



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 708-2012**

**CONSTRUCTION OF WATER TREATMENT PLANT PROTECTED CONNECTIONS**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 CONSTRUCTION OF WATER TREATMENT PLANT PROTECTED CONNECTIONS

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, October 18, 2012.

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

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

### **B3. SITE INVESTIGATION**

B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site from 9:00 A.M. on October 4, 2012 to provide Bidders access to the Site.

B3.2 The Bidder is advised that site access is restricted and access to view the site can only be made under supervision of the City.

B3.3 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

B3.4 Proponents will not be allowed to take pictures at any of the site investigations. The Proponent may request pictures of specific areas from the Project Manager identified in D4. The pictures will then be issued to all the Proponents registered for the site investigations.

B3.5 Although attendance at the Site Investigations is not mandatory, the City strongly suggests that Proponents attend.

B3.6 The Bidder is advised that the 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, and safety boots, as well as personal lighting required to view the site.. The City of Winnipeg will provide a retrieval hoist, surface lighting, and gas detector. Personnel attending the site shall be properly trained in Confined Space entry in accordance with Manitoba legislation and their individual company policy.

B3.7 Proponents are required to register for the Site Investigations at least 48 hrs. prior by contacting the Contract Administrator identified in D4

B3.8 Bidders registered for the site visit must provide the Project Manager identified in D4 with a Public Safety Verification search obtained not earlier than one (1) year prior to the site visit.

- (a) The Public Safety Verification Check may be obtained from BackCheck. Forms to be completed can be found on the website at: <http://www.backcheck.net/>. Note that the check will take between 12 and 48 hrs. to complete. See Appendix A for further Information

### **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. ADDENDA**

- B5.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B5.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B6. SUBSTITUTES**

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

function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B15.1(a).

## **B7. BID COMPONENTS**

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
  - (c) Bid Security
    - (i) Form G1: Bid Bond and Agreement to Bond, or  
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or  
a certified cheque or draft;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B7.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B7.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B15.1(a).

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

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

**B8. BID**

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

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

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

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

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

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

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, 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.

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

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

**B9. PRICES**

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

B9.2 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

## **B10. QUALIFICATION**

### **B10.1 The Bidder shall:**

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

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

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

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

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

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

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

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

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

## **B11. BID SECURITY**

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

- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
- (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form



included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or

- (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

- B11.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.
- B11.1.2 All signatures on bid securities shall be original.
- B11.1.3 The Bidder shall sign the Bid Bond.
- B11.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B11.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.
- B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B11.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

## **B12. OPENING OF BIDS AND RELEASE OF INFORMATION**

- B12.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.
  - B12.1.1 Bidders or their representatives may attend.
- B12.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/default.stm>
- B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/default.stm>
- B12.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

## **B13. IRREVOCABLE BID**

- B13.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B13.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work

until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid.

#### **B14. WITHDRAWAL OF BIDS**

- B14.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B14.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;
  - (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
  - (c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.
- B14.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

#### **B15. EVALUATION OF BIDS**

- B15.1 Award of the Contract shall be based on the following bid evaluation criteria:
- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation there from (pass/fail);
  - (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
  - (c) Total Bid Price;
  - (d) economic analysis of any approved alternative pursuant to B6.
- B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.
- B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.
- B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.
- B15.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

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

## **B16. AWARD OF CONTRACT**

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

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

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

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

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

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

## **PART C - GENERAL CONDITIONS**

### **C0. GENERAL CONDITIONS**

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](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 modification of several cast-in-place concrete valve chambers, installation of owner supplied valves and equipment, modification of piping, and site grading.

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

- (a) Demolition of valve chamber FV-Y304A superstructure.
- (b) Relocation of electrical, control and radio equipment and cabling within FV-Y304A.
- (c) Structural Modifications of FV-Y304A.
- (d) Piping modification and Replacement of existing valve FY-Y304A with owner supplied butterfly valve.
- (e) Installation of concrete bulkheads within the Shoal Lake and Branch I Aqueducts.
- (f) Sandblasting, cleaning and recoating of internal piping and components of valve chamber HV-Y410C.
- (g) Excavation, shoring, and structural modifications to convert existing chlorine contact chamber to a valve chamber.
- (h) Installation of owner supplied butterfly valve in chlorine contact chamber.
- (i) Modifications to Cell 1 and 2 dewatering pump station superstructure.
- (j) Site grading and restoration works.

#### D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "**AWWA**" means American Water Works Association;
- (b) "**NSF**" means National Sanitation Foundation definition;
- (c) "**ASTM**" means American Society for Testing and Materials;
- (d) "**CSA**" means Canadian Standards Association.

#### D4. CONTRACT ADMINISTRATOR

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

Marvin McDonald, C.E.T.  
Project Manager  
99 Commerce Drive  
Winnipeg, MB R3P 0Y7

Telephone No. 204 928-7422  
Facsimile No. 204 284-2040

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

D4.3 Bids Submissions must be submitted to the address in B7.8.

**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. Notices.

**D7. NOTICES**

D7.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

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

D7.3 Notwithstanding C21., all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg  
Chief Financial Officer  
Facsimile No.: 204 949-1174

D7.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:

The City of Winnipeg  
Legal Services Department  
Attn: Director of Legal Services  
Facsimile No.: 204 947-9155

## **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>

### **D11. INSURANCE**

- D11.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
  - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
  - (c) all risks course of construction insurance in the amount of one hundred percent (100%) of the total Contract Price, written in the name of the Contractor and The City of Winnipeg, at all times during the performance of the Work and until the date of Total Performance.
- D11.2 Deductibles shall be borne by the Contractor.
- D11.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D11.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

## **D12. PERFORMANCE SECURITY**

- D12.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
  - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
  - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D12.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D12.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

## **D13. SUBCONTRACTOR LIST**

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

## **D14. DETAILED WORK SCHEDULE**

- D14.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D14.2 The detailed work schedule shall consist of the following:
- (a) a Gantt chart for the Work;  
acceptable to the Contract Administrator.
- D14.3 Further to D14.2(a), 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:
- (a) Valve Chamber FV-Y304A Work
  - (b) Replacement of FV-Y304A
  - (c) Valve Chamber HV-Y410C Work
  - (d) Installation of Concrete Bulkhead with the Shoal Aqueduct
  - (e) Installation of Concrete Bulkhead with the Branch I Aqueduct
  - (f) Chlorine Contact Chamber Works (Valve HV-Y307A)
  - (g) Installation of Valve in Chlorine Contact Chamber
  - (h) Chlorine Contact Chamber Restoration Works
  - (i) Cell 1/2 Dewatering Pump Station Works



