nearest 0.10 metres from ground surface at major changes in surface elevation, at maximum 10 metre intervals along flat surfaces and at horizontal and vertical changes in alignment.
 - (g) Provide the drill path coordinate information to the Contract Administrator on a daily basis.
 - (h) Begin reaming operations to enlarge pilot hole after the Contract Administrator has accepted the pilot bore. The number and size of reaming heads is at the discretion of the Contractor.
 - (i) Continuously monitor and track the following during boring operation.
 - (i) Thrust and pullback pressure.
 - (ii) Rotational torque.
 - (iii) Times when drilling fluid circulation was lost.
 - (iv) Drilling fluid composition.
 - (v) Ground conditions encountered.
 - (j) Operate and maintain a closed loop drilling fluid system if possible.
 - (k) Ensure drilling fluids and cuttings are contained and stored at entrance and exit hole locations in accordance with the management plan. Drilling fluid shall at no time be directed to the river, sewers, manholes or catch basins. Drilling fluid and cuttings shall be loaded, hauled from the Site and disposed of at a Site approved by the Contract Administrator.
 - (l) Provide a swivel when pulling pipe into bore hole to reduce torsional loads transmitted to the pipe.
 - (m) Cap end of pipe before pulling into bore hole to prevent matter and fluids from entering the pipe.
 - (n) Provide pipe rollers, side booms or other devices to support and protect pipe while pulling into bore hole.
 - (o) If required, fill pipe with water when pulling into bore hole to help prevent against flotation and excessive pull-back pressures.
 - (p) Provide a strain gauge, “weak link”, or other approved method/device, between the reamer and pipe to continuously measure or ensure the pull back force on the pipe does not exceed the maximum force allowed by the pipe manufacturer.
 - (q) Allow HDPE pipe a minimum 24 hours to recover and rebound after pull-in before making connections to appurtenances. Measure location of both pipe ends to ensure pipe recovery is complete.

E11.3.4 Installation of HDPE Pipe in Open Excavations

- (a) Bed pipe using Type 3 granular bedding in accordance with specification CW 2030 and SD-001.
- (b) Backfill excavations using Class 5 backfill in accordance with CW 2030 and SD-002.

E11.3.5 Record Information

- (a) Provide copies of HDD tracking information for each pipe to the Contract Administrator on a daily basis for a review of the drill path and for the preparation of as-constructed drawings.
- (b) Tracking information should be referenced to the City's UTM coordinates based on reference points which will be provided to the Contractor before HDD commences.

E11.3.6 Pressure Testing of HDPE Pipe After Installation

- (a) Perform hydrostatic testing of the entire length of pipe after installation in the directionally drilled bore hole.
- (b) Hydrostatic test procedure to consist of an initial expansion phase followed by a test phase.
- (c) Test pressure to be 0.70 MPa (100psi) at the lowest elevation under test.
- (d) Testing is to be witnessed by the Contract Administrator. Notify the Contract Administrator at least two (2) days in advance of hydrostatic pressure testing.
- (e) Record test results and deliver the final test report to the Contract Administrator within thirty (30) days of completing the tests.
- (f) The following procedure shall be followed for the initial expansion phase.
 - (i) Fill entire pipe with clean water. Bleed any trapped air from the pipe.
 - (ii) The initial expansion phase is to last 3 hours.
 - (iii) Pressurize the pipe to the test pressure of 0.70 MPa.
 - (iv) Add make-up water to the pipe at 1, 2, and 3 hour intervals to restore pressure to 0.70 MPa test pressure.
- (g) The test phase shall commence 4 hours after initial pressurization and after the initial expansion phase. Reduce test pressure by 1.45 kPa (10 psi) and monitor pressure for 1 hour. Do not increase pressure or add make-up water.
- (h) If no visual leakage is observed, and pressure during the test phase remains steady (within 5% of the test phase pressure) for the 1 hour test phase period, a passing test is indicated.
- (i) If retesting is necessary, depressurize the test by reducing pressure or releasing water at a controlled rate. Allow pipe to relax for 8 hours before re-pressurizing.

E11.4 Measurement and Payment

E11.4.1 Joining HDPE Pipe Sections

- (a) Fusion joining of HDPE pipe sections will not be measured for separate payment and will be included with "Installation of HDPE Pipe".

E11.4.2 Installation of HDPE Pipe

- (a) HDPE pipe supply and installation will be measured for payment on a length basis for each type and size of pipe, method of installation and type of backfill and paid for at the Contract Unit Price per metre for "Installation of HDPE Pipe". Length to be paid for will be the total number of linear metres of HDPE pipe installed in accordance with this specification, accepted and measured by the Contract Administrator.
- (b) Supply of HDPE pipe will not be measured for separate payment and will be included with "Installation of HDPE Pipe".

- (c) Measurement for installation of HDPE pipe will be made along the centreline of each pipe from the standpipe to outlet flange.
- (d) Installation of HDPE fittings if used will not be measured for separate payment and will be included with "Installation of HDPE Pipe".

E11.4.3 Installation of Fittings and Appurtenances

- (a) Installation of fittings will not be measured for separate payment and will be included with "Installation of HDPE Pipe".

E11.4.4 Pressure Testing

- (a) Pressure testing of the pipes before and after installation will not be measured for separate payment and will be included with "Installation of HDPE Pipe".