



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 259-2017

**CIVIL MAINTENANCE/AQUEDUCT STORAGE BUILDING
INSTALLATION OF ELECTRICAL AND COMMUNICATION UTILITIES AND SEWER
AND WATER SERVICING**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

CIVIL MAINTENANCE/AQUEDUCT STORAGE BUILDING
INSTALLATION OF ELECTRICAL AND COMMUNICATION UTILITIES AND SEWER AND
WATER SERVICING

B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 12:00 noon Winnipeg time, April 27, 2017.
- 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 Contract Administrator or an authorized representative will be available at the Site at 9:00 AM on April 13, 2017 to provide Bidders access to the Site. The Site is the City of Winnipeg Water Treatment Facility, located on Provincial Road 207 between Highway 1 and Highway 15.
- B3.2 The Bidder is advised that Site access is restricted, and access to view the Site can only be made under supervision of the City.
- B3.3 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.
- B3.4 Bidders will not be allowed to take pictures at the Site Investigation. The Bidder may request pictures of specific areas from the Contract Administrator identified in D4. The pictures will then be issued to all Bidders by Addendum.
- B3.5 Although attendance at the Site Investigation is not mandatory, the City strongly suggests that Bidders attend.
- B3.6 Bidders are required to register for the Site Investigation at least 48 hours prior by contacting the Contract Administrator identified in D4.
- B3.7 Bidders registered for the Site Investigation must provide the Contract Administrator identified in D4 with a Public Safety Verification search obtained not earlier than one (1) year prior to the site visit.
- (a) The Public Safety Verification Check may be obtained from BackCheck. Bidders will need to setup a BackCheck account prior to requesting individual background checks. This process should be done 72 hours prior to requesting the first check. The account can be set up using the following link: <https://forms.sterlingbackcheck.com/partners/platform2-en.php?partner=winnipegcity>. Note that the check will take up to 48 hours to complete. See PART F – Security Clearance for further information.
- (b) The results of the Public Safety Verification Check must be received by the City directly through BackCheck. Bidders must set up an account with BackCheck under their company name and grant BackCheck permission to share the results of the Public Safety Verification check with the City of Winnipeg.

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 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 (5) 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) Obtain the 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) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) or
 - (i) 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
 - (ii) 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
- (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/>.)

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.
- B14.2 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>
- 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/default.stm>
- 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 installation of new services, conduits and water lines to the Civil Maintenance/Aqueduct Storage Building located south of the Deacon Booster Pumping Station.

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

- (a) Supply and installation of HDPE sewage force main by horizontal direction drilling from the Civil Maintenance/Aqueduct Storage Building and connect to the existing Water Treatment Plant force main.
- (b) Supply and installation of HDPE fire protection water main by horizontal direction drilling and connection to existing fire protection water main.
- (c) Supply and installation of PEX water service by horizontal direction drilling from the Deacon Booster Pumping Station to the civil maintenance building.
- (d) Supply and installation of communication and power cables and conduits:
 - (i) Power cables between the Deacon Booster Pumping Station and the Civil Maintenance/Aqueduct Storage Building .
 - (ii) Communications and data cables from the Chemical Feed Building to the Civil Maintenance/Aqueduct Storage Building.
 - (iii) Telephone cables between the Civil Maintenance/Aqueduct Storage Building and MTS pedestal.

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "AWWA" means American Waterworks Association,
- (b) "CSA" means Canadian standard Association,
- (c) "NSF" means National Sanitation Foundation,
- (d) "ASTM" means American Society for Testing and Materials,
- (e) "ANSI" means American National Standards Institute,
- (f) "C.P.M." means Critical Path Method,
- (g) "MTS" means Manitoba Telecom Services, and
- (h) "SCADA" means Supervisory Control and Data Acquisition

D3.2 Notwithstanding C1.1, when used in this Bid Opportunity:

- (a) "Business Day" means any Calendar Day, other than a Saturday, Sunday, or a statutory or civic holiday.

D4. CONTRACT ADMINISTRATOR

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

Greg Karman, C.E.T.
Project Manager, Water

Telephone No. 204 477-5381
Email Address greg.karman@aecom.com

D4.2 At the pre-construction meeting, Mr. Karman 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/her designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

D6.1 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.

D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D6.3 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.

D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

D7. NOTICES

D7.1 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.

D7.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D7.3, D7.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D4.1.

D7.3 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

D7.4 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

D7.5 Bids Submissions must not be submitted to the above facsimile numbers. Bids must be submitted in accordance with B8.

D8. FURNISHING OF DOCUMENTS

D8.1 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

D9. AUTHORITY TO CARRY ON BUSINESS

D9.1 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.

D10. SAFE WORK PLAN

D10.1 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.

D10.2 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>

D10.3 Notwithstanding B12.4 at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

D11. INSURANCE

D11.1 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) 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) all risks course of construction insurance, including testing and commissioning, in the amount of one hundred percent (100%) of the total Contract Price, written in the name of

the Contractor and The City of Winnipeg, at all times during the performance of the Work and until the date of Total Performance.

- (d) Property insurance for all contractors equipment and machinery that is owned, rented, leased or borrowed.

D11.2 Deductibles shall be borne by the Contractor.

D11.3 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.

D11.4 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.

D12. PERFORMANCE SECURITY

D12.1 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.

D12.1.1 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.

D12.2 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.

D13. SUBCONTRACTOR LIST

D13.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D14. EQUIPMENT LIST

D14.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D15. DETAILED WORK SCHEDULE

D15.1 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.

- D15.2 The detailed work schedule shall consist of the following:
- (a) a Gantt chart for the Work based on the C.P.M. schedule.
- D15.3 Further to D15.2, the C.P.M. schedule shall clearly identify the start and completion dates of all activities/tasks making up the Work as well as showing those activities/tasks on the critical path.

SCHEDULE OF WORK

D16. COMMENCEMENT

- D16.1 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.
- D16.2 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 D9;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D10;
 - (iv) evidence of the insurance specified in D11;
 - (v) the performance security specified in D12;
 - (vi) the Subcontractor list specified in D13;
 - (vii) the equipment list specified in D14; and
 - (viii) the detailed work schedule specified in D15.
 - (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.
 - (c) The Contractor has provided the Security Clearances as specified in PART F – Security Clearance.
- D16.3 The Contractor shall commence the Work no later than July 10, 2017.

D17. SUBSTANTIAL PERFORMANCE

- D17.1 The Contractor shall achieve Substantial Performance by August 4, 2017.
- D17.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.
- D17.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D18. TOTAL PERFORMANCE

- D18.1 The Contractor shall achieve Total Performance by August 18, 2017.
- D18.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D18.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

D19. LIQUIDATED DAMAGES

D19.1 If the Contractor fails to achieve Substantial Performance 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) Substantial Performance – two thousand dollars (\$2,000);
- (b) Total Performance – seven hundred fifty dollars (\$750).

D19.2 The amounts specified for liquidated damages in D19.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.

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

D20. SCHEDULED MAINTENANCE

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

- (a) Landscaping Maintenance as specified in CW 3510.

D20.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D21. JOB MEETINGS

D21.1 Regular 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.

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

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

D22.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

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

D23.1 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.

MEASUREMENT AND PAYMENT

D24. PAYMENT

D24.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D25. WARRANTY

D25.1 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.

D25.1.1 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 D12)

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. 259-2017

CIVIL MAINTENANCE/AQUEDUCT STORAGE BUILDING
INSTALLATION OF ELECTRICAL AND COMMUNICATION UTILITIES AND SEWER AND WATER
SERVICING

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 D12)

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 259-2017

CIVIL MAINTENANCE/AQUEDUCT STORAGE BUILDING
INSTALLATION OF ELECTRICAL AND COMMUNICATION UTILITIES AND SEWER AND WATER
SERVICING

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

(Name of Contractor)

(Address of Contractor)

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

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

(Address)

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

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

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

(Date)

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

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

This credit is subject to the Uniform Customs and Practice for Documentary Credit (2007 Revision), International Chamber of Commerce Publication Number 600.

