



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 492-2018**

**PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT  
SERVICES FOR RIVER CROSSING INSPECTIONS – PHASE TWO**

**Note to Bidders: Please be aware of revisions to B15.4**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR RIVER CROSSING INSPECTIONS – PHASE TWO

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, June 27, 2018.

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 following locations starting at 9:00 A.M. on June 13, 2018 to provide Bidders access to the Site. Bidders are instructed meet at the first location at 9:00 A.M. after which the site investigation will move on to the subsequent location:

- (a) Site 6 – Fort Garry/St. Vital Feeder Main, West Chamber (Bishop Grandin, immediately west of the Fort Garry Bridges, access off eastbound Bishop Grandin)
  - (i) Chamber entry available
- (b) Site 6 – Fort Garry/St. Vital Feeder Main, East Chamber (Bishop Grandin immediately east of the Fort Garry Bridges, access off eastbound Bishop Grandin at River Avenue)
  - (i) Chamber entry available
- (c) Site 1 – Kildonan-Redwood Feeder Main, East Chamber (Hespeler Ave, immediately east of the Harry Lazarenko Bridge)
  - (i) Chamber entry available
- (d) Site 1 – Kildonan-Redwood Feeder Main, West Chamber (Hespeler Ave, immediately west of the Harry Lazarenko Bridge)
  - (i) Chamber entry available
- (e) Site 4 – Newton Ave Force Main, discharge chamber (Newton Ave and Scotia St.)
  - (i) No chamber entry available
- (f) Site 4 – Newton Ave Force Main, valve chamber (Kildonan Dr. and Larchdale Cres.)
  - (i) Chamber entry available

B3.2 Proponents attending the site investigation are required to register for the site investigation at least 48 hours prior to the site investigation by contacting the Contract Administrator listed in D4.1.

B3.3 The Bidder is advised that all valve chambers are Confined Entry locations. Persons wishing to enter the chambers will be required to supply all necessary personal protective safety equipment, including body harness, hard hats, safety boot, gas detector, and personal lighting. The City of Winnipeg will provide a retrieval hoist, surface lighting, and a gas detector for pre entry measurements. Personnel attending the Site shall be properly trained in Confined Space entry in accordance with Manitoba legislation and their individual company policy.

B3.4 Although attendance at the Site Investigation is not mandatory, the City strongly suggests that Proponents attend.

B3.5 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.

B3.6 The Bidder may view portions of the site located within public right of ways without making an appointment.

#### **B4. ENQUIRIES**

B4.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

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

B6.3 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>

B6.4 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.

B6.5 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 B18.

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.

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 B18.1(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 13 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. CONFLICT OF INTEREST AND GOOD FAITH**

- B12.1 Bidders, by responding to this Bid Opportunity, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.
- B12.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:
- (a) other commitments;
  - (b) relationships;
  - (c) financial interests; or

- (d) involvement in ongoing litigation;  
that could or would be seen to:
  - (i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or
  - (ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;
- (e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of its participation in the Bid Opportunity process or the Work; or
- (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Bid Opportunity process) of strategic and/or material relevance to the Bid Opportunity process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

B12.3 In connection with its Bid, each entity identified in B12.2 shall:

- (a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;
- (b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Bid Opportunity process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and
- (c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B12.4 Without limiting B12.3, the City may, in its sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

B12.5 Without limiting B12.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:

- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of its employees proposed for the Work;
- (b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in its sole discretion, determines cannot be avoided or mitigated;
- (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B12.4 to avoid or mitigate a Conflict of Interest; and
- (d) disqualify a Bidder if the Bidder, or one of its employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

B12.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in its sole discretion.

## **B13. QUALIFICATION**

### **B13.1 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.

### **B13.2 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>

### **B13.3 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);

### **B13.4 Further to B13.3(a), the Bidder and/or any proposed Subcontractor undertaking the cleaning of water mains and force mains shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator to demonstrate the following qualifications in accordance with B13.6 (Form L: Contractor Experience):**

- (a) A minimum of three (3) successfully cleaned water mains or force mains, utilizing cleaning methods proposed for this work for pressurized water mains.
- (b) A minimum of three (3) examples of successful pipeline pigging using polyurethane foam pigs.
- (c) A minimum of three (3) examples of successful tapping sleeve installations on water mains larger than 400 mm in diameter.

### **B13.5 Further to B13.3(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/>.

- B13.6 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.
- B13.7 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.

#### **B14. BID SECURITY**

- B14.1 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.
- B14.1.1 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.
- B14.1.2 All signatures on bid securities shall be original.
- B14.1.3 The Bidder shall sign the Bid Bond.
- B14.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B14.2 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.
- B14.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B14.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B14.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B14.3 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.

#### **B15. OPENING OF BIDS AND RELEASE OF INFORMATION**

- B15.1 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.
- B15.1.1 Bidders or their representatives may attend.

- B15.2 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>
- B15.3 After award of Contract, the name(s) of the successful Bidder(s), their address(es) 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>
- B15.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).
- B15.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

## **B16. IRREVOCABLE BID**

- B16.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B16.2 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.

## **B17. WITHDRAWAL OF BIDS**

- B17.1 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.
- B17.1.1 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.
- B17.1.2 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 13 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B17.1.3 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 13 of Form A: Bid; and
  - (c) if the notice has been given by any one of the persons specified in B17.1.3(b), declare the Bid withdrawn.
- B17.2 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 B16.2 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.

## **B18. EVALUATION OF BIDS**

- B18.1 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 B1 (pass/fail);
  - (c) Total Bid Price;
  - (d) economic analysis of any approved alternative pursuant to B7.
- B18.2 Further to B18.1(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.
- B18.3 Further to B18.1(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.
- B18.4 Further to B18.1(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.
- B18.4.1 Further to B18.1(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.

## **B19. AWARD OF CONTRACT**

- B19.1 The City will give notice of the award of the Contract or will give notice that no award will be made.
- B19.2 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.
- B19.2.1 Without limiting the generality of B19.2, 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.
- B19.3 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 B18.
- B19.3.1 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.
- B19.3.2 If no Contract is awarded, then the City of Winnipeg will pay the requested Bidder up to a maximum of five hundred dollars (\$500) for each of the requested submissions listed in E2 for the preparation and delivery of Shop Drawings. Delivery of the Shop Drawings to the City and payment of the above amounts will constitute full and final consideration of each party to the other and neither party will have any further liability to the other with respect to this Bid Opportunity.

## 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](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 development of access to, and cleaning of, feeder mains and force mains crossing under rivers, and provision of inspection support services to specialized pipeline inspection contractor.

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

- (a) Internal (In-Line) Pipeline Inspection Sites
  - (i) Development of site access.
  - (ii) Development of pipeline tool access through:
    - (i) Construction of pipeline access points by installing tool launching wyes.
    - (ii) Removal or modification of existing chamber piping.
  - (iii) Cleaning of pipeline crossing under river using pipeline cleaning pigs, jet flushers, and other equipment as needed.
  - (iv) Insertion of rope tag lines in crossing for deployment of specialized "smart" inspection tools.
  - (v) Winching of pipeline inspection contractor supplied gauge pigs through pipelines to confirm diameters and obstructions.
  - (vi) Provision of confined entry support to pipeline inspection contractor and engineering staff.
  - (vii) Installation of pipeline inspection tool launch barrels and cable guide systems/pulleys (provided by others).
  - (viii) Provision of other miscellaneous inspection support.
  - (ix) Completion of low-head leakage test at all sites.
  - (x) Water main and feeder main flushing, disinfection, and health testing.
  - (xi) Final pipeline and chamber modifications.
  - (xii) Site restoration.
- (b) External Pipeline Inspection Sites
  - (i) Development of site access.
  - (ii) Remove cladding and insulation from portions of St. Vital Bridge Force Main.
    - (i) Assist/facilitate exterior inspection by specialized inspection contractor.
  - (iii) Expose Heritage Park Force Main and assist AECOM personnel in completing inspection of the pipeline.
    - (i) Remove PVC pipe sample and complete repair within pump station shutdown window.
  - (iv) Completion of low-head leakage test on Heritage Park Force Main.
  - (v) Complete repairs and repair external pipeline coating as required.
  - (vi) Backfill and restore sites.

D2.3 Inspection of the following river crossings are to be undertaken as part of this contract:

- (a) Site 1: Kildonan-Redwood Feeder Main (cleaning and internal inspection)
- (b) Site 2: Charleswood-Assiniboia Feeder Main (cleaning and internal inspection)

- (c) Site 3: St. Vital Bridge Force Main (external inspection)
- (d) Site 4: Newton Ave Force Main (cleaning and internal inspection)
- (e) Site 5: Heritage Park Force Main (external inspection)
- (f) Site 6: Fort Garry/St. Vital Feeder Main (internal inspection, no cleaning)

D2.4 Third party inspections by a specialized pipeline inspection contractor will be grouped into multiple inspection periods. Inspection mobilization dates are subject to change based on weather, high water conditions, availability of the pipeline inspection contractor, and system operations within the City of Winnipeg.

- (a) Inspection 1
  - (i) Site 1: Kildonan-Redwood Feeder Main – Electromagnetic in-line pipeline inspection
  - (ii) Site 2: Charleswood-Assiniboia Feeder Main – Electromagnetic in-line pipeline inspection
  - (iii) Site 3: St. Vital Bridge Force Main – External electromagnetic inspection
- (b) Inspection 2
  - (i) Site 4: Newton Ave Force Main – Sonar inspection
- (c) Inspection 3
  - (i) Site 6: Fort Garry/St. Vital Feeder Main – Internal acoustic/CCTV inspection

D2.5 Third party inspections are not required for Site 5.

### D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "**CSA**" means Canadian Standards Association;
- (b) "**ASTM**" means American Society for Testing and Materials;
- (c) "**AWWA**" means American Water Works Association;
- (d) "**Site 1**" means the Kildonan-Redwood Feeder Main crossing of the Red River;
- (e) "**Site 2**" means the Charleswood-Assiniboia Feeder Main crossing of the Assiniboine River;
- (f) "**Site 3**" means the St. Vital Bridge Force Main crossing of the Red River;
- (g) "**Site 4**" means the Newton Ave Force Main crossing of the Red River;
- (h) "**Site 5**" means the Heritage Park Force Main crossing of Sturgeon Creek;
- (i) "**Site 6**" means the Fort Garry/St. Vital Feeder Main; and,
- (j) "**Inspection Contractor**" means a third party inspection company contracted by the City of Winnipeg to undertake inspection of the pipelines identified herein and on the Drawings.

### D4. CONTRACT ADMINISTRATOR

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

Adam Braun, P. Eng.  
Municipal Engineer

Telephone No. 204-477-5381  
Email Address adam.braun@aecom.com

D4.2 At the pre-construction meeting, Mr. Braun 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 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:

The City of Winnipeg  
Attn: Chief Financial Officer  
Office of the Chief Administrative Officer  
Susan A. Thompson Building  
2nd Floor, 510 Main Street  
Winnipeg MB R3B 1B9

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 number. 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 B13.5 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 five million dollars (\$5,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
  - (b) Automobile Liability Insurance 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) The Contractor shall provide and maintain CPL insurance in the amount of at least one million dollars (\$1,000,000) per occurrence and one million dollars (\$1,000,000) aggregate insuring against claims for:
    - (i) Bodily injury;
    - (ii) Property damage including diminution in value, and Natural Resource Damages;
    - (iii) Clean-up costs;
    - (iv) Transported cargo and non-owned disposal sites (blanket basis); and,
    - (v) Sudden and gradual pollution conditions including the further disruption of pre-existing conditions from the services rendered by the Contractor.

(d) CPL insurance is to remain in place during the performance of the Work and during the warranty period.

D11.2 The Contractor is to ensure that all sub-contractors provide and maintain comparable insurances to that outlined in D11.1(a) and D11.1(b) above. The Contractor is to ensure that any sub-contractors provide and maintain comparable insurances to that outlined in D11.1(c) as deemed necessary by the Contractor. Insurances are to be maintained during the performance of the Work and throughout the warranty period.

D11.3 Deductibles shall be borne by the Contractor.

D11.4 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.

D11.5 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 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B14.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

## **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 Work on any Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- (a) The Contractor shall note that schedule adjustments may be required in the event that the pipeline inspection contractor schedule is altered.
- 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 Pipeline inspections shall be scheduled on successive days in each mobilization. Each individual pipeline inspection is expected to take one day. Time permitting, more than one inspection may be completed in one day. The pipeline inspection contractor may require up to two (2) days to convert tools to different pipe sizes. This conversion period may occur on a weekend.
- D15.4 Further to D15.2, the schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work, as well as showing those activities/tasks on the critical path based on the proposed inspection schedule in D2.4.
- (a) For each internal inspection site:
- (i) Site Access and Piping Modifications
  - (ii) Pipeline Cleaning and Gauging
  - (iii) Inspection Support
  - (iv) Low head leakage testing
  - (v) Feeder Main Flushing, disinfection, and health testing (where required)
  - (vi) Final Piping Modifications
  - (vii) Site Restoration
- (b) For each external inspection site:
- (i) Site Access and Piping Modifications
  - (ii) Inspection Support (where required)
  - (iii) Low head leakage testing (where required)
  - (iv) Final Piping Modifications
  - (v) Site Restoration
- D15.5 Further to D15.2(a), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

## **SCHEDULE OF WORK**

### **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.

D16.3 The City intends to award this Contract by July 31, 2018.

D16.3.1 If the actual date of award is later than the intended date, the dates specified for Commencement, Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

## **D17. SCHEDULE RESTRICTIONS**

D17.1 Inspection of Site 5 shall be scheduled during typical dry weather flow periods and shall not occur between May 1<sup>st</sup> and June 30<sup>th</sup>.

D17.2 Feeder Main Shutdowns

D17.2.1 Feeder main shutdowns will be scheduled based on a number of factors including routine maintenance and repair work, water demand, weather and other factors. The City shall endeavour to make the specified time periods available to the Contractor to schedule his Work requiring isolation and draining of various feeder mains, without limiting the City's control over the operation of the regional water system to complete other work, maintain adequate system service and maintain the integrity of the infrastructure. The City shall reserve the right to cancel and/or delay these schedule dates at any time, due to any circumstances that could adversely affect water supply system operation, including but not limited to high water demand, abnormal weather, failures of related water system components and/or security concerns.

D17.2.2 The Contractor shall provide notice to the Contract Administrator in writing, a minimum of ten (10) Business Days prior to requiring the shutdown. The City will endeavour to schedule the shutdown as requested, pursuant to D17.2.1.

D17.2.3 Feeder Main Shutdown Restrictions

- (a) Feeder Main shutdowns will only be permitted between September 1<sup>st</sup> and May 15<sup>th</sup>.
- (b) The Fort Garry/St. Vital Feeder Main crossing (Site 6) cannot be taken out of service concurrently with the Kildonan-Redwood Feeder Main crossing (Site 1).
- (c) The launch wyes, temporary launch tubes, and blind flanges shall be installed on Charleswood-Assiniboia Feeder Main crossing (Site 2) prior to disassembly of piping on the Kildonan-Redwood Feeder Main crossing (Site 1).
- (d) Feeder Main shut durations shall be limited as follows:
  - (i) The Kildonan-Redwood Feeder Main crossing (Site 1):
    - ◆ The feeder main cannot be taken out of service prior to seven (7) Calendar Days before the mutually agreed upon inspection date as established in accordance with D18.
    - ◆ The feeder main shall be returned to service within fourteen (14) Calendar Days of the inspection.
  - (ii) The Charleswood-Assiniboia Feeder Main crossing (Site 2):
    - ◆ The feeder main cannot be taken out of service prior to fourteen (14) Calendar Days before the mutually agreed upon inspection date as established in accordance with D18.
    - ◆ The feeder main shall be returned to service within seven (7) Calendar Days of the inspection.

(iii) The Fort Garry/St. Vital Feeder Main crossing (Site 6) cannot be taken out of service prior to seven (7) Calendar Days before the mutually agreed upon inspection date as established in accordance with D18.

(e) Changes to these criteria will not be permitted without the approval of the City of Winnipeg Water and Waste Department.

**D17.2.4 Waste Water Pump Station Shutdown Restrictions**

(a) Schedule and timing of flow diversions, temporary blockages and pumping station shutdowns are impacted by a number of factors such as system operation, maintenance activities, rainfall, and daily usage peaks. The City will endeavor to provide the requested schedule times and dates, but reserves the right to delay, postpone or re-schedule system operation events.

(b) The Contractor shall provide notice in writing to the Contract Administrator a minimum of five (5) Business Days prior in advance of any pump station shutdowns.

**D18. CRITICAL STAGES**

D18.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) The Contractor shall complete an inspection of the Victaulic coupling on the existing site outlet elbow (Site 1, west tunnel shaft) for confirmation of the Victaulic coupling style and replacement requirements within ten (10) Working Days of Award.

(b) Inspection 1 pipelines – All preparation and cleaning work shall be completed by date established in D18.2(a).

(c) Inspection 2 pipeline – All preparation and cleaning work shall be completed by date established in D18.2(b).

(d) Inspection 3 pipeline – All preparation work shall be completed by date established in D18.2(c).

D18.2 Final Critical Stage dates will be established immediately upon receipt of letter of intent, on a mutually agreeable schedule between the pipeline inspection contractor, the City of Winnipeg, and the successful Contractor based on the availability of all parties and procurement of materials. The Contract Administrator will schedule a meeting with all parties within three (3) Business Days of receipt of the Letter of Intent. Schedule dates shall be limited by the following dates:

(a) Inspection 1 pipelines are to be available for inspection no later than October 12, 2018.