- (j) Cell 1/2 Dewatering Pump Station Restoration Works
- (k) Substantial Performance
- (l) Total Performance

D14.4 Further to D14.2, the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

## **SCHEDULE OF WORK**

### **D15. COMMENCEMENT**

D15.1 The Contractor shall not commence any Work until he/she is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D15.2 The Contractor shall not commence any Work on the Site until:

- (a) the Contract Administrator has confirmed receipt and approval of:
  - (i) evidence of authority to carry on business specified in 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; and
  - (vii) the detailed work schedule specified in D14.
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- (c) The Contractor has provided Security Clearances as identified in E4 and Appendix A

D15.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

### **D16. SCHEDULE RESTRICTIONS**

D16.1 Aqueduct, Yard Piping and Reservoir Operations

- (a) Aqueducts, existing yard piping and reservoir shutdown periods are scheduled based on a number of factors including routine maintenance and repair work along the Aqueduct, water demand, weather, reservoir operation and other factors. The City shall endeavour to make the specified time periods available to the Contractor to schedule his work requiring removal of the Aqueduct and yard piping from service, without limiting the City's control over the operation of the regional water infrastructure to complete other work, maintain adequate water supply and storage of water 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 the Aqueducts or water supply, including but not limited to high water demand, abnormal weather, failures of related water system components, and/or security concerns.
- (b) The Bidder shall note that operations involving shutdown or excessive risks to the Cell 1 and Cell 3 supply chains cannot occur simultaneously. Works involving the Cell 3 Raw Water lines in the vicinity of existing live pipes cannot commence until works in the vicinity of the Cell 1 supply chain are complete, and the Cell 1 supply lines placed back into service.
- (c) The Bidder shall note that portions of the Work requiring a shutdown of the Shoal Lake, Branch I or Branch II Aqueducts or Cell 3 Supply Piping, can only be carried out during the time periods prior to May 21 or after September 17 of a given year, unless amended as

specified in D16.1(a). The Contractor shall note the following restrictions applicable during this period:

- (i) The pipelines will not be taken out of service unless all precast pipe, valves, connectors, fittings and miscellaneous components required to complete the installation are on site, tested, and pre-fitted, to ensure that the pipelines can be restored to service within the timeframe noted in D16.2.
  - (ii) Branch Aqueducts shall not be taken out of service at the same time. The first Branch Aqueduct must be fully back in service before the second Branch Aqueduct may be taken out of service. Allow a minimum of five Business Days for testing and operational changes.
- (d) The Bidder shall note that scheduled shutdown of the Shoal Lake Aqueduct is subject to regulatory approvals, weather conditions, Operations planning and other factors that may result in delays to or cancellation of planned shutdowns. Work requiring shutdown of the Shoal Lake Aqueduct may be cancelled, delayed or completed by others based on timing and availability of Shoal Lake Aqueduct Shutdowns. There shall be no additional compensation made to the Bidder should this portion of the work be delayed or deleted. For the purposes of schedule, delay will not exceed one (1) year from the date of award of contract.

#### D16.2 Reinstatement Aqueduct and Yard Piping Flow

- (a) At any time during construction, the Contractor must be prepared to reinstate the Shoal Lake Aqueduct, Branch I, or Branch II Aqueducts to a serviceable condition within 48 hours of receiving written notification. Reconnection of severed sections of the Branch I Aqueduct can be made by utilizing precast pipe components, valves and other appurtenances intended for permanent installation.

#### D16.3 Water Shutdown Restrictions and Time Periods

- (a) The following is a list of restrictions for proposed works;
- (i) Shoal Lake Aqueduct cannot be removed from service between February 1 and March 31, or any time Cell 1 supply chain (North Reservoir Cells) is not available for use. Coordinate with other contractors
  - (ii) Shoal Lake Aqueduct shutdown is limited to seven (7) Calendar Days.
  - (iii) Branch I or Branch II shutdowns are limited to seven (7) Calendar Days.
  - (iv) Cell 3 Raw Water Line (Construction of HV-Y307A) cannot be removed from service between February 1 and March 31, or any time Cell 1 supply chain is not available for use. Coordinate with other contractors
  - (v) Cell 3 Raw Water Line shutdown (Construction of HV-Y307A) is limited to 14 Calendar Days for Chlorine Contact Chamber conversion.
- (b) Shutdowns will be measured from the time the pipe is turned over to the Contractor by the City, until the pipe control is turned back to the City for refilling and testing.
- (c) The Contractor shall provide a minimum of 15 Business Days notice of requiring a shutdown.
- (d) Changes to these criteria will not be permitted without the approval of City of Winnipeg Water and Waste Department.

### D17. COOPERATION WITH OTHERS

D17.1 The Contractor shall note that other contracts and activities are scheduled to be under construction in the Deacon Reservoir area and Water Treatment Plant site during the proposed Works. These include;

- (a) City of Winnipeg Bid Opportunity 567-2012 – Deacon Reservoir Interconnector Culvert Rehabilitation, Nelson River Construction Inc.
- (i) During this work, shutdowns involving the Cell 3 supply piping or Shoal Lake Aqueduct shutdowns will be restricted.

- (b) Manitoba Hydro – Specification 030107 Construction of Potable Water Booster Station, PCL Constructors.
  - (i) Activities involving shutdowns to Branch I or Branch II Aqueducts will require coordination with other contractors
- (c) City of Winnipeg – replacement of butterfly valve seats shall be coordinated with Cell 3 Raw Water shutdown and Branch I Aqueduct Shutdown.

D17.2 The Contractor shall coordinate activities with other contractors. Any changes to scheduled dates of work activities shall be approved by the Contract Administrator.

**D18. SUBSTANTIAL PERFORMANCE**

D18.1 The Contractor shall achieve Substantial Performance by May 17, 2013.

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

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

**D19. TOTAL PERFORMANCE**

D19.1 The Contractor shall achieve Total Performance by June 15, 2013.

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

D19.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

**D20. LIQUIDATED DAMAGES**

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

- (a) Substantial Performance – one thousand five hundred dollars (\$1,500);
- (b) Total Performance – five hundred dollars (\$500).

D20.2 The amounts specified for liquidated damages in D20.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.

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

## **CONTROL OF WORK**

### **D21. JOB MEETINGS**

- D21.1 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.
- D21.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

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

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

## **MEASUREMENT AND PAYMENT**

### **D23. PAYMENT**

- D23.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

## **WARRANTY**

### **D24. WARRANTY**

- D24.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

**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. 708-2012

CONSTRUCTION OF WATER TREATMENT PLANT PROTECTED CONNECTIONS

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. 708-2012

CONSTRUCTION OF WATER TREATMENT PLANT PROTECTED CONNECTIONS

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.