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM K: EQUIPMENT
(See D14)

CIVIL MAINTENANCE/AQUEDUCT STORAGE BUILDING
INSTALLATION OF ELECTRICAL AND COMMUNICATION UTILITIES AND SEWER AND WATER
SERVICING

<p>1. Category/type: Horizontal Directional Drill</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>2. Category/type: Trenching</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>3. Category/type: Backfilling and Compaction</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

FORM K: EQUIPMENT
(See D14)

CIVIL MAINTENANCE/AQUEDUCT STORAGE BUILDING
INSTALLATION OF ELECTRICAL AND COMMUNICATION UTILITIES AND SEWER AND WATER
SERVICING

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

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

- E1.1 These Specifications shall apply to the Work.
- E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management 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>Specification No.</u>	<u>Specification Title</u>
16107	Direct Buried Underground Cable Ducts
16108	Installation of Cables in Trenches and in Ducts
16111	Conduits, Conduit Fastenings and Conduit Fittings
16122	Wires and Cables 0-1000 V

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
1-0601H-A0243-001	SCADA and Data Cable Installation
1-0601H-C0020-001	Firemain
1-0601H-C0021-001	100 Sanitary Forcemain
1-0601H-C0022-001	Potable Water Service
1-0601H-D0002-001	Cover Sheet
1-0601H-D0003-001	Miscellaneous Details
1-0601H-E0014-001	Power Cable Installation
1-0601H-E0015-001	Telephone Cable Installation
1-0601H-G0001-001	General Site Plan

GENERAL REQUIREMENTS

E2. PROVISIONAL ITEMS

- E2.1 The Provisional Items listed in the Schedule of Prices are a part of the Contract.
- E2.2 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.
- E2.3 Notwithstanding C: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 grounds of loss of anticipated profit or for any other reason.

E3. SITE SECURITY

- E3.1 Description
- (a) This specification covers on site security requirements during construction.

E3.2 Site Security

- (a) All personnel on Site are required to obtain a Criminal Record Search Certificate and Public Safety Verification Check as outlined in PART F – Security Clearance. The Contractor shall submit copies of the Criminal Record Search Certificates and Public Safety Verification Checks to the Contract Administrator identified in D4.
- (b) The City of Winnipeg Water Services Division will issue time-limited security passes to personnel identified as approved to work on the project. Personnel receiving passes are not permitted to provide or share security passes with other personnel to gain access to the Site. Violation of this policy will result in immediate dismissal of the personnel from the Site.
- (c) On a daily basis during course of work, advise the City of Winnipeg Deacon Control Centre at 204-986-4781 as to the status of the site security, and in particular when Contractor staff leave the Site. The Contractor is not required to provide security services when not on Site.
- (d) The Deacon Site is monitored by CCTV and other security monitoring devices, and unauthorized attendance to the Site will result in dispatch of Police or security personnel to the Site.

E3.3 Emergency Response

- (a) The following lists appropriate Emergency Response Contacts for the Site;
 - (i) Fire, Rescue and Paramedics – City of Winnipeg, 911. If Provincial 911 is reached ask to be transferred to City of Winnipeg 911.
 - (ii) Police – RCMP, Provincial 911

E3.4 Photographs

- (a) All site photographs required for construction documentation shall be approved by City of Winnipeg Water Services Division representative, as identified by the Contract Administrator.

E3.5 Measurement and Payment

- (a) The work specified in E3 shall be considered incidental to the Work and will not be measured for payment. No separate payment will be made.

E4. ENVIRONMENTAL PROTECTION

E4.1 The Contractor shall be aware that the Deacon Booster Pumping Station, surrounding Aqueducts, pipelines and Water Treatment Plant are for potable water supply and no contamination by fuel, chemicals, etc. shall be permitted at any time. Fuels or chemicals shall not be stored within 30 metres of the reservoirs, pumping station, Aqueducts or potable water piping

E4.2 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the environmental protection measures as herein specified.

E4.3 Submittals

- (a) Environmental protection plan including:
 - (i) Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - (ii) Names and qualifications of persons responsible for manifesting hazardous waste to be removed from Site.
 - (iii) Names and qualifications of persons responsible for training site personnel.
 - (iv) Descriptions of environmental protection personnel training program.
- (b) The Contractor is required to prepare and submit the following to the Contract Administrator prior to commencing construction, if applicable:

- (i) Storm Water Pollution Prevention Plan describing water quality protection measures including erosion and sediment controls, inspections, monitoring and staff training. The Plan shall also provide a schematic drawing indicating location and type of erosion and sediment protection measures.
- (ii) Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on Site.
- (iii) Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
- (iv) Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
- (v) Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- (vi) Construction Waste Management Plan describing onsite waste management, disposal, reuse or materials, recycling and staff training.
- (vii) Hazardous Material Spill Management Plan describing management, reporting, emergency response and contact numbers, and staff training.

E4.4 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

- (a) Workplace Hazardous Material Information System (Hazardous Product Act and Canada Labour Code);
- (b) Canadian Environmental Protection Act;
- (c) Canadian Environmental Assessment Act;
- (d) Transportation of Dangerous Goods Act;
- (e) Manitoba Environmental Act;
- (f) The Endangered Species Act E111;
- (g) The Manitoba Nuisance Act N120;
- (h) The Public Health Act c.P210;
- (i) Manitoba Dangerous Goods, Handling, and Transportation Act;
- (j) Fisheries Act;
- (k) The Workplace Safety and Health Act W210; and
- (l) Current applicable associated regulations.

E4.5 The Contractor is advised that the following environmental protection measures apply to the Work.

E4.5.1 Materials Handling and Storage

- (a) Construction materials shall not be stored within five (5) metres of existing pipe centerlines.

E4.5.2 Fuel Handling and Storage

- (a) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
- (b) 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.

- (c) 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.
- (d) Fueling of stationary equipment shall be completed with portable tanks containing only enough fuel to fill equipment.

E4.5.3 Waste Handling and Disposal

- (a) The construction area shall be kept clean and orderly at all times during and at completion of construction.
- (b) 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.
- (c) Indiscriminate dumping, littering, or abandonment shall not take place.
- (d) No on-site burning of waste is permitted.

E4.5.4 Dangerous Goods/Hazardous Waste Handling and Disposal

- (a) Dangerous goods/hazardous waste are identified by, and shall be handled according to, The Dangerous Goods Handling and Transportation Act and Regulations.
- (b) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations.

E4.5.5 Emergency Spill Response

- (a) The Contractor shall ensure that due care and caution is taken to prevent spills.
- (b) The Contractor shall report all major spills of petroleum products or other hazardous substances with the potential for impacting the environment and threat to human health and safety to the Contract Administrator and Manitoba Environment, immediately after occurrence of the environmental accident, by calling the 24-hour emergency telephone phone number 204-945-4888.
- (c) 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.
- (d) 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 (RCMP), Fire Department (City of Winnipeg), Ambulance, company backup)
 - (ii) 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
 - proximity to waterways and the Aqueduct
 - (iii) 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
 - dike spill material with dry, inert sorbent material or dry clay soil or sand
 - prevent spill material from entering waterways and utilities by diking
 - prevent spill material from entering Aqueduct manholes and other openings by covering with rubber spill mats or diking

- (iv) Resume any effective action to contain, clean up, or stop the flow of the spilled product.
- (e) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to the Manitoba Environment according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.

E4.5.6 Controlled Products

- (a) Materials classified as “Controlled Products” under Regulation 52/88, “Workplace Hazardous Materials Information System”, including amendments, are prohibited inside the Reservoir Dikes, unless the material will be directly employed in the Work.

E4.6 Measurement and Payment

- (a) The work specified in E4 shall be considered incidental to the Work and will not be measured for payment. No separate payment will be made.

E5. CONTRACTOR USE OF PREMISES

E5.1 Limit use of premises for Work and access to allow:

- (a) City of Winnipeg operation and occupancy.

E5.2 Co-ordinate use of premises under direction of Consultant.

E5.3 City of Winnipeg will occupy premises during entire construction period for execution of normal operations.

E5.4 Co-operate with Owner and City of Winnipeg in scheduling operations to minimize conflict and to facilitate City of Winnipeg usage.

E6. WATER FOR CONSTRUCTION USE

E6.1 The Contractor is advised that pressurized potable and non-potable water are not available on site. The Contractor shall allow in his bid for the cost of hauling water to site for construction uses.

E7. SHOP DRAWINGS

E7.1 Description

- (a) This Specification shall revise, amend, and supplement the requirements of CW 1100 of the City of Winnipeg’s Standard Construction Specifications
- (b) The term “Shop Drawings” means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data which are to be provided by the Contractor to illustrate details of a portion of the Work.

E7.2 Submit all Shop Drawings in accordance with CW 1100 except as modified herein.

E7.3 The Contractor shall submit specified Shop Drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent must also be shown.

E7.4 Submit Show Drawing submissions within five (5) Business Days of a request as indicated in E7 or receipt of Notice of Award in accordance with B18, whichever is earlier.

E7.5 Allow for a five (5) Business Day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.