(b) Inspection 2 pipeline is to be available for inspection no later than September 1, 2018.

(c) Inspection 3 pipeline is to be available for inspection no later than September 14, 2018.

D18.3 Once inspection dates are established, the Critical Stage Dates identified in D18 will be established.

**D19. SUBSTANTIAL PERFORMANCE**

D19.1 The Contractor shall achieve Substantial Performance by November 30, 2018.

D19.2 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.

D19.3 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.

## **D20. TOTAL PERFORMANCE**

- D20.1 The Contractor shall achieve Total Performance by June 30, 2019.
- D20.2 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.
- D20.3 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.

## **D21. LIQUIDATED DAMAGES**

- D21.1 If the Contractor fails to achieve Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:
- (a) Critical Stage: Inspection of Existing Victaulic fittings at Site 1 (D18.1(a)) – five hundred dollars (\$500)
  - (b) Critical Stages: Preparation of sites for inspection (D18.1(b) to D18.1(d)) – five thousand dollars (\$5,000);
  - (c) Substantial Performance – one thousand dollars (\$1,000);
  - (d) Total Performance - five hundred dollars (\$500).
- D21.2 The amounts specified for liquidated damages in D21.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.
- D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## **CONTROL OF WORK**

### **D22. JOB MEETINGS**

- D22.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D22.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

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

- D23.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).
- D23.2 The Inspection Contractor under City of Winnipeg Bid Opportunity 495-2018 will be completing work on sites under control of the Contractor as defined herein.

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

D24.1 Further to B13.5, 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 B13.5.

**MEASUREMENT AND PAYMENT**

**D25. PAYMENT**

D25.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

**WARRANTY**

**D26. WARRANTY**

D26.1 Warranty is as stated in C13.

**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. 492-2018

PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO

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. 492-2018

PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES  
FOR RIVER CROSSING INSPECTIONS – PHASE TWO

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)

**PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO**

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

**FORM K: EQUIPMENT**  
(See D14)

PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO

<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>

**FORM L: CONTRACTOR EXPERIENCE**

(See B1)

**PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO**

Attach additional resumes and documents as required. Indicate whether Projects/Project Personnel are for Contractor or Subcontractor, and if applicable include name of Subcontractor.

**1. Project References:**

Project Client/Contact: \_\_\_\_\_

(Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(phone)

\_\_\_\_\_  
(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

**2. Project References:**

Project Client/Contact: \_\_\_\_\_

(Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(phone)

\_\_\_\_\_  
(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
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_____	_____	_____
_____	_____	_____
_____	_____	_____

**FORM L: CONTRACTOR EXPERIENCE**

(See B1)

**PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO**

**3. Project References:**

Project Client/Contact: \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_ (phone) \_\_\_\_\_ (email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------


**4. Project References:**

Project Client/Contact: \_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_ (phone) \_\_\_\_\_ (email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
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**FORM L: CONTRACTOR EXPERIENCE**

(See B1)

**PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO**

**5. Project References:**

Project Client/Contact: \_\_\_\_\_

(Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(phone)

\_\_\_\_\_  
(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

**6. Project References:**

Project Client/Contact: \_\_\_\_\_

(Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(phone)

\_\_\_\_\_  
(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
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_____	_____	_____
_____	_____	_____
_____	_____	_____

**FORM L: CONTRACTOR EXPERIENCE**

(See B1)

**PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO**

**7. Project Personnel:**

Name and Title: \_\_\_\_\_  
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>

**8. Project Personnel:**

Name and Title: \_\_\_\_\_  
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>

**9. Project Personnel:**

Name and Title: \_\_\_\_\_  
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>

**FORM L: CONTRACTOR EXPERIENCE**

(See B1)

**PROVISION OF PIPELINE ACCESS MODIFICATIONS, CLEANING AND SUPPORT SERVICES FOR  
RIVER CROSSING INSPECTIONS – PHASE TWO**

**10. Project Personnel:**

Name and Title: \_\_\_\_\_  
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>

## 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>Appendix No.</u>	<u>Title</u>
A	Record Drawings
B	Site Photos
C	AECOM Confined Space Safe Work Procedures
D	City of Winnipeg Under Bridge Crane (UBC) Training Requirements

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
D-15157	COVER SHEET
D-15158	SITE 1 – KILDONAN-REDWOOD FEEDER MAIN – WEST CHAMBER
D-15159	SITE 1 – KILDONAN-REDWOOD FEEDER MAIN – EAST CHAMBER
D-15160	SITE 2 – CHARLESWOOD-ASSINIBOIA FEEDER MAIN
D-15161	SITE 6 – FORT GARRY/ST. VITAL FEEDER MAIN
11820	SITE 3 – ST. VITAL BRIDGE FORCE MAIN
11821	SITE 4 – NEWTON AVENUE WWS FORCE MAIN
11822	SITE 5 – HERITAGE PARK WWS FORCE MAIN

### GENERAL REQUIREMENTS

#### E2. SHOP DRAWINGS

- E2.1 Description
- (a) This Specification shall revise, amend, and supplement the requirements of CW 1110 of the City of Winnipeg's Standard Construction Specifications.
- E2.2 Submit all Shop Drawings in accordance with CW 1110 except as modified herein.
- E2.3 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 shall also be shown on all submissions for Engineering review.
- E2.4 Submit Shop Drawing submissions within five (5) Calendar days of a request as indicated in E2.8.1 or receipt of Notice of Award in accordance with B19, whichever is earlier.
- E2.5 Allow for a five (5) Calendar day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
- E2.6 Shop Drawings not meeting the requirements of CW 1110 or the requirements specified herein will be returned to the Contractor without review for resubmission.

- E2.7 Review of Shop Drawings by the Contract Administrator will be limited 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 billed of the Contractor.
- E2.8 Expedited Shop Drawings
- E2.8.1 Further to CW 1110, in order to expedite Shop Drawings with critical timelines, the lowest responsive Bidder, as outlined in B18, will be required, after receiving a written request from the Contract Administrator, to arrange for the preparation of Shop Drawings for the following items with critical timelines:
- (a) Ductile Iron Piping Components
  - (b) Fabricated Steel Piping Components
  - (c) Sleeve Couplings
  - (d) Concrete Pressure Pipe Tapping Sleeve
- E2.8.2 Schedule to submit Shop Drawings listed in E2.8.1 within five (5) Business Days of a request as indicated in E2.4 or receipt of Notice of Award in accordance with B19.
- E2.9 Measurement and Payment
- (a) If Award is made to the lowest responsive Bidder, then the provision of Shop Drawings shall be considered incidental to the Work and will not be measured for payment and no additional payment will be made. If no contract is awarded, payment for Shop Drawings prepared will be paid in accordance with B19.3.

### **E3. ENVIRONMENTAL PROTECTION**

- E3.1 The Contractor shall be aware that feeder mains and associated infrastructure is for potable water 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 existing chambers, excavations, etc.
- E3.2 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.
- E3.3 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:
- E3.3.1 Federal
- (a) Canadian Environmental Protection Act (CEPA) c.16;
  - (b) Canadian Environmental Assessment Act (CEAA) c.37;
  - (c) Transportation of Dangerous Goods Act and Regulations c.34; and
  - (d) Migratory Birds Convention Act, 1994
- E3.3.2 Provincial
- (a) The Dangerous Goods Handling and Transportation Act D12;
  - (b) The Endangered Species Act E111;
  - (c) The Environment Act c.E125;
  - (d) The Fire Prevention Act F80;
  - (e) The Manitoba Heritage Resources Act H39.1;
  - (f) The Manitoba Noxious Weeds Act N110;
  - (g) The Manitoba Nuisance Act N120;
  - (h) The Public Health Act c.P210;
  - (i) The Workplace Safety and Health Act W210; and
  - (j) And current applicable associated regulations.

### E3.3.3 Municipal

- (a) The City of Winnipeg By-law no. 1/2008;
- (b) The City of Winnipeg Waterway By-Law no. 5888/92; and
- (c) Other applicable Acts, Regulations and By-laws.

### E3.4 The Contractor is advised that the following environmental protection measures apply to the Work.

#### E3.4.1 Materials Handling and Storage

- (a) Construction materials and debris shall be prevented from entering drainage pipes or channels.
- (b) Construction materials and debris shall also be prevented from accumulating on local roadways and sidewalks when tracked out of the Site by trucks hauling excavated materials.
- (c) The Contractor shall provide on-Site measures to mitigate the tracking of sediment off-Site and therefore reduce the amount of street cleaning required. These measures may take the form of a truck wheel wash (automated or manually operated) or other measures as approved by the Contract Administrator.

#### E3.4.2 Fuel Handling and Storage

- (a) The Contractor shall obtain all necessary permits from Manitoba Conservation for the handling and storage of fuel products and shall provide copies to the Contract Administrator.
- (b) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.
- (c) Fuels, lubricants, and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.
- (d) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
- (e) Products transferred from the fuel storage area(s) to specific Work Sites shall not exceed the daily usage requirement.
- (f) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheets 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.
- (g) Refuelling of mobile equipment and vehicles shall take place at least 100 metres from a watercourse.
- (h) The area around storage Sites and fuel lines shall be distinctly marked and kept clear of snow and debris to allow for routine inspection and leak detection.
- (i) A sufficient supply of materials, such as absorbent material and plastic oil booms to clean up minor spills shall be stores nearby on-site. The Contractor shall ensure that additional material can be made available on short notice.

#### E3.4.3 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) All resulting debris shall be deposited at a Waste Disposal Ground operating under the authority of Manitoba Regulation #150/91. Exceptions are liquid industrial and hazardous wastes which may require special disposal methods (see SC:21.4 D).

- (d) Indiscriminate dumping, littering, or abandonment shall not take place.
- (e) No on-site burning of waste is permitted.
- (f) Waste storage areas shall not be located so as to block natural drainage.
- (g) Run-off from a waste storage area shall not be allowed to cause siltation of a watercourse.
- (h) Waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
- (i) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.

#### E3.4.4 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.
- (c) The Contractor shall have on-site staff that is trained and certified in the handling of the dangerous/hazardous goods, when said dangerous/hazardous goods are being utilized on-site for the performance of the Work.
- (d) Different waste streams shall not be mixed.
- (e) Disposal of dangerous goods/hazardous wastes shall be at approved hazardous waste facilities.
- (f) Liquid hydrocarbons shall not be stored or disposed of in earthen pits on-site.
- (g) Used oils shall be stored in appropriate drums, or tankage, until shipment to waste oil recycling centres, incinerators, or secure disposal facilities approved for such wastes.
- (h) Used oil filters shall be drained, placed in suitable storage containers, and buried or incinerated at approved hazardous waste treatment and disposal facilities.
- (i) Dangerous goods/hazardous waste storage areas shall be located at least 100 metres away from the high water line and be diked.
- (j) Dangerous goods/hazardous waste storage areas shall not be located so as to block natural drainage.
- (k) Run-off from a dangerous goods/hazardous waste storage area shall not be allowed to cause siltation of a watercourse.
- (l) Dangerous goods/hazardous waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.

#### E3.4.5 Emergency 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. The Contract Administrator shall also be notified.
- (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, Fire Department, Ambulance, company backup)
  - (ii) Attend to public safety:
    - ◆ stop traffic, roadblock/cordon off the immediate danger area
    - ◆ eliminate ignition sources
    - ◆ initiate evacuation procedures if necessary
  - (iii) Assess situation and gather information on the status of the situation, noting:
    - personnel on site
    - cause and effect of spill
    - estimated extent of damage
    - amount and type of material involved
    - proximity to waterways and the Aqueduct
  - (iv) If safe to do so, try to stop the dispersion or flow of spill material:
    - approach from upwind
    - stop or reduce leak if safe to do so
    - 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
  - (v) 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.
  - (f) When dangerous goods are used on-site, materials for containment and cleanup of spill material (e.g. absorbent materials, plastic oil booms, and oversized recovery drums) shall be available on-site.
  - (g) Minor spills of such substances that may be contained on land with no significant impact on the environment may be responded to with in-house resources without formal notification to Manitoba Environment.
  - (h) City emergency response, 9-1-1, shall be used if other means are not available.

### E3.5 Vegetation

- (a) Vegetation shall not be disturbed without written permission of the Contract Administrator. The Contractor shall protect plants which may be at risk of accidental damage. Such measures may include protective fencing or signage.
- (b) Herbicides and pesticides shall not be used adjacent to any surface watercourses.
- (c) All landowners adjacent to the area of application of herbicides or pesticides shall be notified prior to the Work.
- (d) Trees and shrubs shall not be felled into watercourses.
- (e) Areas where vegetation is removed during clearing, construction, and decommissioning activities, shall be revegetated as soon as possible in accordance the requirements outlined herein, or as directed by the Contract Administrator.

### E3.6 Measurement and Payment

- (a) The work covered in this section will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

#### **E4. RIVER CROSSING SITE ACCESS**

##### **E4.1 Site Access Requirement and Constraints**

- (a) Site 1 – Kildonan-Redwood Feeder Main (Redwood Ave / Harry Lazarenko Bridge from Main Street to Glenwood Cres)
  - (i) Access to chambers on both sides of the river is by local streets.
  - (ii) The Contractor shall develop site access as required to complete the work. Contractor shall limit activity to a single access path and the space required to complete the modifications and pipeline investigation.
  - (iii) The Contractor shall keep construction activities within the City of Winnipeg easement (west chamber) and right of way (east chamber).
  - (iv) Construction trailers and all vehicles not required to complete work shall be parked on adjacent residential streets.
  - (v) Maintain access to all private approaches.
  - (vi) Access requirements also include but are not limited to:
    - (i) Excavation to top of valve chambers;
    - (ii) Removal of concrete roof panels.
  - (vii) Removal of the existing guardrail may be required on the west side of the Harry Lazarenko Bridge may require removal to facilitate site access. If removed the Contractor shall install traffic barriers to protect the exposed end of the traffic barrier and worksite.
  - (viii) Contractor shall be responsible for providing and maintaining all necessary traffic control in accordance with E10 and the City of Winnipeg Manual of Temporary Traffic Control.
- (b) Site 2 – Charleswood-Assiniboia Feeder Main (Assiniboine Avenue at Rouge Road to Berkley Street)
  - (i) Access to chambers on both sides of the river is via a grassed right-of-way off residential streets.
  - (ii) Provide access to both chambers for preparation, cleaning, and inspection work.
  - (iii) Contractor shall limit disturbance of existing grassed areas to a single access path (6 m wide max) and an area near the work site as required to complete modifications and pipeline investigation.
  - (iv) Construction trailers and all vehicles not required to complete work shall be parked on adjacent residential streets.
  - (v) Contractor to maintain access to all private approaches.
  - (vi) Contractor shall protect existing landscaping, including but not limited to:
    - (i) interlocking paving stone pathways;
    - (ii) signage and historical displays; and,
    - (iii) Trees and plantings.
- (c) Site 3 – St. Vital Bridge Force Main (Osborne Street from Kingston Row to Churchill Drive)
  - (i) Access on both sides of the bridge is via local streets.
  - (ii) Contractor shall develop site access and work areas as required to complete the work. Contractor shall limit activity to a single access path and the space required to complete the investigation and pipeline repair.
  - (iii) Provide access to the pipeline at the areas designated on the drawings by scaffolding or similar lifting device from the existing ground level wherever possible.
  - (iv) The City can provide an under bridge crane (UBC) to be utilized in completing the pipeline modification and inspection work should river levels preclude accessing the pipeline from the ground. Pipeline access using the UBC shall be from northbound Osborne Street. See E4.2 for UBC use.

- (v) Contractor shall be responsible for providing and maintaining all necessary traffic control in accordance with E10 and the City of Winnipeg Manual of Temporary Traffic Control.
- (d) Site 4 – Newton Avenue Force Main (Newton Ave to Frasers Grove Park (Kildonan Drive) between Rossmere Crescent and Larchdale Crescent)
  - (i) Access to chambers on the east side of the river is via a multi-use pathway from Kildonan Drive.
  - (ii) Access to discharge manhole on the west side of the river is via local streets.
  - (iii) Contractor shall develop site access and work areas as required to complete the work. Contractor shall limit activity to a single access point and the space required to complete the chamber modifications and pipeline investigation.
  - (iv) Provide access to chambers on the east side of the river, and the manhole on the west side of the river for preparation, cleaning, and inspection work.
- (e) Site 5 – Heritage Park Force Main (Ness Avenue from Valley View Drive to School Road)
  - (i) Access to Heritage Park Pump Station is from back lane off Valley View Dr, north of Ness Ave.
  - (ii) Downstream manhole is located at the intersection of Ness Avenue and School Road.
  - (iii) Provide access to both access points for inspection work.
  - (iv) Contractor shall be responsible for providing and maintaining all necessary traffic control in accordance with E10 and the City of Winnipeg Manual of Temporary Traffic Control.
- (f) Site 6 – Fort Garry/St. Vital Feeder Main (Bishop Grandin at the Red River between the Fort Garry Bridges)
  - (i) Access to west chamber is off eastbound Bishop Grandin prior to the Fort Garry Bridge.
  - (ii) Access to east chamber is from River Road:
    - (i) Large equipment shall utilize the Bishop Grandin median.
    - (ii) Small equipment and light duty trucks may utilize the multiuse path located within the Bishop Grandin north boulevard.
  - (iii) Provide access to both access points for inspection work.
- (g) The Contractor shall exercise caution to prevent damage to existing pavements, curbs, sidewalks, grassed areas, and trees. Surface restoration of damaged areas caused by the Contractor outside of the designated construction areas shall be the responsibility of the Contractor.
- (h) The Contractor shall protect existing interlocking paved paths from damage. Where excavations are required, the existing paving stones shall be carefully removed prior to excavation for replacement upon completion of the work.
- (i) Where site access utilizes multi-use pathways, the pathways must remain open to public use. Ensure adequate delineation, fencing, flagging or other measures are used to protect public.
- (j) Where tracked equipment is utilized, protect pathways from damage with planking. No payment will be made for damages caused by equipment tracks on unprotected surfaces.
- (k) Where site access utilizes grassed right-of-ways, limit access for heavy equipment to a single pathway directly from street to work area. Protect grassed areas with planking or other measures to minimize rutting and damage.
- (l) Laydown and storage areas shall be staged away from areas prone to damage.
- (m) The Contractor shall maintain access to all businesses during business hours, except where written authorization has been provided by the business.

