



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 865-2018**

**AUBREY OUTFALL GATE CHAMBER UPGRADES**

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

## TABLE OF CONTENTS

### PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	4
Form G1: Bid Bond and Agreement to Bond	6
Form G2: Irrevocable Standby Letter of Credit and Undertaking	8

### PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	1
B5. Confidentiality	1
B6. Addenda	2
B7. Substitutes	2
B8. Bid Components	3
B9. Bid	4
B10. Prices	4
B11. Disclosure	5
B12. Conflict of Interest and Good Faith	5
B13. Qualification	6
B14. Bid Security	7
B15. Opening of Bids and Release of Information	8
B16. Irrevocable Bid	8
B17. Withdrawal of Bids	8
B18. Evaluation of Bids	9
B19. Award of Contract	9

### PART C - GENERAL CONDITIONS

C0. General Conditions	1
------------------------	---

### PART D - SUPPLEMENTAL CONDITIONS

#### General

D1. General Conditions	1
D2. Scope of Work	1
D3. Definitions	1
D4. Contract Administrator	1
D5. Contractor's Supervisor	2
D6. Ownership of Information, Confidentiality and Non Disclosure	2
D7. Notices	2

#### Standardization

D8. Standardized Goods	3
D9. Contractual Arrangement	3
D10. Payment of Standardization Vendors	3
D11. Payment shall be in Canadian funds net thirty (30) Calendar Days after receipt and approval of the Standardization Vendor's invoice.	3
D12. Furnishing of Documents	3

#### Submissions

D13. Authority to Carry on Business	3
D14. Safe Work Plan	3
D15. Insurance	4
D16. Performance Security	4
D17. Subcontractor List	5

#### Schedule of Work

D18. Commencement	5
-------------------	---

D19. Critical Stages	5
D20. Substantial Performance	5
D21. Total Performance	6
D22. Liquidated Damages	6
D23. Scheduled Maintenance	6
<b>Control of Work</b>	
D24. Traffic Control and Maintenance of Access	6
D25. Job Meetings	7
D26. Prime Contractor – The Workplace Safety and Health Act (Manitoba)	7
D27. The Workplace Safety and Health Act (Manitoba) – Qualifications	7
<b>Measurement and Payment</b>	
D28. Invoices	7
D29. Payment	8
<b>Warranty</b>	
D30. Warranty	8
Form H1: Performance Bond	9
Form H2: Irrevocable Standby Letter of Credit	11
Form J: Subcontractor List	13

**PART E - SPECIFICATIONS**

<b>General</b>	
E1. Applicable Specifications and Drawings	1
Division 22 - Mechanical	1
Division 26 - Electrical	1
Division 40 – Process Integration	1
E2. Soils Investigation Report	3
E3. Materials Supplied by the City	3
E4. Underground Structures Temporary Relocations	3
<b>General Requirements</b>	
E5. Mobilization And Demobilization	4
E6. Office Facilities	4
E7. Truck Weight Limits	4
E8. Dangerous Work Conditions	4
E9. Waterway By-Law Compliance	5
E10. Flow Control	5
E11. Shop Drawings	6
E12. Site Development And Restoration	8
E13. Traffic Management	9
E14. Protection Of Existing Trees	10
E15. Protection Of Existing Structures	10
E16. Supply And Installation Of Temporary Shoring	11
E17. Removal Of Existing Sluice Gate	13
E18. Cast-In-Place Concrete Gate Chamber Construction	14
E19. Cold Weather Requirements	17
E20. Miscellaneous Metal Fabrications	17
E21. Supply And Installation Of Discharge Piping	20
E22. Installation And Field Testing Of Cast Iron Sluice Gate	20
E23. Installation And Field Testing Of Cast Iron Flap Gate	22
E24. Groundwater Management Plan	24
<b>Contractor Supplied Standardized Goods</b>	
E25. General Requirements	30
E26. Standardized Electric Valve Actuators	31
E27. Foundation Waterproofing	38
E28. Temporary Surface Restoration And Maintenance	40
E29. Backfill Under Temporary Surface Restorations	40
E30. Sodding	40

E31. Snow Clearing	40
E32. Video Inspection Of Discharge Piping Within Limits Of New Installation	41
E33. Cash Allowance For Repairs	41

**PART F - SECURITY CLEARANCE**

F1. Security Clearance	1
------------------------	---

**Appendix A – Geotechnical Investigation Memorandum**

**Appendix B – Electrical Design Guide**

**Appendix C – Identification Standard**

**Appendix D – Reference Drawings**

## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 AUBREY OUTFALL GATE CHAMBER UPGRADES

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, October 10, 2018

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

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

### **B3. SITE INVESTIGATION**

B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site from 9:00 am to 10:00 am on October 1, 2018 to provide Bidders access to the Site.

B3.2 The Bidder is advised that the Site Investigation is not mandatory, but is highly recommended to view Site clearances and restrictions that could impede work progress.

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 Further to B3.1, the Bidder may view the Site at any time without making an appointment.

### **B4. ENQUIRIES**

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

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

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

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

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

### **B5. CONFIDENTIALITY**

B5.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Bidder before receipt hereof; or
- (b) becomes publicly known other than through the Bidder; or

(c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B5.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

## **B6. ADDENDA**

B6.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.

B6.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.

B6.3 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgmt/bidopp.asp>

B6.4 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B6.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B7. SUBSTITUTES**

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

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

B7.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.

B7.4 The Bidder shall ensure that any and all requests for approval of a substitute:

- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
- (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
- (c) identify any anticipated cost or time savings that may be associated with the substitute;
- (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
- (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B18.
- B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

## **B8. BID COMPONENTS**

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
  - (c) Bid Security
    - (i) Form G1: Bid Bond and Agreement to Bond, or  
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or  
a certified cheque or draft;
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.
- B8.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B8.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B8.5 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.
- B8.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B18.1(a).
- B8.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B8.8 Bids shall be submitted to:

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

**B9. BID**

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

B9.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:

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

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

B9.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B9.4 Paragraph 13 of Form A: Bid shall be signed in accordance with the following requirements:

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

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

B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

**B10. PRICES**

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

B10.1.1 Notwithstanding C12.2.3(c), prices on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B10.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.



- B10.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

**B11. DISCLOSURE**

B11.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B11.2 The Persons are:

- (a) N/A

**B12. CONFLICT OF INTEREST AND GOOD FAITH**

B12.1 Bidders, by responding to this Bid Opportunity, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B12.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:

- (a) other commitments;
- (b) relationships;
- (c) financial interests; or
- (d) involvement in ongoing litigation;

that could or would be seen to:

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

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

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

- B12.4 Without limiting B12.3, the City may, in its sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.
- B12.5 Without limiting B12.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:
- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of its employees proposed for the Work;
  - (b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in its sole discretion, determines cannot be avoided or mitigated;
  - (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B12.4 to avoid or mitigate a Conflict of Interest; and
  - (d) disqualify a Bidder if the Bidder, or one of its employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.
- B12.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in its sole discretion.

### **B13. QUALIFICATION**

- B13.1 The Bidder shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; and
  - (b) be financially capable of carrying out the terms of the Contract; and
  - (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.
- B13.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>
- B13.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) have successfully carried out work similar in nature, scope and value to the Work; and
  - (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
  - (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);
- B13.4 Further to B13.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) or
  - (i) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (ii) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program or
- (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>.)

B13.5 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.

B13.6 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.

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

B14.1 The Bidder shall provide bid security in the form of:

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

B14.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B14.1.2 All signatures on bid securities shall be original.

B14.1.3 The Bidder shall sign the Bid Bond.

B14.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B14.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B14.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B14.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B14.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B14.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

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

B15.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.

B15.1.1 Bidders or their representatives may attend.

B15.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B14 will not be read out.

B15.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B15.3 After award of Contract, the name(s) of the successful Bidder(s), their address(es) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B15.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

B15.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

## **B16. IRREVOCABLE BID**

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

B16.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid.

## **B17. WITHDRAWAL OF BIDS**

B17.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B17.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B17.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 13 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

- B17.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;
  - (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 13 of Form A: Bid; and
  - (c) if the notice has been given by any one of the persons specified in B17.1.3(b), declare the Bid withdrawn.

B17.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B16.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

## **B18. EVALUATION OF BIDS**

B18.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B13 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

B18.2 Further to B18.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B18.3 Further to B18.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B18.4 Further to B18.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B18.4.1 Further to B18.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

## **B19. AWARD OF CONTRACT**

B19.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B19.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B19.2.1 Without limiting the generality of B19.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
- (d) only one Bid is received; or

(e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B19.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B18.

B19.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

## 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 removal of the inoperable positive gate and installation of a submersible pump in the existing chamber on Aubrey Street and discharge piping as shown on the drawing. The Work shall also consist of construction of a new cast-in-place concrete gate chamber beside the existing chamber, installation of steel thimble, cast-iron sluice and flap gates, electric actuator operator and associated hardware. Any deviation of existing conditions from the drawings shall be communicated to the Contract Administrator immediately.

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

- (a) Construction of a new cast-in-place concrete gate chamber including installation of steel thimbles, cast-iron sluice and flap gates, electric actuator operator and associated hardware.
- (b) Removal of inoperable positive gate from the existing chamber on Aubrey Street.
- (c) Installation of submersible pump, complete with electric power and all associated automation and controls complete with buried discharge piping to the adjacent existing 600 mm dia combined sewer on Aubrey Street.
- (d) Groundwater Management.
- (e) Excavation, Shoring and Backfilling as required.
- (f) Sodding and landscaping.
- (g) Site restoration and clean up.

#### D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "**SRS**" means Storm Retention Sewer;
- (b) "**AWWA**" means American Water Works Association;
- (c) "**ASTM**" means American Society for Testing and Materials;
- (d) "**CSA**" means Canadian Standards Association.

#### D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is WSP Canada Group Limited, represented by:  
Mr. Grantley King, P.Eng., PMP  
Senior Project Manager, Major Projects

Telephone No. 204 943-3178  
Email Address Grantley.King@WSP.com

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

D4.3 Bid Submissions must be submitted to the address in B8.8.



**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.

**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, 0 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator identified in D4.1.

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

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

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

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

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

## **STANDARDIZATION**

### **D8. STANDARDIZED GOODS**

- D8.1 The following goods have been standardized by the City and will be supplied by the Contractor:
- (i) Standardized Electric Valve Actuators as per E26.

### **D9. CONTRACTUAL ARRANGEMENT**

- D9.1 Each Standardization Vendor shall be a Subcontractor of the Contractor.
- D9.2 The City's contract with each of the Standardization Vendors defines the prices and general terms of supply to the Contractor. Each Standardization Vendor is obligated to enter into a contract with the Contractor, based upon such prices and general terms of supply.
- D9.2.1 The City is not a party to any contract between a Standardization Vendor and the Contractor, or any Subcontractor.
- D9.3 In the event that a potential dispute arises between the Contractor and a Standardization Vendor, the Contract Administrator shall be notified.

### **D10. PAYMENT OF STANDARDIZATION VENDORS**

- D10.1 The Contractor is obligated to pay the Standardization Vendors in accordance with general terms of supply applicable to such Standardization Vendor.
- D10.2 The Contractor's payment terms to the Standardization Vendor, in respect of Standardized Electric Valve Actuators identified in E26, include the following:

### **D11. PAYMENT SHALL BE IN CANADIAN FUNDS NET THIRTY (30) CALENDAR DAYS AFTER RECEIPT AND APPROVAL OF THE STANDARDIZATION VENDOR'S INVOICE.**

### **D12. FURNISHING OF DOCUMENTS**

- D12.1 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**

### **D13. AUTHORITY TO CARRY ON BUSINESS**

- D13.1 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.

### **D14. SAFE WORK PLAN**

- D14.1 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.

D14.2 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>

## **D15. INSURANCE**

D15.1 The Contractor shall provide and maintain the following insurance coverage:

- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
- (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
- (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.

D15.2 Deductibles shall be borne by the Contractor.

D15.3 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.

D15.4 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.

## **D16. PERFORMANCE SECURITY**

D16.1 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.

D16.1.1 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.

D16.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B14.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

## **D17. SUBCONTRACTOR LIST**

D17.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.

## **SCHEDULE OF WORK**

### **D18. COMMENCEMENT**

D18.1 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.

D18.2 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 D13;
  - (ii) evidence of the workers compensation coverage specified in C6.15;
  - (iii) the Safe Work Plan specified in D14;
  - (iv) evidence of the insurance specified in D15;
  - (v) the performance security specified in D16; and
  - (vi) the Subcontractor list specified in D17.
- (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.

D18.3 The Contractor shall commence the Work at the discretion of the Contractor provided the commencement date will allow the achievement of Substantial Performance of the Work in accordance with D20.

D18.4 The City intends to award this Contract by November 9, 2018.

D18.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

### **D19. CRITICAL STAGES**

D19.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

- (a) All work necessary for the operation of the new flap gate and sluice gate, including construction of the new concrete chamber, installation of the gates and operator, and any other activities impacting the operation of the gates to their intended use shall be complete by March 15, 2019.

### **D20. SUBSTANTIAL PERFORMANCE**

D20.1 The Contractor shall achieve Substantial Performance by April 30, 2019.

D20.2 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.

D20.3 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.

## **D21. TOTAL PERFORMANCE**

- D21.1 The Contractor shall achieve Total Performance by June 30, 2019.
- D21.2 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.
- D21.3 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.

## **D22. LIQUIDATED DAMAGES**

- D22.1 If the Contractor fails to achieve, Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:
- (a) All work necessary for the operation of the new flap gate and sluice gate, including construction of the new concrete chamber, installation of the gates and operator, and any other activities impacting the operation of the gates to their intended use – one thousand five hundred dollars (\$1,500);
  - (b) Substantial Performance – one thousand dollars (\$1,000);
  - (c) Total Performance – five hundred dollars (\$500).
- D22.2 The amounts specified for liquidated damages in D22.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve, Critical Stages, Substantial Performance or Total Performance by the days fixed herein for same.
- D22.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## **D23. SCHEDULED MAINTENANCE**

- D23.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
- (a) Landscaping maintenance as specified in CW3510.
- D23.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

## **CONTROL OF WORK**

### **D24. TRAFFIC CONTROL AND MAINTENANCE OF ACCESS**

- D24.1 Comply with the requirements of CW 1130 for traffic control and maintenance of access.
- D24.2 Further to D24.1, should the Contract Administrator require that Work on a Regional Streets be carried out at night, on Sundays, on public holidays or that Work be restricted or suspended during peak traffic hours, the Contractor shall comply without additional compensation being considered to meet these requirements.
- D24.3 Traffic control during construction shall be as follows:

- (i) Maintain one lane of traffic with street signed as “Road Closed – Local Access Only”.
- (ii) Intersecting streets and private approaches must be maintained at all times.
- (iii) Bus traffic must be maintained at all times

D24.4 The Contractor will have access to the open lanes of traffic during non-restricted hours provide flag persons are used in accordance with Section 3.12 of The City of Winnipeg, “Manual of Temporary Traffic Control in Work Areas on City streets” to maintain traffic safety.