## PART E - SPECIFICATIONS

### GENERAL

#### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
1-0601M-D0004-001	Water Treatment Plant Protected Connections - Cover
1-0601Y-C0055-001	Water Treatment Plant Protected Connections – Civil - Site Plan
1-0620M-C0008-001	Deacon Culvert Rehabilitation - Civil - Cell 1 Dewatering Pump Station – Grading Plan
1-0601Y-C0056-001	Water Treatment Plant Protected Connections - Civil - Valve Chamber FV-Y304A – Plans & Sections
1-0601Y-C0057-001	Water Treatment Plant Protected Connections - Civil - Valve Chamber HV-Y410C – Plan, Elevations & Sections
1-0601Y-C0058-001	Water Treatment Plant Protected Connections - Civil - Chlorine Contact Chamber – Plan, Elevations & Sections
1-0601Y-S0022-001	Water Treatment Plant Protected Connections - Structural – Chlorine Contact Chamber – Plan, Elevations, Sections & Details
1-0620M-S0001-001	Deacon Culvert Rehabilitation - Structural - Cell 1 Dewatering Pump Station – Sections and Details
1-0620M-E0001-001	Deacon Culvert Rehabilitation - Electrical - Cell 1 Dewatering Pump Station – Details
1-0620Y-E0011-001	Water Treatment Plant Protected Connections - Electrical – Valve Chamber HV-Y304A

#### E2. SOILS INVESTIGATION REPORT

- E2.1 Any test holes or test pits made by the contractor shall be done in accordance with the requirements of the Water and Waste Department. Contractor shall notify the Contract Administrator prior to proceeding with any subsurface investigations.

### GENERAL REQUIREMENTS

#### E3. OFFICE FACILITIES

- E3.1 The Contractor shall supply office facilities meeting the following requirements:
- The minimum facility floor area shall be 12 square metres.
  - The facility shall have a door with lockable hardware.
  - The facility shall have lighting, heating and cooling provisions to maintain a temperature between 15°C and 25°C.

- (d) The facility shall have a desk, chair and plan table, and file cabinet.
- (e) Portable washroom facility with lockable door.

E3.2 Location of temporary office facilities shall be approved by the Contract Administrator.

E3.3 Areas for office facilities and lay down areas are available, generally located south of the Deacon access road and west of the lagoon access road. The contractor shall not have exclusive use of this area. Coordinate with others.

#### **E4. SITE SECURITY AND PROTECTION**

E4.1 Description

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

E4.2 Site Security

- (a) All personnel on Site are required to obtain a Criminal Record Search Certificate and Public Safety Verification Check, as outlined in Appendix A. The Contractor shall submit copies of the Criminal Record Search Certificates to the Contract Administrator identified in D4. The City of Winnipeg Water Services Division will issue time-limited photo security passes to personnel identified as approved to work on the project. Personnel receiving passes are not permitted to provide or share security passes with other personnel to gain access to the Site. Violation of this policy will result in immediate dismissal of the personnel from the Site.
- (b) The City of Winnipeg will provide one (1) security key to the Contractor, upon receipt of a five hundred dollar (\$500) security deposit cheque. The cheque will be returned upon return of the security key. The Contractor shall provide the name and contact information for the person in charge and responsible for security on Site.
- (c) On a daily basis during course of work, advise the City of Winnipeg Deacon Control Centre at 204-986-4781 as to the status of the site security, and in particular when Contractor staff leave the Site. The Contractor is not required to provide security services when not on Site.
- (d) The Deacon Site is monitored by CCTV and other security monitoring devices, and unauthorized attendance to the Site will result in dispatch of Police or security personnel to the Site.
- (e) Reservoir cell gates are alarmed. Contact Control Operator at 204-986-4781 prior to opening gates, and advise Operator when gates are closed and locked at the end of the workday, or when vacating Site temporarily.
- (f) When security personnel and crews are not within visual range of Reservoir access gates, the gates shall be closed.
- (g) The Contractor shall notify the Contract Administrator a minimum of 2 Business Days in advance of works where gates to the reservoirs require opening.

E4.3 Emergency Response

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

E4.4 Photographs

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

#### **E4. SITE SAFETY**

##### **E4.1 Safety**

- (a) Be fully responsible for all aspects of Site and public safety, in compliance to D22.
- (b) Install Contractor's locks on City installed lock-out devices, on all valve and sluice gates (closed position) prior to commencement of operations involving connection to existing pipelines at the following locations;
  - (i) Replacement of Valve FV-Y304A
    - i. HV-Y306A
    - ii. HV-Y410A
    - iii. HV-Y410B
    - iv. Valve 103 ( Branch II Interconnector, Lagimodiere and Bishop Grandin)
  - (ii) Construction of Concrete Bulkhead within the Branch I Aqueduct
    - v. HV-Y410A
    - vi. FV-Y305A
    - vii. HV-Y410C
    - viii. LAV5 (MacLean Reservoir Complex)
  - (iii) Construction of Concrete Bulkhead within the Shoal Lake Aqueduct
    - ix. HY-Y410B
    - x. HV-Y410C
    - xi. Intake Gates (2) ( At Shoal Lake Intake)
  - (iv) Chlorine Contact Chamber Butterfly Valve Installation (HV-Y307A)
    - xii. Cell 3 outlet sluice gate (1 unit)
    - xiii. HV-Y303A
    - xiv. FV-Y301A
- (c) The City of Winnipeg will provide access to valve locations. The Contractor shall name a primary contact and backup personnel, available on a 24 hour per day basis, with access to lockout keys, in the event on an emergency.

#### **E5. CONDITION, PROTECTION OF AND ACCESS TO THE AQUEDUCT AND YARD PIPING**

##### **E5.1 Description**

E5.1.1 This Section details operating constraints for all work to be carried out in close proximity to the Aqueduct (Shoal Lake, Branch I and Branch II) and Water Treatment Plant yard piping. Close proximity shall be deemed to be any construction activity within a 5 m offset from the centreline of the Aqueduct, Feedermain, or yard piping.

##### **E5.2 General Considerations for Work in Close Proximity to the Aqueduct and Existing Yard Piping**

E5.2.1 The Water Treatment Plant and area contains numerous water conduits of various constructions and vintages. All are critical components of the City of Winnipeg Water Supply and shall be treated with the utmost caution. Work around any of these pipelines shall be well planned and executed to ensure that the Pipelines are not subjected to construction related loads, including excessive vibrations and concentrated or asymmetrical lateral loads during backfill placement.