- (n) The Contractor shall not park company or private vehicles inside a barricaded work zone in a manner that will block sightlines for vehicles and pedestrians approaching and crossing intersections.
- (o) The Contractor is responsible for maintaining safe vehicular traffic through their work site. The Contractor shall rectify any unsafe conditions immediately upon notification. This could include but is not limited to providing flag persons, clearing debris and snow from sites, moving equipment, and erecting additional signage.

#### E4.2 Under Bridge Crane

- (a) If required due to elevated river levels, the City will provide an Under Bridge Crane (UBC) for use by the Contractor and Inspection Contractor in the preparation, inspection, and repair of the St. Vital Bridge Force Main.
- (b) The Contractor shall provide notice to the Contract Administrator a minimum of twenty (20) Business Days prior to the scheduled use of the UBC.
- (c) The Contractor shall provide a detailed schedule for the UBC operations a minimum of five (5) Business Days prior to the scheduled use of the UBC.
- (d) The Contractor shall review and undertake orientation and training provided in Appendix D, and provide evidence of appropriate training from third party sources.
- (e) Contractor shall provide required PPE including body harness and lanyard.
- (f) Only one (1) person other than the City of Winnipeg operator will be permitted in the UBC at any time.
- (g) City of Winnipeg UBC crew will be fully in charge of operation of UBC. Contractor shall abide by any instruction provided by UBC crew.

#### E4.3 Measurement and Payment

- (a) Development of site access will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No separate payment will be made.
- (b) Restoration, where approved by the Contract Administrator will be measured and paid in accordance to E16.
- (c) The City shall cover costs associated for the use and operation of the under bridge crane if required to complete the Work at Site 3.

### **E5. EXCAVATION, SHORING, AND BACKFILL**

#### E5.1 Description

- (a) This Specification covers the requirements for excavations and backfilling of trenches, pipelines, and structures.

#### E5.2 Submittals

- (a) Shop Drawings for all excavation shoring (where required) shall be prepared and submitted in accordance with E2 a minimum of five (5) Business Days prior to undertaking the excavation and shoring installation. Where required by Workplace Safety and Health Regulation, shoring Shop Drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in the design of excavation shoring systems.

#### E5.3 Approvals

- (a) City of Winnipeg Waterways approvals have been submitted and will be in place prior to the start of construction.

#### E5.4 Shoring Design

- (a) Shoring shall be provided for excavations in accordance with CW 2030.

- (b) Excavation shoring shall be designed to accommodate the installation of all pipe and fittings.
- (c) Where long term shoring for excavations is required provide stamped Shop Drawings in accordance with E5.2.
- (d) All shoring systems shall comply with Manitoba Workplace Safety and Health requirements.

#### E5.5 Excavation

- (a) Material from excavations shall not be stockpiled on the riverbank, or within 30 metres of the top of the riverbank.
- (b) Granular materials, pipe bedding, and other materials shall not be stockpiled on the riverbank, or within 30 metres of the top of the riverbank.
- (c) Materials shall not be stockpiled over pipelines.
- (d) Excess excavation material from excavations shall be disposed of off-site.
- (e) Granular bedding in the vicinity of existing pipelines shall be dewatered and stabilized prior to undermining pipes to prevent loss of granular pipe foundation.
- (f) Carefully excavate to expose existing pipelines. Excavation within 1.0 m of the pipe shall be done using soft dig or hand excavation methods to prevent damage to the pipe.
- (g) The Contractor shall undertake all efforts to prevent freezing of soils underlying existing pipelines, bedding and backfilling will not be permitted overtop of frozen soils. Excavations left open when nighttime atmospheric temperatures are expected to drop below 0°C shall be horded and heated as required to keep soils and pipelines from freezing.
- (h) See E6 for additional restrictions when working in close proximity to feeder mains.
- (i) Provide heating and hoarding around the lower portion of the excavation and pipe during freezing conditions.

#### E5.6 Backfill

- (a) Backfill within 1 m of existing and proposed pavements shall be completed to CW 2030, Class 2 standards.
- (b) Backfill under paths and walkways shall be completed to CW 2030, Class 2 standards.
- (c) Backfill within 1 metre of existing 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.
- (d) All other areas shall be backfilled with a Class 4 backfill unless otherwise noted on the Drawings.
- (e) The Contractor shall undertake all efforts to prevent excavated material intended for backfilling from freezing. Backfilling with frozen materials will not be permitted.

#### E5.7 Measurement and Payment

- (a) Excavation, shoring, and backfilling for excavations will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No separate payment will be made.

### **E6. OPERATING CONSTRAINTS FOR WORK IN CLOSE PROXIMITY TO FEEDER MAINS**

#### E6.1 Description

- E6.1.1 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 centerline of

the feeder main, within 5 m of valve chambers and other appurtenances, and any other infrastructure identified below.

E6.1.2 The following shall be considered critical pipelines and water infrastructure for this project:

- (a) Site 1: Kildonan-Redwood Feeder Main
- (b) Site 2: Charleswood-Assiniboia Feeder Main
- (c) Site 6: Fort Garry/St. Vital Feeder Main
- (d) Feeder main valve chambers located on the sites identified herein and as shown on the Drawings.

E6.2 General Considerations for Work in Close Proximity to Feeder Mains

E6.2.1 Feeder mains are a critical component of the City of Winnipeg Regional Water Supply System and work in close proximity to feeder mains shall be undertaken with an abundance of caution. Feeder mains 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.

E6.2.2 Work around feeder mains 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.

E6.2.3 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. PCCP typically fails in a non-ductile mode and has the potential to cause extensive consequential damage to infrastructure if failure should occur.

E6.2.4 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.

E6.3 Submittals

E6.3.1 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.

E6.3.2 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, excavation equipment locations, and loading positions;
- (b) excavation plans, including shoring designs, for excavations occurring in close proximity to feeder mains (within 5 m horizontal of the pipe's centerline) where the excavation to be extended below the top of the feeder mains embedment zone (150 mm above the pipe)
- (c) any other pertinent information required to accurately describe the construction activities in close proximity to the feeder main and permit the Contract Administrator to review the proposed construction plans.

- E6.3.3 Submit the following documentation for inclusion in the City's feeder main shutdown protocol for each planned feeder main shutdown a minimum of ten (10) Business Days prior to the proposed shutdown in accordance with E2:
- (a) A step by step list of a tasks to be undertaken during the shutdown
  - (b) A contingency plan for any problems, issues, or unforeseen circumstance that might occur
  - (c) Check list of equipment, materials, tools required to complete the work that need to be on site prior to undertaking the shutdown
- E6.4 Feeder Main Shutdowns
- (a) Isolation of the feeder main crossings will be completed by City forces using mainline valves and secondary valves wherever possible.
  - (b) Dewatering of the following feeder mains will be completed by City forces. The Contractor shall be responsible for dewatering all other water mains.
    - (i) Site 2 - Charleswood-Assiniboia Feeder Main
    - (ii) Site 6 – Fort Garry/St. Vital Feeder Main
  - (c) Refer to D17.2 for feeder main shutdown restrictions. Work shall be scheduled to minimize the duration of all shutdowns.
- E6.5 Lock-out and Tag-out Procedures
- E6.5.1 The City of Winnipeg will endeavor to provide redundant valve closures (double blocking) of pressurized pipelines that enter the work space where possible. However, there are locations within the system where it is impractical to provide double blocking without widespread service disruption. Where regional water system network does not allow double blocking, non-redundant valve closures (single blocking) will be provided.
- E6.5.2 At locations where only single valve blocking is practical, additional safety measures and monitoring will be required in order to provide a safe work environment for employees. Development of adequate safety plans in accordance to the WorkPlace Safety and Health Act and Regulation 217/06 are the responsibility of the Contractor, but as a minimum shall include:
- (a) Provision of adequate egress from confined spaces including removal of removable roof slabs and manhole covers, and provision of ladders and other means of site exit
  - (b) Use of body harnesses and safety hoisting equipment at all times when pressurized systems are disassembled and protected only by single block valves.
  - (c) Monitor and assess water leakage in closed system prior to disassembly of system. Monitor water leakage rate and advise Contract Administrator immediately of change in inflow rates. Evacuate confined space if necessary.
- E6.5.3 The Contractor, City of Winnipeg Water and Waste Department, and Contract Administrator will all be required to lock out all valves closed in order to facilitate this work. Where site access and lockout space on system valves is limited, the following lockout/tag out procedures will be implemented;
- (a) Lockout locations for valves will be identified by the City.
  - (b) City of Winnipeg will provide a single lock, chains and other devices to adequately secure valves within pits and chambers. The Contractor has the right to inspect the installation and satisfy that the lockout system is adequate. All locks utilized will be commonly keyed.
  - (c) Key(s) for single locked valves will be placed in secure lock box at the site. City staff, Contractors, and Contract Administrator will place personal/company locks complete with identification and tag out information on this lock box.

- (d) Key(s) placed within the secure lock box will not be removed until all City staff, Contractor, and Contract Administrator locks have been removed from the lock box, and verified that the work is completed.
- (e) City staff will then unlock all valves, and will commence with restoration of the systems to service.

#### E6.6 Pre-Work, Planning and General Execution

- E6.6.1 No work shall commence in close proximity to feeder mains, chambers, and critical infrastructure until the equipment specifications and construction method statement have been submitted and accepted, and feeder main locations have been clearly delineated in the field. Work over feeder mains shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications on the pipe.
  - E6.6.2 Contact the City of Winnipeg Water and Waste Department, Construction Services Coordinator prior to construction.
  - E6.6.3 Locate feeder mains and confirm their position horizontally and vertically at the proposed the following locations prior to undertaking work in close proximity to the identified feeder mains. Note, exact locations to be identified in the field.
  - E6.6.4 Visually delineate all critical infrastructure identified herein on Site by use of paint, staking/flagging, construction fencing, snow fencing, or other suitable methods
  - E6.6.5 Only utilize construction practices and procedures that do not impart excessive vibratory loads on feeder mains and chambers or that would cause settlement of the subgrade below feeder mains and critical pipelines.
  - E6.6.6 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.
  - E6.6.7 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.
  - E6.6.8 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).
  - E6.6.9 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.
  - E6.6.10 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 Administrator, 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.
- #### E6.7 Demolition, Excavation, and Shoring
- E6.7.1 Use of pneumatic concrete breakers within 3 m of a feeder main, valve chamber, or critical pipeline is prohibited. Pavement shall be full depth sawcut and carefully removed. Use of hand held jackhammers for pavement removal will be allowed.

- E6.7.2 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.
- E6.7.3 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.
- E6.7.4 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.
- E6.7.5 Excavations within 3 m of the outside edge of a feeder main (hydrovac holes for confirming trenchless installations excluded) and which extend below the invert of the feeder main shall utilize shoring methods that precludes the movement of native in-situ soils (i.e. a tight shoring system).
- E6.7.6 Pre-bore all piles to below the invert of critical infrastructure within 5 m (horizontally) of the pipeline's outside edge.
- E6.7.7 Offset pile driving equipment a minimum of 3 m (horizontally) from the centerline of the pipeline during piling operations.
- E6.8 Subgrade Construction
- E6.8.1 Subgrade and backfill compaction within 3 metres (horizontal) of a critical pipeline or valve chamber shall be limited to non-vibratory methods only. Small walk behind vibratory packers will be permitted.
- E6.8.2 Subgrade, sub-base and base course construction shall be kept in a rut free condition at all times. Construction equipment is prohibited from crossing pipelines if the grade is insufficient to support the equipment without rutting.
- E6.8.3 Subgrade conditions should be inspected by personnel with competent geotechnical experience (e.g. ability to adequately visually classify soils and competency of subgrade, subbase, and base course materials). In the event of encountering unsuitable subgrade materials above the feeder main, proposed design revisions shall be submitted to this office for review to obtain approval from the Water and Waste Department relative to any change in conditions.
- E6.8.4 Fill material shall not be dumped directly on pipelines but shall be stockpiled outside the limits noted in these recommendations and shall be carefully bladed in-place
- E6.8.5 Only use compaction equipment approved by the contract administrator to compact fill materials above critical pipelines. Compaction of fill materials shall be completed using static methods only, no vibratory compaction will be allowed within the limits noted in these recommendations.
- E6.8.6 Construction operations shall be staged to minimize the time period between excavation to subgrade and placement of granular subbase materials. Should bare subgrade be left overnight, measures shall be implemented to protect the subgrade against inadvertent travel over it and to minimize the impact of wet weather.
- E6.9 Subbase and Base Course Construction
- E6.9.1 Subbase or base course materials shall not be dumped directly on pipelines but shall be stockpiled outside limits noted in these recommendations and shall be carefully bladed in-place.
- E6.9.2 Subbase compaction within 3 m horizontal of the centerline 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.

## E6.10 Paving

E6.10.1 When constructing asphalt pavements only non-vibratory compaction should be used within 3 m (horizontal) of the center of critical pipelines.

## E6.11 Measurement and Payment

- (a) Work covered in this section will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No separate payment will be made.

## E7. WORKING AROUND MANITOBA HYDRO NATURAL GAS INFRASTRUCTURE

### E7.1 General

E7.1.1 Further to CW 1120, be advised that the Work will be completed in the vicinity of Manitoba Hydro high pressure natural gas mains. The approximate locations of the natural gas mains are provided on the Drawings. This Section details operating constraints for all work to be carried out in close proximity to Manitoba Hydro high pressure natural gas mains.

### E7.2 General Requirements

E7.2.1 The following general requirements for work around natural gas mains or services shall be adhered to, unless modified in following sections where the most stringent requirements shall apply or as directed otherwise by the Contract Administrator:

- (a) all requirements of Manitoba Hydro's Safe Excavation and Safety Watch guidelines shall apply. All natural gas mains and services must be properly located and marked by Manitoba Hydro personnel. This can be arranged by visiting [ClickBeforeYouDigMB.com](http://ClickBeforeYouDigMB.com) or call 1-800-940-3447. Construction operations are not to commence unless these conditions are adhered to;
- (b) all excavations within 1.0 m of any natural gas main or service must be completed by hand or hydro-excavated;
- (c) a minimum vertical separation of 300 mm from natural gas mains and 100 mm from natural gas services lines must be maintained between any Manitoba Hydro facility and any new installations;
- (d) a minimum 600 mm of cover shall be maintained in all areas where equipment will be crossing, traveling, or compacting over natural gas mains. Vibratory compaction cannot be used over or within 1.0 m of a main;
- (e) a minimum 450 mm of cover shall be maintained in all areas where equipment will be crossing, traveling, or compacting over the gas service lines. Vibratory compaction cannot be used over or within 1.0 m of a service;
- (f) less than the minimum depth of cover, earth bridging, or steel plates shall be placed over the main and extend a minimum of 1.0 m on either side at each crossing location;
- (g) all construction operations within the vicinity of natural gas mains or services are to take place in a manner so as not to damage or cause detriment to the integrity of the natural gas pipeline; and,
- (h) Any damages to the coating must be reported to and repaired at no cost by Manitoba Hydro prior to backfilling.

### E7.3 High Pressure Natural Gas Mains

E7.3.1 The following requirements for work around high pressure natural gas mains shall be adhered to, unless modified in following sections where the most stringent requirements shall apply or as directed otherwise by the Contract Administrator:

- (a) Approximate locations of the existing high pressure natural gas mains are as follows:
  - (i) 350 mm main crossing the Assiniboine River between Berkley Street and Rouge Road (Site 2).

- (b) A Manitoba Hydro High Pressure Safety Watch is required for all construction activities within 3.0 m of the high pressure natural gas mains.
- (c) Contact "Click before you dig" a minimum of 2 weeks prior to any Work commencing within 3.0 m of the high pressure natural gas main to arrange for the main to properly located and marked by Manitoba Hydro personnel at ClickBeforeYouDigMB.com or Call 1-800-940-3447. Upon receiving clearances, the excavator will be provided with the phone number of the appropriate District in order to coordinate a Manitoba Hydro High Pressure Safety Watch.
- (d) Prior to construction at these locations, the Contractor shall expose the main by hand or hydro-excavation in order to confirm elevation of the pipe. The Contractor shall provide a minimum of five (5) Calendar Days notice to the Contract Administrator of conducting utility exposures, such that the Contract Administrator can measure depths of the exposed utility.
- (e) A minimum 900 mm of cover shall be maintained in all areas where equipment will be crossing, traveling or compacting over the high pressure natural gas mains. Vibratory compaction cannot be used over or within 3.0 m of a high pressure natural gas main.
- (f) If equipment must cross, travel, or compact over the gas main with less than the minimum depth of cover, earth bridging or steel plates shall be placed over the main and extend a minimum of 1.0 meter on either side at each crossing location.
- (g) A smooth edged bucket shall be used for any excavations within 3.0 m of a high pressure natural gas main.
- (h) Caution must be used to ensure the integrity of the pipeline coating. Any damages to the coating must be reported to and repaired at no cost by Manitoba Hydro prior to backfilling.