D24.5 Further to Section 3.6 of CW 1130, the Contractor shall maintain safe pedestrian crossing at intersections at all times. If possible, only one pedestrian crossing at an intersection is to be blocked by construction at any one time. If more than one pedestrian crossing is blocked by construction at an intersection at the same time the Contract shall provide flag person to safely escort pedestrians across the intersection. The Contractor shall leave pedestrian crossing locations safe and free if equipment that may hamper pedestrians when no construction activities are being performed at a particular crossing location.

D24.6 The Contractor shall not park company or private vehicles inside the barricaded work zone in a manner that will block sightlines for vehicles and pedestrians approaching and crossing

D24.7 Provide flag persons to direct traffic around construction vehicles that are unloading equipment and materials at the Site.

D24.8 The Contractor shall not stockpile materials in a location and manner that will obstruct the safe operation of motor vehicles past the Site

#### **D25. JOB MEETINGS**

D25.1 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.

D25.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

#### **D26. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)**

D26.1 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).

#### **D27. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS**

D27.1 Further to B13.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B13.4.

#### **MEASUREMENT AND PAYMENT**

##### **D28. INVOICES**

D28.1 Further to C12, the Contractor shall submit an invoice for each portion of Work performed. to:  
The City of Winnipeg

Corporate Finance - Accounts Payable  
4th Floor, Administration Building, 510 Main Street  
Winnipeg MB R3B 1B9

Facsimile No.: 204-949-0864

Email: [CityWpgAP@winnipeg.ca](mailto:CityWpgAP@winnipeg.ca)

D28.2 Invoices must clearly indicate, as a minimum:

- (a) the City's purchase order number;
- (b) date of delivery;
- (c) delivery address;
- (d) type and quantity of work performed;
- (e) the amount payable with GST and MRST shown as separate amounts; and
- (f) the Contractor's GST registration number.

D28.3 The City will bear no responsibility for delays in approval of invoices which are improperly submitted.

**D28.4 Bid Submissions must not be submitted to the above facsimile number. Bids must be submitted in accordance with B8.**

## **D29. PAYMENT**

D29.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

## **WARRANTY**

### **D30. WARRANTY**

D30.1 Warranty is as stated in C13.

D30.1 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.

D30.2 Notwithstanding C13.2 or D30.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

- (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.

D30.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

**FORM H1: PERFORMANCE BOND**  
(See D16)

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. 865-2018

AUBREY OUTFALL GATE CHAMBER UPGRADES

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 D16)

\_\_\_\_\_  
(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 865-2018

AUBREY OUTFALL GATE CHAMBER UPGRADES

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

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

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

\_\_\_\_\_ Canadian dollars.

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

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

Partial drawings are permitted.

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

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

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

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

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

\_\_\_\_\_  
(Date)

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

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

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

\_\_\_\_\_  
(Name of bank or financial institution)

Per: \_\_\_\_\_  
(Authorized Signing Officer)

Per: \_\_\_\_\_  
(Authorized Signing Officer)



## 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/matmgmt/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:

### DIVISION 22 - MECHANICAL

<u>Specification No.</u>	<u>Specification Title</u>
NMS Section 22 14 29.16	Submersible Sump Pump
NMS Section 22 14 29.17	Submersible Sump Pump - Discharge Piping

### DIVISION 26 - ELECTRICAL

<u>Specification No.</u>	<u>Specification Title</u>
NMS Section 26 05 01	Common Work Results – Electrical
NMS Section 26 05 21	Wires and Cables (0-1000 V)
NMS Section 26 05 28	Grounding - Secondary
NMS Section 26 05 29	Hangers and Supports for Electrical System
NMS Section 26 05 31	Splitters, Junction, Pull Box and Cabinets
NMS Section 26 05 32	Outlet Boxes, Conduit Boxes, and Fittings
NMS Section 26 05 34	Conduits, Conduit Fastenings and Fittings
NMS Section 26 05 44	Installation of Cables in Ducts in Trances
NMS Section 26 08 05	Acceptance Testing
NMS Section 26 12 17	Dry Type Transformers up to 600 V Primary
NMS Section 26 24 17	Panel Boards Breaker Type
NMS Section 26 27 26	Wiring Devices
NMS Section 26 28 13	Disconnect Switches – Fused and Non-fused
NMS Section 26 28 21	Moulded Case Circuit Breaker
NMS Section 26 29 10	Motor Starters to 600V
NMS Section 26 50 00	Lighting
NMS Section 26 91 90	Instrumentation

### DIVISION 40 – PROCESS INTEGRATION

<u>Specification No.</u>	<u>Specification Title</u>
NMS Section 40 05 01	Common Work Results
NMS Section 40 80 08	Factory Acceptance Test
NMS Section 40 80 11	Automation Commissioning
NMS Section 40 92 00	Automation – Primary Control Devices
NMS Section 40 94 43	Programmable Logic Controller (PLC)
NMS Section 40 95 13	Control Panels
NMS Section 40 99 01	Training

NMS Section 40 99 90 Maintenance and Support

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
LD-8013	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Cover Page
LD-8014	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Site Plan
LD-8015	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Concrete Details (Sheet 1 of 2)
LD-8016	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Concrete Details (Sheet 2 of 2)
LD-8017	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Reinforcing Details (Sheet 1 of 2)
LD-8018	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Reinforcing Details (Sheet 2 of 2)
LD-8019	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Access Hatch & Miscellaneous Metal Details (Sheet 1 of 2)
LD-8020	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber - Access Hatch & Miscellaneous Metal Details (Sheet 2 of 2)
LD-8021	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Existing Chamber Upgrades - Structural Details
LD-8022	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Control Panel Foundation Detail
LD-8023	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Mechanical Details
LD-8024	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Control Panel Detail General Notes
LD-8025	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Electrical Site Plan and Chamber Details
LD-8026	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Details and Area Classification
LD-8027	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Electrical Single Line Diagram, Panel Schedule
LD-8028	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Piping and Instrumentation Diagram
LD-8029	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Power and Fuse Distribution
LD-8030	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Lockout, Chamber Overflow, Gate HI Level, Gate Remote Mode
LD-8031	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Sluice Gate Open, Sluice Gate Closed, 120 Power Fail
LD-8032	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – UPS and Power Distribution
LD-8033	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Pump Low Level, Sluice Gate Fault, Wireless OK, Pump Auto Inhibit
LD-8034	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – P1 Feedback
LD-8035	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Digital I/O Spares
LD-8036	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Pump Auto Inhibit, Sluice Gate Open/Close/Stop, Wireless OK
LD-8037	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Pump Inhibit, Pump Control Overrides
LD-8038	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Pump SP-01 Call to Run, Pump SP-01 Control
LD-8039	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Sluice Gate, Gate Operation

LD-8040	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Sluice And Flap Gate Position
LD-8041	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – RTU-01 Back Plate Cut-Out, Back Plate
LD-8042	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – RTU-01 Panel Door, Alarm Display Light
LD-8043	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – Cabinet Layout, Device Placement
LD-8044	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – TS01 and TS05 Device Placement Details
LD-8045	Outfall Gate Chamber Upgrades – Aubrey Street – SRS Outfall Gate Chamber – TS02, TS03 and TS04 Device Placement Details

## **E2. SOILS INVESTIGATION REPORT**

### **E2.1 Further to C3.1,**

- (a) A geotechnical investigation has been performed on site with test holes having been drilled in the vicinity of the proposed Works at the Aubrey Outfall Chamber site to determine the character of subsurface soil to facilitate the design of the Work. The information listed is considered accurate at the location indicated in the Site Plan and at the time of the investigation. However, considerable variations in the soil conditions may exist between test holes and fluctuations in ground water levels can be expected seasonally. The test hole logs and associated Geotechnical Design Memorandum is included in Appendix A.
- (b) Bidders are responsible for any interpretation they place on the supplied information and are expected to make such additional investigation of the soil at the Site as they feel necessary to satisfy themselves.
- (c) Any test borings made by the Bidder shall be done in accordance with the requirements of the appropriate authority of the City of Winnipeg. Bidders shall notify the Contract Administrator prior to starting any soil boring operation.

## **E3. MATERIALS SUPPLIED BY THE CITY**

### **E3.1 The City will supply the following equipment:**

#### **E3.1.1 Materials:**

- (a) One (1) 2438mm X 2438mm (96" X 96") cast iron sluice gate complete with wall thimble, an electric-actuated mechanical lift operator, stems, wall brackets and accessories, f.o.b. 598 Plinguet Street, Winnipeg.
- (b) One (1) 2438mm X 2438mm (96" X 96") cast iron flap gate complete with wall thimble and accessories, f.o.b. 598 Plinguet Street, Winnipeg.
- (c) One wireless modem and antenna for remote terminal unit (RTU), f.o.b. 598 Plinguet Street, Winnipeg.

**E3.2** A technical representative from the manufacturer will witness installation of the gates, and this cost will be paid for separately by the City.

**E3.3** The Contract Administrator must be provided with minimum fourteen (14) days notice prior to installation of the gates to allow for arrangements to be made with the gate supplier for the inspection.

## **E4. UNDERGROUND STRUCTURES TEMPORARY RELOCATIONS**

### **E4.1 Further to C3.1,**

- (a) It is the responsibility of the Contractor to locate all underground utilities in the vicinity of the Work and temporarily relocate as required for the proposed Construction methods.

## **GENERAL REQUIREMENTS**

### **E5. MOBILIZATION AND DEMOBILIZATION**

- E5.1 Mobilization and Demobilization will include but not be limited to start-up costs, equipment setup and removal, field office and storage facilities set-up, removal and site cleanup.
- E5.2 Mobilization and Demobilization will not be measured and shall be included in the lump sum cost for "Cast-In-Place Concrete Gate Chamber Construction".

### **E6. OFFICE FACILITIES**

- E6.1 The Contractor shall supply a site trailer with available space for intermittent use by the Contract Administrator.
- E6.2 The office facility shall meet the following requirements:
- (a) The building shall be conveniently located near the Site of the Work.
  - (b) The building shall have a minimum floor area of 25 square metres, two windows and a door entrance with a suitable lock.
  - (c) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16-18°C or 24-25°C.
  - (d) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.
  - (e) The building shall be furnished with a drafting table, a table 2.5m X 1.2m, and a minimum of 8 chairs.
  - (f) A portable toilet shall be located near the field office building. The toilet shall have a locking door.
  - (g) The field office building and the portable toilet shall be cleaned on a weekly basis.
- E6.3 Measurement and Payment
- (a) Providing Office Facilities shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

### **E7. TRUCK WEIGHT LIMITS**

- E7.1 The City shall not pay for any portion of material which results in the vehicle exceeding the maximum gross vehicle weight allowed under The City of Winnipeg Traffic By-Law, unless such vehicle is operating under special permit.

### **E8. DANGEROUS WORK CONDITIONS**

- E8.1 Further to clause C6.24 of the General Conditions, the Contractor shall be aware that underground chambers, manholes, and sewers are considered a confined space and shall follow the "Guidelines for confined Entry Work" as published by the Manitoba Workplace Safety and Health Division.
- E8.2 The Contractor shall be aware of the potential hazards that can be encountered in gate chambers, manholes and sewers such as explosive gases, toxic gases and oxygen deficiency.
- E8.3 The air in a confined space must be tested before entry and continuously during the time that personnel are inside the space. Equipment for continuous monitoring of gases must be explosion-proof and equipped with a visible and audible alarm. The principal tests are for oxygen deficiency, explosion range and toxic gases. Testing equipment must be calibrated in accordance with manufacturer's specifications.



- E8.4 The Contractor shall ventilate all confined spaces including underground chambers, tunnels, pipes and shafts as required and approved by the Manitoba Workplace Safety and Health Act (the "Act"). If no ventilation is supplied, a Worker must wear a respirator or supplied air to enter the confined space.
- E8.5 Workers must wear a respirator or supplied air at all times when entering a chamber, manhole or sewer where live sewage is present.
- E8.6 If products containing volatile organic carbons (VOCs) are used, the Contractor shall provide a photoionization detector (PID) on Site to monitor potential VOCs in the confined spaces. The gas detector and safety equipment conforming to the Act shall be made available to the Contract Administrator for his use during inspections. In addition, the Contract Administrator may collect discrete air samples for laboratory analysis.
- E8.7 The Contract Administrator may issue a Stop Work order to the Contractor if the above guidelines are not being followed. The Contractor shall not resume his operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to the Stop Work order for not following these safety guidelines.

## **E9. WATERWAY BY-LAW COMPLIANCE**

- E9.1 The Contractor shall be aware that the Works associated with this Bid Opportunity falls within approximately 100 meters of the Assiniboine River, and therefore will require a Waterways Permit. The Contract Administrator will apply and pay for required Waterway Permits for the project. The Contractor shall adhere to restrictions imposed by the permit.

## **E10. FLOW CONTROL**

- E10.1 During winter months, land drainage and storm relief sewers can receive flow of an undetermined amount from groundwater infiltration, watermain breaks, snow melt and other unforeseen sources.
- E10.2 Provide flow control measures to contend with and maintain flows in the 2890 mm diameter storm relief sewer during demolition and installation of the new pump and discharge piping. Also, provide temporary pumping to contend with upstream flows. Flows shall be diverted to the closest upstream combined sewer manhole.
- E10.3 Provide flow control measures within the gate chamber excavation to contend with overland flows and groundwater within the shored excavation. Flow control measures shall include but are not limited to diversions, flumes and by-pass pumping. All dewatering shall occur within the shoring.
- E10.4 Provide a cofferdam just downstream of the work area as required to prevent river water from entering the excavation. The cofferdam shall be constructed in accordance with "Sandbag Dike Construction Instructions" as published by the Government of Manitoba Emergency Measures Organization. Cofferdams shall be constructed with 6 mil polyethylene sheeting to ensure watertightness. Maintain a 150mm (6") freeboard at all times. Downstream cofferdams shall not be constructed to more than one-half of the pipe diameter as to not restrict flows in the case of an emergency condition (e.g. watermain break).
- E10.5 Discharge hoses for by-pass pumping shall not be laid across vehicle or pedestrian traffic areas and must be protected from freezing during winter months. Pumping equipment if used shall be set-up in a location and in such a way to not be a noise problem for nearby residences.
- E10.6 Provide a flow control plan to the Contract Administrator for review prior to commencement of any demolition work.
- E10.7 In the event the river level becomes higher than the gate chamber activation level and the flow in the sewer system is expected to exceed the sewer capacity due to spring runoff, the Contract

Administrator may suspend Work activities that require temporary by-pass pumping. Suspension of these activities will continue until the high flow diminishes in the sewer.

E10.8 If in the opinion of the Contract Administrator suspension of Work activities that require temporary by-pass pumping cause a delay in completion of the Work through no fault of the Contractor, the completion date of the Work will be adjusted accordingly.