E7.6 Shop Drawings not meeting the requirements of CW 1100 or the requirements specified herein will be returned to the Contractor without review for resubmission.

- E7.7 Shop Drawing submissions will be limited to two (2) reviews per Shop Drawing. This shall include a review of the initial submission and a review of the revised submission. Costs associated with subsequent reviews will be charged to the Contractor.
- E7.8 Measurement and Payment
- (a) The provision of Shop Drawings will be considered incidental to the Work and no separate payment will be made.

E8. OPERATING CONSTRAINTS FOR WORK IN CLOSE PROXIMITY TO CRITICAL INFRASTRUCTURE

E8.1 Description

E8.1.1 This Section details operating constraints for all work to be carried out in close proximity to the City feeder mains and other critical water infrastructure. Close proximity shall be deemed to be any construction activity within a 5 m horizontal offset from the centreline of the feeder main, aqueduct, process yard piping, within 5 m of valve chambers and other appurtenances, and any other infrastructure identified below.

E8.2 The following shall be considered critical pipelines and water infrastructure for this project:

E8.2.1 Shoal Lake Aqueduct

(a) Cast-in-place reinforced concrete pipe, installed approximately 1916.

E8.2.2 Branch I Aqueduct

(a) Constructed of 1200 mm cast iron pressure pipe, manufactured and installed approximately 1918.

E8.2.3 Branch II Aqueduct

(a) Constructed of AWWA C301 pre-stressed concrete cylinder pipe, manufactured and installed approximately 1958.

E8.2.4 Cell 3/4 Supply Line

(a) AWWA C301 pre-stressed concrete cylinder pipe, manufactured and installed in approximately 1995.

E8.2.5 1500 and 1219 drain and overflow lines.

E8.2.6 Power and control lines.

E8.3 General Considerations for Work in Close Proximity to Critical Water Infrastructure:

E8.3.1 The pipelines and infrastructure listed in E8.2 are critical components of the City of Winnipeg Regional Water Supply System and work in close proximity to the pipelines and infrastructure identified herein shall be undertaken with an abundance of caution. The aqueducts cannot typically be taken out of service for extended periods to facilitate construction and inadvertent damage caused to the pipe would likely have catastrophic consequences.

E8.3.2 Work around critical pipelines shall be planned and implemented to minimize the time period that work is carried out in close proximity to the pipe and to ensure that the pipeline is not subjected to excessive construction related loads, including excessive vibrations and/or concentrated or asymmetrical lateral loads during backfill placement.

E8.3.3 Large diameter pressure pipe generally has limited ability to withstand increased earth and live loading. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters.

E8.3.4 Construction in close proximity to critical infrastructure shall not commence until both the equipment and construction method statements have been submitted, reviewed, and accepted by the Contract Administrator.

E8.4 Submittals

- E8.4.1 Submit proposed construction equipment specifications to the Contract Administrator for review a minimum of five (5) Business Days prior to construction. The equipment submission shall include:
- (a) equipment operating and payload weights;
 - (b) equipment dimensions, including: wheel or track base, track length or axle spacing, track widths or wheel configurations;
 - (c) load distributions in the intended operating configuration.
- E8.4.2 Submit a construction method statement to the Contract Administrator a minimum of five (5) business days prior to construction. The construction method statement shall contain the following minimum information:
- (a) proposed construction plan including excavation locations, haul routes, stockpiles, excavation equipment locations, and loading positions;
 - (b) excavation plans, including shoring designs, for excavations occurring in close proximity to critical infrastructure (within 5 m horizontal of the pipe's centerline) where the excavation is to be extended below the top of the feeder mains embedment zone (150 mm above the pipe)
 - (c) trenchless construction methodology for critical infrastructure crossings, including: installation methods, means of grade control, means of confirming clear separation between the new HDPE piping and existing infrastructure;
 - (d) any other pertinent information required to accurately describe the construction activities in close proximity to critical infrastructure and permit the Contract Administrator to review the proposed construction plans.
- E8.4.3 Incomplete or partial submissions will not be reviewed and will be returned to the Contractor for re-submission.
- ## E8.5 Pre-Work, Planning and General Execution
- E8.5.1 No work shall commence in close proximity to aqueducts, feeder mains, chambers, and critical infrastructure until the equipment specifications and construction method statement have been submitted and accepted, and infrastructure locations have been clearly delineated in the field. Work over critical infrastructure shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications on the pipe.
- E8.5.2 Generally, legal traffic loads, equivalent to an AASHTO HS20 design vehicle, or other City of Winnipeg regional roadway restrictions in place at the time of the Works, will be permitted to cross piping. Larger loads may be permitted upon approval of the Contract Administrator.
- E8.5.3 Locate critical infrastructure and confirm their position horizontally and vertically at the proposed crossing locations prior to undertaking work in close proximity to the identified pipelines. Note, exact locations to be identified in the field. Deviations from the elevations noted on the Drawings shall be reported to Contract Administrator for review prior to proceeding with work. As a minimum, the following crossings shall be located:
- (a) Shoal Lake Aqueduct:
 - (i) 150 mm Firemain Crossing
 - (b) Branch I Aqueduct:
 - (i) SCADA Cable Crossing
 - (ii) Power Cable Crossing
 - (iii) 50 mm Water Service Crossing
 - (c) Branch II Aqueduct:
 - (i) 50 mm Telephone Cable Crossing

- (ii) 100 mm Sprinkler Service Crossing
 - (iii) 100 mm Force Main Crossing
 - (d) Branch II Sample Line:
 - (i) MTS Cable Crossing
 - (ii) 100 mm Sprinkler Service Crossing
 - (iii) 100 mm Force Main Crossing
 - (e) Cell 3/4 Supply Line:
 - (i) 150 mm Firemain Crossing
 - (f) 1500 Drain:
 - (i) SCADA Cable Crossing
 - (ii) Power Cable Crossing
 - (iii) 50 mm Water Service Crossing
 - (g) 1219 Overflow:
 - (i) Power Cable Crossing
 - (ii) 50 mm Water Service Crossing
- E8.5.4 Visually delineate all critical infrastructure identified herein on Site by use of paint, staking/flagging, construction fencing, snow fencing, or other suitable methods
- E8.5.5 Only utilize construction practices and procedures that do not impart excessive vibratory loads on the identified pipelines, or that would cause settlement of the subgrade below critical pipelines.
- E8.5.6 Where the existing road structure must be removed, crossing of critical infrastructure shall be prohibited from the time the existing roadway structure is removed until the completion of granular base construction. At all times prior to completion of final paving; reduce equipment speeds to levels that minimize the effects of impact loading to the critical infrastructure.
- E8.5.7 Only equipment and construction practices stipulated in the accepted construction method statement and the supplemental requirements noted herein may be utilized in close proximity to feeder mains, chambers, and other critical infrastructure identified herein.
- E8.5.8 Construction operations should be staged in such a manner as to limit multiple construction loads at one time, (e.g., offset crossings sufficiently from each other, rollers should remain a sufficient distance behind spreaders to limit loads. A reasonable offset distance is 3 m between loads).
- E8.5.9 Granular material, construction material, soil, and/or other material shall not be stockpiled on the pipelines or within 5 m of any feeder main, valve chamber, or other critical infrastructure identified herein.
- E8.5.10 The Contractor shall ensure that all crew members understand and observe the requirements of working near feeder mains, valve chambers, and critical infrastructure. Prior to commencement of on-Site work, the Contractor shall jointly conduct an orientation meeting with the Contract Administer, all superintendents, foreman, and heavy equipment operators to make all workers on the Site fully cognizant of the limitations of altered loading on, the ramifications of inadvertent damage to, and the constraints associated with work in close proximity to feeder mains and critical pipelines. New personnel introduced after commencement of the Project need to be formally orientated as outlined herein. It is recommended that restrictions associated with the crossing, consistent with the Contractor's submitted method statement be posted on Site and near the crossing.
- E8.6 Demolition and Excavation
 - E8.6.1 Use of pneumatic concrete breakers within 3 m of critical infrastructure is prohibited. Pavement shall be full depth sawcut and carefully removed. Use of hand held jackhammers for pavement removal will be allowed.