#### E7.4 Measurement and Payment

- (a) Work covered in this section will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No separate payment will be made.

### **E8. WATER SUPPLY**

#### E8.1 Further to specifications CW 1120, Section 3.1, CW 2140 and CW 2145, water supply for the Work may be taken from City of Winnipeg hydrants in accordance with the following:

- (a) Only hydrants approved by WSD shall be used for water supply.
- (b) The Contractor shall supply and use a Backflow Protection Arrangement as shown on Standard Drawing SD-019 when taking water from City hydrants. Alternatively, the Contractor may rent the Backflow Protection Arrangement from the Water Services Division (WSD) if available. WSD will supply a meter and locks for the Backflow Protection Arrangement.
- (c) The Contractor is permitted to turn approved hydrants on and off provided the Contractor has received training by the Water Services Division and the turn-ons and turn-offs are done in the presence of the Contract Administrator.
- (d) Hydrants approved for use shall be considered to be "in the Contractor's control" from the time the City has turned the hydrant on until the Contractor has notified the City the hydrant is no longer being used and the meter box has been removed.
- (e) Between November 1 and April 30 of any year the Contractor shall take all necessary precautions to prevent freezing of hydrants and related appurtenances for hydrants in their control and shall be responsible to pump out hydrants turned off by Emergency Services. Heating and hoarding of hydrants will be required by the Contractor.
- (f) If a hydrant or appurtenance is damaged due to freezing or improper turn-on or turn-off procedures while in the Contractor's control, WSD will assess the damage and determine if WSD will repair the damage or if the Contractor will be responsible to repair the damage. Costs for repairs completed by WSD will be deducted from payments owing the Contractor. Repairs completed by the Contractor will be at the Contractor's expense.

- (g) Erect and maintain signage (bump signs) warning oncoming traffic of hose crossings to the satisfaction of the Contract Administrator and the Manual of Temporary Traffic Control. Construct ramps as shown on attached Drawing D-8211.
- (h) Direct hook-up of pipeline flushing equipment to a hydrant is not permitted unless approved by the Contract Administrator
- (i) WSD may instruct the Contractor to make other arrangements for hydrant turn-ons and turn-offs.

#### E8.2 Measurement and Payment

- (a) The supply of the Backflow Protection Arrangement or rental of same from WSD shall be considered incidental to "Pipeline Modifications" and will not be measured for payment. No additional payment will be made.
- (b) All costs associated with heating and hoarding shall be considered incidental to "Pipeline Modifications" and will not be measured for payment. No additional payment will be made.
- (c) Further to Section 3.7 of CW 1120, charges incurred for the permit and water meters shall be paid for by the Contractor when taken out. The Contractor shall forward the invoice to the Contract Administrator for reimbursement. The billing for water usage sent to the Contractor shall be forwarded to the Contract Administrator for payment. The Bid Opportunity number shall be noted on each permit.

### E9. **CONFINED SPACE ENTRY SUPPORT**

#### E9.1 Description

- (a) This specification covers provision of confined entry and access support for specialized inspection contractors and inspection personnel.

#### E9.2 General

E9.2.1 The Contractor shall be aware that Hydrogen Sulphide Gas is present in all underground structures connected to the City's sewer systems and has been known to accumulate in concentrations sufficient to cause serious harm or death to personnel who are not using adequate Personal Protective Equipment.

E9.2.2 The Contractor's attention is drawn to the Province of Manitoba Workplace Safety and Health Act ("the Act"), and the Regulations and Guidelines there-under pertaining to Confined Space Entry Work and in particular the requirements for conducting hazard/risk assessments and providing personal protective equipment (PPE).

#### E9.3 Scope of Services

- (a) Inspection Contractors, consultants and City personnel require dedicated confined entry support services during pipeline inspection of pipeline river crossings. The following sites will require confined entry access on one or both sides of the river crossing for installation and retrieval of in-line inspection tools. For purpose of provision of services, allow for 2 entrants per side and additional support as required for standby and rescue.
  - (i) Site 1: Kildonan-Redwood Feeder Main
  - (ii) Site 2: Charleswood-Assiniboia Feeder Main (Existing Chambers, if required)
  - (iii) Site 4: Newton Ave Force Main
  - (iv) Site 5: Heritage Park Force Main (Pumping Station)
  - (v) Site 6: Fort Garry/St. Vital Feeder Main
- (b) For waste water pipelines, services will include provision of air supply for self-contained breathing apparatus (SCBA), forced air ventilation fans and air quality monitors.

#### E9.4 Equipment

- (a) Safety Retrieval winch and tripod
  - (i) Provide sufficient retrieval winches to support inspection crews on each side of the crossing. A maximum of two entrants shall be assumed per side.
  - (ii) Provide two body harnesses per entry location, plus additional harnesses for backup and rescue.
- (b) Self-Contained Breathing Apparatus (SCBA) air supply
  - (i) Provide air supply and regulators to support two entrants per location, plus rescue backup.
  - (ii) Provide 5 minute backup bottles for each entrant.
  - (iii) Regulators compatible with Scott AV-3000 masks or masks compatible with the Contractors equipment shall be provided.
  - (iv) Entrants will provide their own masks if Scott Av-300 compatible system used.
  - (v) Support and rescue personnel and equipment shall be provided by Contractor.
- (c) Air Quality Monitors
  - (i) Provide a minimum of two multi-gas air quality monitors for each crossing access location. Each monitor shall provide continuous exposure monitoring for oxygen, carbon monoxide, hydrogen sulphide and combustible gases.

#### E9.5 Methods

- E9.5.1 Be fully responsible for confined entry access on site, in accordance to Manitoba Workplace Health and Safety Regulation 217/2006 and subsequent amendments.
- E9.5.2 Support services will be required to support one pipeline crossing (one inspection crew) at a time. Each crossing will require support on each side of the river.
- E9.5.3 Safety Personnel shall be dedicated to confined entry access when inspection personnel are in confirmed areas.
- E9.5.4 Maintain confined entry permit logs.
- E9.5.5 Hazard Assessment
  - (a) In conjunction with securing the site and obtaining underground clearances, the Contractor shall conduct a hazard assessment for each site requiring work within a confined space. The assessment shall identify and evaluate the hazards, including but not be limited to review of the following as it pertains to the work to be performed:
    - (i) nature of the work;
    - (ii) structural condition of the existing structure; and,
    - (iii) atmospheric conditions in the structure.
  - (b) The hazard assessment shall be based on the Contractors review of structures and external conditions. Prior to the inspection, the Contractor shall conduct the necessary atmospheric monitoring of the affected structures to establish acceptable entry conditions.
- E9.5.6 Safe Work Plan
  - (a) Subsequent to performing a hazard assessment the Contractor shall develop a safe work plan to address the potential hazards associated with each site. In addition to addressing the potential hazards the safe work plan shall address but not be limited to the following:
    - (i) guidelines for confined space entry work established by The Manitoba Workplace Safety and Health Act;
    - (ii) provision for emergency response;
    - (iii) training and duties for entry personnel;
    - (iv) rescue and emergency services;

- (v) requirement for purging, ingesting, flushing and/or continuous ventilation to eliminate or control atmospheric hazards;
  - (vi) requirement for and provision of supplied air;
  - (vii) communication between members of the repair crew in the pipe/trench and on the ground's surface;
  - (viii) current and forecasted weather conditions;
  - (ix) provision of back-up equipment;
  - (x) method of ingress into the structure; and,
  - (xi) method of egress out of the structure.
- (b) The Contactor shall not enter the structures to begin the work until they have completed a hazard assessment and safe work plan for the specific repair and reviewed the plans with their designated safety officer for acceptance. The safe work plan procedures and practices shall conform to all federal, provincial and municipal codes, regulations and guidelines including Manitoba Workplace Safety and Health Regulations.

#### E9.5.7 Third Party Inspections

- (a) The Contractor's safe work plan and confined space entry procedures for inspections involving the Inspection Contractor and/or AECOM personnel shall meet or exceed all requirements outlined in AECOM's Safe Work Procedure, attached in Appendix C and those of the Inspection Contractor. The Inspection Contractor's safe work procedures will be provided prior to commencement of construction.
- (b) The Contractor shall provide confined space support for the Inspection Contractor and third party inspections by AECOM and Citer personal. The Inspection Contractor, AECOM, and City personal will provide personal PPE. Support shall include but is not limited to:
- (i) Furnishing all confined space entry documentation and permits. Copies of the signed and closed out permits shall be provided to the Contract Administrator within five (5) Business Days of the confined space entry;
  - (ii) Provision of an attendant and supervisor dedicated to the confined space entry;
  - (iii) Provision of a retrieval tripod, complete with retractable winch line;
  - (iv) Provision of confined space harnesses. Harnesses shall be certified in accordance with the manufacturer's recommendations;
  - (v) Provision of atmospheric monitors for each entrant. Atmospheric monitors shall be calibrated and tested in accordance with the manufacturer's recommendations; and,
  - (vi) The Contractor shall complete and document atmospheric monitoring prior to and during entry in accordance with submitted confined space procedures.
- (c) Inspections may be delayed or postponed where onsite confined space procedures, hazard mitigation measures, or confined space entry support do not meet the Contractor's submitted and accepted safe work plan and procedures until such a time that discrepancies have been addressed to the satisfaction of the entrants. Claims for delays resulting from improper confined space operations will not be considered.

#### E9.6 Measurement and Payment

- (a) Confined entry support will be considered incidental to "Pipeline Modifications" and "Pipeline Inspection Support Services" and will not be measured for payment. No additional payment will be made.

### **E10. TRAFFIC MANAGEMENT**

- E10.1 Further to Section 3.7 of CW 1130 of the General Requirements the Contractor shall be responsible to redirect and maintain traffic with appropriate signing in accordance with The City

of Winnipeg, "Manual of Temporary Traffic Control in Work Areas on City Streets" at all times during construction.

- E10.2 Maintain access for approaches, driveways, public lanes and crossing streets for all locations.
- E10.3 The Contractor shall maintain access to all businesses during business hours, except where written authorization has been provided by the business.
- E10.4 The Contractor shall maintain access to all schools, community centres, and other public buildings at all times.
- E10.5 Further to Section 3.6 of CW 1130 of the General Requirements, the Contractor shall maintain safe pedestrian crossings at intersections at all times. If possible, only one pedestrian crossing at an intersection is to be blocked by construction at any one time. If more than one pedestrian crossing is blocked by construction at an intersection at the same time the Contractor shall provide flag persons to safely escort pedestrians across the intersection. The Contractor shall leave pedestrian crossing locations safe and free of equipment that may hamper pedestrians when no construction activities are being performed at a particular crossing location.
- E10.6 Further to Clause 3.7 of CW 1130 of the General Requirements, should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.
- E10.7 The Contractor shall not park company or private vehicles inside the barricaded work zone in a manner that will block sightlines for vehicles and pedestrians approaching and crossing intersections.
- E10.8 The Contractor is responsible for maintaining safe vehicular and pedestrian traffic through their work site as identified herein. The Contractor shall rectify any unsafe conditions immediately upon notification. This could include but is not limited to, providing flag persons, clearing debris and snow from sites, moving equipment, and erecting additional signage.
- E10.9 Regional Street Lane Closures
- E10.9.1 Construction activities requiring lane closures on Regional Streets shall be restricted during Weekday Peak Periods (07:00 to 09:00 and 15:30 to 17:30 Monday to Friday) and during other hours as outlined herein or directed by the Contract Administrator.
- E10.9.2 The City reserves the right to restrict or cancel Regional Street lane closures at any time due to the occurrence of special events or conflicting third party work.
- E10.9.3 The Contractor shall submit all regional lane closure requests to the Contract Administrator a minimum of five (5) Business Days prior to the planned work. Requests for regional lane closures shall include all required information for submission required by the City's online request form. A link to the form can be found here:  
<http://www.winnipeg.ca/publicworks/trafficcontrol/laneclosures/LaneClosuresMap.asp>).
- E10.10 Residential Streets
- (a) Erect Road Closure signage in accordance with The City of Winnipeg, "Manual of Temporary Traffic Control in Work Areas on City Streets".
- (b) The contractor shall strive to maintain at least one lane of traffic on residential streets.
- (c) A minimum of one lane of traffic shall be maintained on one-way residential streets at all times.
- (d) Where complete street closures are required, the Contractor shall provide notice of complete street shutdowns complete with dates and duration a minimum of five (5) Business Days prior to the street closures.

E10.11 Notwithstanding the requirements noted herein and CW 1130, the Contractor shall maintain the following minimum site specific traffic control requirements:

- (a) Site 1 – Kildonan-Redwood Feeder Main
  - (i) The Contractor should maintain two lanes of traffic (one in each direction) at all times on Redwood Ave and Hespeler Ave.
- (b) Site 3 – St. Vital Bridge Force Main
  - (i) Maintain one lane of northbound traffic on Osborne St/Dunkirk Drive at all times.
  - (ii) Maintain two lanes of northbound traffic on Osborne St/Dunkirk Drive during the AM weekday peak period.
- (c) Site 5 – Heritage Park Force Main
  - (i) Maintain a minimum of one lane of traffic on Ness Ave during leakage test.
- (d) Site 6 – Fort Garry/St. Vital Feeder Main
  - (i) Lane closures on River Ave and Bishop Grandin will not be permitted.

E10.12 Measurement and Payment

- (a) Traffic management as outlined here will be considered incidental to the Work and will not be measured for payment. No separate payment will be made.

## **E11. WWS FLOW CONTROL AND PUMP STATION SHUTDOWNS**

E11.1 Description

- (a) This Specification shall cover pipeline shutdowns for the purposes of modifying and testing force mains.

E11.2 Submittals

E11.2.1 Submit an operation plan for each site in accordance with E2. The operation plan shall include the following:

- (a) A detailed description of the works to be undertaken, including but not limited to:
  - (i) Pump station shutdowns
  - (ii) Pipeline plugging for leakage tests
  - (iii) Pipeline modifications to be undertaken during pump station shutdowns
- (b) A list of the key components required for the works.
- (c) Sketches and diagrams illustrating the installation and blocking of all temporary plugs and in flow operations.
- (d) Step by step procedure for installation and removal of all in flow works.
- (e) Means and methods for dealing with excessive flows or wet weather events.
- (f) A detailed (step by step) schedule for any pump station shutdowns.

E11.3 Products

E11.3.1 Temporary Inflatable Plugs for Leakage Tests

- (a) Plugs shall be capable of withstanding a minimum of 345 kPa (50 psi) of backpressure.
- (b) Plugs shall be capable of being anchored from downstream.
- (c) Plugs shall have a 25 mm (min) air bleed port.

E11.3.2 Sandbags

- (a) Where required, provide sandbags for diversion of flow. Remove and dispose of sandbags upon completion of inspection. Sandbags in contact with sewage shall be disposed of at an approved disposal facility.

#### E11.4 Site Specific Requirements and Restrictions

##### E11.4.1 Site 4 - Newton Avenue Force Main

- (a) Install temporary piping as shown on the Drawings. Temporary piping may remain in place for the duration of the work.
- (b) Shutdown of the Hawthorne Pumping Station is required to facilitate the work:
  - (i) A maximum of two (2) pump station shutdowns will be permitted for reconfiguration of chamber piping in the east valve chamber, one (1) prior to inspection and one (1) post cleaning and inspection.
  - (ii) The shutdown may only occur during peak dry weather flows.
  - (iii) The shutdown may only occur between the hours of 10:00 pm and 10:00 am.
  - (iv) Maximum 12 hr pump station shut down.
- (c) Full time monitoring of upstream wastewater levels required during pump station shutdowns.
  - (i) Maximum allowable elevation: 225.00 m.
  - (ii) Monitoring point to be identified prior to the pump station shutdown.

##### E11.4.2 Site 5 – Heritage Park Force Main

- (a) Complete force main sampling and leakage test as shown on the Drawings and specified.
- (b) Shutdown of the Heritage Park Pumping Station is required to facilitate the work:
  - (i) A maximum of two (2) pump station shutdowns will be permitted; one (1) to facilitate the force main sampling and one (1) to facilitate the leakage test.
  - (ii) The shutdown may only occur during peak dry weather flows.
  - (iii) The shutdown may only occur between the hours of 12:00 am and 7:00 am.
  - (iv) Maximum duration: 5 hr.
- (c) Full time monitoring of upstream wastewater levels required during pump station shutdowns.
  - (i) Maximum allowable elevation: 231.30 m.
  - (ii) Monitoring point to be identified prior to the pump station shutdown.

#### E11.5 Methods

##### E11.5.1 Installation of Inflatable Plugs

- (a) Install plugs as per manufacturers recommendations
- (b) Plugs to be braced or anchored as recommended by the manufacturer
- (c) Provide air supply and monitor plug inflation pressure, in accordance with manufacturer's recommendations.

E11.5.2 Be prepared to remove flow diversions immediately due to flow backups, wet weather flows or as requested by the Contract Administrator.

#### E11.6 Measurement and Payment

E11.6.1 All materials and labour required to undertake pump station shutdown's will be considered incidental to "Pipeline Modifications" and "Low Pressure Leakage Tests" and will not be measured for payment. No additional payment will be made.