E10.9 Measurement and Payment

- (a) Flow Control shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

## **E11. SHOP DRAWINGS**

E11.1 Description

- (a) This Specification shall revise, amend and supplement the requirements of CW1110.
  - (i) The term 'shop drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, including site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the work.
  - (ii) The Contractor shall submit specified shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be on all submissions for Engineering review.
  - (iii) Provision of Shop Drawings will be considered incidental to the price for supply and delivery of equipment and materials.
- (b) Shop Drawings
  - (i) Original drawings are to be prepared by Contractor, Subcontractor, supplier, distributor, or manufacturer, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate sections.
  - (ii) Shop drawings for the following structural components shall bear the seal of a Professional Engineer registered to practice in the Province of Manitoba.
    - (a) Shoring;
    - (b) Reinforcing steel;
    - (c) Metal fabrications.
- (c) Contractor's Responsibilities
  - (i) Review shop drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.
  - (ii) Verify:
    - (i) Field Measurements
    - (ii) Field Construction criteria
    - (iii) Catalogue numbers and similar data
  - (iii) Coordinate each submission with requirements of Work and Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.
  - (iv) Notify Contract Administrator, in writing at time of submission, of deviations from requirements of Contract Documents.
  - (v) Responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review of submission, unless the Contract Administrator gives written acceptance of specified deviations.
  - (vi) Responsibility for errors and omissions in submission is not relieved by the Contract Administrator's review of submittals.

- (vii) The Contractor shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of Shop Drawings. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Contract Administrator on the previous submission.
  - (viii) After Contract Administrator's review and return of copies, distribute copies to subtrades as required.
  - (ix) Maintain one (1) complete set of reviewed shop drawings, filed by Specification Section Number, at the site of the work for use and reference of the Contract Administrator and Subcontractors.
- (d) Submission Requirements
- (i) Schedule submissions at least 7 Calendar days before dates reviewed submissions will be needed, and allow for a 7 Calendar day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
  - (ii) Submit five (5) paper prints of shop drawings. The Contractor is advised that the Contract Administrator will retain three (3) copies of all submittals and return two (2) copies to the Contractor.
  - (iii) Accompany submissions with transmittal letter, containing:
    - (i) Date
    - (ii) Project title and Bid Opportunity Number
    - (iii) Contractor's name and address
    - (iv) Number of each shop drawing, product data and sample submitted
    - (v) Specification Section, Title, Number and Clause
    - (vi) Drawing Number and Detail/ Section Number
    - (vii) Other pertinent data
  - (iv) Submission shall Include:
    - (i) Date and revision dates.
    - (ii) Project title and Bid Opportunity number.
    - (iii) Name of:
      - (i) Contractor
      - (ii) Subcontractor
      - (iii) supplier
      - (iv) manufacturer
      - (v) separate detailer when pertinent
    - (iv) Identification of product of material.
    - (v) Relation to adjacent structure or materials.
    - (vi) Field dimensions, clearly identified as such.
    - (vii) Specification section name, number and clause number or drawing number and detail/section number.
    - (viii) Applicable standards, such as CSA or CGSB numbers.
    - (ix) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents.
- (e) Other Considerations
- (i) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
  - (ii) Material and equipment delivered to the site of the works will not be paid for at least until pertinent shop drawings have been submitted and reviewed.
  - (iii) Incomplete shop drawing information will be considered as stipulated deductions or the purposes of progress payment certificates.

- (iv) No delay or cost claims will be allowed that arise because of delays in submission, re-submissions and review of shop drawings.

#### E11.2 Measurements and Payment

- (a) Preparation and submittal of Shop Drawings shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

### **E12. SITE DEVELOPMENT AND RESTORATION**

#### E12.1 Description

- (a) This Specification shall supplement the requirements of CW1130.
- (b) This Specification shall cover all aspects of the Site Development and Restoration Work, including:
  - (i) Erection, maintenance and removal of safety fencing;
  - (ii) Snow clearing;
  - (iii) Water/flow control;
  - (iv) General access development;
  - (v) Start-up costs;
  - (vi) Equipment setup and removal;
  - (vii) Office facilities;
  - (viii) Access maintenance; and
  - (ix) Site restoration.

#### E12.2 Materials

##### E12.2.1 Equipment

All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

#### E12.3 Construction Methods

##### E12.3.1 Site and Construction Access

The Contractor shall be responsible to develop suitable Site access. This includes but is not limited to, temporary bridging over structures, temporary removal and reinstallation of safety fencing, any landscaping and grading repairs, restoration of vegetation, etc. necessary to restore any Site and construction access area to their pre-existing condition.

##### E12.3.2 Site Security

At the end of each Work Day, all excavations and underground structure openings shall be secured to prevent access. Safety fence shall also be closed and secured to prevent public access.

##### E12.3.3 Environmental Regulations

- (a) The Contractor shall adhere to all relevant Federal and Provincial environmental regulations.
- (b) The Contractor shall plan to Work in accordance with the current environmental regulations of "Manitoba Stream Crossing Guidelines for Protection of Fish and Fish Habitat", Fisheries and Oceans, and Manitoba Natural Resources
- (c) The Contractor shall supply, in writing, prior to the commencement of Work on-Site to cleanup minor spills, should they occur. The Contractor shall supply the name, address and phone number of a local supplier, where additional kits are available on short notice.

#### E12.4 Staging Areas

- (a) During the Site Investigation outlined in B3.1, the Contract Administrator will identify staging areas within the Aubrey Street that are acceptable to the City for staging areas for materials and placement of a Site Trailer

#### E12.5 General Site Cleanup and Restoration

All areas of the construction Site shall be restored to a condition at least equivalent to its original condition prior to initiation of Work. This may include, but is not necessarily limited to the Contractor's lay down area, and removal of all temporary fencing.

#### E12.6 Permanent Surface Restorations

- (a) If required, permanently restore all existing surface areas disturbed by construction activities including but not limited to areas disturbed by; construction equipment, placement of equipment trailers and where construction materials were stockpiled, shall be restored as follows:
  - (i) Boulevards, ditches and grassed areas – sodding using imported topsoil in accordance with CW 3510.
  - (ii) Asphalt surfaces – match existing base course and asphalt thickness or a minimum of 150 millimetres of base course and 75 millimetres of Type 1A Asphaltic Concrete, whichever is greater, in accordance with CW 3410.
  - (iii) Miscellaneous concrete slabs, including sidewalk - in accordance with CW 3235
  - (iv) Interlocking stones – in accordance with CW 3330.
  - (v) Concrete curb and gutter – in accordance with CW 3240.

#### E12.7 Method of Measurement and Payment

- (a) Site Development and Restoration shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

### **E13. TRAFFIC MANAGEMENT**

#### E13.1 Further to clause 3.7 of CW 1130:

- E13.1.1 Maintain traffic open on Palmerston Avenue and Aubrey Street at all times during the Works.
- E13.1.2 No stockpiling of material will be permitted on the roadway.
- E13.1.3 Intersecting street and private approach access shall be maintained at all times.
- E13.1.4 Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he shall review the planned disruption with the residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.
- E13.1.5 Pedestrian access and ambulance/emergency vehicle access must be maintained at all times.
- E13.1.6 Pedestrian access shall be restricted by maintaining a security fence around the perimeter of the Work site.

#### E13.2 Payment

- (a) Traffic Management shall be considered incidental to the Works of this Contract and no separate payment will be made for this item.

#### **E14. PROTECTION OF EXISTING TREES**

- E14.1 The Contractor shall take the following precautionary steps to avoid damage from construction activities to any existing trees within the limits of the construction area.
- E14.1.1 Do not stockpile materials and soil or park vehicles and equipment within 2 metres of trees.
- E14.1.2 Strap mature tree trunks with 38 x 140 x 2400 wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.
- E14.1.3 Excavations shall be carried out in a manner to minimize damage to existing root systems. Where roots must be cut to facilitate an excavation they shall be neatly pruned at the face of the excavation.
- E14.1.4 Work on Site shall be carried out in a manner to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch.
- E14.1.5 American elm trees shall not be pruned between April 1st and August 1st and Siberian elm trees between April 1st and July 1st of any year under provisions of The Dutch Elm Disease Act.
- E14.2 All damage to existing trees due to construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Public Works Department and Forestry Branch at the Contractor's expense.
- E14.3 Payment
- (a) Protection of Existing Trees shall be considered incidental to the Works of this Contract and no separate payment will be made for this item.

#### **E15. PROTECTION OF EXISTING STRUCTURES**

- E15.1 The Contractor shall take all precautions to prevent damage to existing structures and adjacent property. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.
- E15.2 A third party representative of the Contractor having a minimum of three (3) years of residential inspection experience to the satisfaction of the Contract Administrator shall carry-out a pre-construction inspection of adjacent properties and structures to fully catalogue all existing conditions prior to the commencement of any Site construction activities. This inspection will serve as a baseline of existing conditions in the event of damage claims due to construction activities.
- E15.2.1 The pre-construction inspection shall include both interior and exterior inspections of the residential house immediately west side of the Work Site as identified by the Contract Administrator. The inspection shall document all existing conditions including:
- (a) Photographic and written documentation of all existing interior conditions of house along the east side of the structure, including drywall or plaster cracking, chipping or other existing damage observed. Measurements of existing damage shall be made, including length, width and depths as appropriate.
- (b) Photographic and written documentation of all existing exterior conditions along the east face of the structure. The inspector shall comment on any observed damage and take measurements as appropriate.
- (c) Photographic and written documentation of any visible existing foundation damage.
- E15.2.2 The City of Winnipeg will be responsible for distribution of a notification letter indicating that a representative of the Contractor is requesting access to the property for inspection.
- E15.2.3 The inspection shall be completed with the assistance of the property owner. Following completion of the inspection, the inspector shall review all inspection findings with the owner and have the owner sign and date the report.

- E15.2.4 The resulting inspection report, including all photographs shall be submitted to the Contract Administrator following completion. The property owner shall receive a duplicate copy of the inspection report.
- E15.2.5 Access to and inspection of private property shall be only by personnel having submitted a valid background check in accordance with Part F of these specifications and reviewed by the Contract Administrator.
- E15.3 The Contractor is advised that two (2) vibration monitors shall be installed by a testing contractor concurrently with any on site work associated with this Contract. These instruments shall be set up at two separate locations immediately adjacent to the Work Site.
- E15.3.1 The vibration monitor data will be reviewed at regular intervals throughout construction to ensure that construction-induced vibrations are kept below established threshold values to preclude aesthetic and structural damage to adjacent properties.
- E15.3.2 The City of Winnipeg will be responsible for distribution of a notification letter indicating that the Contractor is requesting access to the property for purposes of installation of a vibration monitor.
- E15.3.3 Access to private property shall be only by personnel having submitted a valid background check in accordance with Part F of this specification, to the satisfaction of the Contract Administrator.
- E15.4 Measurement and Payment
- (a) Pre-construction inspections shall be measured on a lump sum basis and paid for at the Contract Lump Sum Price for "Pre-Construction Inspections." Said price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.
  - (b) Allowance for vibration monitoring will be measured on a lump sum basis and paid for at the Contract Lump Sum price for "Vibration Monitoring Allowance." Said price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

## **E16. SUPPLY AND INSTALLATION OF TEMPORARY SHORING**

- E16.1 Description
- (a) This Specification shall cover shoring requirements for the Works related to the excavation and construction of the new Gate Chamber, as shown on the Drawings.
- E16.2 Construction Methods
- E16.2.1 Excavation
- (a) Remove excavated material from the site immediately. Excavated material shall not be stockpiled on-site unless it will be used as backfill the same day it is excavated.
  - (b) Stockpiling of excavated soils, if required, shall be placed at a safe distance away from the excavation to minimize the potential of excavation instability. A designated stockpile area should be identified on the contractor's construction plan and shall be submitted to Contract Administrator for approval prior to proceeding.
  - (c) Any groundwater seepage into the excavation shall be properly managed to protect the bearing surface from disturbance or loss of resistance. Groundwater seepage management may consist of sumps and pumps at the exterior of the bearing surface in the excavation.
  - (d) Place a minimum 75mm thick lean mix concrete slab in the bottom of the excavation to provide a clean working base upon completion of the excavation to the required limits. Allow the concrete to set for twenty-four (24) hours before setting up forms or placing reinforcing steel.

- (e) Lean mix concrete shall be well-tamped and screened to give a level working platform for setting up forms and placing reinforcing steel.
- (f) Supply and place lean mix concrete, as directed by the Contract Administrator, as backfill for any portions of the excavation, carried beyond the required limits of excavation. The limits of excavation shall be considered to be the inside face of the shoring system and the underside of the working base slab.
- (g) All working areas below grade shall be kept adequately and securely supported during and after excavation until the shoring and bracing is in place to prevent loss of ground or injury to any person from falling material.

#### E16.2.2 Excavation Depressurization

- (a) Construction of the outfall chamber will require the depressurization of the excavation area by a well system to control ground water levels and pressures and protect against excavation basal heave/blowout, piping, seepage and sloughing. Once required, the well system will be required to operate continuously during excavation, construction and backfill activities.
- (b) Prior to construction the Contractor shall submit a Groundwater Management Plan designed and sealed by a Professional Engineer or Professional Geologist registered to practice in the Province of Manitoba for review by the Contract Administrator including:
  - (i) An evaluation of static groundwater conditions and required drawdown elevations for successful completion of the Project excavations.
  - (ii) Permissible groundwater levels (pressures) at various stages of excavation and backfill to prevent uplift of soil layers and to prevent any other disturbance to the in-situ foundation soils due to any excess groundwater pressures.
  - (iii) Confirmation of the elevation to which the excavation may proceed before the well system commences operation.
  - (iv) Confirmation of the extent to which chamber construction and backfill must be completed before the well system can cease operation.
  - (v) Number of wells, including location, size, pumps and installation details.
  - (vi) Schedule of monitoring, maintenance, manpower estimates, and interpreting of groundwater levels throughout the duration of the Project.

#### E16.2.3 Excavation Security Fence

- (a) Further to Clause 3.1 of CW 1130, completely cover the excavation and provide a security fence to completely surround the excavation when unattended generally in accordance with the following.
- (b) Security fence shall be chain link fence or approved equal, a minimum 1.80 metres high with metal support posts embedded far enough into the ground and spaced close enough together so the fence will not sag or collapse.
- (c) Attach fencing securely to posts.
- (d) Secure the gate or end of the fencing to a post with chain and a padlock.
- (e) Provide alternate security fence proposal to Contract Administrator for approval.

#### E16.2.4 Shoring

- (a) The type, strength, and amount of shoring and bracing shall be such as the nature of the ground and attendance conditions may require, taking into account property lines, existing slopes, utilities, roadways and existing structures.
- (b) Shoring and bracing shall be so spaced and dimensioned as to prevent caving, loss of ground, surface settlement, or squeezing of the soil beyond the neat lines of excavation. It shall be free from defects that might impair its strength or suitability for the Work. Sheeting/shoring and bracing shall conform to the latest revisions of the "Construction Safety Act" of the Department of Labour of the Government of



Manitoba and in accordance with Province of Manitoba “W210 The Workplace Safety and Health Act” and “Guidelines for Excavation Work”.