- E8.6.2 Offset excavation equipment a minimum of 3 m from the centerline of critical pipelines when undertaking excavations where there is less than 2.4 m of earth cover over the pipeline.
- E8.6.3 Utilize only smooth edged excavation buckets, soft excavation, or hand excavation techniques where there is less than 1.5 m of earth cover over the pipeline. Where there is less than 1.0 m of soil cover above the pipeline, provide full time supervision and complete the excavation utilizing hand excavation or soft excavation methods.
- E8.6.4 Equipment should not be allowed to operate while positioned directly over a feeder main or critical pipeline except where permitted herein, outlined in the reviewed and accepted construction method statement.
- E8.6.5 Compaction of backfill materials within 3.0 m (horizontally) of a critical pipeline shall be either carried out by static methods (without vibration) or with smaller approved equipment such as hand held plate packers or smaller roller equipment.
- E8.6.6 Excavations within 3 m of the outside edge of aqueduct or other critical pipe lines (hydrovac holes for confirming trenchless installations excluded) and which extend below the feeder main shall utilize shoring methods that precludes the movement of native in-situ soils (i.e. a tight shoring system).
- E8.7 **Underground Construction and Trenchless Pipe Installation**
- E8.7.1 Install new pipes to the grades shown on the Drawings. Minimum clear separation distance (outside to outside of pipe wall) shall be maintained between crossing pipes and the critical infrastructure identified in E8.2 as follows:
- (a) 500 mm when crossing above critical pipes
 - (b) 1000 mm when crossing below critical pipes
- E8.7.2 The Contractor shall locate critical pipelines and confirm their position horizontally and vertically prior to commencing with any trenchless pipe installations to ensure proper clearances are maintained. Under NO circumstances should blind coring proceed across critical infrastructure.
- E8.7.3 The Contractor shall visually confirm the location and alignment of the drill rods or jacking pipe (horizontally and vertically) prior to proceeding with the trenchless critical infrastructure crossings. It is recommended that the new pipe alignment be confirmed within 2 m of the outside of the critical pipelines but no closer than 0.5 m from the outside edge of the pipe.
- E8.7.4 No trenchless methods involving soil displacement (plugs) shall be permitted in the vicinity of the critical pipelines.
- E8.7.5 Pressure grouting or approved alternative methods shall be used to fill voids caused by the installation or if the bored hole diameter is greater than the outside diameter of the pipe by more than 25 mm.
- E8.7.6 Where excavation is required within the pipeline's embedment zone, the Contractor shall take steps to ensure the granular embedment material surrounding the feeder main remains stable during the work and the feeder main outside of the excavation is not undermined.

E9. SURFACE RESTORATIONS

- E9.1 Further to CW 1130, the Contractor shall restore the condition and appearance of the site to pre-construction conditions or better. Costs for restoration work performed shall be considered incidental to the Work and no separate measurement or payment will be made.
- E9.2 Prior to construction, Contractor shall inspect the grassed, asphalt pavement and gravel surfaces within and adjacent to the Site with the Contract Administrator to record the current

condition. After construction and Site cleanup is complete, re-inspect the condition with the Contract Administrator.

- E9.3 Restoration of grassed areas damaged as result of construction excavation will be restored in accordance with CW 3510. Restoration of miscellaneous areas of excavation less than 1 m² (such as hydro-vac excavations) may be restored with topsoil and seed in accordance with CW 3520. Areas damaged by travel of the contractor's equipment, materials storage, or excavation spoil piles shall be restored in accordance with CW 3510.
- E9.4 Pavement damaged as a result of construction activities will be restored in accordance with CW 3310 and CW 3410.
- E9.5 Gravel surfacing damaged as a result of construction activities will be restored in accordance with CW 3150.

E10. PEX WATER SERVICE PIPING

E10.1 Description

E10.1.1 General

- (a) Supply and installation of 50mm potable water piping from the Deacon Booster Pump Station to the Civil Maintenance/Aqueduct Storage Building by trenchless installation methods.

E10.1.2 Referenced Standard Construction Specifications

- (a) CW 1120 - Existing Services, Utilities and Structures
(b) CW 2030 - Excavation, Bedding and Backfill
(c) CW 2110 – Watermains

E10.1.3 Referenced Approved Products

- (a) AP-013 - Minneapolis Style Curb Box for 20 and 25 Millimetre Minneapolis Style Curb Stops

E10.1.4 Standards

- (a) Work and materials to be in accordance with the following standards:
- (i) NSF National Sanitation Foundation
 - ◆ NSF Standard 14 - Plastic Piping System Components and Related Materials
 - ◆ NSF Standard 61 - Drinking Water System Components - Health Effects
 - (ii) PPI Plastic Pipe Institute
 - (iii) American Water Works Association
 - ◆ ANSI/AWWA C904 - Cross-Linked Polyethylene (PEX) Pressure Pipe, ½ In. (12 mm) Through 3 In. (76 mm), for Water Service
 - (iv) ASTM
 - ◆ ASTM F 876 - Standard Specification for Cross-Linked Polyethylene (PEX) Tubing
 - ◆ ASTM F 877 - Cross-linked Polyethylene (PEX) Plastic Hot and Cold Water Distribution Systems
 - (v) Canadian Standards Association (CSA International)
 - ◆ B 137.5 Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications

E10.2 Products

E10.2.1 Cross-linked Polyethylene (PEX) Pressure Pipe for Water Service

- (a) PEX water service tubing, SDR9 copper tube sizes (CTS), certified to CSA B 137.5 "Cross-Linked Polyethylene (PEX) Tubing for Pressure Applications", NSF Standard 14 and 61, ASTM F 876, and ANSI/AWWA C904.
- (b) Pressure Class 1105 kPa @ 23°C (160 psi @ 73.4°F)
- (c) Cell classification: 354400 in accordance with ASTM D 3350
- (d) Minimum degree of crosslinking - 80% in accordance with ASTM D 2765, Method B.
- (e) Markings (at intervals of 1.5 m or less):
 - (i) manufacturer's name or trademark
 - (ii) manufacturing date and machine number
 - (iii) nominal size and SDR
 - (iv) pressure class and temperature rating
 - (v) material designation
 - (vi) Certifications of: ASTM F 876, CSA B 137.5, NSF, and AWWA
 - (vii) meterage marking.
- (f) Pipe to be supplied in coils of sufficient length to permit installation without couplings.
- (g) Approved product:
 - (i) Municipex – as manufactured by Rehau
 - (ii) Blue904 – as manufactured by Ipex,
 - (iii) or Approved Equal in accordance to B7.
- (h) Pipe shall be installed within twelve (12) months of the date of manufacture.

E10.2.2 Fittings

- (a) Fittings must meet all material and design requirements of City of Winnipeg Standards AT-4.1.2.31 and AT-4.1.2.40 and be from one of the approved manufacturers, except as noted herein.
- (b) Fittings shall be compression style and installed with stainless steel support insert approved for use by the manufacturer.
- (c) Fittings shall incorporate an anode/thaw wire connection point.
- (d) Fittings shall be manufactured and installed to provide electrical continuity between the wire connectors and the corporation, curb stop and/or valve.

E10.2.3 Tracer Wire

- (a) Type RWU 90, 12 gauge, 7 or more strand copper wire, 60°C or higher. 600V or approved equivalent; continuous strand.

E10.2.4 Wall Penetration Seals

- (a) Segmented modular pipe seals – Low Durometer EPDM interlocking links, 316 Stainless Steel bolts and nuts, Non-metallic pressure plates.
- (b) Approved products:
 - (i) Innerlynx L-316 – as manufactured by Advance Product Systems
 - (ii) Link-Seal LS-316 – as manufactured by GPT Industries,
 - (iii) or Approved Equal in accordance to B7.

E10.3 Construction Methods

E10.3.1 Complete excavation and backfill in accordance with CW 2030.

E10.3.2 Install pipe by trenchless methods (HDD).