E5.2.2 The Shoal Lake Aqueduct, east of HV-Y410C is a cast-in-place reinforced concrete pipe, vintage 1916-1917. The Branch I Aqueduct running west of HV-Y410C, immediately south of the Booster Pumping Station, is constructed of precast reinforced concrete pipe, vintage 1918-1919. The Branch II Aqueduct, running southerly from the surge tower structure, is constructed of AWWA C301 pre-stressed concrete cylinder pipe vintage 1958-1960. Other existing water transmission lines within the Deacon Booster Pumping Station compound consist of AWWA C301 pre-stressed concrete cylinder pipe vintage 1970-1995.

### E5.3 Submittals

- E5.3.1 Submit proposed construction equipment specifications intended to work in proximity to Aqueducts and Yard Piping, to the Contract Administrator for review seven (7) days prior to construction. Submittal shall include:
- (a) Equipment operating weight and dimensions including wheel or track base, track length or axle spacing, track widths or wheel configurations
  - (b) Payload weights
  - (c) Load distributions in the intended operating configuration
- E5.3.2 Submit a Construction Method Statement with proposed construction plan including haul routes, excavation equipment locations, loading positioning and base construction sequencing to the Contract Administrator for review seven (7) days prior to construction. Do not commence construction until the Construction Method Statement has been reviewed and accepted by the Contract Administrator.
- E5.3.3 The Contractor shall ensure that all work crew members understand and observe the requirements of these work procedures and constraints. Prior to commencement of on-site work, the Contractor shall jointly conduct an orientation meeting with the Contractor Administrator with all superintendents, foremen and heavy equipment operators to make all workers on Site fully cognizant of the limitations of altered loading on the Aqueduct and Yard Piping, the ramifications of inadvertent damage to the pipelines, the constraints associated with work in close proximity to the Aqueduct and Yard Piping and the specific details of the Construction Method Statement in instances where a Construction Method Statement is in effect.
- E5.3.4 Employees of the Contractor or any Subcontractor that fail to comply with the conditions for working in close proximity to the Aqueduct and Yard Piping shall be promptly removed from the Site.

### E5.4 Construction Procedures

- E5.4.1 Pre-work, Planning and General Execution
- (a) No work shall commence at the Site until a Construction Method Statement has been reviewed and accepted. The Method Statement is to be a formal submission from the contractor as to his proposed construction methodology, including procedures, equipment and timing, in order for him to demonstrate to the Contract Administrator his understanding of the scope and limitations on the work and conformance to project specifications and these recommendations.
  - (b) Pipeline centreline and outside of pipe locations shall be clearly delineated in the field.
  - (c) Contact the City of Winnipeg WWD Department prior to construction.
  - (d) Work shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications by the Contract Administrator.
  - (e) Vehicular traffic that is compliant to City of Winnipeg load restrictions will be permitted to cross pipelines once suitable granular subbase or temporary crossing is in place that will adequately support loads without rutting. Temporary pipeline crossings shall be constructed to the same grade as existing or proposed ground.
  - (f) For crossings of pipelines in support of construction activities, designate crossing locations and confine equipment crossing the pipe(s) to these locations. Reduce equipment speeds to levels that minimize the impacts of impact loading.
  - (g) Subgrade, subbase, base construction, or temporary crossings shall be kept in a rut free condition at all times. Construction equipment is prohibited from crossing pipelines until subbase is constructed and the grade is sufficient to support the equipment without rutting.
  - (h) No materials shall be stockpiled above or within 5 metres of the pipeline centerline.

- (i) For construction work activities either longitudinally or transverse to the alignment of the pipeline work only with equipment and in the manner stipulated in the accepted Construction Method Statement and the supplemental requirements noted herein.
- (j) Where work is in close proximity to pipelines, utilize construction practices and procedures that do not impart excessive vibration loads on the pipeline or that would cause settlement of the subgrade below the pipeline.

#### E5.4.2 Demolition and Excavation

- (a) Demolition of structures adjacent to pipelines shall be carefully executed to prevent damage and movement to remaining and adjacent pipelines.
- (b) Use of pneumatic concrete breakers within 5 metres of the pipeline centerline is prohibited. Use of hand held jackhammers will be allowed.
- (c) Where there is less than 1.6 metres of earth cover over a pipeline and further excavation is required either adjacent to or over the pipeline, utilize only smooth edged excavation buckets, soft excavation or hand excavation techniques. Where there is less than 1 metre of cover over a pipeline, carefully expose the pipe by hand excavation to delineate the location and depth of the main, and provide full time supervision of the excavation.
- (d) Offset backhoe or excavation equipment from the pipeline a minimum of 3 m from centerline, to carry out excavations.
- (e) Equipment should not be allowed to operate while positioned directly over a pipeline.

#### E5.4.3 Underground Construction

- (a) Asymmetrical water pressures shall not be permitted to build up on one side of a pipeline.
- (b) Install watertight bulkheads at all locations where the Aqueduct or Yard Piping is exposed, or pipe is removed.
- (c) Through wall cutting of existing pipelines must be employed prior to removal of sections of pipe.
- (d) Where there is less than 1.5 metres of earth cover over a pipelines, backfill compaction shall be prohibited within 3 metres of the Aqueduct. Backfill compaction within 5 metres of a pipeline shall be limited to non-vibratory methods only.

### **E6. ENVIRONMENTAL PROTECTION**

E6.1 The Contractor shall be aware that the Deacon Reservoir, surrounding Aqueducts, pipelines and Water Treatment Plant are for potable water supply and no contamination by fuel, chemicals, etc. shall be permitted at any time. Fuels or chemicals shall not be stored within 30 metres of the reservoirs, Aqueducts or potable water piping

E6.2 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.

#### E6.3 Submittals

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

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

E6.4 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

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

E6.5 The Contractor is advised that the following environmental protection measures apply to the Work.

E6.5.1 Materials Handling and Storage

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

E6.5.2 Fuel Handling and Storage

- (a) The Contractor shall abide by the requirements of Manitoba Environment for handling and storage of fuel products.
- (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 groundsheet of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill.
- (g) Refueling 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 stored nearby on-site. The Contractor shall ensure that additional material can be made available on short notice.
- (j) Where stationary equipment is required to be erected on or within the reservoir dikes, equipment shall be staged on impermeable containment membrane or containment pans of sufficient volume to contain all hazardous fuels and liquids plus a safety factor of 50 percent.
- (k) Fueling of stationary equipment shall be completed with portable tanks containing only enough fuel to fill equipment. Use of fuel trucks on or within the Reservoir dikes is prohibited.