- (c) Supporting design calculations as required to facilitate review of the submission for conformance with the Contract Documents.
- (d) Submit AutoCAD Shop Drawings and design calculations for the shoring/excavation system designed and sealed by a Professional Engineer registered or licensed to practice in the Province of Manitoba and experienced in the structural design of shoring systems. The designer of the shoring system shall inspect the system during construction and certify, in writing to the Contract Administrator, that construction is in conformance with the approved design.
- (e) Shoring and bracing shall be installed such that the structure size and wall thickness shown on the shop drawings can be obtained subsequent to installation of the shoring system.
- (f) Shoring and bracing shall be designed and installed to prevent settlement and damage to existing structures. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.
- (g) Shoring and bracing shall remain in place until concrete has attained 75% of the design strength.

#### E16.2.5 Monitoring Movement of Shoring

- (a) The Contractor shall submit to the Contract Administrator a plan for monitoring the movement of shoring during construction a minimum of two (2) Working Days prior to the installation of shoring. The monitoring plan shall be performed by approved survey methods for vertical or horizontal movement of the shoring, acceptable to the Contract Administrator. Costs for monitoring shall be incidental to the installation of the temporary shoring.

#### E16.3 Measurement and Payment

- (a) Shoring will be paid for at the Contract Lump Sum Price for “Temporary Shoring for Gate Chamber”. Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.
- (b) Excavation depressurization will be paid for at the Contract Lump Sum Price for “Temporary Depressurization for Gate Chamber”. Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

### **E17. REMOVAL OF EXISTING SLUICE GATE**

#### E17.1 Description of Work

- E17.1.1 This specification shall cover the removal, salvaging, and delivery of the existing sluice gate and associated accessories as outlined below, but should not be limited to this description. The Contractor shall be responsible for all labour, equipment, transportation, and associated costs.
  - (a) Carefully remove the existing sluice gate along with mechanical lift operator and stem from the existing Aubrey Outfall Chamber
  - (b) Transport and deliver the removed sluice gate, mechanical lift operator and stem, and associated accessories to City of Winnipeg’s Water Services Division shop located at 598 Plinguet Street.
  - (c) Necessary precautions shall be taken to minimize damage to the sluice gate, mechanical lift operator and stem and associated accessories.

E17.2 The Contractor shall not remove the existing sluice gate, mechanical lift operator or stem until the new flap and sluice gates are operational and tested in accordance with E22.3.2 and E23.3.2

E17.3 Measurement and Payment

- (a) Removal of Existing Sluice Gate will be paid for at the Contract Lump Sum Price for "Removal of Existing Sluice Gate". Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

**E18. CAST-IN-PLACE CONCRETE GATE CHAMBER CONSTRUCTION**

E18.1 Description

E18.1.1 This specification will cover construction of cast-in-place concrete gate chamber and shall supplement, revise and amend CW 2160.

E18.2 Materials

- (a) Concrete Mix Design

The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this Specification. Concrete shall be supplied in accordance with the requirements of CSA A23.1-14, with the minimum properties as provided below:

(i) Cast-In-Place Concrete Gate Chamber Construction

Class of Exposure	S-1
Maximum Size of Aggregate	20 mm
Cement Type	Type HS
Maximum Water/Cementing Materials Ratio	0.40
Compressive Strength at 7 Days	20 MPa
Compressive Strength at 28 Days	35 MPa
Slump/Flow	80 mm +/- 20 mm
Air Content	5.0% to 8.0%

(ii) Lean Mix Concrete

Cement Type	Type HS
Maximum Water/Cementing Materials Ratio	0.49
Compressive Strength at 28 Days	15 MPa
Slump/Flow	80 mm
Air Content	nil

- (b) Provide a "Mix Design Statement" for each type of concrete to be used certifying constituent materials and mixing proportions to the Contract Administrator at least 2 weeks prior to delivery of Concrete to the Site. Supply reasonable evidence to the Contract Administrator that the mix proportions selected will produce concrete meeting the specified strength, workability and yield.
- (c) Admixtures

- (i) All admixtures shall be compatible.
  - (ii) Air entraining agent shall meet ASTM C260.
  - (iii) Chemical water reducing admixtures shall meet ASTM C494.
- (d) Grout
  - (i) Grout shall be Sika Grout 212 SR or approved equivalent in accordance with B7.
- (e) Reinforcing Steel
  - (i) Bar accessories:
    - To be made of a non-corroding material
    - Shall not stain, blemish or spall the concrete surface for the life of the concrete
    - Shall be approved by the Contract Administrator
    - Bar chairs shall be PVC.
- (f) Bonding Agent shall be Sika Latex R or approved equivalent in accordance with B7.
- (g) Waterproofing
  - (i) Waterproofing shall be in accordance with E27 of this specification.
- (h) Waterstop
  - (i) Waterstop shall be 150 mm wide by 10 mm thick vinyles ribbed-center bulb or approved equal in accordance with B7.
- (i) Cast Iron Sluice Gates
  - (i) Cast iron sluice gates, wall thimbles, mechanical lift operator, stems, wall brackets and accessories shall be in accordance with E22 of this specification.
- (j) Cast Iron Flap Gates
  - (i) Cast iron flap gates and wall thimbles shall be in accordance with E23 of this specification.
- (k) Miscellaneous Metals and Accessories
  - (i) In accordance with E20 of this specification and as shown on the Drawings.
- (l) Shop Drawings:
  - (i) Provide shop drawings in accordance with E11 of this specification.
  - (ii) Submit shop drawings for reinforcing steel a minimum of two (2) weeks prior to the fabrication of any reinforcing steel.
- (m) Backfill
  - (i) In accordance with CW 2030. Class of backfill to be as shown on the Drawings.

### E18.3 Construction Methods

#### E18.3.1 Construction Method Submission

- (a) No Work shall commence on construction of cast-in-place concrete chamber until after the Contract Administrator's review of the Contractor's Construction Method submission.
- (b) Excavation for the construction of the gate chambers shall be by the shored excavation method.
- (c) The Contractor shall prepare for the Contract Administrators review a Construction Method submission detailing:
  - (i) Construction sequence to be followed including all methods to be employed.
  - (ii) Shoring system to be used.

- (iii) Proposed method of chamber construction.
- (iv) Specialized equipment to be used.
- (v) Any design revisions proposed to accommodate the Contractor's proposed construction method.
- (vi) Water control consideration including details on the Contractor's proposed method of groundwater and surface runoff control.

- (d) The Contractor shall respond to any concerns that may be raised by the Contract Administrator after review of Construction Method submission.

#### E18.3.2 Cast-in-place Concrete Gate Chamber Construction

- (a) Construct cast in place concrete gate chamber in accordance with CW 2160, except as supplemented, revised or amended in this specification and as indicated in the construction notes on the Drawings.
- (b) Adjust the location of reinforcing steel adjacent to openings to frame those openings in accordance with good practice, and maintain the bar spacing intent.
- (c) Do not use welded splices for reinforcing steel.
- (d) Order all wall reinforcement steel in lengths to best suit the spacing of walers so that reinforcing bars will not be bent or misformed in order to remove the walers
- (e) Install foundation waterproofing in accordance with E27 of this Specification.
- (f) The Contractor shall note that existing formwork may be present around the existing gate chamber and will have to be removed prior to placement of the gate chamber at the Contractor's expense.

#### E18.3.3 Backfill

- (a) Place and compact backfill material as indicated in the drawings and in accordance with CW 2030.
- (b) Do not place backfill material on frozen ground.
- (c) Do not place backfill material in a frozen state.
- (d) Supply heating and hoarding in accordance with CW 2160 if required to ensure material does not freeze before compaction is complete.
- (e) Notify the Contract Administrator at least one (1) full Working Day in advance of any backfilling operation. No Backfill shall be placed against concrete until approved by the Contract Administrator and in no case before field cured test cylinders show the concrete strength to be 75% of that specified.

#### E18.3.4 Grout

- (a) Mix and apply grout in accordance with the manufacturer's instructions. Consistency is to be suitable for the intended application

#### E18.3.5 Sluice Gate Installation

- (a) Install sluice gates, wall thimbles, mechanical lift operator, stem and accessories as shown on the Drawings and in accordance with E22 of this specification
- (b) Sluice gates shall be left in the open position at all times except when on site working on the gate.

#### E18.3.6 Flap Gate Installation

- (a) Install flap gates, wall thimbles, mechanical lift operator, stem and accessories as shown on the Drawings and in accordance with E23 of this specification.

#### E18.3.7 Miscellaneous Metal Fabrications

- (a) Install miscellaneous metal fabrications as shown on the Drawings and in accordance with E20 of this specification.

E18.3.8 Fibreglass Work Platform Installation

- (a) Install mid-level fibreglass work platform with all appurtenances in existing chamber as shown on the Drawings.

E18.3.9 Measurement and Payment

- (a) Construction of the cast-in-place concrete gate chamber will be paid for at the Contract Lump Sum Price for "Cast-In-Place Concrete Gate Chamber Construction." Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification.

**E19. COLD WEATHER REQUIREMENTS**

E19.1 Should any concrete Work be required to be carried out when the daily mean temperature is below 5°C or anticipated to be below 5°C within the next 24 hours, cold weather requirements will be specified herein.

E19.2 All freshly placed concrete shall be protected from the elements and from defacements due to construction operations.

E19.3 The following are minimum requirements for protecting concrete during and after placement during freezing weather, but mere adherence to these requirements will not relieve the Contractor of the necessity for producing concrete which has not been weakened or injured by frost or freezing, or replacing such damaged Work at no additional cost to the City;

- (a) Before any concrete is placed, all ice, snow, and frost shall be completely removed from all formwork, and other surfaces against which concrete temperatures of such surfaces raised above 7°C for twenty-four (24) hours minimum prior to concreting. Where concrete Work is to come in contact with the earth, the surface of the earth shall be completely free of frost when concrete is placed thereon.
- (b) Concrete aggregates shall be heated to not over 80°C. Concrete shall be not less than 20°C or more than 30°C in temperature when deposited. Concrete when placed during freezing weather, or if freezing is anticipated during curing period, shall be fully enclosed and the temperature of same maintained at not less than 20°C for five (5) days nor less than 5°C for an additional five (5) days.
- (c) Heating enclosures shall be strong and wind-proof, well ventilated with heating units so located as to prevent local overheating or drying of the concrete or damage from combustion gases. Only indirect fired heaters will be accepted. Units must be vented outside the enclosure. No direct fired units will be accepted.
- (d) The Contractor shall inform the Contract Administrator well in advance as to the methods of enclosure and frost protection he proposes to employ.

E19.4 Measurement and Payment

- (a) Cold weather requirements shall be considered incidental to the Contract Lump Sum Price for "Cast-In-Place Concrete Gate Chamber Construction" and no separate payment will be made for this item.

**E20. MISCELLANEOUS METAL FABRICATIONS**

E20.1 Description

E20.1.1 General

- (a) This Specification shall cover the supply, fabrication, transportation, handling, delivery and placement of metal fabrications.

E20.2 Materials

- (a) All materials shall be of a type acceptable to the Contract Administrator, and shall be subject to inspection and testing by the Contractor Administrator.

- (b) Material intended for use in the various assemblies shall be new, straight, clean, with sharply defined profiles.
- (c) Steel Sections and Plates: to CAN/CSA G40.20/G40.21, Grade 300 W, except W, HP and HSS sections, which shall be Grade 350 W.
- (d) Stainless Steel Sections: to ASTM A276/A276M-17 type 304 or 304L. Stainless Steel Plates: to ASTM A240/A240M-17 type 304 or 304L.
- (e) Steel Pipe: to ASTM A53/A53M, seamless, galvanized, as specified by item.
- (f) Welding materials: to CSA W59.
- (g) Hot dipped galvanized steel repair material: Galvalloy and Gal-Viz
- (h) Stud Anchors: to ASTM A108, Grade 1020.
- (i) Aluminum: to CAN/CSA S157 and the Aluminum Association 'Specifications for Aluminum Structures'. Aluminum for plates shall be Type 6061-T651. Aluminum plate shall have an approved raised oval or multi-grip pattern.
- (j) Isolating sleeves shall be "Nylite" – headed sleeve as manufactured by SPAE-Naur of Kitchener, Ontario, or approved equal in accordance with B7.
- (k) Anchor bolts and fasteners: ASTM A276, Type 316 stainless steel, of ample section to safely withstand the forces created by operation of the equipment or the load to which they will be subjected.
- (l) Paint: Amerlock 2 epoxy or approved equivalent in accordance with B7; Colour: neutral black.
- (m) Fibreglass Grating and accessories: NG 2" Deep Molded Grating as manufactured by National Grating, or approved equal in accordance with B7.

### E20.3 Construction Methods

#### E20.3.1 Submittals

- (a) Submit the qualifications of the fabricator and welders to the Contractor Administrator for acceptance.
- (b) Submit shop drawings in accordance with E11 clearly indicating materials, core thickness, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and, accessories. Indicate field measurements on shop drawings.

#### E20.3.2 Fabrication

- (a) Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured. Assemble work in such a way that no disfigurements will show in the finished work, or impair the strength.
- (b) Confirm measurements for all fabrications before fabricating.
- (c) Cut aluminum plate with edges straight and true, and as far as practical, maintain continuity of the pattern at abutting edges.
- (d) Pieces shall be of the sizes indicated on the Drawings and shall not be built up from scrap pieces. Confirm sizes with field measurements.
- (e) Where possible, fit work and shop assemble, ready for erection.
- (f) Angle frames shall be of the same material as the cover plate, and cover plates shall be hinged and be supplied with lifting handles, as shown on the Drawings. Exterior covers shall be supplied with a hasp for a padlock.
- (g) Remove and grind smooth burrs, filings, sharp protrusions, and projections from metal fabrications to prevent possible injury. Correct any dangerous or potentially harmful installations as directed by Contract Administrator.

- (h) All steel welding shall conform to CSA Standard W.59. Fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with CSA Standard W.47.1. Welding shall be done by currently licensed welders only.
- (i) All aluminum welding shall conform to Welding shall be in accordance with the requirements of CSA W59.2. The fabricator shall be fully certified in conformance with CSA Standard W47.2. All welding shall be done in a licensed welding shop, and no field welding will be permitted unless approved in writing, in advance, by the Contract Administrator.
- (j) Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- (k) All steel shall be hot-dip galvanizing after fabrication, in accordance with CAN/CSA-G164, to a minimum net retention of 600 gm/m<sup>2</sup>.
- (l) Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1.
- (m) Use self-tapping shake-proof flat-headed screws on items requiring assembly by screws.

#### E20.3.3 Coating

- (a) Surface prepare steel fabrications requiring epoxy coating to SSPC SP6 (Commercial Blast).
- (b) Apply two coats of Amerlock 2 Epoxy paint, 150 µm per coat dry film thickness. Colour: Neutral Black.
- (c) Recoating and curing times shall be as per coating manufacturers recommendations.