- E10.3.3 Pipe bedding to be Class B sand bedding in open trench locations.
- E10.3.4 Installation to CW 2110 except as noted herein.
- E10.3.5 Couplings for PEX to PEX piping will not be permitted. Use continuous lengths.
- E10.3.6 Connections:
- (a) Tap pipe at 10 – 20 degrees above horizontal.
 - (b) Cut pipe squarely with an approved tool.
 - (c) Connect to compression fittings with stainless steel inserts.
 - (d) Ensure correct pipe alignment at fittings.
 - (e) Install pipe with minimum 1.2 m gooseneck at connection to main.
 - (f) Carefully bed pipe at fittings to ensure no stress and pipe remains true at connection.
- E10.3.7 Snake pipe in trench to Manufacturer's recommended offsets for installation temperature.
- E10.3.8 Do not bend back pipe from coil beyond straight.
- E10.3.9 Do not kink pipe, or use kinked pipe.
- E10.3.10 Do not exceed Manufacturer's recommended minimum bending radius.
- E10.3.11 Tracer Wire Installation
- (a) Attach tracer wire to anode/thaw wire lug on corporation stop.
 - (b) Fasten tracer wire to PEX tubing every 1.5 m with general purpose cable tie.
 - (c) Attach tracer wire to curb stop anode/thaw wire lug, and curb box anode wire.
 - (d) Splicing of tracing wire is not allowed.
 - (e) Demonstrate tracer wire continuity from corporation stop to curb box.
- E10.3.12 Install anode on all curb stop boxes.
- E10.3.13 Wall Penetration at Deacon Booster Pump Station
- (a) Core appropriate sized hole through foundation wall at Deacon Booster Pump Station. Location is to be field determined based upon existing piping and penetrations and is to be approved by the Contract Administrator prior to commencement.
 - (b) Wall penetration to employ double link seal.
 - (c) Tighten the bolts from the inner face and fill the outer annular space with grout.
 - (d) Grout annulus and repaint interior wall to match existing.
 - (e) If seepage occurs during the warranty period, the Contractor is responsible for repair and/or replacement, at no cost to the City.
- E10.3.14 Pipe Terminations
- (a) Connect to existing pipe stub outside the Civil Maintenance/Aqueduct Storage Building.
 - (b) Piping to extend 300 mm beyond interior wall and be terminated with a cap rated to the pressure rating of the pipe.
- E10.4 Measurement and Payment
- E10.4.1 The supply and installation of PEX water Service piping will be measured on a length basis and paid for at the Contract Unit Price per meter for Water Service Pipe.
- E10.4.2 Tracer wire is incidental to pipe installation.
- E10.4.3 Connection to the existing 50mm stub at the Civil Maintenance/Aqueduct Storage Building will be paid on a lump sum basis.

- E10.4.4 Wall penetration and termination of piping in the Deacon Booster Pump Station will be paid on a lump sum basis.
- E10.4.5 Curb Stops will be measured and paid for as specified in CW 2110.

E11. HDPE PRESSURE PIPELINES

E11.1 General

- (a) The supply and installation of fire mains and sewage forcemains and their appurtenances.
- (b) Construction of the 100 mm sprinkler connection from the new fire hydrant to the Civil Maintenance/Aqueduct Storage Building is subject to the availability of funds and as such is listed under the provisional items section in Form B. The Contractor will be advised at the preconstruction meeting if this work will be deleted from the Contract.

E11.2 Products

E11.2.1 Use only those products listed as Approved Products for Underground Use in the City of Winnipeg in the City of Winnipeg Standard Construction Specifications or as specified herein.

E11.2.2 HDPE Piping

(a) General:

- (i) Pipe to be made from polyethylene resin compound with a minimum cell classification of PE 445574C for PE 4710 materials in accordance with ASTM D3350. Resin is to have a minimum hydrostatic design basis (HDB) of 1600 psi and qualify for a 0.63 design factor to establish a maximum recommended hydrostatic design stress (HDS) of 1000 psi at 73°F (23°C) for water. Materials shall be listed in Plastic Pipe Institute (PPI) TR-4 2009, TABLE I.A.13 - PE 4710.
- (ii) To be iron pipe sized, certified for potable water use, made in accordance with AWWA C906, and CSA B137
- (iii) Manufacture pipe to ASTM F 714.
- (iv) Compounds used shall meet the requirements of clause 7.2 of CSA B137.0 for toxicity for potable water service.
- (v) Manufacture pipe to ASTM F 714.
- (vi) Markings: continuously or at 1.5 m intervals indent print the following: pipe Manufacturer, nominal pipe size, dimension ratio, PE grade per ASTM D3350, followed by the Hydrostatic Design basis in 100's of psi, CSA/Warnock Hersey/or NSF International certification complete with certification trademark logo, Manufacturing reference standard ASTM D 3035, and date of manufacture.
- (vii) Maximum pipe ovality for polyethylene pipe prior to joining shall not exceed 4%.
- (viii) Shall contain no recycled material except that generated in the Manufacturer's own plant from the resin of the same specification and same raw material supplier

(b) HDPE Firemain

- (i) Use DR 11 for all piping unless otherwise stated. Pipe shall be rated for use at a pressure class of 1.38 MPa (200 psi).
- (ii) Pipe to be FM approved.

(c) HDPE Forcemain

- (i) Use DR 17 for all piping unless otherwise stated. Pipe shall be rated for use at a pressure class of 0.86 MPa (125 psi).

(d) Acceptable Products:

- (i) Sclairpipe by KWH Canada

- (ii) DriscoPlex by Performance Pipe
- (iii) JM Eagle HDPE Water Pipe
- (iv) or Approved Equal in accordance to B7
- (e) Polyethylene Pipe Joints
 - (i) Joints to be thermal butt fusion welded, except where connecting to flanged fittings.
 - (ii) Flanged connections with epoxy coated ductile iron backing rings. Bolts and nuts to be 316 stainless steel.

E11.2.3 Polyethylene Fittings

- (a) Manufactured in accordance with the same specifications as HDPE pipe and shall be the same series and resin as the pipe with which the appurtenance is used.
- (b) Fittings shall be of the dimension ration (DR) as the pipe. The average wall thickness shall be 25% greater than that of the pipe. Where butt-fused, ends shall have the same wall thickness as the pipe.
- (c) Electrofusion fittings as per ASTM F1055.

E11.2.4 PVC Pipe and Fittings

- (a) As per City of Winnipeg Approved Products.

E11.2.5 Hydrants, Valves and Tapping Sleeves

- (a) As per City of Winnipeg Approved Products.
- (b) Valve boxes on sewage forcemains to be marked "S".

E11.2.6 Joint Restraint System:

- (a) Joint restraint systems to CW 2110 and as specified herein.
- (b) Joint restraint systems to be rated for pressure equal to or greater than the rated pressure of the pipe. Ratings must include a minimum safety factor of 2 to 1.
- (c) Fasteners and restraining rods to be 316 stainless steel.
- (d) Coating: fusion bonded epoxy or approved equal as specified in B7.
- (e) Acceptable products:
 - (i) EBAA Iron
 - (ii) Romac Industries
 - (iii) Ford/Uni-Flange

E11.3 Submittals

E11.3.1 Shop drawings for HDPE pipe in accordance with CW 1100.

E11.3.2 Pipe Manufacture Quality Control Reports

- (a) Submit quality control reports, for testing required in accordance to AWWA C906 Section 5.4, no later than five (5) Business Days upon manufacture of pipe.

E11.3.3 Affidavit of Compliance

- (a) An affidavit of compliance signed by an officer of the pipe manufacturing company shall be provided stating that the pipe and fittings comply with this Specification, in accordance with Section 6.3 of AWWA C906.

E11.3.4 Written verification from the Manufacturer that the Contractor's personnel performing pipe fusing are qualified and that the jointing equipment has been inspected and is suitable for the pipe supplied.

E11.3.5 Pipe Manufacturer's written bulletins on required procedures, heat and pressures for butt fusion of HDPE pipe.

- E11.3.6 Installation requirements for electrofusion fittings.
- E11.3.7 Field welding reports containing data on:
- (a) Location of welds
 - (b) Ambient temperature
 - (c) Fusion temperature
 - (d) Interface pressure
 - (e) Heating time
 - (f) Cooling time
- E11.3.8 Data on all electrofusion welds performed.
- E11.4 Quality Control
- E11.4.1 Inspection
- (a) The Contractor shall afford the Contract Administrator every facility to access and inspect all plant to be provided, work to be performed, materials to be supplied and equipment or machinery to be installed in accordance with Specifications.
- E11.4.2 Testing of Pipe and Materials
- (a) The Contractor shall provide access to the Contract Administrator or his appointed representative to conduct plant inspections, in accordance to Section 5.8 of AWWA C906. The Contractor shall provide a minimum of 7 calendar days notice of commencement of pipe manufacture, for the purposes of scheduling plant inspections.
 - (b) The Contract Administrator reserves the right to conduct third party quality control testing.
- E11.4.3 Dimensional Checks
- (a) Notwithstanding AWWA C906, Section 5.4.2, dimensional checks shall be carried out for each and every pipe in the production run.
- E11.5 Construction Methods
- E11.5.1 General
- (a) Pipes, fittings, valves, hydrants, and appurtenances shall be cleaned of accumulated debris before installation.
 - (b) Carefully inspect all materials for defects. Remove defective materials from site.
- E11.5.2 Fusing
- (a) HDPE pipe sections are to be thermal butt fused with flanged connections used at fitting locations unless otherwise specified by the Contract Administrator.
 - (b) Provide trained personnel and fusion machine suitable for the type of pipe being fused. Provide certification from the pipe manufacturer showing that the joining equipment is suitable for type of pipe used, and the Operator is qualified to operate same.
 - (c) Submit records of fusing operations including:
 - (i) Location of welds; Ambient temperature; Fusion temperature; Interface pressure; Heating time; Cooling time.
- E11.5.3 Horizontal Directional Drilling
- (a) Horizontal Directional Drilling in accordance with E13.