#### E6.5.3 Waste Handling and Disposal

- (a) The construction area shall be kept clean and orderly at all times during and at completion of construction.
- (b) At no time during construction shall personal or construction waste be permitted to accumulate for more than one day at any location on the construction site, other than at a dedicated storage area as may be approved by the Contract Administrator.
- (c) Indiscriminate dumping, littering, or abandonment shall not take place.
- (d) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.

#### E6.5.4 Dangerous Goods/Hazardous Waste Handling and Disposal

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

#### E6.5.5 Fires

- (a) Fires and burning of rubbish on Site shall not be permitted.

#### E6.5.6 Emergency Spill Response

- (a) The Contractor shall ensure that due care and caution is taken to prevent spills.
- (b) The Contractor shall report all major spills of petroleum products or other hazardous substances with the potential for impacting the environment and threat to human health and safety to the Contract Administrator and Manitoba Environment, immediately after occurrence of the environmental accident, by calling the 24-hour emergency telephone phone number 204-945-4888.

- (c) The Contractor shall designate a qualified supervisor as the on-site emergency response coordinator for the project. The emergency response coordinator shall have the authority to redirect manpower in order to respond in the event of a spill.
- (d) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-site emergency response coordinator:
  - (i) Notify emergency-response coordinator of the accident:
    - identify exact location and time of accident
    - indicate injuries, if any
    - request assistance as required by magnitude of accident (Manitoba Environment 24-hour Spill Response Line (204) 945-4888, Police (RCMP), Fire Department (City of Winnipeg), Ambulance, company backup)
  - (ii) Assess situation and gather information on the status of the situation, noting:
    - personnel on Site
    - cause and effect of spill
    - estimated extent of damage
    - amount and type of material involved
    - proximity to waterways and the Aqueduct
  - (iii) If safe to do so, try to stop the dispersion or flow of spill material:
    - approach from upwind
    - stop or reduce leak if safe to do so
    - dike spill material with dry, inert sorbent material or dry clay soil or sand
    - prevent spill material from entering waterways and utilities by diking
    - prevent spill material from entering Aqueduct manholes and other openings by covering with rubber spill mats or diking
  - (iv) Resume any effective action to contain, clean up, or stop the flow of the spilled product.
- (e) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to the Manitoba Environment according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.

#### E6.5.7 Controlled Products

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

### **E7. DEMOLITION OF STRUCTURES**

#### E7.1 Construction Methods

- (a) Where indicated on the Drawings, excavate and expose superstructures in preparation for demolition.
- (b) Carefully expose existing cables and wires and provide protection, support or relocation.
- (c) Coordinate electrical and control removals prior to commencing demolition.
- (d) Provide full depth saw cuts in concrete to isolate from structures to remain
- (e) Carefully demolish structures, taking care not damage components, piping electrical or other equipment to remain.
- (f) Dispose of all demolition materials off site. Clean fill may remain on site and neatly disposed in designated on site fill dump.
- (g) Provide barricades around open structures and excavations



**E7.2 Method of Measurement and Basis of Payment**

- (a) Demolition will not be measured for payment, it shall be considered incidental to the Work outlined in E8.

**E8. CHAMBERS AND ASSOCIATED WORK**

**E8.1 Materials**

- (a) Sub Drain Pipe
- (i) As per City of Winnipeg, Division 4 Approved Products, complete with geotextile filter sock.
  - (ii) Pipe to be PVC SDR 35 products only.
- (b) Formwork, Reinforcing Steel and Concrete
- (i) As per City of Winnipeg CW 2160.
- (c) Concrete Mix Design
- (i) Concrete Mix Design as per Table CW 2160.1, Type A mix.
  - (ii) Concrete Mix Design for Aqueduct internal bulkheads shall achieve design strength within Aqueducts shall be designed to achieve required design strength within 3 days. .
- (d) Water Stops
- (i) Extruded PVC Waterstops As per CW 2160.
  - (ii) Hydrophilic Waterstops: One-part polyurethane, extrudable swelling waterstop (bentonite-free). Sikaswell S-2 or approved equal in accordance with B6.
- (e) Dampproofing
- (i) As per City of Winnipeg CW 2160.
- (f) Rigid Insulation
- (i) Rigid insulation for below grade applications shall be rigid polystyrene insulation conforming to CAN/ULC S701 Type 4, Styrofoam SM by Dow Chemical, Celfort 300 by Owens Corning, or approved equal in accordance with B6.
  - (ii) Flame resistant rigid board insulation shall conform to ASTM C1289-11, Type 1 Class 2. THERMAX by Dow Chemical or approved equal in accordance with B6.
- (g) Foundation Insulation
- (i) Extruded 50 mm polystyrene board to CAN/ULC-S701 Type IV, rigid, closed cell, with integral high density skin.
  - (ii) Integral 8mm thick latex-modified concrete facing.
  - (iii) Accepted Products: Concrete Faced Insulation (CFI) Wall Panels as manufactured by T. Clear Corporation or approved equal in accordance with B6.
  - (iv) Metal Cap Flashing: 24ga galvanized steel J-channel. As recommended by the insulation panel manufacturer.
  - (v) Anchorage: Purpose made galvanized steel securement clips as manufactured by T. Clear Corporation or approved in accordance with B6.
- (h) Joint Fillers and Sealant
- (i) Primers: type recommended by sealant manufacturer.
  - (ii) Joint Fillers
    - Joint Filler to meet requirements of ASTM C920, Type S, Grade P, Class 25, Use T, M, A, O, and I.
    - Approved product: Vulkem 45 as manufactured by Tremco or approved equal in accordance with B6.
  - (iii) Backer rod shall meet requirements of ASTM C1330.
  - (iv) Bond Breaker: pressure sensitive plastic tape, which will not bond to sealants.

- (v) Sealants
  - Sealant shall meet requirements of ASTM C920, Type S, Grade NS, Class 100/50, Use, T, NT, M, G, A,, and O.
  - Approved product: Dow Corning 790 Silicone Building Sealant or approved equal in accordance with B6.
- (vi) Joint Cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.
- (i) Insulated Access Hatch
  - (i) Minimum 6.35 mm aluminum frame and cover.
  - (ii) Diamond-pattern treat plate reinforced for 14.4 kPa live load.
  - (iii) Stainless steel hardware.
  - (iv) Lockable latch with interior handle and removable exterior turn/lift handle.
  - (v) Door lift asset mechanism required.
  - (vi) For HV-Y410C:
    - Custom JD-AL as manufactured by Bilco or approved in accordance with B6.
  - (vii) For FV-Y304A:
    - 914 x 914 J-AL as manufactured by Bilco or approved equal in accordance with B6.