#### E20.3.4 Erection

- (a) Do steel welding work in accordance with CSA W59 and aluminum welding work in accordance with CSA W59.2
- (b) Erect metalwork in accordance with reviewed shop drawings, square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- (c) Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles where not specifically indicated on the Drawings.
- (d) Provide components for building in accordance with shop drawings and schedule.
- (e) Make field connections with bolts to CAN/CSA-S16, or weld.
- (f) Touch-up rivets, bolts and burnt or scratched surfaces that are to receive paint finish, with zinc primer after completion of erection.
- (g) Repair damaged galvanized surfaces and field welds with self-fluxing, low temperature, zinc-based alloy rods in accordance with ASTM A780, Repair of Damaged Hot Dip Galvanizing Coatings. The general procedure shall be to allow a small amount of the repair alloy to flow then spread by brushing briskly with a wire brush. Brushing shall be sufficient to obtain a bright finish. Repeat process three times to ensure a proper thickness is achieved. Temperatures shall be kept below 177°C (350°F) at all times. All heating of structural steelwork shall be done in the presence of the Contract Administrator.
- (h) Install access hatch frames square and level at the locations show on the Drawings. Embed anchors in concrete as shown on the Drawings. Install covers and adjust hardware to proper function.
- (i) All aluminum surfaces in contact with concrete shall be isolated using alkali-resistant bituminous paint meeting the requirements of CGSB 31-GP-3M.
- (j) Install electrochemical isolation gaskets and sleeves to electrically isolate dissimilar metals.

#### E20.4 Measurement and Payment

- (a) Supply, fabrication, transportation, handling, delivery and placement of metal fabrications will be paid for at the Contract Lump Sum Price for "Supply and Installation of Miscellaneous Metals." Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification.

### **E21. SUPPLY AND INSTALLATION OF DISCHARGE PIPING**

#### E21.1 Description

- (a) This specification shall cover the supply and installation of 200 mm discharge piping from the existing Aubrey Outfall Gate Chamber the 600 mm sewer main at Aubrey Street.
- (b) The installation shall be trenchless installation complete with Class B sand bedding and Class 3 backfill.

#### E21.2 Materials

Quantities of the materials listed below are an approximation only and should not be considered by the Contractor to be the actual quantities required for this work. Actual quantity may vary depending on site condition, and it is the Contractor's responsibility to obtain these quantities.

- (a) 200 mm diameter AWWA C900 PVC discharge pipe of 20 m length, including all necessary 200 mm diameter flexible adapter couplings, 200 mm diameter CI 45° standard radius elbows, and any other required fixtures.
- (b) One 200 DI swing check valve with removable inspection cover, backflow actuator, mechanical indicator, and manufacturer's nameplate attached to valve body with stainless steel fasteners.
- (c) One 150 DI solid wedge gate valve with bronze trim, flanged ends, non-rising stem, and adjustable cast iron valve box with cast iron hinged lid (marked "S" on top).
- (d) One 200 mm diameter C900 PVC Saddle.
- (e) Two Stainless Steel Bands.
- (f) Thrust blocks and joint restraints as shown on the drawing.

#### E21.3 Construction Methods

- (a) Installation of buried discharge piping to the 600 mm sewer main at Aubrey Street shall be in accordance with CW 2130.

#### E21.4 Measurement and Payment

- (a) Supply and Installation of Discharge Piping will be paid for at the Contract Lump Sum Price for "Supply and Installation of Discharge Piping (Trenchless Installation, Class B Sand Bedding, Class 3 Backfill)". Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification.

### **E22. INSTALLATION AND FIELD TESTING OF CAST IRON SLUICE GATE**

#### E22.1 Description

- (a) This Specification shall cover the pick-up, loading, installation and testing of the cast iron sluice gate, wall thimble, an electric-actuated mechanical lift operator, stems, wall brackets and all associated accessories.
- (b) The City of Winnipeg has procured these items under a separate Tender: Bid Opportunity No. 485-2016. The Contractor will be responsible for picking up these materials and transporting them to site. Materials will be stored at the City of Winnipeg's Water Services Division shop located at 598 Plinguet Street. The Contract Administrator will notify the Contractor upon arrival of the equipment.



- (c) The Contractor shall be solely responsible for all transportation, labour, and equipment to collect the cast iron sluice gate, wall thimble, mechanical lift operator, stem, wall brackets and accessories after being notified by the Contract Administrator of their availability.
- (d) The Contractor shall verify and confirm that the correct type and quantities of the cast iron sluice gate, wall thimble, mechanical lift operator, stem, wall brackets and accessories have been received. In addition, the Contractor shall verify that the cast iron sluice gate, wall thimble, mechanical lift operator, stem, wall brackets and accessories are free of any visible damage or defects. The Contractor shall inform the Contract Administrator of any visible damage or defects within 24 hours of receipt of the components.
- (e) The Contractor shall be solely responsible for the cast iron sluice gate, wall thimble, mechanical lift operator, stem, wall brackets and accessories in his possession from the time of receipt.

## E22.2 Materials

- (a) Frame, Slide, guides and yoke ASTM A48 Cast Iron, (Class 30) or ASTM A126  
Cast Iron (Class B)
- (b) Seating Faces ASTM B21 Naval Bronze, Alloy 482 or ASTM  
B98, Alloy 655
- (c) Wall Thimble ASTM A48 Cast Iron (Class 30) or ASTM A126  
Cast Iron (Class B)
- (d) Wedges ASTM B564 Manganese Bronze, Alloy 865
- (e) Wedge Blocks ASTM A48 Cast Iron (Class 30) or ASTM A126  
Cast Iron (Class B)
- (f) Fasteners & Anchors ASTM A276 Type 316 Stainless Steel
- (g) Hardware ASTM F593 Type 316 Stainless Steel
- (h) Stem ASTM A276 Type 304 Stainless Steel
- (i) Stem Couplings ASTM A276 Type 304 Stainless Steel or ASTM  
B584 Bronze, Alloy 873
- (j) Stem Guide ASTM A48 Cast iron (Class 30) or ASTM A126  
Cast Iron (Class B) with Bronze bushings
- (k) Operator Pedestal ASTM A48 Cast Iron (Class 30) or ASTM A126  
Cast Iron (Class B) or Steel
- (l) Stem cover Aluminium or galvanized steel

## E22.3 Construction Methods

### E22.3.1 Installation

- (a) Install the cast iron sluice gate, wall thimble, mechanical lift operator, stem, wall brackets and accessories as shown on the drawings and in accordance with the manufacturer's recommendations.
- (b) The Contractor will not be allowed to form a block-out in the wall for the installation of the wall thimble. The wall thimble shall be set in place prior to constructing any portion of the wall.
- (c) The Contract Administrator will coordinate to have the field representative of the sluice gate supplier/manufacturer to inspect the installation during and after completion and provide a Certificate of Satisfactory Installation.
- (d) Connection for electrical power for electric sluice gate actuator by Manitoba Hydro.

### E22.3.2 Field Testing

- (a) Perform leakage tests in the Contract Administrator's presence once sluice gate has been installed to ensure compliance with the allowable leakage rate indicated in the latest edition of AWWA C501. The gate supplier under the bid opportunity 485-2016 shall be responsible for the compliance requirements.
- (b) The Contract Administrator will arrange to have a field representative of the sluice gate supplier/manufacturer to be present during field testing.
- (c) Generally, the test for seating head will be performed by closing the gate against high river levels in the spring and measuring the leakage rate through the gate.
- (d) If it is not possible to use high river level, install an inflatable plug in the outfall, fill the chamber with water to the specified head and measure the leakage rate through the gate. Inflatable plug shall be inflated from, anchored to and removable from the ground surface.
- (e) The leakage test for the flap and sluice gate will be performed concurrently by closing the sluice gate and filling the flap gate chamber to the specified sluice gate unseating head. The leakage rate will be assessed by measuring the combined leakage rate through both the sluice gate and flap gate. Visual assessments of leakage will be obtained on either side of the control gates.
- (f) Water used for testing purposes must be chlorine free. Potable drinking water shall be dechlorinated if used for testing purposes.
- (g) The Contractor will be responsible to pump water from the Assiniboine River or supply potable water from a delivery truck or hydrant into the chamber for testing purposes.
- (h) If a gate fails the field leakage test, the Contract Administrator will direct the sluice gate supplier/manufacturer's field representative to undertake adjustments, replacements or other modifications and the Contractor shall repeat the test. The sequence shall be repeated until the gate passes no more than the allowable leakage rate.

#### E22.4 Measurement and Payment

- (a) Installation and testing of the cast iron sluice gate, wall thimble, electric-actuated mechanical lift operator, stem, wall brackets and accessories will be paid for at the Contract Lump Sum price for "Installation and Field Testing of Cast Iron Sluice Gate (Supplied by City of Winnipeg)".
  - (i) 85% of the Installation and Field Testing of Cast Iron Sluice Gate (Supplied by City of Winnipeg) will be paid upon installation.
  - (ii) The remaining 15% of the Installation and Field Testing of Cast Iron Sluice Gate (Supplied by City of Winnipeg) will be paid upon completion of successful field testing of the sluice gate and acceptable to the Contract Administrator..

### **E23. INSTALLATION AND FIELD TESTING OF CAST IRON FLAP GATE**

#### E23.1 Description

- (a) This Specification shall cover the pick-up, load, installation and testing of the cast iron flap gate, wall thimble and accessories.
- (b) The City of Winnipeg has procured these items under a separate Tender: Bid Opportunity No. 485-2016. The Contractor will be responsible for picking up these materials and transporting them to site. Materials will be stored at the City of Winnipeg's Water Services Division shop located at 598 Plinguet Street.
- (c) The Contractor shall be solely responsible for all transportation, labour, and equipment to collect the cast iron flap gate, wall thimble and accessories after being notified by the Contract Administrator of their availability.
- (d) The Contractor shall verify and confirm that the correct type and quantities of the cast iron flap gate, wall thimble and accessories have been received. In addition, the Contractor shall verify that the cast iron flap gate, wall thimble and accessories are free of any visible

damage or defects. The Contractor shall inform the Contract Administrator of any visible damage or defects within 24 hours of receipt of the components.

- (e) The Contractor shall be solely responsible for the cast iron flap gate, wall thimble, and accessories in his possession from the time of receipt.

#### E23.2 Materials

- (a) Cast Iron pieces: ASTM A48 Cast Iron, (Class 30) or ASTM A126  
Cast Iron (Class B)
- (b) Seating Faces: ASTM B21 Bronze, Alloy 482
- (c) Links: Cast iron or high tensile Bronze B584 – C865
- (d) Bushings: Bronze B21, Alloy 482
- (e) Hinge Pins: ASTM A276, Type 316 stainless steel or silicon Bronze  
B98 CA655
- (f) Fasteners: ASTM A276, Type 316 stainless steel
- (g) Grease Nipples: Stainless Steel

#### E23.3 Construction Methods

##### E23.3.1 Installation

- (a) Install the cast iron flap gate and wall thimble as shown on the drawings and in accordance with the manufacturer's recommendations.
- (b) The Contractor will not be allowed to form a block-out in the wall for the installation of the wall thimble. The wall thimble shall be set in place prior to constructing any portion of the wall.
- (c) The Contract Administrator will coordinate to have the field representative of the flap gate supplier/manufacturer to inspect the installation during and after completion and provide a Certificate of Satisfactory Installation.

##### E23.3.2 Field Testing

- (a) Perform leakage tests in the Contract Administrator's presence once flap gate has been installed to ensure compliance with the allowable leakage rate of 1.24L/min per meter of seated perimeter at any head. The gate supplier under the bid opportunity 485-2016 shall be responsible for the compliance requirements.
- (b) The Contract Administrator will arrange to have a field representative of the flap gate supplier/manufacturer to be present during field testing.
- (c) The test for seating head will be performed by closing the flap gate and sluice gate, filling the chamber between the gates with water to the specified head and measuring the leakage rate through the gates.
- (d) Water used for testing purposes must be chlorine free. Potable drinking water shall be dechlorinated if used for testing purposes.
- (e) The Contractor will be responsible to pump river water or supply water from a delivery truck or hydrant into the chamber for testing purposes.
- (f) If the gate fails the field leakage test, the Contract Administrator will direct the flap gate supplier/manufacturer's field representative to undertake adjustments, replacements or other modifications and the Contractor shall repeat the test. The sequence shall be repeated until the gate passes no more than the allowable leakage rate.

#### E23.4 Measurement and Payment

- (a) Installation and testing of the cast iron flap gate and associated wall thimble will be paid for at the Contract Lump Sum price for "Installation and Field Testing of Cast Iron Flap Gate (Supplied by City of Winnipeg)".

- (b) 85% of the Installation and Field Testing of Cast Iron Flap Gate (Supplied by City of Winnipeg) will be paid upon installation.
- (c) The remaining 15% of the Installation and Field Testing of Cast Iron Flap Gate (Supplied by City of Winnipeg) will be paid upon completion of successful field testing of the flap gate and acceptable to the Contract Administrator.

## **E24. GROUNDWATER MANAGEMENT PLAN**

- E24.1 Provide the Contract Administrator with a groundwater management plan at least five (5) Business Days prior to commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract. The Groundwater Management Plan shall address the requirements for bedrock groundwater depressurization, including:
- (a) The supply, installation and testing of pumping wells,
  - (b) The supply, installation and testing of monitoring wells (if necessary),
  - (c) The supply, installation, testing and commissioning of a bedrock groundwater depressurization pumping system,
  - (d) Bedrock groundwater depressurization system operation,
  - (e) Bedrock groundwater depressurization system decommissioning, and
  - (f) Well decommissioning.
- E24.2 The Groundwater Management Plan shall be prepared and submitted in a format that clearly identifies how the Contractor will undertake bedrock groundwater control activities at the Site during construction.
- E24.3 The Groundwater Management Plan shall include provisions for drawing down the bedrock and till groundwater pressures sufficient to lower the pressure in these zones a minimum of 1 meter below the base of the excavation. This will require the use of pumping and monitoring wells. The Groundwater Management Plan shall be further updated or altered as dictated by Site conditions. The Groundwater Management Plan shall remain in effect until all construction and backfill activities are completed.
- E24.4 Construction Methods

### **GENERAL**

- E24.4.1 The City of Winnipeg will obtain the permit(s) required for groundwater withdrawal and discharge to the city drainage system. Comply with the terms and conditions associated with these permits.
- E24.4.2 The Contractor shall provide access to the wells and groundwater depressurization system, including access for drill rigs and service vehicles.
- E24.4.3 The Contractor shall operate the full groundwater depressurization system continuously for at least 48 hours before initiation of excavation in the affected areas. Increase this duration as required based on monitoring of field groundwater conditions to confirm the groundwater depressurization objective has been achieved before excavation starts.
- E24.4.4 The Contractor is advised that the Contract Administrator will oversee the installation, operation, monitoring, and decommissioning of the groundwater depressurization system and all associated works.
- E24.4.5 Maintain all pumping and monitoring wells within the construction area for the duration of the Work. Repair or replace any well damaged during the course of the Work.
- E24.4.6 Be responsible for damage to any groundwater depressurization or monitoring system components during construction activities. Repair or replace damaged components to the satisfaction of the Contract Administrator.