### **E12. PIPELINE MODIFCATIONS**

#### E12.1 Description

- (a) This Specification shall cover the modification of valve chambers, feeder mains, and force mains, as required for cleaning and inspection the river crossing pipelines.

## E12.2 Description of Work:

### E12.2.1 Piping Modifications:

- (a) See Drawings for details on proposed piping modifications.
- (b) Site 1 – Kildonan-Redwood Feeder Main
  - (i) Install new gate valve on 300 mm water main offtake, exterior to existing valve chamber.
  - (ii) Expose chambers and remove roof slabs as required.
  - (iii) Remove chamber piping as shown on the Drawings, taking all care to preserve the components to be reinstalled.
  - (iv) Abandon existing fire hydrant and related piping, and patch wall penetration.
  - (v) Remove abandoned 300 mm water main piping and patch wall penetrations.
  - (vi) Install temporary piping to enable cleaning and inspection of the feeder main as shown on the Drawings.
  - (vii) Reinstall existing chamber piping components to be re-used as shown on the Drawings.
  - (viii) Supply and install new chamber piping as shown on the Drawings.
  - (ix) Restore chambers and site as shown on the Drawings.
- (c) Site 2 – Charleswood-Assiniboine Feeder Main
  - (i) Install permanent inspection wyes and temporary piping to enable cleaning and inspection of the feeder main as shown on the Drawings.
  - (ii) Install permanent blind flanges on inspection launch wyes.
  - (iii) Backfill and restore site as shown on the Drawings.
- (d) Site 3 – St. Vital Bridge Force Main
  - (i) Remove select areas of existing cladding and insulation from 500 mm force main as indicated on the Drawings.
  - (ii) Coat the exterior of the pipeline where exposed.
  - (iii) Install new insulation and cladding as specified herein.
- (e) Site 4 - Newton Avenue Force Main
  - (i) Perform temporary piping modifications within upstream valve chamber and downstream manhole as shown on the Drawings.
  - (ii) Restore force main, chamber piping, valve chamber, and site as shown on the Drawings.
- (f) Site 5 – Heritage Park Force Main
  - (i) Retrieve a 1000 mm long section of PVC force main to be sent for material testing.
  - (ii) Restore force main piping using new PVC spool piece.
- (g) Site 6 – Fort Garry-St. Vital Feeder Main
  - (i) Complete permanent and temporary piping and chamber modifications as shown on the Drawings.
  - (ii) Restore chamber and site as shown on the Drawings.
- (h) All tool launching assemblies, including 45 degree elbows, and spool pieces shall be turned over to the City upon completion of work.

### E12.3 Submissions:

- E12.3.1 Submit Shop Drawings for all permanent and temporarily installed fittings, valves, piping and couplings in accordance with E2.
- E12.3.2 Submit Shop Drawings for pipeline insulation and cladding in accordance with E2.

E12.3.3 Submit a tapping sleeve installation procedure complete with all pertinent product literature and procedures in accordance with E2.

## E12.4 Products

### E12.4.1 Fasteners

- (a) Bolts for all direct bury flange connections shall be ASTM A307 or ASTM F568M, grade B.
- (b) Nuts for all direct bury flange connections shall be ASTM A563 or ASTM A563M, grade B.
- (c) Bolts for all sleeve style couplings and/or restraints shall be ASTM F593 or ASTM F738M, type 316 stainless steel.
- (d) Nuts for all sleeve style couplings and/or restraints shall be ASTM F594 or ASTM F836M, type 316 stainless steel.
- (e) Anti-seize compound shall be used on all bolts.
- (f) For flanged connections, bolt size, type and diameter shall be in accordance to AWWA C207. Bolt length suitable for coupling AWWA C207 Class D flange.
- (g) All flanged connections shall be wrapped in a petrolatum tape coating system in accordance with E12.4.20. All steel bolting hardware shall be liquid epoxy coated in accordance with AWWA C116, E12.4.16, and E12.5.3 prior to wrapping with petrolatum tape coating system.

### E12.4.2 Flange Gaskets

- (a) 3mm, full-faced, SBR rubber gaskets or neoprene in accordance with AWWA C207.
- (b) Gaskets shall be one piece construction where possible.
- (c) Segmented gaskets shall be constructed of a minimum number of segments and joints shall be of dovetailed construction, or other jointing methods approved by the Contract Administrator.

### E12.4.3 Blind Flanges

- (a) Steel blind flanges shall be AWWA C207 Class D.
- (b) Cast and ductile blind flanges shall be ASME/ANSI B16.1 Class 125.
- (c) Steel blind flanges to be fusion bonded epoxy coated in accordance with AWWA C213, E12.4.16, and E12.5.3.
- (d) Cast and ductile blind flanges shall be fusion bonded epoxy coated in accordance with AWWA C116, E12.4.16, and E12.5.3.

E12.4.4 Temporary bends and launch piping shall be constructed from either Ductile Iron in accordance with E12.4.5 and E12.4.6 or PVC in accordance with E12.4.7.

### E12.4.5 Ductile Iron Fittings

- (a) Flanged ductile iron fittings conforming to AWWA C110.
- (b) Fittings shall meet the following minimum criteria:
  - (i) Fittings shall be new.
  - (ii) Permanently installed fittings shall be cement-mortar lined in accordance with AWWA C104.
  - (iii) Temporarily installed fittings shall be liquid epoxy lined to AWWA C210, E12.4.15, and E12.5.3. as a minimum.
  - (iv) All fittings to be liquid epoxy coated to AWWA C210, E12.4.15, and E12.5.3.

### E12.4.6 Ductile Iron Pipe

- (a) Ductile iron pipe conforming to AWWA C151.

- (b) Pipe shall meet the following minimum criteria:
  - (i) Thickness Class 54 (minimum).
  - (ii) Pipe shall be new.
  - (iii) Permanently installed pipe shall be cement-mortar lined in accordance with AWWA C104.
  - (iv) Temporarily installed pipe shall at a minimum be liquid epoxy lined to AWWA C210, and in accordance with E12.4.15, and E12.5.3.
  - (v) All pipe to be liquid epoxy coated in accordance with AWWA C210, E12.4.15, and E12.5.3.
- (c) Pipe used for feeder main and water main tool launching purposes must be cleaned disinfected in accordance with E14.2 prior to use.

#### E12.4.7 PVC Pipe and Fittings

- (a) PVC pipe and fittings shall conform to AWWA C900 or AWWA C905 and CSA B137.3.
- (b) Pipe and fittings shall meet the following minimum requirements:
  - (i) Shall have a dimension ratio (DR) of 18.
  - (ii) Shall be new.
- (c) Temporary pipe used for launching cleaning and inspection tools may be in used condition.
- (d) Pipe used for feeder main tool launching purposes must be cleaned disinfected in accordance with E14.2 prior to use.
- (e) Flange adaptors used must be fully restrained from axial movement.

#### E12.4.8 Fabricated Steel Pipe and Fittings

- (a) Steel pipe and fittings shall conform to AWWA C200, AWWA C208, and meet the following requirements:
  - (i) Minimum steel yield strength of 240 MPa (35,000 psi)
  - (ii) Minimum wall thickness of 9.5 mm for all sizes.
  - (iii) All exposed steel surfaces (interior and exterior) shall be coated in accordance with AWWA C210, E12.4.15, and E12.5.3.
- (b) Welded steel patches on existing steel pipelines shall be a minimum thickness of 9.51 mm.
- (c) Welded steel patches on existing pipelines shall be externally coated with a petrolatum tape wrap system in accordance with E12.4.20 and E12.5.5.
- (d) Pipe used for feeder main and water main tool launching purposes must be cleaned disinfected in accordance with E14.2 prior to use.

#### E12.4.9 Flanges for Pipe and Fittings

- (a) Steel flanges shall conform to AWWA C207, minimum Class D Flange
- (b) Threaded ductile iron flanges shall conform to AWWA C115 ASME/ANSI B16.1 Class 125.

#### E12.4.10 Pipe Couplings and Flange Adaptors

- (a) Pipe couplings shall conform to AWWA C219.
- (b) Unless otherwise specified, center sleeves for pipe couplings shall be constructed from:
  - (i) Ductile iron or steel for sizes 300 mm and smaller
  - (ii) Steel for sizes greater than 300 mm
- (c) Minimum requirements for sleeve couplings are:
  - (i) Center sleeve length: 250 mm

- (ii) Center sleeve thickness for steel couplings: 9.5 mm
- (iii) Couplings capable of accommodating up to 2 degrees deflection
- (iv) Design pressure 150 psi
- (d) Minimum requirements for flange adaptors:
  - (i) Flanges shall conform to ASME/ANSI B16.1 Class 125.
- (e) Restraining end rings shall be supplied where axial thrust restraint is specified on the Drawings. Restraint rings shall be specifically designed for the material type of the pipes being joined.
- (f) All hardware shall be type 316 stainless steel in accordance with E12.4.1.
- (g) Couplings to be fusion bonded epoxy coated in accordance with E12.4.16 and E12.5.3.
- (h) Couplings to be supplied with two di-electric insulating boots.
- (i) Buried pipe couplings shall be further protected against corrosion by wrapping the assembled coupler with petrolatum tape coating system in accordance with E12.4.20.
- (j) All transition couplings larger than 300 mm in diameter, with differential outside pipe diameters greater than 25 mm, shall be restrained to prevent movement of the coupling due to differential thrust forces. Tie rods placed in compression for the purpose of restraining differential thrust forces shall be no longer than 150 mm and the Contractor must demonstrate they are capable of withstanding the applied forces.

#### E12.4.11 Grooved Joints and Couplings

- (a) Direct grooved ends for ductile iron pipe shall conform to AWWA C606.
- (b) Grooved flange adaptors shall be compatible with AWWA C606 grooved end joints. Confirm compatibility to existing piping and fittings.
- (c) Grooved couplings and adaptors shall be constructed from ductile iron conforming to ASTM A536, grade 65-45-12.
- (d) Grooved end fittings shall be epoxy coated in accordance with E12.4.15 or E12.4.16 and E12.5.3.
- (e) Bolting hardware for grooved end fitting shall be galvanized steel conforming to E12.4.1.
- (f) Approved manufacturer: Victaulic or approved equal in accordance with B7.

#### E12.4.12 Gate Valves

- (a) Gate valves shall conform to CW2110, City of Winnipeg Specification AT-4.21.1.7, AWWA C509, and shall be supplied with the following:
  - (i) Flanged joints conforming to AWWA 509.
  - (ii) Fusion bonded epoxy coating conforming to AWWA C550.
  - (iii) 50 mm AWWA operating nut.
  - (iv) Operating direction in accordance with SD-008.

#### E12.4.13 Tapping Sleeve

- (a) Tapping sleeve shall be a purpose built tapping sleeve intended for use on concrete cylinder pipe.
- (b) The tapping sleeve shall meet the following requirements:
  - (i) Minimum pressure capacity: 1030 kPa (150 psi)
  - (ii) Body Construction: Carbon Steel
  - (iii) Fasteners: Type 304 Stainless Steel
  - (iv) Coating: Fusion Bonded Epoxy in accordance with AWWA C213.
  - (v) Gaskets: Nitrile meeting ASTM D2000
- (c) Approved Products: Robar Model 6996 or approved equal in accordance with B7.

E12.4.14 Coatings

- (a) Unless otherwise specified herein coatings for all metal chamber piping and fittings shall be a liquid epoxy meeting the requirements of E12.4.15. As an alternative to liquid epoxy, the contractor shall have the option to use fusion bonded epoxy in accordance with E12.4.16.
- (b) Field-applied pipe coatings for above ground piping shall be a liquid epoxy meeting the requirements of E12.4.15.

E12.4.15 Liquid Epoxy Coatings

- (a) Liquid epoxy coatings shall conform to AWWA C210.
- (b) Liquid epoxy coatings shall be NSF 61 certified for immersion service in feeder main and water main pipelines.
- (c) All coatings shall be applied in a minimum of two (2) or more layers (5 mils dry film thickness minimum each coat) for a minimum final coating dry film thickness of the greater of 16 mils or the thickness recommended by the manufacturer for immersion service.
- (d) Interior pipe linings shall be a 100% solids liquid epoxy product. Approved products: Enviroline 230, Bar-Rust 234P, Specialty Polymer Coatings SP-7888, or approved equal in accordance with B7.
- (e) Exterior coatings for all exposed steel, piping, valves, and actuators shall be Polyamide Epoxy. Approved products: Enviroline 230, Bar-Rust 234P, Specialty Polymer Coatings SP-7888, Tnemec Series 140F Pota-Pox Plus, Amerlock 2 or approved equal in accordance with B7.
- (f) Submit product data for interior lining and exterior coating products in accordance with E2.

E12.4.16 Fusion Bonded Epoxy Coatings

- (a) Fusion bonded epoxy coatings shall conform to AWWA C213 for steel components and AWWA C116 for ductile iron fittings.
- (b) Fusion bonded epoxies shall be NSF 61 certified for immersion service in feeder main and water main pipelines.
- (c) The final minimum coating thickness shall be the greater of 16 mils or the thickness recommended by the manufacturer for immersion service.
- (d) Submit product data for interior lining and exterior coating products in accordance with E2.

E12.4.17 Flange Isolation Kits

- (a) Flange isolation kits shall be used where noted, where dissimilar metal piping or fittings are joined.
- (b) Flange isolation kits shall be to City of Winnipeg specification except as modified below.
- (c) Each kit shall be double flange isolation kit with insulating sleeves and washers for each flange of the bolted connection.
- (d) Bolt sleeves shall be comprised of G10 or G11 epoxy glass.

E12.4.18 Continuity Bonding

- (a) Wires for continuity bonding shall be No.10 American Wire Gauge (AWG) 7-strand copper conductor with black TWU insulation.
- (b) Thermite weld products shall be properly selected based on the wire size, pipe size and material.

- (c) Thermitite weld caps shall be constructed from 20 mil high-density polyethylene and may be either pre filled or field filled with a bituminous mastic coating or approved equal.

#### E12.4.19 Galvanic Anodes

- (a) Galvanic anodes for cathodic protection of buried ferrous pipes and fittings shall be 10.9 kg pre-packaged zinc anodes to City of Winnipeg specification.

#### E12.4.20 Petrolatum Tape Corrosion Protection System

- (a) All buried pipe couplers and flanged connections shall be protected against corrosion by a petrolatum tape corrosion protection system consisting of the following components:
  - (i) Petrolatum paste primer
  - (ii) Void-filling mastic filler
  - (iii) Petrolatum tape
  - (iv) Protective outerwrap
- (b) Petrolatum tape systems shall conform to AWWA C217.
- (c) Approved product: Petrolatum tape system manufactured by Denso North America Inc., Trenton Corporation, Petro Coating Systems Ltd, or approved equal in accordance with B7.
- (d) Submit Shop Drawings for petrolatum wrapping system in accordance with CW1110.

#### E12.4.21 Pipe Insulation

- (a) All new insulation for above ground piping shall be rigid polyurethane foam meeting or exceeding the following requirements:
  - (i) Thickness: 50 mm
  - (ii) Density: (ASTM D 1622) 35 to 46 kg/m<sup>3</sup>
  - (iii) Thermal Conductivity (ASTM C518): 0.027 W/m°C
  - (iv) Closed Cell Content (ASTM D6226): 90%, minimum
  - (v) Water Absorption (ASTM D2842): 4.0% by volume
- (b) Half shells for closures around pipe shall be prefabricated and molded for a snug fit.
- (c) Prefabricated foam shells shall include a thin polymer coating on all surfaces for strength during transit and installation.

#### E12.4.22 Pipe Cladding

- (a) All new cladding for above ground piping shall be 1.214 (18 gauge) (minimum) galvanized steel.
- (b) Banding used to secure new cladding shall be 20 millimetre wide by 0.38 millimetre thick 316 Stainless Steel.
- (c) Length of closure pieces shall be maximized in order to minimize the number of joints required for each closure.

### E12.5 Methods

#### E12.5.1 Confirmation of Victaulic Components

- (a) The Contractor shall confirm the diameter and style of existing Victaulic couplings prior to procurement of materials. Specifically, the existing 350 mm Victaulic connection within the Site 1 west tunnel shaft requires exposure and confirmation of size shortly after Award.
- (b) The Contractor shall clean the existing couplings sufficiently to identify the coupling style and required replacement components.
- (c) A qualified representative of Victaulic shall be present at the investigation to confirm the coupling style.

#### E12.5.2 Installation of Lead Wires, Continuity Bonding and Galvanic Anodes

- (a) Anodes and continuity bonding shall be installed on new and existing pipes and fittings where shown on the Drawings or as directed by the Contract Administrator.
- (b) Thermite Welding Procedure:
  - (i) Prepare steel surface to bare metal by grinding or filing. Remove all coatings, dirt, mill scale, oxide, grease, moisture, and other foreign matter from weld areas in an area required to complete the weld.
  - (ii) Before welding, remove wire insulation as required to fit mold, avoiding damage to the exposed copper wire. If wire is cut or nicked over halfway through its diameter, cut off and strip new end. If manufacturer requires the use of a copper sleeve, crimp it securely to wire and remove excess wire protruding from the end of the sleeve.
  - (iii) After charge is set, remove mold and slag from weld area with welder's hammer. Strike top and sides of weld with hammer to test secureness of connection. If weld does not hold, remove scrap weld material, clean, and begin weld process again.
  - (iv) After welding and before coating the cleaned weld area, the Contract Administrator may test the joint bond for and wires for electrical continuity.
  - (v) When the weld passes test for soundness and electrical continuity, repair the coating in the weld area with mastic and weld cap placed over the weld. Clean weld area to remove any loose material, and welding residuals. Cover exposed metal on the pipe and wire with mastic filled weld cap. Ensure weld cap covers the entire area of coating removed for installation of the thermite weld. If not, repair coating as per the coating manufactures recommendations prior to installing weld cap.