## E8.2 Submittals

- (a) Submit reinforcing steel shop drawings and concrete mix design in accordance to CW 2160.
- (b) Submit fabrication drawings for access hatches

## E8.3 Construction Methods

- (a) Cast-in-place concrete as per CW 2160.
- (b) Floor Sump
  - (i) Construct floor sump as detailed on the drawings.
- (c) Pipe, Valves Fittings and Appurtenances
  - (i) As per E9
- (d) Subdrain pipe shall be installed in a geotextile wrapped drainage trench as per City of Winnipeg Standard Detail SD-245.
- (e) Waterstops
  - (i) Install as per CW 2160 and manufactures recommendations.
- (f) Dampproofing
  - (i) As per City of Winnipeg CW 2160.
- (g) Rigid Insulation
  - (i) Below ground rigid insulation to be installed as detailed on the drawings.
  - (ii) Rigid insulation within valve chambers to be fastened to existing concrete walls utilizing power driven masonry nails with 25 mm washers or caps. All exposed edges insulation to be covered with cement board.
  - (iii) Flame resistant rigid board insulation to be installed as per manufactures recommendations utilizing mechanical fasteners with 25 mm caps or washers. Seams to be sealed with aluminium or white foil tape.
- (h) Foundation Insulation
  - (i) Layout concrete-faced insulation boards to maximize board sizes. No not use boards less than 150 mm wide.
  - (ii) Install concrete-faced insulation board system, complete with fastening clips and bap flashing in accordance with manufacturer's installation guidelines.

- (i) Joint Fillers and Sealant
  - (i) Preparation
    - (i) Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.
    - (ii) Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
    - (iii) Remove oil, grease, and other coatings from nonferrous metals with joint cleaner.
    - (iv) Prepare concrete, glazed, and vitreous surfaces to sealant Manufacturer's instructions.
    - (v) Examine joint sizes and correct to achieve depth ratio  $\frac{1}{2}$  of joint width with minimum width and depth of 6 mm, maximum width 25 mm.
    - (vi) Install joint filler to achieve correct joint depth.
    - (vii) Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
    - (viii) Apply bond breaker tape where required to Manufacturer's instructions.
    - (ix) Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
  - (ii) Application
    - (i) Apply sealants, primers, joint fillers, bond breakers, to manufacturer's instructions. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
    - (ii) Apply sealant to joints between access frames to adjacent building components, around perimeter of every external opening, to control joints in concrete slabs and where indicated.
- (j) Insulated Access Hatch
  - (i) Install as per manufactures recommendations.

#### E8.4 Method of Measurement and Basis of Payment

- (a) Construction or modification of Valve Chambers shall be measured on a lump sum basis, for each item shown on Form B: Prices, in accordance to these specifications. The lump sum price shall include excavation, backfill, cast-in-place concrete works, FRP, steel, or aluminum grating, installation of butterfly valves, supply and installation of chamber piping, supply and installation of miscellaneous valves, appurtenances, painting and recoating of existing valves. piping and appurtenances, miscellaneous metals, couplings, sub drains, interior plumbing, exterior grading and landscaping, retaining walls, miscellaneous materials and bollards. Chamber piping shall be considered all piping within the chamber, to the outside face of the chamber wall.
- (b) Grading and landscaping the area surrounding FV-Y304A and HV-Y410C shall be considered part of the works of HV-Y304A.
- (c) Work required for valve chamber HV-Y410C is split into two pay items as follows;
  - (i) 2a) Shoal Lake Aqueduct Shutdown Work, including construction of cast-in-place bulkhead, removal and installation of 150 mm air valve, replacement of 150 mm drain valve, and removal of 300 mm gate valve including installation of blind flange and drain, as indicted on the drawings. This work requires Shoal Lake Aqueduct shutdown. Further to D16.1(d), Work requiring shutdown of the Shoal Lake Aqueduct may be cancelled, delayed or completed by others based on timing and availability of Shoal Lake Aqueduct Shutdowns. There shall be no additional compensation made to the Bidder should this portion of the work be delayed or deleted.
  - (ii) 2b) Branch I Aqueduct Shutdown and Related Work, including all other work not identified in item 2a) or indicated on the drawings. This item will include supply of

150 millimetre air valve, 150 millimeter ball valve, and 300 millimetre blind flange and drain for item 2a) Work.

## **E9. CHAMBER PIPING**

### **E9.1 Supply and Field Testing of Butterfly Valves**

- (a) The 1500 and 2100 mm Butterfly valves and manual actuators are being supplied by the City of Winnipeg. Valves have been supplied, delivered and tested, and are stored at the City of Winnipeg, Water Treatment Plant compound, including;
  - (i) One (1) manually actuated 1500 mm valve for replacement of FV-Y304A, as supplied by Flo-Crest Equipment.
  - (ii) One (1) manually actuated 2100 mm valve for the chlorine contact chamber, as supplied by Power and Mine Supply Co.Shop Drawings for the valves are included in Appendix D.
- (b) The Contractor shall attend a delivery inspection, with the Valve Supply Contractor, and Contract Administrator. The Supply Contractor, prior to turning valves over to the Installation Contractor, shall rectify any damage noted during the delivery inspection. Written acceptance of the valves and actuators by a duly completed "Certificate of Equipment Delivery (Form 200)" (Appendix B) shall constitute acceptance for installation from the Installation Contractor.
- (c) The Installation Contractor may leave the valves in storage at the City facility at the Water Treatment Plant compound, until required on-site for preassembly and installation.
- (d) Once removed from storage at the City facility, the Contractor shall transport valves to the jobsite. Once delivered to the Site for preassembly and installation, the valves shall remain stored in a secure, on-site storage compound.
- (e) For the purposes of transportation of the valves from the storage facility to the jobsite, the Contractor shall ensure the following:
  - (i) Valve flange faces are protected from damage by installation of a minimum of 20 mm plywood cover on both faces of each valve.
  - (ii) Valves to be handled only by methods approved by the manufacturer, and properly secured to preclude any damage during transport.

### **E9.2 Materials**

- (a) Bolts
  - (i) Bolts for installation of butterfly valves shall be ASTM A307 grade B. Bolt size, type and diameter shall be in accordance to AWWA C207, and as indicated on Supplier Shop Drawings (Appendix D).
  - (ii) Flange insulator kits shall be Advance Products and Systems or approved equal in accordance with B6, including full faced gasket, hole sleeves and washers.
- (b) Flange Gaskets
  - (i) 3mm, full faced, SBR rubber gaskets or neoprene and shall be in accordance to AWWA C207. Gaskets shall be one piece construction where possible. 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.
- (c) Cement
  - (i) Portland Cement shall be CSA A3000 Type HS Sulphate Resistant Cement.
  - (ii) Approval in writing is required if the Contractor proposed to use fly ash or pozzolan as a supplementary cementing material in conformance with AWWA Standard C301, Section 4.4.1.
  - (iii) Approval requests should be accompanied by a submission from an independent testing laboratory complete with sampling and testing results of the material conforming to ASTM Standard C311.