## E24.5 Pumping Well Installation and Testing

- E24.5.1 The work includes the furnishing of all labour, materials, supplies, equipment, tools, transportation and appurtenances necessary to complete the satisfactory drilling, casing construction, disinfection, logging, development, pumping tests and submittals of logs and test results for bedrock pumping wells.
- E24.5.2 Previous test work at the Aubrey site has indicated that the transmissivity of the aquifer at that location is on the order of  $4.5 \times 10^{-3} \text{ m}^2/\text{s}$  (24,440 lgpd/ft, +/-). Based on that estimate of transmissivity, sufficient bedrock groundwater depressurization can likely be achieved by pumping groundwater at rates on the order of 31.5 Lps (400 lgpd). The actual transmissivity of the aquifer and the associated flow rates required to achieve the required bedrock groundwater depressurization will need to be confirmed during the installation and testing of the pumping wells. The number and size of pumping wells needed to achieve the required depressurization, as well as monitoring wells if required to monitor and confirm the effectiveness of the depressurize system adjacent to the excavation will be determined by the Contractor.
- E24.5.3 The location of the pumping wells will be determined by the Contractor in consultation with the Contract Administrator. The pumping wells are to be placed as close as practical to the excavation without adversely affecting access to the excavation and construction operations. The minimum setback from the excavation limits will be 3 meters. The maximum setback from the excavation limits will be 30 meters, or as approved by the Contract Administrator. For a two well pumping system, the wells are to be placed on opposite sides of the excavation. For a four well pumping system, the wells are to be placed one each on the four sides. Setback from the edge of the excavation will be determined by the Contractor in consultation with the Contract Administrator and the proposed construction methodology, including shoring locations, equipment and material access and egress requirements.
- E24.5.4 The following is a summary of the work to be completed for each pumping well required:
- a) Drill borehole to the top portion of the bedrock and set casing into competent bedrock. The casing is to be grouted in place with cement, placed with a tremie line, to surface. Pneumatic grout pumps shall be used to pump the grout from bottom to top.
  - b) Drill open hole in bedrock to a depth as determined appropriate by the Contractor.
  - c) Develop the well to remove cuttings and fine sediment using airlift pumping, surge blocks and jetting as required to remove the particulate and produce a well that pumps free and clear of sediment.
  - d) Perform an 8 hour pumping and recovery test on each pumping well following completion. Water levels in the pumping well are to be measured during the test using a depth sounder. Flow rates are to be checked regularly. Provide the Contract Administrator with the results of the pumping test. Recovery is to be recorded until 80% recovery has been achieved.
- E24.5.5 Existing Stratigraphy – See geotechnical and hydrogeologic logs in Appendix A for details of the stratigraphy. In general, there is clay and glacial till overburden to a depth below grade of approximately 12.2 meters (40 feet) below grade followed by limestone carbonate bedrock.
- E24.5.6 Water For Well Drilling – Make arrangements to obtain fresh clean water and transport to site.
- E24.5.7 Definitions
- a) Cement Grout – Mixture of high sulfate Portland cement (Type 50) and water mixed at a ratio of one 40 kg bag of cement to 20 litres of fresh clean water. Do not add any aggregate or stone.

- b) Tremie Pipe – A small diameter placed inside the well annulus through which grout is piped down and used to carry grout to the bottom of the well annulus and to eliminate air pockets. Tremie pipes prevent bridging of materials and diluting of liquid grouts.
- c) Drilling Mud – A suspension of finely divided heavy material, such as bentonite and barite, pumped through the drill pipe during rotary drilling to seal off porous zones and flush out cuttings, and to lubricate and cool the bit. Drilling fluids must be mixed thick (viscous) enough to bring cuttings up from the bottom of the hole to the surface, yet not so viscous as to prevent their settling out in the mud pits.

#### E24.5.8 Quality Assurance

- a) Contractor shall have been engaged in the business of test pumping, construction of test holes and wells of diameter, depth, and production equivalent to the proposed pumping wells for a period of at least ten (10) years. Well driller on site to have at least 10 years experience.
- b) Be thoroughly familiar with governing regulations having jurisdiction on this project. The driller shall be a licensed Water Well Driller by the Province of Manitoba.
- c) Use qualified workmen who are fully familiar with this work and perform all work under the direct supervision of an experienced well driller with a minimum of 10 years experience.

#### E24.6 Monitoring Well Installation and Testing (if Required)

- E24.6.1 The requirement for additional monitoring wells will be at the discretion of the Contractor to confirm that depressurization has been achieved according to the minimum requirements of paragraph E24.3 to allow for a safe excavation.
- E24.6.2 The work includes the furnishing of all labour, materials, supplies, equipment, tools, transportation and appurtenances necessary to complete the satisfactory drilling, soil cuttings removal, backfilling or grouting, casing construction, logging, development, monitoring of pumping tests and submittals of logs
- E24.6.3 Monitoring wells may consist of vibrating wire (VW) piezometers to monitor the groundwater pressures in low permeable soils (i.e. clay, silt, etc), or an opened PVC standpipe (i.e. 50mm dia. PVC) with the slotted section for high permeability soils (i.e. sand, till, fractured bedrock, etc). VW tips and / or standpipe slotted sections should to be buried in the soil zone of interest.
- E24.6.4 Details of the monitoring well installation and backfilling shall be submitted to Contract Administrator for review and approval prior to installation.
- E24.6.5 The location of the monitoring wells shall be determined by the Contractor in consultation with the Contract Administrator. The monitoring wells are to be placed as close as practical to the excavation without adversely affecting access to the excavation and construction operations.
- E24.6.6 Backfilling / grouting details for the monitoring wells shall be determined by the Contractor in consultation with the Contract Administrator.

#### E24.7 Groundwater Depressurization System Installation

- E24.7.1 Supply and install pumps, drop pipes, well head connections, valves and flow meters as required to meet manufactures specifications and to provide a fully functioning system. Verify the design and sizing of the pumps including power supply requirements, drop piping and other appurtenances to be used within the overall groundwater depressurization system. The combined pumping flow rate required is anticipated to be in the 31.5 Lps (400 lgpm, +/-) range. The actual combined total pump flow rate requirement and the individual well flow requirement will be determined by the Contractor following the installation and testing of the pumping wells.
- E24.7.2 Supply and install all appurtenances related to electrical components, including but not limited to transformers, wiring, electrical disconnect and motor starter, to meet the

enclosures. Configure the electrical system to allow pumps to be operated concurrently or independently as required.

E24.7.3 Provide a back-up power supply complete with automatic transfer switch to engage back-up power in the event of a failure of the primary power supply. Back-up power supply to be rated to supply sufficient power to operate all pumps. As part of the system performance verification testing, the contractor will be required to demonstrate that the back-up power supply will automatically engage and operation of the pumps will resume.

E24.7.4 Install discharge hoses from the well heads to the point of discharge. Direct discharge directly to an approved land drainage system manhole. If pumping is conducted in winter conditions, protect the discharge lines from freezing. Lay discharge hoses so as not to interfere with access or activities at the site, or provide suitable crossing structures to maintain access. Be responsible for all site preparation at the end of each discharge pipe.

E24.7.5 Undertake groundwater depressurization system performance verification testing and monitoring following installation and commissioning of the groundwater depressurization system. This testing will involve simultaneous operation and monitoring of all system wells (or as directed by the Contract Administrator) for a minimum period of 48 hours.

E24.7.6 The Contractor shall have qualified personnel to monitor the flow rates and groundwater levels within the on-site pumping and monitoring wells during performance verification testing. The results of the flow rates and groundwater levels of the pumping and monitoring wells shall be made available to Contract Administrator for review upon request. The Contract Administrator shall additionally monitor instrumentation in the areas relative to possible groundwater depressurization impacts to local domestic well users.

#### E24.8 Groundwater Depressurization System Operation

E24.8.1 Notify the Contract Administrator as least 48 hours prior to any groundwater depressurization system operation activities.

E24.8.2 Operate and maintain the groundwater depressurization system on a 24 hour per day basis for the duration of construction that requires lowered groundwater levels.

E24.8.3 The required discharge rate will depend on groundwater elevations at the time of construction and the elevation at the base of the excavation and will be determined by the Contractor after the installation and testing of the pumping wells and revised periodically during construction based on the monitoring results and on the final depth of excavation required.

E24.8.4 Monitor and record the flow rate at each pumping well once every hour. Measure and record ground water levels in the pumping wells once every 24 hours. Provide copies of the field data sheets to the Contract Administrator daily.

E24.8.5 Monitor and record groundwater levels in all of the monitoring wells at the site at a minimum of once every 24 hours. Provide copies of the field data sheets to the Contract Administrator daily.

E24.8.6 Non-Operating Periods: Ensure the wells are equipped with well seals or other measures to prevent infiltration of surface water into the underlying bedrock aquifer or the discharge of groundwater from the wells. Ensure that these components are in place and maintained during non-operating periods. Remove and reinstall equipment if necessary during non-operating periods.

E24.8.7 Do not make changes to the set up or operation of the groundwater depressurization system without prior acceptance by the Contract Administrator. Where emergency changes are required to maintain the system in a fully functioning manner, take the appropriate action and then immediately advise the Contract Administrator of the actions taken and the reasons therefore. If requested by the Contract Administrator,

provide a written report of the source of the problem, the actions taken to rectify the issue and the steps taken to ensure the problem does not reoccur.

E24.8.8 Protect the groundwater depressurization system at all times, including but not limited to the pumping and monitoring wells, pumps, gauges, dataloggers for piezometers and hoses.

E24.8.9 Any damaged existing or to be installed instruments, wells, pumps, etc. as part of the groundwater depressurization system should be repaired, replaced at no cost to the City of Winnipeg.

#### E24.9 Groundwater Depressurization System Decommissioning

E24.9.1 Remove all pumps, back-up pumps, drop piping, connections, control valves, flow meters, discharge hose, energy dissipation mats and other appurtenances.

#### E24.10 Well Decommissioning

E24.10.1 The following wells are currently present at the site (Refer to geotechnical report for specific well details):

- (a) Pumping Test Well – TW17-01 (150 mm dia. steel casing X 25 m deep)
- (b) Monitoring Well – 2016-TH02 (Aubrey) (25 mm dia. PVC x 17.2 m deep)
- (c) Monitoring Well - 2017-TH01 (Aubrey) (50 mm dia. PVC x 23 m deep)
- (d) Monitoring Well – 2017-TH02 (Aubrey) (VW piezometer x 9 m deep)

E24.10.2 Decommission all pumping and monitoring wells at the end of construction as instructed by the Contract Administrator. In this regard, the Contract Administrator may request that certain wells stay in place at the end of the project.

E24.10.3 For open bedrock holes, backfill the lower portion of the wells that extend into the carbonate bedrock aquifer with clean sand. Tremie backfill the remaining casing with bentonite /cement grout to ground surface. Cut the casing off a minimum of 1 meter below grade.

E24.10.4 For screened monitoring wells, tremie back the entire length with bentonite / cement grout up to ground surface. Cut the casing off a minimum of 1 meter below grade.

#### E24.11 Construction Sequence

E24.11.1 In order to minimize any potential impacts of pumping on nearby domestic wells, the construction sequence shall be such that the excavations for which depressurization is required are completed either simultaneously or within the shortest possible overall time frame. Coordinate and schedule the work in a manner that minimizes the duration that groundwater depressurization is required.

#### E24.12 Quality Control / Quality Assurance

E24.12.1 All materials supplied under this Specification will be subject to inspection and testing by the Contract Administrator or by a certified testing laboratory designated by the Contract Administrator.

#### METHOD OF MEASUREMENT

#### E24.13 Pumping Well and Monitoring Wells Installation and Testing

E24.13.1 The supply, installation and testing of the pumping wells and monitoring wells will be measured on a lump sum basis for the installation and testing of the pumping wells and monitoring wells to the specified requirements.

#### E24.14 Groundwater Depressurization System Installation

E24.14.1 The supply and installation of the groundwater depressurization system (including system performance verification testing) will be measured on a lump sum basis.



#### E24.15 Groundwater Depressurization System Operation

- E24.15.1 Operation of the groundwater depressurization system will be measured on a lump sum basis.

#### E24.16 Groundwater Depressurization System Decommissioning

- E24.16.1 The groundwater depressurization system decommissioning will be measured on a lump sum basis.

#### E24.17 Well Decommissioning

- E24.17.1 Well decommissioning will be measured on a per well basis for pumping and monitoring wells.

### BASIS OF PAYMENT

#### E24.18 Pumping Well and Monitoring Wells Installation and Testing

- E24.18.1 The supply installation and testing of the pumping wells will be paid for at the Contract Lump Sum Price for "Pumping Well and Monitoring Wells Installation" measured as specified herein, which will be payment in full for the installation, development and testing of the pumping well and monitoring wells to the specifications.

#### E24.19 Groundwater Depressurization System Installation

- E24.19.1 The supply, installation and performance verification testing of the groundwater depressurization system will be paid for at the Contract Lump Sum Price for "System Installation" measured as specified herein, which will be payment in full for performing all operations herein described and all other items incidental to the Work to provide a fully functioning groundwater depressurization system.

#### E24.20 Groundwater Depressurization System Operation

- E24.20.1 Operation of the groundwater depressurization system will be paid for at the Contract Lump Sum Price for "System Operation" measured as specified herein, which will be payment in full for performing all operations herein described and all other items incidental to the Work.

#### E24.21 Groundwater Depressurization System Decommissioning

- E24.21.1 The groundwater depressurization system decommissioning will be paid for at the Contract Lump Sum Price for "System Decommissioning" measured as specified herein, which will be payment in full for performing all operations herein described and all other items incidental to the Work

#### E24.22 Well Decommissioning

- E24.22.1 Pumping well decommissioning will be paid for at the Contract Unit Price for "Pumping Well Decommissioning" measured as specified herein, which will be payment in full for performing all operations herein described and all other items incidental to the Work.

The number of pumping wells requiring decommissioning will be confirmed by the Contract Administrator.

- E24.22.2 Monitoring well decommissioning will be paid for at the Contract Unit Price for "Monitoring Well Decommissioning" measured as specified herein, which will be payment in full for performing all operations herein described and all other items incidental to the Work. The number of monitoring wells requiring decommissioning will be confirmed by the Contract Administrator.