#### E12.5.3 Coatings

- (a) Where indicated on the Drawings and directed by the Contract Administrator, prepare metal surfaces for recoating using the following methods:
  - (i) Steel - Prepare steel surfaces for recoating by blast cleaning to near-white metal as specified by Joint Surface Preparation Standard NACE No.2/SSPC-SP10.
  - (ii) Cast and Ductile Iron - Prepare ductile iron surface in accordance with NAF 500-03.
  - (iii) Remove all dust and loose residues from the prepared surfaces and surrounding area. The surface shall be roughened to a degree suitable for the coating system employed.
- (b) Protect valve seals, machined surfaces, threads, and nameplates from sandblasting.
- (c) Primer coat to follow immediately after completion of sandblasting and prep.
- (d) Apply liquid epoxies of prepared surfaces in accordance with AWWA C210, E12.4.15, and the manufactures recommendations.
- (e) Apply fusion bonded epoxies of prepared surfaces in accordance with AWWA C213, E12.4.16, and the manufactures recommendations.
- (f) Provide adequate ventilation and heat to facilitate curing of coatings.
- (g) Interior linings for pipes and fittings shall be applied and cured as recommended by the manufacturer prior to placing into service. Linings must be fully cured for immersion service prior to installation and reinstating the line into service. Where accelerated cure times are required for assembly and water immersion, a coating and curing plan shall be submitted to the Contract Administrator in accordance with E2 a minimum of five (5) Business Days prior to application.

#### E12.5.4 Field Welding of Steel Pipelines and Fittings

- (a) Field welding of steel pipes shall conform to AWWA C206.

- (b) Connections to existing pipelines shall be accomplished with a full penetration butt weld or a fillet welded split sleeve (external).
- (c) Patches on steel pipelines shall be fillet welded.
- (d) All fillet welds shall have minimum leg lengths equal to the thickness of the material being welded.
- (e) All welds shall be inspected using magnetic particle testing methods by a qualified inspector in accordance with ASTM E1444.

#### E12.5.5 Installation of Petrolatum Tape Corrosion Protection Systems

- (a) Install in accordance with AWWA C217 and the manufactures recommendations.
- (b) For all surfaces to be wrapped with the corrosion protection system, remove loose rust, paint and foreign matter by hand and/or power tool cleaning in accordance with SSPC-SP-2 or SSPC-SP-3.
- (c) Apply a thin uniform coat of petrolatum paste primer, using a glove or brush, to all surfaces to be wrapped with the corrosion protection system.
- (d) Apply void-filling mastic filler, by hand, to all flanges designated to be wrapped with the corrosion protection system. Mold the mastic to a rounded configuration around the flange, filling all spaces around fasteners and eliminating sharp edges and irregular shapes.
- (e) Spirally wrap the petrolatum tape, using a minimum 25mm overlap, over the primed and mastic-filled pipe and flange surfaces. While wrapping, press out all air pockets and smooth all lap seams.
- (f) Spirally wrap clear outerwrap, using sufficient tension to make a tight-fitting cover, over the petrolatum tape.

#### E12.5.6 Bedding

- (a) All pipes shall be installed in accordance with CW2030, utilizing a Class B bedding.

#### E12.5.7 PVC Pipe Sample Retrieval

- (a) Coordinate inspection and sample retrieval with pump station shutdown.
- (b) Carefully excavate to expose existing pipelines in accordance with E5.5.
- (c) Install shoring in accordance with E5.
- (d) Maintain a safe and dry excavation while the external pipeline inspection is being undertaken.
- (e) Confirm diameter of pipeline and ensure appropriate repair couplers are available.
- (f) Have all necessary parts on hand and pre-assembled prior to pump station shutdown.

#### E12.5.8 Installation of Gate Valves

- (a) Carefully excavate to expose existing pipelines in accordance with E5.5.
- (b) Confirm diameters of pipelines at tie in points and ensure appropriate couplers are available for reconnection of work.
- (c) Do not sever existing pipeline until all materials to complete installation are on site and available for installation.

#### E12.5.9 Installation of Tapping Sleeve

- (a) Install as per manufacturer's recommendations and AWWA M9.

#### E12.5.10 Pipe Insulation and Cladding (Site 3)

- (a) Removal of Existing
  - (i) Confirm work locations with the Contract Administrator prior to removal of cladding.

- (ii) Neatly cut away the existing galvanized cladding between pipe supports as shown on the Drawings, leaving a minimum of 200 mm to the inside of each pipe support on either end. Take care not to damage the surface of the pipe when removing the cladding.
- (iii) Remove all existing foam insulation from the pipe. Mechanically clean the pipe surface to bare steel to allow for inspection of the pipe wall.
- (b) Installation of New
  - (i) Neatly square ends of existing cladding and insulation as required to allow for a clean joint.
  - (ii) Test fit the new foam insulation half shells. Trim ends where necessary using hand tools to ensure a snug fit with the existing insulation.
  - (iii) Once a proper fit is achieved, coat exposed pipe in accordance with E12.4.15 and E12.5.3.
  - (iv) Lay a bead of silicone caulking on both mating surfaces of the new half shells and at the interface between the existing insulation and pipe surface prior to installation.
  - (v) Position the shells around the pipe and secure in place with tape if required. Seams in the foam half shells should be at 3:00 and 9:00 position.
  - (vi) Seal any cracks or voiding between the half shell insulation components and/or existing insulation with an expanding polyurethane insulation product compatible with the insulation system.
  - (vii) Joints between new insulation and existing pipe should be sealed with self-adhesive butyl mastic tape. The joint seals should extend at least 75 mm to either side of the joint.
    - ◆ Apply joint seals as per manufacturer's recommendations.
  - (viii) Cut galvanized steel overwrap components to length, allowing for a minimum 100 mm overlap at each end. If a single-piece wrap is used, position the seam such that:
    - ◆ The lap is positioned at either 3 or 9 o'clock.
    - ◆ The top portion of the lap lays on top of the lower portion in order to shed water from the joint.
  - (ix) Applied mastic sealant around the circumference of the cladding to be overlapped and along each longitudinal seam.
  - (x) Secure galvanized steel cladding in place with stainless steel banding and gear clamps at 600 mm on center (maximum). Clamps shall be located within 50 mm of the edge of each section of cladding.

## E12.6 Measurement and Payment

### E12.6.1 Pipeline Modifications

- (a) The completion of pipeline modifications will be measured and paid on a Lump Sum basis for each river crossing site at the Contract Unit Price for "Pipeline Modifications" as listed in the Form B: Prices except where noted in the Form B: Prices.
- (b) Payment for "Pipeline Modifications" shall include the supply of all materials and performance of all pipe access modifications required for cleaning and inspection of the pipelines.
- (c) Payment for pipeline modifications shall include but is not limited to the following:
  - (i) Removal and trimming of trees;
  - (ii) Temporary grading and excavations;
  - (iii) Construction of temporary work platforms;
  - (iv) Erection of scaffolding;
  - (v) Supply, installation and maintenance of traffic control;
  - (vi) Temporary water supplies;

- (vii) Supply and installation of all new valves;
  - (viii) The supply of all permanent and temporary piping components not paid for separately (E12.6.2);
  - (ix) Installation of all permanent piping and fittings;
  - (x) Installation and removal of all temporary piping and fittings;
  - (xi) The supply and installation of all gaskets, fasteners, and couplings required to complete the Work;
  - (xii) The installation of tag lines for cleaning and inspection purposes;
  - (xiii) Completion and shoring of all excavations;
  - (xiv) Pipe bedding and backfilling;
  - (xv) Restoring site to existing grades;
  - (xvi) Disinfection and health testing of pipelines;
  - (xvii) Disposal of all chlorinated water;
  - (xviii) Heating and hoarding.
- (d) Payment for Site 3 has been broken out into “Mobilization and Site Access” and “Pipe Insulation and Cladding - Removal and Restoration (up to 3.0 m per location)”.
- (i) The removal of existing pipeline insulation and cladding and installation of new insulation and cladding will be measured and paid on a unit basis for each section of pipeline acceptable prepared for inspection and restored upon completion of the inspection work at the Contract Unit Price for “Inspection Preparation and Restoration of Pipeline Insulation and Cladding (up to 3.0 m per location)” as listed in Form B: Prices. Payment for “Pipe Insulation and Cladding - Removal and Restoration (up to 3.0 m per location)” will include all labour and materials necessary to complete the work as specified.
  - (ii) Site preparation and mobilization will be measured and paid on a lump sum basis at the Contract Unit Price for “Mobilization and Site Access” as listed in Form B: Prices. Payment for “Mobilization and Site Access” will include all labour and materials necessary to complete the work as specified.
- (e) Payment for “Pipeline Modifications” shall not include the use of pipeline flushing equipment except for the purposes of installing tag lines.

#### E12.6.2 Supply of Fittings and Valves

- (a) The supply of fittings will be measured and paid for on a unit basis for each type of fitting or valve acceptable supplied at the Contract Unit Price for “Supply of Fittings” as listed in Form B: Prices.

### **E13. PIPELINE CLEANING**

#### E13.1 Description

- (a) This Specification shall cover the supply of foam pipeline cleaning pigs and the cleaning of the pipelines to be inspected.
- (b) The following pipelines require cleaning prior to inspection:
- (i) Site 1: Kildonan-Redwood Feeder Main
  - (ii) Site 2: Charleswood-Assiniboia Feeder Main
  - (iii) Site 4: Newton Ave Force Main

#### E13.2 Submittals

##### E13.2.1 Cleaning Plan

- (a) The Contractor shall submit in writing a detailed cleaning plan for each pipeline crossing for review by the Contract Administrator. The cleaning plan at a minimum shall include the following:
- (i) Method(s) of cleaning

- (ii) Sizes and densities of foam pigs to be used
- (iii) Means of debris collection and disposal
- (b) The pipeline cleaning plan must be submitted a minimum of ten (10) Business Days prior to undertaking cleaning operations.
- (c) No cleaning operations shall be undertaken prior to review of the cleaning plan by the Contract Administrator.

#### E13.2.2 Shop Drawings

- (a) The Contractor shall submit Shop Drawings for the proposed winch line (or flusher hose), complete with the safe pull strength as recommended by the manufacturer.
- (b) The Contractor shall submit Shop Drawings for all cleaning pigs proposed for use.

### E13.3 Products

#### E13.3.1 Tether Line

- (a) Tether lines used for installing winch lines shall be a minimum of 9 mm synthetic rope.

#### E13.3.2 Foam Cleaning Pigs

- (a) Material: One piece moulded open-cell polyurethane
- (b) Density: up to a standard medium density cleaning pig (80 to 112 kg/m<sup>3</sup>)
- (c) Pigs shall be new and packaged for shipping and stored to prevent contamination.
- (d) Pigs shall be supplied complete with a factory installed steel pulling cable. The cable and loops shall be rated for a tensile force equal to 1.5 times the capacity of the proposed winch,
- (e) For towed pigs, pigs shall be supplied complete with a steel support disc on both ends suitable for towing pigs. The steel disk shall have a minimum diameter of 100 mm.
- (f) Foam cores for pigs shall be of equal or greater density than foam body
- (g) Pigs to be sized for the internal diameter of the pipeline, or as recommended by the manufacture and approved by the Contract Administrator.
- (h) Where required, bristled pigs shall be complete with synthetic plastic brush designed for regular scraping

E13.3.3 Gauge Pigs will be supplied by the pipeline inspection contractor.

E13.3.4 Water for pig launching may be obtained from fire hydrants in accordance with CW 1120 and E7.

### E13.4 Equipment

#### E13.4.1 Winch and Winch Line

- (a) Winch lines for cleaning shall not cause damage to pipelines or pipeline coatings. Provide synthetic winch line such as Amsteel, cable coated with sacrificial synthetic coating, or braided flusher hose.
- (b) Proposed winch lines must have a third party verified tensile load rating.
- (c) Winches used for cleaning purposes shall have sufficient load capacity to facilitate pipeline cleaning.
- (d) Winces used for cleaning purposes shall be fitted with gauges capable of monitoring winching loads. Winch loads shall be monitored at all times to ensure the load rating of the winch lines and cleaning pigs is not exceeded.

#### E13.4.2 Sewage, Debris, Pumping and Disposal

- (a) Equipment as per CW 2140, except storage tank volume shall be a minimum of 13,500 (3000 Gal Imp) litres.

- (b) Where requested by Contract Administrator, such as in the case of a blockage, store liquid and decant at an approved offsite location.

E13.4.3 Flushing Equipment

- (a) Equipment as per CW 2140.
- (b) Nozzle pressures when utilizing flushing equipment within pipelines shall be limited to 10,350 kPa.
- (c) Disinfection of Equipment: Any equipment coming in contact with the potable water system shall be clean, must never have been used in a non-potable water or sewer system and shall be disinfected in accordance with E14.

E13.4.4 Internal pipeline diameters based on the best available record information. The Contractor is responsible to confirm the inner pipe diameters prior to undertaking cleaning work:

Site	Nominal Diameter (mm)	Estimated Internal Diameter (mm)
Site 1	600	594 and 584
Site 2	600	597
Site 4	350	327

E13.5 Methods

E13.5.1 Pigging

- (a) Where applicable, provide pig launch tubes, pipe and fittings, including valves.
- (b) Winch lines shall be inserted into the pipelines for cleaning purposes. Winch lines may be inserted by high pressure flusher nozzle, flow drone or other approved method.
- (c) Cleaning is to be completed sufficiently to accommodate in-line inspection tools, typically 25 millimetres smaller than pipe inside diameter.
- (d) Minimum cleaning requirements per pipeline crossing:
  - (i) Pull one 25 mm undersized medium density foam cleaning pig (prove bore prior to pulling the gauge pig)
  - (ii) Pull one full sized low density foam cleaning pig (debris removal)
- (e) The use of foam cleaning pigs shall not introduce air into pipeline below river levels. Many pipelines are weighted bottom installations, or shallow cover, and susceptible to floatation. Pipelines shall be kept full behind pigs.
- (f) Foam cleaning pigs shall be tethered on each end and be capable of being winched in either direction.
- (g) A gauge pig shall be pulled through the pipe during the cleaning operation to determine the effectiveness of the cleaning operation. Gauge pig shall be tethered on each end and be capable of being winched in either direction.
- (h) Cleaning operations shall continue until the Contract Administrator is satisfied that the pipe is passable by the inspection tools. This shall be proved by passing of the supplied gauge pig through the line.
- (i) Upon completion of cleaning, a tag line shall be left in the pipeline and securely fastened, for future use by the pipeline inspection contractor.
- (j) The Contractor shall be prepared to remove hard debris from the pipe during cleaning process to the extent required to pass the supplied gauge pig.
- (k) It is anticipated that pipeline cleaning will take a maximum of one day per pipeline. More than one pipeline can be cleaned per day, time permitting. Overtime rate shall be approved by the Contract Administrator.

E13.5.2 Flushing of Pipelines using Traditional Flushing Equipment

- (a) Flushing equipment shall conform to CW2140 and may be utilized for removal of debris from pipelines.
- (b) Nozzle pressures when utilizing flushing equipment within pipelines shall be limited to 10,350 kPa.

E13.6 Provisional Flushing and Hydrovac Services

- (a) Where requested by the Contract Administrator, provide provisional flushing and hydrovac services to assist in inspection operations. This work is outside of the normal cleaning operations identified in E13.5.
- (b) Flushing Equipment
  - (i) Flushing equipment shall conform to CW 2140 and may be utilized for removal of debris from pipelines.
  - (ii) Nozzle pressures when utilizing flushing equipment within pipelines shall be limited to 10,350 kPa.
- (c) Hydrovac equipment shall conform to E13.4.3.

E13.7 Chamber Cleaning

- (a) Clean excessive debris from all below-ground portions of chambers prior to undertaking inspection work. Areas to be cleaned shall be identified by the Contract Administrator prior to undertaking cleaning operations.
- (b) A pressure washer capable of supplying 20,685 kPa of pressure for cleaning shall be used. Care should be taken to clean but not damage existing chamber components.
- (c) Collect and dispose of solid debris off site as per CW 2140.

E13.8 Disposal of Solid Debris

- (a) Where hydrovacating of cleaning debris is required, the liquid may be decanted into nearby WWS MH's at rates shown on the Drawings and as approved by the Contract Administrator.
- (b) Solid debris shall be hauled off site as per CW 2140.

E13.9 Feeder Main Flushing

- (a) Flushing of solid debris from feeder mains shall be undertaken after completion of pipeline inspection work and shall conform to CW2125 and AWWA C651.
- (b) Feeder mains greater than 300 millimetres diameter shall be flushed to achieve a minimum of three (3) pipe volumes, or until water runs clear.
- (c) Feeder mains shall be flushed in the direction shown on the Drawings unless otherwise approved by the Contract Administrator. If no direction is shown on the Drawings, feeder mains may be flushed in either direction.
- (d) Disinfection of pipelines and disposal of chlorinated water shall be completed in accordance with E14.