E11.5.4 Trenched Installation

- (a) Excavation shall be in accordance with Specification CW2030, "Excavation, Bedding and Backfill" and E12.
- (b) Pipe installation in accordance with CW 2110.
 - (i) Provide mechanically restrained joints at locations indicated on drawings.
 - (ii) Supply and install denso paste and tape to coat all backing rings on flanged connections.

E11.6 Field Testing

E11.6.1 Flush new mains in accordance with City of Winnipeg Standard Construction Specifications CW 2145 prior to testing.

E11.6.2 Hydrostatic Leakage Testing

- (a) After the system has been installed and backfilled to the satisfaction of the Contract Administrator, pressure test the system.
- (b) Provide labour, equipment and materials required to perform hydrostatic leakage tests hereinafter described. Ensure system will pass test prior to requesting Contract Administrator to witness test.
- (c) Notify Contract Administrator at least two (2) working days in advance of all proposed tests. Perform tests in presence of Contract Administrator.
- (d) Where any section of system is provided with concrete thrust blocks, do not conduct tests until at least five (5) days after placing concrete or two (2) days if high early strength concrete is used.
- (e) The test shall consist of an initial expansion phase and a test phase.

E11.6.3 Test Procedure

- (a) Open mainline valves.
- (b) Expel air from main by slowly filling main with potable water and complete flushing by running water to waste. Provide all water required for filling and flushing.
- (c) Flushing shall achieve velocities of 3.0 m/s.
- (d) Initial Expansion Phase:
 - (i) Pressurize the pipeline to an initial pressure of 1,000 kPa, based on the elevation of highest point in main and corrected to elevation of gauge, for a period of two (2) hours. To accommodate the initial expansion of the pipe under test, sufficient make-up water shall be added to the system at hourly intervals for four (4) hours to return to the initial test pressure.
 - (ii) Do not exceed the test pressure within 72 hours prior to completing the pressure testing.
 - (iii) In the event that the initial test pressure cannot be obtained, discontinue testing and repair leaks.
- (e) Test Phase:
 - (i) At the end of the four hour expansion phase, reduce the pipeline pressure by 70 kPa and monitor the pressure for 1 hour. No additional makeup water shall be added during the test phase.
 - (ii) Acceptable pressure drop during the one hour test phase is 5% of test pressure.
 - (iii) Following completion of the test phase bleed off water equivalent to from a location remote from the gauge location to demonstrate the pressure drop in the system.
- (f) Irrespective of pressure drop, repair any known leaks.

- (g) Depressurize and allow the piping system to “relax” for at least eight hours if the test is not completed within eight hours or must be repeated for any reason.
- (h) Locate and repair defects if leakage is greater than amount specified. Report leaks to Contract Administrator prior to excavating to allow Contract Administrator to be on Site if so desired. Provide written summary of all repair works completed.
- (i) Record tests whether acceptable or not on and sign and submit leakage test form to the Contract Administrator.
- (j) Repeat test in the presence of the Contract Administrator until pressure drop is within specified allowance.
- (k) Remove all temporary access points after satisfactorily completion of test and seal holes with brass plugs or as otherwise directed by the Contract Administrator.

E11.6.4 Valves

- (a) Demonstrate operation of all valves in presence of Contract Administrator and the City. All gate valves shall operate smoothly with no binding at the valve box.
- (ii) Connections to Existing Systems
 - (a) Make connections to existing systems following acceptance of all pressure testing.
 - (b) Coordinate all shut downs with Contract Administrator and City and submit schedule for shut downs 14 calendar days prior to Work.
 - (c) Re-confirm schedule for shutdowns 24 hours prior to Work.
 - (d) Expose all connections points prior to construction to confirm elevation and location.
 - (e) Relocate existing sewage forcemain as require for installation of tapping sleeve and valve.

E11.7 Measurement and Payment

E11.7.1 With the exception of the items listed below, Measurement and Payment will be in accordance with CW 2110 as indicated for the items listed in Form B.

- (a) Tracer wire is incidental to pipe installation.
- (b) The supply and installation of Firemain and Forcemain piping will be measured on a length basis and paid for at the Contract Unit Price per meter for Firemain or Forcemain.
- (c) Connect to existing 250mm Firemain (Complete) will be measured on a lump sum basis and paid for at the Contract Unit Price per connection to existing 250mm Firemain (Complete).
- (d) Payment for Connect to Existing 250mm Firemain (Complete) shall include the supply of all materials, and completion of all work specified herein and on the drawings, including trenching and backfilling, removal of existing elbow, supply and installation of 250mm Tee, 250 x 150mm reducer, 150mm 90 degree elbow & PVC flange adaptor and PVC pipe as required to complete the work. 150mm valve to be paid separate.
- (e) Connect to existing 150mm Forcemain with tapping sleeve and valve will be measured on a lump sum basis and paid for at the Contract Unit Price per connection to existing 150mm Forcemain (Complete).
- (f) Payment for Connect to Existing 150mm Forcemain with Tapping Sleeve and Valve (Complete) shall include the supply of all materials, and completion of all work specified herein and on the drawings, including trenching and backfilling, supply and installation of tapping sleeve and valve as required to complete the work. Re-grading of the existing 200mm forcemain is considered incidental to the connection works.

E12. EXCAVATION, TRENCHING, AND BACKFILL

E12.1 Description

- (a) Further to CW 2030, this Specification defines additional requirements for excavation, trenching and backfilling for utilities.

E12.2 Submittals

- (a) Shop drawings for all excavation shoring shall be prepared and submitted in accordance with E7. All shop drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experience in the design of excavation shoring systems.

E12.3 Shoring Design

- (a) Excavation shoring shall be designed to accommodate installation of all pipe and fittings.
- (b) All excavations and shoring systems shall comply with Manitoba Workplace Safety and Health requirements.

E12.4 Excavation

- (a) Excess excavation from trenching operations shall be disposed of off-site.
- (b) Granular bedding in the vicinity of existing pipelines shall be dewatered and stabilized prior to undermining pipes to prevent loss of granular pipe foundation.

E12.5 Backfill

- (a) Backfill within 1 m of existing and proposed pavements and granular roadways shall be completed to CW 2030, Class 2 standards. Granular backfill shall extend to the underside of the proposed pavement structure, as indicated on the drawings. The remaining trench backfill shall be completed to existing grade to CW 2030, Class 4 standards.
- (b) Backfill under paths and walkways shall be completed to CW 2030, Class 2 standards.
- (c) Backfill within 1 metre of existing and new concrete structures shall be completed with free draining pit run granular material to CW 2030, Class 2 standards. The top 600 millimetres of the backfill adjacent to concrete structures shall be insitu clay material completed to CW 2030, Class 4 standards.

E12.6 Embedment Material

- (a) Embedment material shall be Bedding Sand material conforming to CW2030 Table CW 2030.1.
- (b) Frozen material will not be permitted.

E12.7 Cable Protection and Warning Marking

- (a) Warning tape shall conform to specification 16108 – Installation of Cable in Trenches and in Ducts.

E12.8 Trenching for MTS Cables

- (a) The Contractor shall coordinate with Manitoba Telephone Services (MTS), who will connect the telephone cable for the project.
- (b) The Contractor will be responsible to excavate the trenches, supply and install cable, backfill trenches and backfill connections points once MTS personnel have completed connections.

E12.9 Measurement and Payment

- (a) Excavation, shoring, and backfilling shall be considered incidental to the installation of the utility pipe being installed and will not be measured for payment. No separate payment will be made.

- (b) Cable Protection and Warning Tape shall be considered incidental to the utility being installed.

E13. HORIZONTAL DIRECTIONAL DRILLING

E13.1 Description

- (a) This specification covers the installation of pipe by horizontal directional drilling (HDD). Horizontal directional drilling is a trenchless excavation method which is accomplished in two phases. The first phase consists of drilling a pilot hole along a designed directional path. The second phase consists of pulling the pipe into the pilot hole. Horizontal directional drilling is accomplished using a specialized drilling rig with ancillary tools and equipment.

E13.2 Scope of Work

- (a) Limits of utilities to be installed by HDD are as indicated on the construction drawings. Utilities to be installed include water supply lines, cable conduits, and sanitary sewer forcemain.