## CONTRACTOR SUPPLIED STANDARDIZED GOODS

### E25. GENERAL REQUIREMENTS

- E25.1 Comply with the general requirements of E25 for all Standardized Goods supplied by the Contractor.
- E25.2 Comply with the following Standardization Goods requirements:
- (a) Electric Valve Actuators in accordance with E26.
- E25.3 Contact the Contract Administrator regarding any potential uncertainty as to whether a good is covered under a standardization agreement.
- E25.4 The Contractor may utilize a Standardization Vendor to provide other goods required under the Contract, in addition to Standardized Goods.
- E25.5 The Contractor shall separately track all goods supplied under each standardization agreement.
- (a) In the event that one or more Standardization Vendors are utilized to procure goods not covered under a standardization agreement, the Contractor shall ensure such goods are quoted, ordered, tracked and accounted in a separate manner.
- E25.6 Pricing:
- (a) The City has obtained discounted pricing for Standardized Goods. Each Standardization Vendor is obligated to sell Standardized Goods to all prospective Contractors at the discounted price, provided the goods are for the City of Winnipeg.
  - (b) The Standardization Vendors may at their option provide lump sum pricing for goods packages. The Standardization Vendor is not required to provide breakout pricing details to the Contractor.
  - (c) The Contractor and Subcontractors shall not utilize the City's agreements with the Standardization Vendors for any purpose other than City work.
  - (d) The City may audit the goods purchased from the Standardization Vendors under the standardization agreements and may identify to the Standardization Vendors any goods procured that are not associated with the Contract.
- E25.7 The Contractor is responsible for ensuring that the Material supplied by the Standardization Vendors meets the requirement of the Contract. The Contractor shall review and confirm quotations supplied by the Standardization Vendors to ensure that all required Material is supplied.
- E25.8 Without limiting or otherwise affecting any other term or condition of the Contract, including (non-exhaustive) D10.2:
- (a) The supply of goods through a Standardization Vendor shall not relieve the Contractor of their obligations.
  - (b) Errors or omissions by a Standardization Vendor shall not be a cause for a Change in Work.
  - (c) Delays by a Standardization Vendor shall not be a cause for a Change in Work where the delay could have been avoided through reasonable planning, contingency allocation, or communication by the Contractor.
- E25.9 Submittals
- (a) Submittals shall be provided for Standardized Goods in accordance with the Specifications and typical industry practice. Submittals shall not be bypassed for Standardized Goods.

## **E26. STANDARDIZED ELECTRIC VALVE ACTUATORS**

- E26.1 The City has standardized on a specific vendor for the supply and delivery of electric valve actuators. The Standardization Vendor was selected via RFP 331-2014 and was awarded to Rotork Control Canada Ltd. (Rotork).
- (a) Copies of the tender documents are available from City of Winnipeg Material Management's website.
- E26.2 Goods to be procured via this standardization agreement include but are not limited to:
- (a) Multi-turn electric valve actuators and quarter-turn electric valve actuators with approximate torque requirements of:
    - (i) On/off torques > 250 Nm
    - (ii) Modulating torques > 150 Nm
  - (b) Associated accessories are also included in the agreement.
- E26.3 For clarity, this standardization agreement does not include:
- (a) Solenoid valve actuators;
  - (b) Small HVAC damper actuators; and
  - (c) Electric valve actuators with a power supply < 120 VAC.
- E26.4 The use of gearboxes shall not be utilized to reduce actuator torque requirements for the purpose of bypassing this standardization agreement.
- E26.5 The following model series shall be utilized unless otherwise indicated in the Specifications, Drawings or otherwise approved by the Contract Administrator:
- (a) IQ3 Range – (IQ, IQM, IQS, IQT, IQTM)
- E26.6 Valve Integration Assistance
- (a) Coordinate with Rotork to review the integration of valves with the valve actuators. Comply with guidance provided by Rotork.
  - (b) The review provided by Rotork shall be for the purpose of ascertaining conformance of the actuator application with the given valve. The responsibility for integration of the valve with the valve actuator shall remain with the Contractor.
  - (c) Rotork will make all applicable actuator shop drawings and datasheets available to the Contractor to allow for integration of the valve with the valve actuator.
  - (d) In the event that the valve cannot directly attach to a standard base available for the electric actuator, supply and installation of valve adaptors between the actuator base and the valve will be the responsibility of the Contractor.
  - (e) Costs
    - (i) Rotork is obligated to provide valve integration assistance services at no additional cost above the supply of the actuator.
- E26.7 Valve Integration Services
- (a) The Contractor may engage Rotork to provide valve integration services in addition to that required in E26.6; however, this additional work would be outside of the Standardization Agreement.
    - (i) The Contractor is encouraged to provide the best value for services provided.
- E26.8 Field setup and commissioning:
- (a) Field setup and commissioning of the actuators will be performed by Rotork under the Standardization Agreement. Coordinate with Rotork as required to understand the

limitations of Rotork's field setup and commissioning services and provide all remaining services to provide a complete commissioning and start-up.

E26.9 Primary contact for all quotations and purchases:

Mr. Henry Zenteno  
#6, 820 - 28th Street North East Street  
Calgary, Alberta, T2A 6K1  
Telephone: 403-569-9455  
Mobile: 403-813-5850  
E-mail: [Henry.Zenteno@rotork.com](mailto:Henry.Zenteno@rotork.com)

E26.10 Quotations and orders:

- (a) Reference the following in all quotation requests and purchase orders:
  - (i) This Bid Opportunity number; and
  - (ii) The standardization agreement number 331-2014.

E26.11 Description

- (a) This specification shall cover the design and manufacture of electric actuator for sluice gate to be supplied under this contract.
- (b) Electric actuators to be supplied under this contract shall be designed and manufactured by a company having at least five (5) years prior experience in manufacturing these types of products in the size and to the pressure ratings as those specified herein Rotork Controls Canada Ltd.
- (c) A standing offer for the supply and delivery of electric actuators exists between the City of Winnipeg and Rotork Controls Canada Ltd. When ordering the electric actuator from Rotork Controls Canada Ltd, the Contractor may reference City of Winnipeg RFP# 331-2014 to obtain pricing consistent with the standing offer.
- (d) Actuators shall be counter clockwise to open.

E26.12 Submittals

- (a) Shop Drawings
  - (i) Submit Shop Drawings in accordance to E11.
  - (ii) Shop Drawings shall state all performance and design criteria.
  - (iii) Allow seven (7) calendar days in delivery schedule for review of Shop Drawings, commencing at the date of receipt by the Contract Administrator.
  - (iv) At the time of submission, the Contractor shall inform the Contract Administrator in writing of any deviation in the Shop Drawings from the requirements of the contract documents. The Shop Drawings shall include a copy of the Specifications attached in Part E and marked by the Contractor as either in "compliance" or "deviation" with comment.
  - (v) Provide valve torque calculations for operating conditions listed.
- (b) Testing
  - (i) Provide all factory pressure test reports.
  - (ii) In the absence of factory inspection and the witness of tests by the Contract Administrator, the Contractor shall provide copies of the following test reports prior to delivery of the actuators:
    - ◆ Proof-of-Design test and,
    - ◆ Performance tests

E26.13 Electric Operators

- (a) General Design Requirements

- (a) This specification is supplementary to and shall be read together with the latest revision of AWWA Standard C540 – “Power-Actuating Devices for Valves and Sluice Gates”.
- (b) All technologies and devices used in the actuator shall have a minimum five (5) years of commercial operating experience for that specific manufacturer. This is to include torque and position sensing, lubrication and electrical compartment design.
- (b) Acceptable Products
  - (i) Electric valve actuators shall be:
    - (i) Solid State Type - Rotork IQ Range,
    - (ii) Multi-Turn gearbox
      - (i) Rotork,
- (c) Design Requirements
  - (i) Design Parameters
    - (i) Opening Multi-Turn, Counter Clockwise to open
    - (ii) Service Condition On/Off Service
    - (iii) Service Temperature -40°C to +70°C (-22°F to +158°F)
    - (iv) Power Supply Minimum 208V/3ph/60Hz
    - (v) Actuator Mounting Remote floor stand
- (d) Actuator Sizing
  - (i) The electric actuators shall be sized to provide the torque required to close or open the gate as per the latest revision of AWWA C540.
- (e) Mounting
  - (i) Electric actuator shall be designed and constructed for remote mounting on a floor stand, coupled to multi-turn gear actuator with a connection shaft. Connection shafts shall be type 304 stainless steel. The length of the extension shafts shall be confirmed by field measurement prior to manufacture.
  - (ii) Connection shaft shall be designed to accommodate actuator torque for the length of connection shaft required.
- (f) Motor
  - (i) Motors shall be CSA approved, of the totally-enclosed, reversing, squirrel cage induction type with Class 'F' insulated windings and suitable for operation at 10% above and below normal specified power supply. Motor duty rating shall be sufficient for one complete operating cycle (open-close-open) without exceeding its temperature rating. Motor bearings shall be amply proportioned of the anti-friction type and permanently lubricated.
  - (ii) The motor shall be of a design that allows for electrical and mechanical disconnection without disturbing the gear case or gate position. Electrical and mechanical disconnection of the motor should be possible without draining the lubricant from the actuator gear case. Plugs and sockets shall not be acceptable as a means of electrical connection for the motor.
  - (iii) The actuator shall include circuitry to ensure the motor runs with the correct rotation for the required direction of operation.
- (g) Motor Protection
  - (i) Protection shall be provided for the motor as follows:
    - (i) The motor shall be de-energized in the event of a stall, when attempting to unseat a jammed gate.
    - (ii) Motor temperature shall be sensed by a thermostat to protect against overheating.

- (iii) Instantaneous reversal protection whereby an automatic time delay circuit limits the current surges when the actuator is signalled to instantaneously reverse direction – for solid state type actuators only.
- (h) Integral Starter and Transformer
  - (i) The reversing starter, control transformer, and local controls shall be integral with the valve actuator, suitably housed to prevent breathing and condensation built-up. For ON/Off service, the starter shall be a solid state type and of rating appropriate to motor size. The controls supply transformer shall have the necessary tapplings and be adequately rated to provide power for the following functions:
    - (i) 120V AC energization of the contactor coils,
    - (ii) 24V DC output where required for remote controls, and
    - (iii) supply for all the internal electrical circuits
  - (ii) The primary and secondary windings shall be protected by easily replaceable fuses.
  - (iii) The reversing motor controller shall consist of separate contactors for controlling gate movement in either the opening or closing direction. Each contactor shall be either magnetic or solid state, full voltage across-the-line type, sized to suit the motor power rating. The contactors shall be of robust construction with double break contacts requiring a minimum of maintenance and being easily replaceable. Mechanical and electrical interlocks shall be provided.
- (i) Gearing
  - (i) The actuator gearing shall be totally encased in an oil filled or sealed gear case complete with fill and drain taps, suitable for operation at any angle. All gearing shall be of hardened steel alloy and alloy bronze construction with machine cut teeth. Thrust bearings of the ball or roller type shall be provided at the base of the operator. The gear case shall be designed to be opened for inspection or repair without releasing the stem thrust or taking the valve out of service.
- (j) Manual Operation
  - (i) Motorized actuators shall be provided with a 50 millimetre x 50 millimetre square operating nut, which shall not rotate during motor operation. The nut operation shall be accomplished by a declutch lever, capable of lockout by padlock. The nut shall disengage automatically from the operating mechanism once the motor is capable of operation. The nut shall be located sufficiently away from the flanges, housings, etc. such that personnel will be able to attach a portable drill on it.
- (k) Drive Bushing
  - (i) The actuator shall be furnished with an easily detachable drive bushing for machining to suit the gate stem or gearbox input shaft. The drive bushing shall be positioned in the base of the actuator to facilitate the valve stem extensions.
  - (ii) Thrust bearings, when housed in a separate thrust base, should be of the sealed-for-life type.
- (l) Turns Limit and Torque Limit Switches for Solid State Type
  - (i) Torque and turns limitation to be adjustable as follows:
    - (i) Position setting range: Gate fully opened to gate fully closed; and to gate fully opened again.
    - (ii) Torque setting: 40% to 100% rated torque.
    - (iii) Torque sensing shall be by purely electrical or electronical methods. Extrapolation of torque from mechanically measured motor speed will not be acceptable due to response time.
    - (iv) "Latching" shall be provided for the torque sensing system to inhibit torque off during unseating or during starting in mid-travel against high inertia loads.
- (m) Remote Gate Position Indication

- (i) Four contacts shall be provided to indicate open position, close position, remote selected, and thermostat tripped.
  - (ii) Contacts to be rated at 5A, 250 VAC, 30V DC.
- (n) Local Position Indication
  - (i) The actuator shall incorporate an illuminated, mechanical dial indicator or digital readout to show continuous movement from fully open to fully closed in 1% increments. The digital display shall be maintained even when the power to the actuator is isolated.
  - (ii) The local display shall be large enough to be viewed from a distance of 1.83 metres when the actuator is powered up.
- (o) Push Buttons and Selector Switches
  - (i) Each actuator shall be complete with a local Open-Stop-Close push-button station with external Red-Open, Green-Closed indicating lights and a Local-Off-Remote selector switch padlockable in any one of the following three positions:
    - (i) Local Control Only,
    - (ii) Off (No Electrical Operation), and
    - (iii) Remote Control.
  - (ii) It shall be possible to select maintained or non-maintained local control.
  - (iii) The local controls shall be arranged so that the direction of valve travel can be reversed without the necessity of stopping the actuator.
  - (iv) All push buttons, selector switches and local controls shall be housed in a secure, tamper-proof, weather-proof and padlockable enclosure to prevent any unauthorized use of the electric motorized gate actuation.
- (p) Controls
  - (i) The internal control and monitoring circuits shall operate at nominal 24 VDC or 120 VAC. Customer control interface shall operate at 120 VAC. All necessary transformers shall be provided.
  - (ii) The necessary wiring and terminals shall be provided in the actuator for the following control functions:
    - (i) Removable links for substitution by external interlocks to inhibit gate opening and/or closing.
    - (ii) Control Method:
      - Open and Close maintained contact closure.
    - (iii) Selection of maintained or push-to-run control for modes a) and b) above shall be provided by links.
    - (iv) The internal circuits associated with the control and monitoring functions shall be designed to withstand simulated lightning impulses of up to 1 kilovolt.
- (q) Monitoring Facilities
  - (i) Facilities shall be provided for monitoring actuator operation and availability as follows:
    - (i) Motor (availability) relay, having one normally open contact, the relay being energized from the control transformer only when the Local/Off/Remote selector switch is in the remote position to indicate that the actuator is available for remote (control room) operation.
    - (ii) Where required, it shall be possible to provide indication of thermostat trip and "Remote" selected as discrete signals.
- (r) Solid State type only:
  - (i) Provision shall be made for the addition of diagnostic module which will store and enable download of historical actuator data to permit analysis of changes in actuator or valve performance.