E13.10 Method of Measurement and Basis of Payment

E13.10.1 Pipeline Cleaning

- (a) Pipeline cleaning will be measured on a daily basis with an hourly overtime rate.
- (b) Payment for "Pipeline Cleaning" will include supplying of all materials and performance of all work as specified herein, including site access, removal of access hatches, confined entry support, temporary access, flow diversions, performance of all cleaning and gauging work, and disposal of solid debris.

- (c) Time measured will be based on on-site availability of the Contractor's crews, from the time crews are present on site, until crews are complete and site secured of the shift, as certified by the Contract Administrator.
- (d) Hourly overtime rate for each hour or portion thereof in excess of the daily minimum rate of 10 hours.
- (e) The supply of pigs for pipeline cleaning will be considered incidental to "Pipeline Cleaning" and will not be measured for payment. No additional payment will be made.
- (f) Flushing of pipelines for the purposes of debris removal will be considered incidental to "Pipeline Cleaning" and will not be measured for payment. No additional payment will be made.
- (g) Disinfection of pipelines, health testing, and disposal of chlorinated water will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No separate payment will be made.

**E13.10.2 Provisional Hydrovac Services**

- (a) Provisional use of a hydrovac truck shall be measured on an hourly basis for each hour of use on site and paid for at the unit price for "Hydrovac Truck". Hauling and disposal of solid debris will not be measured for payment.
- (b) Payment for "Hydrovac Truck" shall include the supply of all materials and disposal of all debris.

**E13.10.3 Provisional Flushing Services**

- (a) Provisional use of sewer flushing equipment shall be measured on an hourly basis for each hour of use on site and paid for at the unit price for "Sewer Flushing Unit".
- (b) Payment for "Flushing Unit" shall include the supply of all materials and equipment required.

**E14. WATER MAIN AND FEEDER MAIN DISINFECTION**

**E14.1 Description**

E14.1.1 This specification covers the disinfection of water mains, feeder mains, and fittings.

**E14.2 General**

E14.2.1 The following feeder mains require disinfection and health testing after completion of the cleaning and inspection work:

- (a) Site 1 – Kildonan-Redwood Feeder Main
- (b) Site 2 – Charleswood-Assiniboia Feeder Main

**E14.3 Disinfection**

E14.3.1 Disinfection of water mains and feeder mains shall be completed in accordance with CW2125 and AWWA C651.

E14.3.2 The Contractor shall take every reasonable precaution during construction to prevent debris from entering the pipeline. If, in the opinion of the Contract Administrator, deleterious substances have entered the pipeline, the Contractor shall flush the pipeline with sanitized pipeline cleaning equipment.

E14.3.3 Further to CW 2125, segments of water mains not disinfected and used as temporary fittings as noted above, shall be disinfected by swabbing as outlined in Section 3.3.16 of CW 2125.

E14.3.4 Upon completion of disinfection, chlorinated water shall be pumped from the pipeline at the lowest point(s) in the system. Chlorinated water shall not be directly discharged to the environment and shall be disposed of in accordance with E14.5.

- E14.3.5 Bi-directional flushing may be required to remove chlorine from the pipeline.
- E14.3.6 All equipment being used within a potable water pipeline shall be spray or swab disinfected using a 200 mg/L free chlorine solution prior to entering or coming in contact with the pipe.
- E14.3.7 Blind flanges shall be supplied with ports adequate to achieve desired flushing velocities.
- E14.3.8 The Contractor shall ensure hoses, hydrants, meters, and other appurtenances used for flushing operations are protected from freezing.
- E14.3.9 The Contractor shall ensure that the selected means of disposing of chlorinated water does not result in unsafe site conditions as a result of freezing atmospheric temperatures.
- E14.4 Health Testing
- E14.4.1 The pipeline shall be refilled with potable water and water samples for health tests taken in accordance to CW 2125, except test samples shall be taken each day at least 24 hours apart for three (3) successive days.
- E14.5 Disposal of Chlorinated Water
- E14.5.1 Chlorinated water shall be treated by one of the following methods, as recommended in AWWARF – Guidance Manual For The Disposal Of Chlorinated Water:
- (a) Discharged into nearby WWS MH's if possible. Allowable discharge rates for nearby WWS manholes have been provided on the Drawings. The Contractor may store water as required to meet allowable discharge rates.
  - (b) De-chlorination of water with discharge into the LDS system or directly to the river. If discharging directly to the river the Contractor shall take all necessary precautions to prevent erosion of the river bank. De-chlorination may be accomplished using the following:
    - (i) Sodium Ascorbate,
    - (ii) Vita-D-Chlor TM by Integra Chemical,
    - (iii) or approved equal in accordance with B7.
  - (c) Contain chlorinated water on Site until chlorine has dissipated to acceptable limits.
- E14.5.2 The contractor shall submit a chlorinated water disposal plan in writing to the Contract Administrator a minimum of five (5) working days prior to performing any cleaning or flushing of water main or feeder mains. The disposal plan shall at a minimum include the following:
- (a) Intended means of disposal for each site
  - (b) Means of de-chlorination (if required)
  - (c) Means of storing water for discharge (if required)
- E14.6 Measurement and Payment
- E14.6.1 Disposal of Chlorinated Water Utilized for Tool Deployment (Site 6)
- (a) Dechlorination of chlorinated water used for deployment of the inline inspection tools will be measured and paid on a lump sum basis for up to four (4) hours of dechlorination at the Contract Unit Price for "Dechlorination (up to 4 hours)" as listed in Form B: Prices. Additional dechlorination required beyond four (4) hours will be measured and paid on an hourly basis at the Unit Contract Price for "Dechlorination (in excess of 4 hours)" as listed in Form B: Prices.
  - (b) Payment for "Dechlorination (up to 4 hours)" and "Dechlorination (in excess of 4 hours)" will include supplying of all materials and performance of all work as specified herein.
  - (c) Time measured will be based on the duration of the feeder main flushing required to deploy the inspection tool and sufficiently clear the water within the pipeline as determined by the Inspection Contractor.

- (d) Disposal of Chlorinated water resulting from the low pressure leakage test at Site 6 will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No additional payment will be made.

#### E14.6.2 Disinfection, Health Testing, and Disposal of Chlorinated Water

- (a) Disinfection, health testing, and disposal of chlorinated water shall be considered incidental to "Pipeline Modifications" and will not be measured for payment. No additional payment will be made.

### **E15. INSPECTION SUPPORT SERVICES**

#### E15.1 Support Services Requirements

##### E15.1.1 General

- (a) Coordinate work hours with pipeline inspection contractor. Contractor and pipeline inspection contractor shall agree on time for commencement of work by the pipeline inspection contractor. The Contractor will be permitted reasonable time for preparation of activities prior to arrival of pipeline inspection contractor. Excessive site support time in advance of agreed site hours will not be measured for payment.
- (b) Pipeline inspections typically will require one day of onsite support per pipeline. It is intended that onsite support services will run on consecutive days. More than one site may be commenced on any day. No more than one inspection will occur at a time.
- (c) The pipeline inspection contractor may require time to configure their tooling prior to pipeline inspections. Scheduling of the inspections will be made after award of the contract.

##### E15.1.2 Electromagnetic In-Line Pipeline Inspections (Site 1 and Site 2)

- (a) Provide support labour to assist the pipeline inspection contractor's crews with handling of equipment, setup, and access.
- (b) Provide minimum of two support persons, including small hand and power tools to assist the pipeline inspection contractor's crew, including:
  - (i) Portable hammer drills for setting anchor bolts in concrete (minimum 12 mm drive chuck)
  - (ii) Shovels
  - (iii) Hand tools
  - (iv) Light duty transportation truck(s)
  - (v) Portable ladders (two per crossing)
  - (vi) Gas powered air compressor with 5 gallon tank (minimum) and capable of supplying 8 cfm at 90 psi.
  - (vii) Disinfection solution and equipment for the purposes of spray and swap disinfection of pipeline inspection contractor's equipment, including but not limited to: inspection tools, launch equipment, winch lines, and any other equipment entering the pipeline. Disinfection equipment and procedures shall conform to E14.
- (c) Support personnel shall assist the pipeline inspection contractor's crews with access, removal of gratings, covers, installation of concrete anchors, where required, installation of flow diversion equipment, and any other general assistance to crews for completion of inspections.
- (d) The Contractor shall provide a heated space at each site for storage and setup of the inspection tools when atmospheric temperatures are below 5°C. The space shall be a minimum of 5 x 2.5 m.

(e) Lifting Equipment

- (i) Provide mobile lifting equipment, boom truck, loader or other equipment capable of lifting, moving and lowering inspection equipment into pipelines in accordance to the following:

Pipeline Size	Inspection Tool Mass (kg)	Maximum Depth (m)
600	395	7

- (f) The Contractor is fully responsible for confined entry access on site, in accordance with Manitoba Workplace Safety and Health Regulation 217/2006 and subsequent amendments. The Contractor shall provide confined entry support for the pipeline inspection contractor's crews, and AECOM personnel as needed, in accordance with E9, where required to facilitate pipeline inspections.

E15.1.3 External Aerial Pipeline Inspection (Site 3)

- (a) Provide support labour to assist the pipeline inspection contractor's crews with handling of equipment, setup, and access.
- (b) Provide scaffolding and/or access to the pipeline for inspection for the duration of the inspection operations in accordance with E4.1(c)(iii). Scaffolding (if used) shall be setup at each inspection location prior to mobilization of the Inspection Contractor to minimize delays in the inspection process.
- (c) Provide minimum of two support persons, including small hand and power tools to assist the pipeline inspection contractor's crew, including:
- (i) Light duty transportation truck(s)
  - (ii) Portable ladders as required to access scaffolding and pipeline locations
- (d) Support personnel shall assist the pipeline inspection contractor's crews with access, mobilization of inspection tools up to the work platforms, and any other general assistance to crews for completion of inspections.
- (e) The Contractor shall provide a heated space at each site for storage and setup of the inspection tools when atmospheric temperatures are below 5°C. The space shall be a minimum of 5 x 2.5 m.
- (f) The Contractor is fully responsible for safety on site, in accordance with Manitoba Workplace Safety and Health Regulations. The Contractor shall provide support for the pipeline inspection contractor's crews, and AECOM personnel as needed working at heights where required to facilitate pipeline inspections.

E15.1.4 Sonar Inspections (Site 4)

- (a) Provide support labour (a minimum of two support persons) to assist the pipeline inspection contractor's crews with handling of equipment, setup, and access.
- (b) Support personnel shall assist the pipeline inspection contractor's crews with access, removal of gratings, covers, and other general assistance to crews for completion of inspections. Light duty transportation truck(s) shall be on site and available to support with the inspection works.
- (c) The sonar Inspection Contractor is responsible for:
- (i) setup of all inspection related equipment and temporary works (physical pipeline modifications excluded);
  - (ii) deployment of the inspection tool;
  - (iii) completion of the sonar inspection; and,
  - (iv) removal of all inspection related equipment and temporary works.
- (d) The Contractor is fully responsible for confined entry access on site, in accordance with Manitoba Workplace Safety and Health Regulation 217/2006 and subsequent amendments. The Contractor shall provide confined entry support for the pipeline inspection contractor's crews, and AECOM personnel as needed, in accordance with E9, where required to facilitate pipeline inspections.

- E15.1.5 Acoustic/CCTV In-Line Pipeline Inspection (Site 6)
- (a) Provide support labour (a minimum of two support persons) to assist the pipeline inspection contractor's crews with handling of equipment, setup, and access.
  - (b) Support personnel shall assist the pipeline inspection contractor's crews with access, removal of gratings, covers, and other general assistance required for completion of inspections. Light duty transportation truck(s) shall be on site and available to support with the inspection works.
  - (c) The Acoustic/CCTV Inspection Contractor is responsible for:
    - (i) setup of all inspection related equipment and temporary works (physical pipeline and chamber modifications excluded);
    - (ii) deployment of the inspection tool;
    - (iii) completion of the sonar inspection; and,
    - (iv) removal of all inspection related equipment and temporary works.
  - (d) The Contractor shall be aware that tool deployment and inspection at Site 6 is anticipated to occur overnight.
  - (e) The Contractor is fully responsible for confined entry access on site, in accordance with Manitoba Workplace Safety and Health Regulation 217/2006 and subsequent amendments. The Contractor shall provide confined entry support for the pipeline inspection contractor's crews, and AECOM personnel as needed, in accordance with E9, where required to facilitate pipeline inspections.
- E15.1.6 Site Access and Restoration
- (a) Minimize disruption of public right-of-ways. Do not encroach on private property.
  - (b) Where access is required for heavy equipment and vehicles, limit access to a single pathway directly from the street to the work area. Plank pathways and grassed areas to minimize damages due to rutting.
  - (c) Remove all waste and debris upon completion of inspection.
  - (d) Clean up any spilled waste water and debris. Where directed, sprinkle sodium hypochlorite powder on spills.
- E15.1.7 Chamber and Manhole Access
- (a) Remove hatches, covers, and removable concrete slabs as required for cleaning and inspection work.
  - (b) City of Winnipeg crews will provide access to chambers and stations as required to facilitate the work. The City will strive to accommodate the Contractor's requests for access, however, the availability of City crews is based on a number of factors, including system operations, other work occurring on the system, and emergencies. The Contractor shall provide as much advance notice as possible for access into City owned structures.
- E15.1.8 Lighting
- (a) Where required for night work, provide adequate lighting
- E15.1.9 Shop Space for Electromagnetic In-Line Inspection Contractor
- (a) The Contractor shall provide the following shop space for the electromagnetic in-line and external electromagnetic Inspection Contractor. Other Inspection Contractors do not require shop space.
  - (b) The Contractor shall provide wash facilities and a heated shop space for the pipeline Inspection Contractor for configuration and storage of inspection tools.
    - (i) A wash bay for cleaning the inspection tool for transport complete with a pressure washer capable of supplying 7 LPM at 10,300 kPa.

- (c) The Contractor shall provide a work shop to facilitate maintenance and conversion of inspection tools by the pipeline Inspection Contractor. The work shop shall meet the following minimum requirements:
  - (i) Floor space - 80 m<sup>2</sup>.
  - (ii) Overhead door adequate for unloading of inspection tools and equipment with forklift or wheel loader. Minimum dimensions - 3.66 m x 3.66 m.
  - (iii) The shop must be heated.
  - (iv) Lifting hoist or forklift availability.
  - (v) Electric air compressor with 20 gallon tank (minimum) and capable of supplying 8 cfm at 90 psi.
  - (vi) Power – two (2) 15 amp, 120 volt AC power circuits.
  - (vii) Work tables complete with vice.
- (d) The shop must be accessible to the pipeline inspection contractor after hours and during weekends.

E15.1.10 Site 1 – Kildonan-Redwood Feeder Main – West Chamber Tunnel and Tunnel Shaft Inspection

- (a) Dewater west siphon chamber and tunneled portion of river crossing.
- (b) Provide confined space entry support in accordance with E9. The Contractor shall assume the existing air supply lines are inoperable and air supply within the tunnel and tunnel shaft will be required.
- (c) Provide lighting sufficient to illuminate vertical and tunnel shaft to the satisfaction of the Contract Administrator.
- (d) The Contractor shall assume the inspection will take four (4) hours.

E15.2 Method of Measurement and Basis of Payment

E15.2.1 Pipeline Inspection Support Services

- (a) Provision of pipeline inspection support services for internal and external pipeline inspection by the Inspection Contractor will be measured on a daily basis with an hourly overtime rate for each inspection type. Payment will be for at the unit prices for “Pipeline Inspection Support Services”.
- (b) Payment for “Pipeline Inspection Support Services” will include confined entry support, inspection support, lifting equipment, lighting, pumps and other miscellaneous support as specified herein.
- (c) Time measured shall be based on on-site availability of the Contractor’s crews, from the time support crews are present on site, until crews are complete and site secured of the shift, as certified by the Contract Administrator.
- (d) Hourly overtime rate for each hour or portion thereof in excess of the daily minimum rate of 10 hours.
- (e) Installation of tag lines shall be considered incidental to “Pipeline Modifications” and will not be measured for payment. No additional payment will be made.
- (f) Provision of a heated shop shall be considered incidental to “Pipeline Modifications” and will not be measured for payment. No additional payment will be made.

E15.2.2 Kildonan-Redwood West Chamber Tunnel Inspection

- (a) Provision of pipeline inspection support services for the Kildonan-Redwood Feeder Main west tunnel shaft will be measured and paid on a lump sum basis Contract Unit Price for “Kildonan-Redwood West Chamber Tunnel Inspection” as listed in Form B: Prices.
- (b) Payment for “Kildonan-Redwood West Chamber Tunnel Inspection” shall include all dewatering, confined entry support, inspection support, lifting equipment, lighting, pumps, and other miscellaneous support as specified herein.

## **E16. LOW PRESSURE LEAKAGE TESTS**

### **E16.1 Description**

- (a) This Specification shall cover the performance of low pressure leakage tests on existing pressure pipeline crossings.

### **E16.2 General**

- (a) Low pressure leakage tests shall be completed at the following sites:
  - (i) Site 1 – Kildonan-Redwood Feeder Main
  - (ii) Site 2 – Charleswood-Assiniboia Feeder Main
  - (iii) Site 4 – Newton Ave Force Main
  - (iv) Site 5 – Heritage Park Force Main
  - (v) Site 6 – Fort Garry/St. Vital Feeder Main

### **E16.3 Submissions**

- (a) Submit a leakage test procedure for each site in accordance with E2 a minimum of five (5) Business Days prior to undertaking the leakage tests. The leakage test procedure shall include:
  - (i) Products and materials proposed for plugging the pipeline. Include shop drawings or product literature for review.
  - (ii) Procedures and installation steps for installation of the pipe blocking/plugging.
  - (iii) Means of filling and flushing air from the pipeline.
  - (iv) Testing procedures.