E13.3 Permits

- (a) The Contractor shall be responsible for obtaining all necessary permits. Copies of each permit shall be made available at the Site.

E13.4 Quality Assurance

- (a) The Horizontal Directional Drilling Contractor shall have been performing this specialty work for a minimum of five (5) years and completed five (5) projects of similar complexity successfully in that period.
- (b) Horizontal directional drilling operations shall be performed under the full-time supervision of a drill rig superintendent having the following minimum requirements:
 - (i) Not less than five (5) years experience in HDD projects of similar type and equal complexity as the proposed project.
- (c) Horizontal directional drilling shall be conducted in accordance with these specifications and the standards of care for the industry. Refer to the IADC Drilling Manual and Horizontal Directional Drilling Consortium Good Practice Guidelines.
- (d) Install HDPE pipe using the horizontal directional drilling method in general accordance with the Plastic Pipe Institute "Guidelines for Use of Mini-Horizontal Directional Drilling for Placement of High Density Polyethylene Pipe" TR-46. The Contractor shall not disturb soils above the crossing.

E13.5 Submittals

- (a) Shop Drawings
 - (i) Submit the following Show Drawings in accordance with City of Winnipeg Specification CW 1100 and Section E7 of this Specification.
 - (i) A detailed schedule and description of procedures for pipe delivery, welding and fusion operations; pilot hole drilling, reaming, testing and pull back.
 - (ii) Description of pilot hole location instrumentation systems.
 - (iii) Description of the drill rig including its pullback and torque capacities.
 - (iv) Description of proposed buoyancy control procedures.
 - (v) Methods, permits required, and location for disposal of all drilled spoils.
 - (vi) Layout drawings showing: placement of pipe adjacent to streets; location of temporary pipe supports; and location and size of bending radii for any curves along the alignment, above ground as well as below.
 - (vii) Layout and locations of topside equipment within the rig side workspace and pipe side work.

- (viii) Number and size of pre-reams.
- (ix) Calculations showing determination of the appropriate back-ream rate for each pre-ream and product pullback.
- (x) Drilling fluid and cuttings management plan, including type of drilling fluid, drilling fluid pressure, fluid containment/storage/recycling, and transport and disposal.
- (xi) Management plan for frac-outs.
- (xii) Detailed installation plans and profiles of the bores.
- (xiii) Drilling fluid composition and any additional lubrication or coatings which may be applied to the outside of the product pipe.
- (ii) Record survey of any pilot holes shall be submitted within 24 hours of completion of the pilot hole. Including details of depths of pipe at locations not exceeding 10m increments along the pipe route.
- (iii) During the HDD operations the Contractor shall submit daily progress reports to the Contract Administrator. The report shall include the work performed, potential conflicts with other aspects of the project, and the as-drilled location of the bit at the end of the day.
- (iv) A Construction Contingency Plan specifying the methods and procedures to overcome construction hazards, such as, but not limited to, damage to all adjacent utilities (i.e. water, drainage, sewer, utilities), encountering subsurface obstructions during pilot hole drilling and pipeline pull-back, pipeline misalignment (horizontal and vertical), drilling mud loss, hole collapse, pipe collapse, and sinkholes in the overburden soils.
- (v) Variations in Planned Alignment and Profile
 - (i) The Contractor may request changes to the proposed vertical and horizontal alignment of the installation and the location of the entry and exit points. Proposed changes shall be submitted in writing to the Contract Administrator and approval received prior to construction.
 - (ii) Where minimum clearances are specified, no reduction in the minimums will be permitted.
 - (iii) Elevations and locations of tie-ins to structures, pipes, and crossings should be considered fixed.
 - (iv) Where the Contract Administrator approves the Contractors requests for variations to the plan or profile alignment, such variation shall not result in a net increase to the project cost.

E13.6 Instrumentation

- (a) The contractor shall at all times provide and maintain a tracking system which will accurately locate the pilot hole, measure drill string axial and torsional loads, and measure drilling fluid discharge rate and pressure. The Contractor shall make these instruments and their readings available at all times.
- (b) Drilling fluids shall be non-hazardous in accordance with E4 and suitable for landfill or similar disposal.

E13.7 Execution

- (a) Protection of Underground Utilities
 - (i) The Contractor shall undertake the following steps prior to commencing drilling operations.
 - (i) Contact all utilities to obtain clearances for underground plant prior to construction.
 - (ii) Positively locate and stake all existing lines, cables, or other underground utilities including exposing any facilities which are located within three (3) meters of the designated drilled path.

- (iii) Modify drilling practices and downhole assemblies to prevent damage to existing utilities.
- (b) Protection of Aqueducts and Water Transmission Lines
- (i) Prior to commencing the pilot bore, shafts shall be vacuum excavated along the bore alignment on either side of all aqueducts and water transmission lines. These shafts shall be shored and maintained to the depth of the bore profile to confirm the elevation of the drill head prior to its approach to the aqueduct or water transmission line, and after passing above or beneath the aqueducts or water transmission line. Physical measurements shall be taken to confirm the depths reported by the tracking system at these points. If minimum clearances are not obtained, the drill head shall be retracted and the pilot bore repeated until the required clearances are achieved.
 - (ii) Reaming or plugging methods that induce vertical displacement of soil will not be permitted in the vicinity of the aqueducts or water transmission lines.
 - (iii) The Contractor shall, at no additional cost to the City, be responsible for repairing any utility which is damaged during construction activities.
- (c) Pilot Hole
- (i) The Contractor shall be responsible for selection of the type of reamer, diameter, and other pertinent operations as required for completion of the installation works, subject to the requirements of these specifications. Equipment is to include a full range of drill stems and reaming heads to allow for various factors and soil types which may be encountered. Drill stems shall be of proper size and diameter to allow for full thrust and torque capabilities of the drilling machine.
 - (ii) Conduct drilling operations in accordance with IADC Drilling Manual and Horizontal Directional Drilling Good Practices Guidelines.
 - (iii) Direction Tolerance: The pilot holes shall be drilled along the paths shown on the plan and profile drawing to the tolerances indicated below. In all cases, concern for adjacent utilities and/or structures shall take precedence over the listed tolerances. Listing of tolerances does not relieve the Contractor from responsibility for safe operations or damage to adjacent utilities and structures.
 - (i) Elevation – The vertical path shall not exceed high points shown on the profile view on the drawings.
 - (ii) Alignment – Plus and minus 200 mm.
 - (iii) The Contract Administrator or Project Manager reserves the right to reject pipes installed not meeting the tolerance requirements specified herein. No additional compensation shall be provided to the Contractor for replacement of pipe not meeting the tolerance requirements.
 - (iv) The Contract Administrator must be notified immediately if any condition is encountered that stops the forward progress of drilling operations. The Contractor may be allowed to abandon the completed portion in place and start a new hole as directed by Contract Administrator at no additional cost to the City.
 - (iv) Record Drawings: During pilot hole drilling, the Contractor shall provide a drawing and a tabulation of coordinates, referenced to the drilling entry point, which accurately describes and documents the location of the pilot hole. Record the depth to the nearest 0.10 m from ground surface at major changes in surface elevation, at maximum 10 m increments, at all utility crossings, and at horizontal and vertical changes in alignment. Indicate the location that the depth was recorded by spray paint, marker buoy, or other method to allow the Contract Administrator to obtain the coordinates of the location. Upon completion of the pilot hole, the Contractor shall provide the Contract Administrator with a “record” drawing accurately depicting the pilot hole location, both horizontally and vertically with the proposed alignment to verify compliance with tolerances. Pull back or reaming operations shall not commence until the pilot hole record information has been reviewed.