- (ii) Diagnostic status screens shall be provided to show multiple functions simultaneously so troubleshooting can be affected rapidly and efficiently.
- (s) Wiring and Terminals
  - (i) Internal wiring shall be of CSA approved insulated stranded cable of appropriate size for the control. Each wire shall be clearly identified at each end. Permanent heat shrunk labelling shall be used.
  - (ii) The terminals shall be embedded in terminal block of high tracking-resistance compound.
  - (iii) The terminal compartment shall be separated from the inner electrical components of the actuator by means of a watertight 'O' ring seal.
  - (iv) The terminal compartment of the actuator shall be provided with a minimum of two (2) threaded cable entries.
  - (v) All wiring supplied as part of the actuator shall be contained within the main enclosure for physical and environmental protection. External conduit connections between components will not be acceptable.
  - (vi) Control logic circuit boards and relay boards shall be mounted on plastic mounts to comply with double insulated standards. No more than a single primary size fuse shall be provided to minimize the need to remove single covers for replacement.
  - (vii) A durable terminal identification card showing plan of terminals shall be attached to the inside of the terminal box cover indicating:
    - (i) Serial number,
    - (ii) External voltage values,
    - (iii) Wiring diagram number, and
    - (iv) Terminal layout.
  - (viii) The identification card shall be suitable to inscribe cable core identification alongside terminal numbers.
- (t) Enclosure
  - (i) Actuators shall be O-ring sealed, watertight to NEMA 6/IP68 as well as have an inner watertight and dustproof O-ring seal between the terminal compartment and the internal electrical elements of the actuator, fully protecting the switch mechanism, motor and all other internal electrical elements of the actuator from ingress of moisture and dust when the terminal cover is removed on site for cabling.
  - (ii) Actuators shall be provided with an internal motor and compartment heater.
  - (iii) All external fasteners shall be of stainless steel.
- (u) Gearbox
  - (i) Gearing and Enclosure
    - (i) Actuators shall be geared with, machine cut gear teeth, and be totally enclosed in a sealed housing. Travelling nut type of mechanisms will not be accepted. Gear lubricant shall be of the bulk grease type; synthetic lubricants will not be accepted.
    - (ii) Number of actuator turns to open or close the valve shall be kept to as few as possible to avoid over-torquing and damage to the actuator.
    - (iii) Accessible parts of the actuator requiring lubrication shall be provided with button-head alemite grease fittings.
  - (ii) Input Limit Stops
    - (i) Adjustable, external stop-limiting devices shall be provided on the actuators to prevent over-travel of the gate in the open and closed position.
    - (ii) Under circumstances where spur gear attachments are installed on the input side of the actuator to facilitate the maximum input operating torque of 356



- Newton (80 ft. pounds), input limit stops shall be installed on the input side of the spur gear attachment.
- (iii) A shear pin or other torque regulating device shall be provided on the actuator or 50 millimetre x 50 millimetre square operating nut as an extra precaution against actuators being over-torqued.
- (iii) Protective Coatings
- (i) All external ferrous components including adaptor and mounting plates, shall be painted and tested in accordance with AWWA C550 and E26.13(x).
- (v) Installation
- (i) The actuators will be installed by the Installation Contractor at a later date.
- (w) Start-up Kit
- (i) Each actuator shall be supplied with a start-up kit comprising installation instruction, electrical wiring diagram, and sufficient spare cover screws and seals to make good any site losses during the commissioning period.
- (x) Protective Coatings
- (i) All external ferrous components including floor stands, adaptors and mounting plates, shall be painted with two coats of polyamide epoxy paint, Amerlock 400 or approved equal in accordance to B7.
- (ii) Any touch-up paintwork required during installation shall be undertaken by the Installation Contractor. The touch-up paint shall be of the same colour and specifications used in the above clauses and shall be supplied by the Contractor. The Contractor shall provide a minimum of one (1) litre of paint product for this purpose.
- (y) Testing
- (i) Each electric motorized actuator shall be performance tested by the manufacturer at their facilities prior to shipping. The test shall simulate a typical valve torque load from full-open to full-close and full-close to full-open. The following information shall be recorded:
- (i) Torque at Maximum Torque Setting,
- (ii) Current at Maximum Torque Setting,
- (iii) Test Voltage and Frequency,
- (iv) Flash Test Voltage,
- (v) Actuator Output Speed and Operating Time for Full-Open to Full-Close, and
- (vi) Amperage draw on motors at breakaway and normal operation.
- (b) Copies of the test reports for the above performance tests signed by the official who is responsible for the actuator assembly and testing shall be forwarded to the Contract Administrator as soon as completed.
- (c) In addition, the test reports shall include details of specification such as gear ratios for both manual and automatic drive, closing direction, wiring diagram code number, etc.
- (d) Actuators
- (i) Electric actuators shall be tested in accordance with the latest revision of AWWA Standard C540.
- (ii) In addition to factory inspection and the witness of tests by the Contract Administrator, the Contractor shall provide copies of the following test reports prior to delivery of the actuators:
- proof-of-design test as per AWWA C540, and
  - performance tests.
- (e) Electric Actuators
- (i) The City will perform voltage, current draw, cycle speed and whatever other tests are deemed appropriate, once the actuators have been delivered to the City of Winnipeg warehouse location.

#### E26.14 Measurement and Payment

- (a) Supply and delivery and installation of an Electric-Actuator Operator will be measured and paid for at the Contract Lump Sum Price for "Supply and Installation of Standardized Electric-Actuated Operator", executed in accordance with this specification and accepted by the Contract Administrator.

### E27. FOUNDATION WATERPROOFING

#### E27.1 Description

##### (a) General

- (i) This Specification shall cover the supply and placement of underground concrete gate chamber foundation waterproofing.

#### E27.2 Materials

- (a) Waterproofing membrane: Styrene-Butadiene-Styrene (SBS) elastomeric polymer, prefabricated sheet, reinforced with non-woven polyester weighing 180 g/m<sup>2</sup>. Top surface polyethylene film. Bottom surface: thermofusible plastic film. Acceptable material: Soprema Sopralene Flam 180, IKO Aquabarrier TG or approved equal.
- (b) Primes, mastic sealant and accessories: as recommended by membrane manufacturer, applicable for substrate.
- (c) Protection board: insulating fibreboard to CAN/CSA-A247, Type II, 12 millimetres thick.

#### E27.3 Construction Methods

##### E27.3.1 Quality Assurance

- (a) Installation of waterproofing membrane shall be performed by workers approved and trained by manufacturer for application of its products. Applicators must have minimum 5 years proven experience. If requested, submit proof of experience, in writing, from manufacturer.

##### E27.3.2 Warranty

- (a) Provide written warranty, signed and issued in the name of The City of Winnipeg stating that the waterproofing is guaranteed against leaking, loss of adhesion, for a period of five (5) years from the date of acceptance.

##### E27.3.3 Environmental Requirements

- (a) Maintain air temperature and structural base temperature at installation area above membrane manufacturer's recommendations before, during and 72 hours after installation.
- (b) For applications in freezing weather do not commence application until authorized by membrane manufacturer.
- (c) For enclosed applications ensure adequate forced air circulation during curing period.
- (d) Install membrane on dry substrates, free of snow and ice. Use only dry materials and apply only during weather that will not introduce moisture beneath waterproofing membrane.

##### E27.3.4 Preparation

- (a) Examine substrates and site conditions to ensure acceptability for application of waterproofing membranes. Notify Contract Administrator, in writing, of unsuitable surfaces or working conditions.
- (b) Do not commence application until all other work that will penetrate membrane is complete.
- (c) Clean substrates of all snow, ice, loose particles, oil, grease, dirt, curing compounds, or other foreign matter detrimental to application of primers and waterproofing membranes.

- (d) Ensure concrete surfaces are fully cured and dry using test methods recommended by membrane manufacturer.
- (e) Repair defects in concrete surfaces such as spalled or poorly consolidated concrete. Remove sharp protrusions, sharp edges and form lines.
- (f) Patch rough areas with a weld-adhered parge coat to provide smooth surface. Allow to fully cure and dry.

#### E27.3.5 Priming

- (a) Apply primer in accordance with manufacturer's instructions at recommended rate of application.
- (b) Do not apply primer to frozen or damp surfaces.
- (c) Apply primer only when air and surface temperatures are within manufacturer's recommended limits.
- (d) Avoid pooling of primer and allow to cure until tack-free.
- (e) Prime only the area to be covered with membrane in a working day. Re-prime areas not covered with waterproofing within 24 hours of application of primer.

#### E27.3.6 Membrane Application

- (a) Apply membrane in accordance with manufacturer's instructions and with good construction practice to maintain continuity of waterproofing over building elements below finished grade elevation.
- (b) Place membrane in position without stretching, taking care to avoid trapped air, creases or fish mouths.
- (c) Ensure membrane is totally bonded to substrate.
- (d) Apply membrane vertically in longest possible lengths to reduce number of end joints.
- (e) Overlap side laps minimum 75 millimetres and end laps minimum 150 millimetres. Stagger end laps minimum 300 millimetres in adjacent rows.
- (f) Seal horizontal and vertical terminations by applying heavy pressure to edges with a roller to ensure positive bond. Apply a continuous bead of mastic sealant to all terminations. Make watertight. Seal daily terminations with mastic sealant.
- (g) Terminate membrane 300 millimetres below finished grade.

#### E27.3.7 Membrane Application at Corners

- (a) Remove sharp or protruding edges from external corners prior to application of membrane.
- (b) Reinforce external corners with cushion strip of membrane minimum 300 mm wide at each corner. Install cushion strip below main membrane.

#### E27.3.8 Membrane Application Over Protrusions and Penetrations

- (a) Apply two layers of membrane flashing around protrusions and extend at least 150 millimetres in all directions. Cut and fit membrane neatly and snug fitting, leave no gaps. Seal all terminations with mastic sealant. Flash protrusions with liquid mastic extending 150 millimetres along pipe or conduit.
- (b) Seal with liquid mastic all protrusions or difficult detail areas which do not allow easy installation of membrane. Make watertight.

#### E27.3.9 Inspection and Repair

- (a) Inspect membrane thoroughly before covering and make corrections immediately.
- (b) Patch and repair misaligned or inadequately lapped seams, tears, punctures or fishmouths.
- (c) Patch with piece of waterproofing membrane and extend minimum 150 millimetres in all directions from fault and seal edges with mastic sealant.

**E27.3.10 Protection Board**

- (a) Install protection board against all waterproofing membranes to protect against backfilling operations.
- (b) Install boards vertically without fasteners or adhesives.
- (c) Install protection board during backfilling operations to allow backfill materials to hold protection board tight to waterproofing membrane.
- (d) Terminate protection board 600 millimetres below grade.

**E27.4 Measurement and Payment**

- (a) Supply and installation of waterproofing membrane and protection board shall be included in the Contract Lump Sum price for "Cast-in-Place Concrete Gate Chamber Construction" and no separate payment will be made for this item.

**E28. TEMPORARY SURFACE RESTORATION AND MAINTENANCE**

- E28.1 Further to CW 1130, if the Contractor fails to maintain disturbed surfaces as directed and within the time period given by the Contract Administrator, the City or its designate may perform the work required and the cost may be deducted from payments owed.
- E28.2 The Contractor shall monitor and maintain temporarily restored surfaces as required until permanent restoration is complete.
- E28.3 If, in the opinion of the Contract Administrator, temporarily restored surfaces are not being adequately maintained or were not properly constructed and pose a danger to the public, maintenance or reconstruction will be done by the City forces with no advance notification to the Contractor.
- E28.4 Temporary Surface Restoration and Maintenance shall be considered incidental to the Works of this Contract and no separate payment will be made for this item.

**E29. BACKFILL UNDER TEMPORARY SURFACE RESTORATIONS**

- E29.1 Use class 2 backfill in excavation under temporary street pavement and sidewalk where Class 3 backfill cannot be jetted and flooded due to cold weather.
- E29.2 Class 2 backfill may be compacted in 600mm lifts where backhoe operated pneumatic plate compactors are used.
- E29.3 Jet and flood Class 2, Class 3 and Class 5 backfilled excavations in spring when ground is not frozen prior to permanent restoration.
- E29.4 Backfill Under Temporary Surface Restorations shall be considered incidental to the Works of this Contract and no separate payment will be made for this item.

**E30. SODDING**

- E30.1 Construct sodding renewals in accordance with CW 3510.
- E30.2 Sodding shall be considered incidental to the Works of this Contract and no separate payment will be made for this item.

**E31. SNOW CLEARING**

- E31.1 All required snow clearing shall be performed by the Contractor at his own expense.
- E31.2 The Contractor will be required to perform snow clearing and sanding operations on City streets and sidewalks within the Site where access to City snow clearing and sanding crews is blocked

due to construction activities or where construction activities have created unsafe, icy conditions.

E31.3 Snow built-up on sidewalks and roadway shall be maintained to the condition of the surrounding sidewalks and roadways.

**E32. VIDEO INSPECTION OF DISCHARGE PIPING WITHIN LIMITS OF NEW INSTALLATION**

E32.1 With the Contract Administrator present, provide video inspection of the discharge piping within the limits of the new installation

E32.2 Video inspection must:

- (a) have an image quality such that an accurate assessment of the new discharge pipe condition can be made.
- (b) have a distance counter visible on the screen.

E32.3 Video inspection of discharge piping shall be measured on a length basis and paid for at the Contract Unit Price per metre for "Discharge Piping Inspection". The length to be paid for shall be the total number of metres of discharge piping inspected, accepted and measured by the Contract Administrator which price shall be payment in full for performing all operations herein described and all other items incidental to the video inspection of discharge piping.

**E33. CASH ALLOWANCE FOR REPAIRS**

E33.1 Description

- (a) The Cash Allowance for Repairs is intended to be used for remedial repairs directed and authorized by the Contract Administrator.
- (b) The City reserves the right to delete any or all of the Cash Allowance from the Contract if the Work intended to be covered by the Cash Allowance is not required, or if the Works intended are found to be more extensive than the provisional Cash Allowance.

E33.2 Method of Measurement and Basis of Payment

- (a) Cost of repairs shall be evaluated by the methods outlined in C7.4, and a Change Order prepared by the Contract Administrator. Cost of the Change Order will be paid on the Progress Estimate and deducted from the Cash Allowance. If the valuation of the authorized work exceeds the Value of the Cash Allowance, the Contract Value will be adjusted by the shortfall.

## PART F - SECURITY CLEARANCE

### F1. SECURITY CLEARANCE

- F1.1 Each individual proposed to perform the following portions of the Work:
- (a) any Work on private property;
  - (b) communicating with residents and homeowners in person or by telephone;
- F1.1.1 Each Individual shall be required to obtain a Police Information Check from the police service having jurisdiction at his/her place of residence. Or
- (a) BackCheck, forms to be completed can be found on the website at: <http://www.backcheck.net/> ; or
  - (b) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: <https://www.commissionaires.ca/en/manitoba/home> .
- F1.2 The following is a link to information for obtaining the Police Information Check from the City of Winnipeg Police Service. <http://winnipeg.ca/police/pr/PIC.stm>
- F1.2.1 The Police Information Check shall include a Vulnerable Sector Screening. This can be obtained by following the link below <http://winnipeg.ca/police/pr/PIC.stm>
- (a) Individuals will need to state in the form, that they may be working in City of Winnipeg pools, libraries and community centres;
- F1.2.2 The original Police Information Check (Form P-612) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner. The applicant shall:
- (a) Provide the original Police Information Check (Form P-612) to the Contract Administrator.
- F1.3 Prior to the award of Contact, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Police Information Check obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform such Work.
- F1.4 Any individual for whom a Police Information Check is not provided, or for whom a Police Information Check indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work specified in F1.1.
- F1.5 Any Police Information Check obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.
- F1.6 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated Police Information Check. Any individual who fails to provide a satisfactory Police Information Check as a result of a repeated Police Information Check will not be permitted to continue to perform any Work specified in F1.1.