- (d) Steel Pipe conforming to AWWA C200
  - (i) Minimum steel yield strength of 307 MPa (30,000 psi)
  - (ii) Minimum wall thickness of 9.5 millimetres
  - (iii) AWWA C207, Class D Flanges
- (e) Pipe Couplers
  - (i) 2100 mm Restrained Dismantling Joint:
    - (i) AWWA C207, Class D Flanges
    - (ii) ASTM A193 Gr B7 Tie Rods
    - (iii) Approved product: Dismantling joint as manufactured by Robar Industries Ltd. Product number 7906DJ.
  - (ii) Victaulic couplers to be to the latest revision of AWWA C-606 for Grooved and Shouldered Joints.
    - (i) Gaskets to be as recommended by the manufacture for domestic water service.
  - (iii) Couplings to be supplied with two di-electric insulating boots
  - (iv) Couplings to be fusion bonded epoxy coated to AWWA C213, and meeting the requirements of ANSI/NSF 61 "Standard for Drinking Water System Components – Health Effects"
- (f) Blind Flanges
  - (i) Steel flanges shall be AWWA C207 Class D.
  - (ii) Cast and ductile flanges shall be ASME/ANSI B16.1 Class 125
  - (iii) Blind flanges to be fusion bonded epoxy coated to AWWA C213, and meeting the requirements of ANSI/NSF 61 "Standard for Drinking Water System Components – Health Effects".
- (g) Gate Valves
  - (i) Gate Valves to be to the latest version of AWWA C509
  - (ii) Joint type as specified on drawings.
    - Flanged joints to conform to ASME B16.1 Class 125 flanges.
  - (iii) Gate valves to be fusion bonded epoxy coated to AWWA C213, and meeting the requirements of ANSI/NSF 61 "Standard for Drinking Water System Components – Health Effects"
- (h) Combination Air Valves

### E9.3 Combination Air Valves

- (a) Combination air/vacuum valve shall conform to the latest revision of AWWA C 512, and the following requirements;
  - (i) 150mm ANSI Class 125 flanged inlet
  - (ii) Dual body design
  - (iii) Suitable for 50 to 300 KPa ( 7-40 psi) operating pressure
  - (iv) Minimum 4.75mm orifice
  - (v) Cast Iron body, cover and Baffle
  - (vi) Stainless steel float and trim
  - (vii) Interior and exterior coatings conforming to AWWA C550
  - (viii) Buna-N seat
  - (ix) Certified under NSF/ANSI 61, Drinking Water System Components—Health Effects
- (b) Acceptable manufacturers:
  - (i) Val-Matic, 106/38,
  - (ii) APCO 1800/200
  - (iii) Or approved equal

- (c) Valve Stem Extensions
  - (i) Schedule 40 Stainless Steel ASTM A-276 Type 304. Size and length as shown on the drawings.
- (d) Ductile-Iron Valves, Piping and Fittings:
  - (i) Ductile-Iron Ball Valves
    - Ductile-Iron ball valve complete with stainless steel ball.
    - ASME B16.1 Class 125 flanges.
    - Approved product: Series 4000D as manufactured by American Valve Inc. or approved equal in accordance with B6.
  - (ii) Ductile-Iron Check Valve
    - Check valve to be to the latest version of AWWA C508.
  - (iii) Ductile Iron Piping
    - Ductile-Iron to be to the latest version of AWWA C115.
    - Cement lined and Epoxy coated as per this specification.
    - ASME B16.1 Class 125 solid flanges.
  - (iv) Ductile-Iron Fittings
    - Ductile-Iron fittings to be to the latest version of AWWA C110.
  - (v) Ductile-Iron fittings, valves and check valves to be fusion bonded epoxy coated to AWWA C213, and meeting the requirements of ANSI/NSF 61 "Standard for Drinking Water System Components – Health Effects"
- (e) Butterfly Valves (150 mm and less)
  - (i) Ductile-Iron butterfly AWWA C504, Class 150B, resilient seat, complete with 316 Stainless Steel disc, shaft and hardware.
  - (ii) Quarter turn handles capable of locking in any of ten (10) positions - 0 degrees to 90 degrees. Handle and release trigger - ductile iron. Return spring and hinge pin: carbon steel. Latch plate and mounting hardware: cadmium plated carbon steel.
  - (iii) ASME B16.1 Class 125 flanges
  - (iv) Butterfly Valves to be fusion bonded epoxy coated to AWWA C213, and meeting the requirements of ANSI/NSF 61 "Standard for Drinking Water System Components – Health Effects".
- (f) Threaded Valves
  - (i) Small diameter threaded ball valves (75mm diameter and less) shall be all cast bronze rated for minimum 1.0 MPa non-shock cold water service. Bronze material shall conform to ASTM B62. Acceptable product; Crane, Jenkins, Kennedy, Mueller, or approved equal in accordance with B6.
- (g) Threaded Piping, Fittings and Flanges
  - (i) Small diameter brass threaded piping, fittings and flanges (75mm diameter and less) shall be cast red brass conforming to ASTM B43 or cast bronze conforming to ASTM B62. Flange dimension and drilling shall be in accordance with ANSI B16.24 - 150#.
  - (ii) Small Diameter steel threaded fittings and flanges (75mm diameter and less) shall accordance with ANSI B16.5 - Class 150.
  - (iii) Small diameter steel pipe nipples shall be Schedule 80 steel.
- (h) Pipe Supports and Hangers
  - (i) Provide 316 stainless steel pipe hangers and supports for small diameter piping.
- (i) Paint
  - (i) Paint for exposed metal surfaces shall meet requirements of AWWA C210.
  - (ii) Paint to be NSF 61 certified.