- (d) Pipe Staging
 - (i) The required piping shall be assembled in a manner that does not obstruct adjacent roadways or driveways and public or City of Winnipeg activities.
- (e) Reaming
 - (i) Begin reaming operations to enlarge pilot hole after the Contract Administrator has accepted the pilot bore.
 - (ii) After completing the pilot hole, utilize larger diameter reaming heads to enlarge the hole as required for pipe pullback. Complete multiple reaming operations as necessary to obtain the required hole size for utility piping. The number and size of reaming heads is at the discretion of the Contractor. The annular space on the final bore hole shall not exceed 75mm measured from the outside diameter of the host pipe.
- (f) Pull Back
 - (i) The pipe shall be pulled back in a continuous non-stop operation in order to prevent the pipe from seizing.
 - (ii) Carry out pullback operations immediately following the pre ream. Pullback operations shall be continuous until completion regardless of time of day works are commenced. Attach a pullback head (pipe grip) to piping to allow for fastening to a swivel head reamer. The head shall be closed to prevent drilling mud from entering the pipe during pullback operation. Rating of the swivel shall be somewhat larger than the lower of either the pull force capability of the drill rig or the strength of the pipe.
 - (iii) The pipe grip shall consist of a fused polyethylene adapter, internal/external clamp, or bolting device. Basket type or internal only grips will not be permitted.
 - (iv) If required, fill the carrier pipe with water when pulling into the bore hole to help prevent flotation. Notify the Contract Administrator prior to filling and pull in.
 - (v) Pulling Loads
 - (i) The maximum allowable tensile load imposed on the pipe pull section shall be equal to 50 percent of the specified minimum yield strength of the pipe.
 - (ii) Provide a weak link between the swivel back reamer and pulling head (pipe grip) to ensure the pullback force on the pipe does not exceed the maximum tensile force allowed by the pipe manufacturer. The weak link is to be designed such that failure will occur prior to the strain on the pipe exceeding acceptable tolerances during pullback. Provide a Shop Drawing including calculations on strain required for failure of the weak link.
 - (vi) Torsional Stress: A swivel shall be used to connect the pull section(s) to the reaming assembly to minimize torsional stress imposed on the section(s).
 - (vii) Pull Section Support: The pull section(s) shall be supported throughout the entire pull back procedure so that the pull section(s) move freely above and below ground such that the pipe is not damaged.
 - (i) Rollers shall be spaced at a maximum of 20 meters on center, and the rollers are to be comprised of a non-abrasive material arranged in a manner to provide support to the bottom and bottom quarter points of the pipeline, allowing for free movement of the pipeline during the pullback.
 - (ii) Care shall be taken during transportation of the pipe to ensure that it is not cut, kinked, or otherwise damaged.
 - (iii) Sufficient number of rollers shall be used to prevent excess sagging of pipe. The HDPE pipe shall not be dragged across the surface during pullback operations.
 - (iv) Sections of the pipes with cuts and gouges exceeding 10 percent of the pipe wall thickness or kinked sections shall be removed and the ends rejoined.
 - (viii) External Collapse Pressure: The pull section shall be installed in the reamed hole in such a manner that external pressures are minimized. Any damage to the pipe

resulting from external pressure during installation shall be the responsibility of the Contractor.

(g) Drilling Fluids

- (i) Composition: The composition of all drilling fluids proposed for use shall be in accordance with API Specification 13A; API Recommended Practice 13B, and API Bulletin 13D and submitted. No fluid shall be utilized that does not comply with permit requirements and environmental regulations.
 - (ii) The Contractor shall be responsible for mixing the required rill fluids to suit the proposed drilling application and types of soils encountered. Mix drill fluids in accordance with Manufacturer's printed instructions.
 - (iii) Water: The Contractor shall be responsible for obtaining, transporting, and storing any water required for drilling fluids.
 - (iv) Recirculation: May be used at the Contractor's discretion, but is not required.
 - (v) Disposal: Disposal of excess drilling fluids shall be the responsibility of the Contractor and shall be conducted in compliance with all environmental regulations, right-of-way and workspace agreements, and permit requirements. Procedures for the disposal of drilling fluids shall be submitted to the Contract Administrator for review.
 - (vi) Inadvertent Returns: The Contractor shall employ his best efforts to maintain full annular circulation of drilling fluids. Drilling fluid returns at locations other than the entry and exit points shall be minimized. In the event that annular circulation is lost, the Contractor shall take steps to restore circulation. Inadvertent surface returns of drilling fluids shall be immediately contained with hand placed barriers (i.e. hay bales, sand bags, silt fencing, etc.) and collected using pumps as practical. If the amount of the surface return is not great enough to allow practical collection, the affected area shall be diluted with fresh water and the fluid will be allowed to dry and dissipate naturally.
 - (vii) If the amount of the surface return exceeds that which can be contained with hand placed barriers, small collection sumps less than 4.0 m³ may be used. If the amount of the surface return exceeds that which may be contained and collected using small sumps, drilling operations shall be suspended until surface return volumes can be brought under control.
- (h) Inadvertent Depressions, Sinkholes, Loss of Ground or Support for Adjacent Utilities
- (i) The Contractor shall be responsible for backfilling all lost ground at all times. Utilities shall be supported to maintain their function at all times.

E14. SCADA, TELEPHONE AND POWER CONDUIT INSTALLATION

E14.1 Description

- (a) This specification shall cover the installation of SCADA, power and telephone cable installation.

E14.2 Materials

- (a) Refer to attached specifications.

E14.3 Methods

- (a) Refer to attached specifications.

E14.4 Measurement and Payment

E14.4.1 SCADA Cables

- (a) The supply and installation of SCADA cables will be measured on a lump sum basis and paid for at the Contract Unit Price for Supply and Installation of SCADA cables.
- (b) Payment for SCADA cable installation shall include the supply of all materials, and completion of all work specified herein and on the drawings, including trenching and

conduit installation, warning tape and mechanical protection as required to complete the work.

- (c) Coiled cable shall be included in the above lump sum price.

E14.4.2 Power Cables

- (a) The supply and installation of power cables will be measured on a lump sum basis and paid for at the Contract Unit Price for Supply and Installation of Power Cables.
- (b) Payment for power cable installation shall include the supply of all materials, and completion of all work specified herein and on the drawings, including trenching and trenchless conduit installation, warning tape and mechanical protection as required to complete the work.
- (c) Coiled cable shall be included in the above lump sum price.
- (d) Wall penetration and termination of piping in the Deacon Booster Pump Station will be paid on a lump sum basis. Payment shall include the supply of all materials, and completion of all work specified herein and on the drawings, including concrete scanning, coring, sealing and repair as required to complete the work.

E14.4.3 Telephone Cables

- (a) The telephone cable installation will be measured on a lump sum basis and paid for at the Contract Unit Price for Installation of Telephone Cable.
- (b) Payment for telephone cable installation shall include the supply of all materials, and completion of all work specified herein and on the drawings, including trenching and conduit installation, warning tape and mechanical protection as required to complete the work. Cable will be supplied by the Owner.
- (c) Connections to the existing building and service will be completed by others and paid for directly by the City.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

- F1.1 Each individual proposed to perform Work under the Contract shall be required to obtain a Criminal Record Search Certificate and a Public Safety Verification Check as detailed below:
- (a) The Criminal Record Search Certificate may be obtained from one of the following:
- (i) police service having jurisdiction at his/her place of residence.
 - (i) The original Criminal Record Search Certificate (Form P-253) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner.
 - (ii) The applicant shall provide the original Criminal Record Search Certificate (Form P-253) to the Project Manager, or
 - (ii) Using BackCheck, Proponents will need to set up a BackCheck account prior to requesting individual background checks. This process should be done at least 72 hours prior to requesting the first check. The account can be set up using the following link: <https://forms.sterlinbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>. The Criminal Record Search Certificate must be received by the City directly through BackCheck;
 - (i) Proponents must set up an account with BackCheck under their company name and grant BackCheck permission to share the Criminal Record Search Certificate with the City of Winnipeg;
 - (ii) Proponents will then be contacted by BackCheck with instructions on how to complete the Criminal Record Search Certificate; and
 - (iii) If additional assistance is required to obtain the Criminal Record Search Certificate, the bidder may contact the following BackCheck representative:
Linda Ferens
Email: linda.ferens@sterlingts.com
Phone: (204) 999-0912; or
 - (iii) Filling out the Core of Commissionaires (Manitoba Division), forms to which can be found on the website at: <https://www.commissionaires.ca/en/manitoba/home>.
- (b) The Public Safety Verification Checks can be obtained from BackCheck, proponents will need to set up a BackCheck account prior to requesting individual background checks. This process should be done at least 72 hours prior to requesting the first check. The account can be set up using the following link. <https://forms.sterlinbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>. The results of the Public Safety Verification Check must be received by the City directly through BackCheck.
- (i) Proponents must set up an account with BackCheck under their company name and grant BackCheck permission to share the Public Safety Verification Check with the City of Winnipeg;
 - (ii) Proponents will then be contacted by BackCheck with instructions on how to complete the Public Safety Verification Check; and
 - (iii) If additional assistance is required to obtain the Public Safety Verification check, the Bidder may contact the following BackCheck representative:
Linda Ferens
Email: linda.ferens@sterlingts.com
Phone: (204) 999-0912; or
- 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 or a Public Safety Verification Check is not provided, or for whom a Criminal Record Search Certificate or a Public Safety Verification Check indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work.
- F1.4 Any Criminal Record Search Certificate and Public Safety Verification Check 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 Certificate or Public Safety Verification Check. 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.