### **E16.4 Materials**

- (a) Pressure pipelines with flange connections shall utilize blind flanges conforming to E12 for blocking purposes.
- (b) Force mains without flanged connections shall utilize inflatable test plugs meeting the requirements of E11.3.1.
- (c) All materials utilized on and coming in contact with potable water pipelines shall have only been utilized on potable water systems in the past.

### **E16.5 Leakage Testing**

**E16.5.1** Complete leakage testing of potable water pipelines after disinfection of the pipeline crossings and receiving acceptable results from the health tests. Leakage testing on force mains may occur at any time prior to post inspection of the pipeline.

#### **E16.5.2 Water and Feeder Mains:**

- (a) The pipeline shall be brought up to system pressure using a hydrant feed. Pressure within the pipeline shall be reduced to the test pressure of approximately 34 kPa (5 psi) less than system pressure or as directed on site.
- (b) The pipeline pressure shall be monitored and recorded for one (1) hour. Add makeup as required to keep the pipeline within 69 kPa (10 psi) of the test pressure or as directed on site. Record the volume of makeup used throughout the test.

#### **E16.5.3 Force Mains**

- (a) Force mains shall be brought up to the designated test pressure through the use of makeup water.
- (b) The force main pressure shall be monitored and recorded for one (1) hour. Add makeup as required to keep the force main within 69 kPa (10 psi) of the test pressure or as directed on site. Record the volume of makeup used throughout the test.

- E16.5.4 Force Main Test Pressure
- (a) Site 4 - Newton Ave Force Main: 49 kPa (7 psi) measured at the upstream (east) valve chamber location
  - (b) Site 5 - Heritage Park Force Main: 345 kPa (50 psi) measured at the Heritage Park Pumping Station
- E16.5.5 The Heritage Park Force Main (Site 5):
- (a) Leakage testing requires the following operations to undertake the leakage test:
    - (i) Connection of water supply lines and testing equipment within the Heritage Park Pumping Station.
    - (ii) Heritage Park Pump Station shutdown, see E11.
    - (iii) Installation of block plug within the discharge manhole.
  - (b) Flushing of the force main may be required to fill and expel air from the pipeline prior to testing.
  - (c) The test shall be stop immediately, blocking plugs removed, and the test rescheduled if during the course of the test, water levels within the upstream collection system dictate reinitiating pump station operations.
- E16.6 Measurement and Payment
- (a) Completion of low pressure leakage tests will be measured and paid on lump sum basis at the Contract Unit Price for "Low Pressure Leakage Tests" as listed in Form B: Prices. Payment for "Low Pressure Leakage Tests" shall include all materials and labour as necessary to complete the work as specified.
- E17. CHAMBER MODIFICATIONS**
- E17.1 Description
- (a) This Specification shall cover the modification and restoration of existing concrete valve chambers as shown on the Drawings.
- E17.2 Shop Drawings
- E17.2.1 Provide shop drawings in accordance with E2.
- E17.3 Materials
- E17.3.1 All materials shall conform to the requirements of this Specification and the requirements of the latest edition of the City of Winnipeg Standard Construction Specification.
- E17.3.2 Structural Concrete
- (a) Provide concrete mixed in accordance with requirements of CW 2160 and CAN/CSA-A23.2.
  - (b) Structural concrete design shall be in accordance with performance specification having the following properties:
    - (i) Class of Exposure: S-1
    - (ii) Minimum Compressive Strength @ 28 days: 35 MPa
- E17.3.3 Reinforcing Steel
- (a) Further to CW 2160 Sentence 2.6 Materials: Reinforcing Steel, all reinforcing steel shall conform to the requirements of CSA G30.18, Grade 400.
- E17.3.4 Bar Accessories
- (a) Bar accessories shall be of type approved by the Contract Administrator. They shall be made from a non-corroding material, and they shall not stain, blemish, or spall the concrete surface for the life of the concrete. Bar chairs are to be PVC; galvanized bar chairs are not acceptable.

- (b) Bar accessories shall include bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices. Bar accessories are not shown on the Contract Drawings. The supply and installation of bar accessories shall be considered incidental to the supply and placing of reinforcing steel.

#### E17.3.5 Non Shrink Grout

- (a) Grout, if required, shall be Sika Grout 212 or CPD Non Shrink Grout or approved equal in accordance with B7, mixed and applied in accordance with the manufacturer's instructions and of a consistency suitable for the intended application, as approved by the Contract Administrator.

#### E17.3.6 Concrete Patching Repair Material

- (a) Patching repair material shall be polymer modified mortar based Sika Top 123 Plus by Sika Canada Inc., Master Emaco S 488CI by BASF Master Builders Solutions, or approved equal in accordance with B7.

#### E17.3.7 Foundation Waterproofing

- (a) Foundation waterproofing shall conform to CW 2160.

#### E17.3.8 Removable Roof Slab Sealant

- (a) Sealant for horizontal removable roof slab joints shall be a general purpose polyurethane sealant rated for buried and exterior locations and suitable for concrete.

#### E17.3.9 Joint Fillers

- (a) Joint Fillers
  - (i) Joint filler for concrete slab shall be self-leveling, polyurethane sealant to meet requirements of ASTM C920, Type S, Grade P, Class 25, Use T, M, A, O, and I.
  - (ii) Approved product: Vulkem 45 as manufactured by Tremco, Sikaflex 1C SL, or approved equal in accordance with B7.
- (b) Backer rod shall meet requirements of ASTM C1330.
- (c) Bond Breaker: pressure sensitive plastic tape, which will not bond to sealants.
- (d) Joint Cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

#### E17.3.10 Extrudable Polyurethane Waterstop

- (a) Extrudable polyurethane waterstop shall be a Gun Grade extrudable polyurethane base waterstop.
- (b) Approved Products: SikaSwell S by Sika, or approved equal in accordance with B6.

### E17.4 Construction Methods

#### E17.4.1 Construction Method Submission

- (a) No Work shall commence on construction of valve chamber until after the Contract Administrator's review of the Contractor's Construction Method submission.
- (b) The Contractor shall prepare for the Contract Administrator's review a Construction Method submission detailing:
  - (i) Construction sequence to be followed including all methods to be employed to ensure no damage occurs to existing structures or adjacent properties within or adjacent to excavation.
  - (ii) Proposed method of construction.
  - (iii) Specialized equipment to be used.
  - (iv) Any design revisions proposed to accommodate the Contractor's proposed construction method.

- (v) Flow control considerations including details on the Contractor's proposed method of flow control.
- (vi) The Contractor shall respond to any concerns that may be raised by the Contract Administrator after review of the Construction Method submission.

#### E17.4.2 Hatches and Removable Slabs

- (a) Remove access hatches, covers and removable slabs where indicated on the drawings and as required for cleaning and inspection services. Replace all fasteners and bolts unless otherwise directed by the Contract Administrator.
- (b) Replace all hatches and roof panels once cleaning and inspection work is complete.
- (c) Installation of Roof Slab
  - (i) Remove all existing sealants and clean joint surfaces as per sealant manufacturer's instructions.
  - (ii) Apply sealant to horizontal surfaces in accordance with the sealant manufacturer's instructions.
  - (iii) Re-install roof slab.
  - (iv) Apply joint filler as shown on the Drawings and in accordance with the manufacturer's instructions.
  - (v) Fill all lifting hook recesses with polyurethane sealant.

#### E17.4.3 Cast-in-Place Concrete Construction

- (a) Adjust the location of the reinforcing steel adjacent to openings and in location of the waterstop along the center line of wall to frame those openings in accordance with good practice, and maintain the bar spacing intent.
- (b) Do not use welded splices for reinforcing steel.
- (c) Install foundation waterproofing in accordance with Specification CW 2160.

#### E17.4.4 Placing of Reinforcing Steel

- (a) Reinforcing steel shall be placed accurately in the positions shown on the Contract Drawings. Carefully adjust the location of reinforcing steel adjacent to openings to frame those openings in accordance with good practice, and maintain the bar spacing intent.
- (b) Splices in reinforcing steel shall be made only where indicated on the Contract Drawings. Prior approval of the Contract Administrator shall be obtained where, in the opinion of the Contractor, other splices must be made. All splices shall have laps of at least 40 bar diameters. Welded splices shall not be used.
- (c) A minimum of twenty-four (24) hours notice shall be given to the Contract Administrator prior to the pouring of any concrete to allow for inspection of reinforcing steel.

#### E17.4.5 Concrete Patching

- (a) Provide heating and hoarding to maintain the manufacturer's minimum installation and curing substrate temperature.
- (b) Use materials in accordance with manufacturer's printed instructions, and as specified.
- (c) Remove delaminated, loose, and spalled concrete using lightweight mechanical chipping hammers or other suitable means to sound concrete. Protect reinforcing bars during removal.
- (d) Thoroughly clean all surfaces previously chipped of any loose concrete and/or laitance and prepare surface for patching in accordance with printed instructions from the manufacturer of the patching mortar. Use pressure washing to clean and prepare concrete surfaces. Do not damage the structures.

- (e) Apply material to concrete substrate in accordance with the manufacturer's printed instructions.
- (f) The patch repair and non-shrink grout shall be finished to match the profile of the surrounding concrete.
- (g) Wet cure patch repairs and non-shrink grout in accordance with the manufacturer's printed instructions.

#### E17.5 Measurement and Payment

##### E17.5.1 Chamber Modifications and Restoration

- (a) Chamber modifications and restoration will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No additional payment will be made.

##### E17.5.2 Bollards (Provisional)

- (a) Construction of bollards will be measured and paid on a unit basis for each bollard acceptably installed at the Contract Unit Price for "Bollards" as listed in Form B: Prices. Payment for "Bollards" will include all labour and materials necessary to complete the work as specified.

### E18. RESTORATION

#### E18.1 Description

E18.1.1 This specification covers the restoration of work sites.

#### E18.2 Restoration Works

- (a) Regrade sites back to original condition upon completion of work.
- (b) Reconstruct asphalt pavements overlays in accordance with CW3410.
- (c) Sidewalks:
  - (i) Reconstruct existing asphalt sidewalks with 75 mm of Type 1A asphaltic concrete pavement conforming to CW3410. The sidewalk shall be constructed with 50 mm (min) of compacted base material and 150 mm (min) of sub-base material.
  - (ii) Reconstruct existing non reinforced concrete sidewalks with a 100 mm non-reinforced concrete conforming to CW3325 and SD-228A. The sidewalk shall be constructed with 100 mm (min) of compacted base material.
  - (iii) Reconstruct of the existing reinforced concrete sidewalks with a 150 mm reinforced concrete conforming to CW3235 and SD-237. The sidewalk shall be constructed with 100 mm (min) of compacted base material. To be used for private approaches.
- (d) Reconstruct concrete curbs in accordance with CW3240 and SD-206A.
- (e) Restore existing interlocking paving stone in accordance with CW3330 and SD-240A. It is anticipated that existing paving stones can be reused for restoration purposes. The Contractor shall take all necessary steps to not damage existing paving stone surfaces.
- (f) Sod all maintained grassed areas in accordance with CW3510.

#### E18.3 Measurement and Payment

##### E18.3.1 Site Regrading

- (a) Regrading of sites to original elevations or as shown on the Drawings will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No additional payment will be made.

##### E18.3.2 Asphalt Overlay

- (a) Repair of asphalt pavement overtop of existing concrete slabs (overlays) will be measured and paid on a square metre basis at the Contract Unit Price for "Asphalt

Overlay over Existing Concrete Pavement” as listed in Form B: Prices. Payment for “Asphalt Overlay over Existing Concrete Pavement” shall include existing pavement removal, surface preparation, and placement asphalt pavements.

**E18.3.3 Concrete Barrier Curb Replacement**

- (a) the renewal of concrete barrier curbs shall be measured on a linear metre basis and paid for at the Contract Unit Price for “Concrete Barrier Curb Renewal “ as listed in Form B: Prices. Measurement will be made for each linear metre of concrete curb acceptably replaced. Payment for “Concrete Barrier Curb Renewal” shall include all base and sub base preparation, and the supply and placement of concrete curbing.

**E18.3.4 Sidewalk Patches**

- (a) Construction of sidewalk patches” shall be measured on a square metre basis for each type of pavement at the Contract Unit Price for “Sidewalk Patches” as listed in Form B:Prices. Measurement will be made for each square metre of sidewalk acceptably replaced. Payment for “Sidewalk Patches” shall include all base and sub base preparation, supply and placement of concrete and asphalt pavements.

**E18.3.5 Interlocking Paving Stones**

- (a) Repair and reconstruction of existing interlocking paving stone pathways will be considered incidental to “Pipeline Modification” and will not be measured for payment. No additional payment will be made.

**E18.3.6 Sodding**

- (a) Supply and installation of sod using imported topsoil shall be measured and paid in accordance with CW 3510.

**E18.3.7 Gravel Pathways**

- (a) Repair of existing gravel pathways shall be measured on a lump sum basis at the Contract Unit Price for “Site 3 – Gravel Path Restoration” as listed in Form B: Prices. Payment for “Site 3 – Gravel Path Restoration” shall include all necessary labour and materials to restore the pathway to its existing condition.

**E18.3.8** Payment for restoration works will be limited to areas disturbed to facilitate construction. Surface restoration outside of the designated construction areas shall be at the Contractors expense.

**E19. TREE PROTECTION, PRUNING, AND REMOVAL**

**E19.1 Description**

**E19.1.1** This specification covers the pruning and removal of existing trees as required to facilitate construction.

**E19.1.2** This specification amends CW 3110 Clearing and Grubbing.

**E19.2 Quality Control**

**E19.2.1** Person performing work shall possess a valid Manitoba Arborists License.

**E19.3 Materials**

**E19.3.1 Wound Dressing**

- (a) Wound dressing shall be horticultural accepted non-hardening bituminous emulsion, free of materials toxic to callus formation, containing disinfectant for fungal and other diseases.

**E19.4 Construction Methods**

**E19.4.1** The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees within the limits of the construction area:

- (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
- (b) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400 mm wood planks, or suitably protected as approved by the Contract Administrator.
- (c) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches), with the outcome read in feet, from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
- (d) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
- (e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E19.4.2 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his/her designate.

#### E19.4.3 Scheduling of Work

- (a) The Contractor shall review work with Contract Administrator prior to starting work.
- (b) The Contractor shall schedule the work in accordance with the restrictions set out in the federal Migratory Birds Convention Act, 1994.

#### E19.4.4 Removal

- (a) If the Contractor requires removing trees to access the Site or facilitate construction, the Contractor shall submit a plan to the Contract Administrator for review, a minimum of ten (10) Business Days prior to removal. No removals of trees shall be made without written acceptance by the Contract Administrator and the City of Winnipeg's Forestry Department. The plan shall at a minimum indicate:
  - (i) Trees requiring removal complete with size and species, and description of requirement for removal.
- (b) Replanting requirements will be determined by the level of tree removals proposed and accepted by the Contract Administrator and City of Winnipeg's Forestry Department.

#### E19.4.5 Pruning

- (a) Prune individual trees as indicated by the Contract Administrator. Remove dead, dying, diseased, interfering, objectionable and weak growth in order to promote healthy development suitable to the purpose for which plant material is grown.
- (b) Prune in accordance with Agriculture Canada Publication 1505-1977, The Pruning Manual.
- (c) Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water. Remove projecting stumps on trunks or main branches. Remove dead and injured branches and branches that rub causing damage to bark. Trim trees without changing their natural shape. Do not damage lead branches or remove smaller twigs along main branches.

E19.4.6 Cut Back

- (a) Eliminate narrow crotches as much as possible; avoid cutting back to small suckers. Remove smaller limbs and twigs to leave foliage evenly distributed.
- (b) When reducing overall size, make symmetrical in appearance to maintain tree-like form typical of species.
- (c) Do not remove more than one-third of total branching at single operation.

E19.4.7 Repair and Protection

- (a) Repair cuts and old scars in accordance with Agriculture Canada Publication 1505-1977, The Pruning Manual.
- (b) Paint new cuts 100mm in diameter and over with wound dressing.

E19.5 Measurement and Payment

- E19.5.1 Tree protection, pruning and removals will be considered incidental to "Pipeline Modifications" and will not be measured for payment. No additional payment will be made.

## **PART F - SECURITY CLEARANCE**

### **F1. SECURITY CLEARANCE**

- F1.1 Each individual proposed to perform the following portions of the Work:
- (a) any Work on private property;
  - (b) any Work within City facilities other than:
    - (i) an underground structure such as a manhole;
    - (ii) in areas and at times normally open to the public;
  - (c) communicating with residents and homeowners in person or by telephone;
- F1.1.1 Each Individual shall be required to obtain a Police Information Check from the police service having jurisdiction at his/her place of residence. Or
- (a) BackCheck, forms to be completed can be found on the website at: <http://www.backcheck.net/> ; or
  - (b) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: <https://www.commissionaires.ca/en/manitoba/home> .
- F1.2 Prior to the award of Contact, 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 Police Information Check 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 Police Information Check is not provided, or for whom a Police Information Check indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work specified in F1.1.
- F1.4 Any Police Information 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 Police Information Check. Any individual who fails to provide a satisfactory Police Information Check as a result of a repeated Police Information Check will not be permitted to continue to perform any Work specified in F1.1.