- (iii) Lining for fabricated pipe shall be two (2) or more layers (5 mils dry film thickness minimum each coat) with a 100% solids liquid Epoxy, Enviroline 230, Bar-Rust 234P, Specialty Polymer Coatings SP-7888, or approved equal in accordance with B6.
  - (iv) Coating for all exposed steel piping valves, and actuators shall be two (2) or more layers (5 mils dry film thickness minimum each coat) Polyamide Epoxy, Enviroline 230, Bar-Rust 234P, Specialty Polymer Coatings SP-7888, Tnemec Series 140F Pota-Pox Plus, Amerlock 2 or approved equal in accordance with B6.
- (j) Air Gap Monitoring Equipment
- (i) Level switch
    - (i) Level switch for the air gap monitoring equipment to be NEMA-8 for submersion.
    - (ii) Approved product Vertical Buoyancy Level Sensor LVV-110 as produced by Omega Engineering Ltd. or approved equal in accordance with B6.
  - (ii) Cable
    - (i) Approved product Cable LVV-110-25 FT as produced by Omega Engineering Ltd. or approved equal in accordance with B6.

#### E9.4 Design

- (a) All pipe and fittings shall be designed for an operating pressure of 700 kPa (100 psi) and a test pressure of 1000 kPa (150 psi).

#### E9.5 Construction Methods

- (a) Installation of Butterfly Valves
  - (i) Prior to installation of butterfly valves, the Contractor shall receive installation instructions from the valve supply contractor. Upon completion of installation, Form 201: Certificate of Instruction (Appendix B) shall be completed and submitted to the Contract Administrator.
  - (ii) Estimated mass of the 2100 millimetre butterfly valves and actuator is 11,350 kilograms. Actual mass shall be confirmed with the valve supplier for lifting and installation purposes.
  - (iii) Install butterfly valve as shown on the drawings. Valves shall be installed with the valve shaft in the horizontal position. The Supply Contractor is obligated to provide installation supervision, and will complete Form 202: Certificate of Satisfactory Installation (Appendix B) upon successful installation.
  - (iv) Core 125 mm opening in roof slabs directly above actuator operation nut. Valve box and valve stem extensions shall be installed plumb and aligned directly above the valve actuator operation nut.
- (b) Commissioning of Butterfly Valves
  - (i) The Contractor shall assist in operation of the butterfly valves for the purpose of commissioning. The Supply Contractor is required to complete Form 203 (Appendix B), indicating a qualified representative has checked the installed equipment, and has found the equipment to be installed and operating in accordance to the specifications.
- (c) Threaded Valves and Fittings
  - (i) Install threaded nipples and flanges where indicated. Wrap all threads with a minimum of two wraps of Teflon tape or "pipe dope" containing Teflon. Isolate dissimilar metal flanges with gaskets, insulating bolt sleeves and non-metallic washers.
- (d) Valve Chamber Sump Drains
  - (i) Install sump drains, traps and cleanouts as indicated on the drawings.

(e) Painting

- (i) Where indicated on the Drawings and directed by the Contract Administrator, prepare metal surfaces for recoating by blast cleaning to near-white metal as specified by Joint Surface Preparation Standard NACE No.2/SSPC-SP10. Remove all dust and loose residues from the prepared surfaces and chamber floor. The surface shall be roughened to a degree suitable for the coating system employed.
- (ii) Protect valve seals, machined surfaces, threads, and nameplates from sandblasting.
- (iii) Paint prepared surfaces in accordance to AWWA C210.
- (iv) Primer coat to follow immediately after completion of sandblasting and prep.
- (v) Provide adequate ventilation and heat to facilitate curing of coatings.
- (vi) Linings shall be applied and cured in conditions suitable to attain complete cure suitable for water immersion within 36 hrs.

E9.6 Method of Measurement and Basis of Payment

- (a) All work described in this section of the technical specification will not be measured for payment. Costs for supply and installation of chamber piping shall be included in the work outlined in E8.

**E10. DISINFECTION OF WATERMAINS**

E10.1 Disinfection of watermains and feeder mains shall be completed in accordance with CW 2125 except initial flushing will not be required. Further to CW 2125, disinfection of segments of Feeder mains shall be completed by swabbing as outline in Section 3.3.16 of CW 2125.

E10.2 In accordance with Section 4.3 of AWWA Standard C651, the Contractor shall take all preventative and corrective measures during construction to prevent debris from entering the pipeline. Further, the Contractor shall flush the pipeline with sanitized pipeline cleaning equipment prior to the commencement of disinfection operations.

E10.3 Upon completion of disinfection, chlorinated water shall be pumped from the pipeline at the lowest point in the system, or continually flushed until chlorine residuals reach levels indicated in CW 2125. Chlorinated water shall not be directly discharged to the environment. 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 a wastewater sewer.
- (b) Be de-chlorinated using sodium ascorbate, Vita-D-Chlor™ by Integra Chemical, or approved equal in accordance with B6.
- (c) Contained on Site until chlorine has dissipated to acceptable limits.

E10.4 The pipeline shall be refilled with potable water and water samples for health tests taken in accordance to CW 2125, prior to being placed in service. Health tests will not be required for raw water pipelines including the Shoal Lake Aqueduct and the Cell 3 Raw Water line.

E10.5 Flushing and refilling of pipelines will be undertaken by the City.

E10.6 Method of Measurement and Basis of Payment

- (a) All work outlined in this section of the Technical Specification shall be considered incidental to the work outlined Section E8. No additional payment will be made.

**E11. EXCAVATION, BEDDING AND BACKFILL**

E11.1 Submittals

E11.1.1 Shop drawings for all excavation shoring shall be prepared and submitted in accordance to CW 1100. All shop drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experience in the design of excavation shoring systems.



## E11.2 Shoring Design

E11.2.1 Where required, excavation shoring shall be designed to accommodate staged excavation. Shoring components, bracing and walers shall be designed to accommodate installation of all pipe and fittings and temporary pipe support structures.

## E11.3 Temporary Pipe Support Structures

E11.3.1 Where excavations are required that undermine existing pipelines, the Contractor shall install a temporary pipe support structure to adequately support existing pipelines during construction.

## E11.4 Excavation

E11.4.1 The Contractor shall note that bulk excavation to the approximate grades indicated on the Construction Drawings will be completed, by others, prior to construction of this Contract. Additional excavations required for construction staging shall be designed and constructed by the Contractor, and submitted for review by the Contract Administrator. Temporary work pads, sub-cut excavations and ramps shall in no way adversely affect access to existing operational facilities, or hinder other Contractors operations.

E11.4.2 Excess excavation from trenching operations shall be disposed of at the excavation dumpsite immediately west of the Deacon Booster Pumping Station compound. The Contractor will be permitted to retain on Site, sufficient excavated material to backfill all excavations.

## E11.5 Measurement and Payment

E11.5.1 Excavation and shoring for pipe installation and valve chambers will not be measured for payment. Costs for excavation and shoring shall be considered incidental to the work outlined in E8. No additional payment shall be made.