



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 600-2011**

**2011 OUTFALL GATE CHAMBER UPGRADES –  
CONTRACT NO. 24**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 2010 OUTFALL GATE CHAMBER UPGRADES, CONTRACT NO. 24

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, August 18, 2011.

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

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

### **B3. ENQUIRIES**

B3.1 All enquiries shall be directed to the Contract Administrator identified in D3.

B3.2 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.

B3.3 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.

B3.4 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.

B3.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

### **B4. ADDENDA**

B4.1 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.

B4.2 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.

B4.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>

B4.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before submitting his Bid.

B4.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B5. SUBSTITUTES**

- B5.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B5.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B5.3 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.
- B5.4 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.
- B5.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B5.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B5.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B5.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B5.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B14.
- B5.9 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.
- B5.10 Notwithstanding B5.2 to B5.9, and in accordance with B6.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B14.1(a).

## **B6. BID COMPONENTS**

- B6.1 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;
- B6.2 Further to B6.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B5.
- B6.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B6.4 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.
- B6.4.1 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.
- B6.5 Bidders are advised not to include any information/literature except as requested in accordance with B6.1.
- B6.6 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 B14.1(a).
- B6.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B6.8 Bids shall be submitted to:
- The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1

## **B7. BID**

- B7.1 The Bidder shall complete Form A: Bid, making all required entries.
- B7.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;
  - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
  - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
  - (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

- B7.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B7.2.
- B7.3 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.
- B7.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
  - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
  - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
  - (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B7.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B7.5 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.

## **B8. PRICES**

- B8.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B8.2 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.
- B8.3 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.
- B8.4 Prices from Non-Resident Bidders are subject to a Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

## **B9. QUALIFICATION**

- B9.1 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.
- B9.2 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>

- (b) have successfully carried out work similar in nature, scope and value to the Work to the portion of the Work proposed to be subcontracted to them, and are fully capable of performing the Work required to be done in accordance with the terms of the Contract
- B9.3 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);
- B9.4 Further to B9.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:
- (a) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association or by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or
  - (b) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association; or
  - (c) 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>)
- B9.5 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.
- B9.6 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.

## **B10. BID SECURITY**

- B10.1 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.



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- B10.1.1 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.
- B10.1.2 All signatures on bid securities shall be original.
- B10.1.3 The Bidder shall sign the Bid Bond.
- B10.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B10.2 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.
- B10.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B10.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B10.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B10.3 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.

#### **B11. OPENING OF BIDS AND RELEASE OF INFORMATION**

- B11.1 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.
  - B11.1.1 Bidders or their representatives may attend.
  - B11.1.2 Bids determined by the Manager of Materials, or his designate, to not include the bid security specified in B10 will not be read out.
- B11.2 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>
- B11.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>
- B11.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

#### **B12. IRREVOCABLE BID**

- B12.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B12.2 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.

### **B13. WITHDRAWAL OF BIDS**

- B13.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B13.1.1 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.
- B13.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B13.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;
  - (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
  - (c) if the notice has been given by any one of the persons specified in B13.1.3(b), declare the Bid withdrawn.
- B13.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B12.2 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.

### **B14. EVALUATION OF BIDS**

- B14.1 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 B99 (pass/fail);
  - (c) Total Bid Price;
  - (d) economic analysis of any approved alternative pursuant to B5.
- B14.2 Further to B14.1(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.
- B14.3 Further to B14.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid or in other information required to be submitted, that he is responsible and qualified.
- B14.4 Further to B14.1(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.
- B14.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each

item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

- B14.4.2 Further to B14.1(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.

## **B15. AWARD OF CONTRACT**

- B15.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

- B15.2 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.

- B15.2.1 Without limiting the generality of B15.2, 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.

- B15.3 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.

- B15.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his Bid upon written request to the Contract Administrator.

## **PART C - GENERAL CONDITIONS**

### **C0. GENERAL CONDITIONS**

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](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 following:

- (a) construction of pre-cast concrete gate chambers for flood control purposes at the following locations in the City of Winnipeg:
  - (i) Deer Lodge Place
  - (ii) Douglas Park Road
  - (iii) Lotus Lane
  - (iv) Pembina Highway
- (b) Site restoration/clean-up.

#### **D3. CONTRACT ADMINISTRATOR**

The Contract Administrator is KGS Group, represented by:

Scott Harnish, P.Eng.  
Senior Engineer and Project Manager

3rd floor - 865 Waverley Street  
Winnipeg, MB. R3T 5P4

Telephone No. (204) 896 - 1209  
Facsimile No. (204) 896 – 0754

D3.1 At the pre-construction meeting, Mr. Harnish will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

#### **D4. CONTRACTOR'S SUPERVISOR**

D4.1 At the pre-construction meeting, the Contractor shall identify his designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

#### **D5. NOTICES**

D5.1 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.

D5.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D5.3, D5.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D3.1.

- D5.3 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 address or facsimile number:

The City of Winnipeg  
Chief Financial Officer  
Administration Building, 3rd Floor  
510 Main Street  
Winnipeg MB R3B 1B9  
Facsimile No.: (204) 949-1174

- D5.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following address or facsimile number:

The City of Winnipeg  
Internal Services Department  
Legal Services Division  
Attn: City Solicitor  
185 King Street, 3rd Floor  
Winnipeg MB R3B 1J1  
Facsimile No.: (204) 947-9155

## **D6. FURNISHING OF DOCUMENTS**

- D6.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him at cost.

## **SUBMISSIONS**

### **D7. AUTHORITY TO CARRY ON BUSINESS**

- D7.1 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.

### **D8. SAFE WORK PLAN**

- D8.1 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.
- D8.2 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>

### **D9. INSURANCE**

- D9.1 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) automobile liability insurance for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00) at all times during the performance of the Work and until the date of Total Performance;
- (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.

D9.2 Deductibles shall be borne by the Contractor.

D9.3 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.

D9.4 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.

#### **D10. PERFORMANCE SECURITY**

D10.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

- (a) 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
- (b) 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.

D10.1.1 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.

D10.2 If the bid security provided in his Bid was not a certified cheque or draft pursuant to B10.1(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.

#### **D11. SUBCONTRACTOR LIST**

D11.1 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.

## **D12. SCHEDULE OF WORK**

- D12.1 The Contractor shall provide the Contract Administrator with a detailed Work schedule at least two (2) Business Days prior to the commencement of any Work on the site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D12.2 The detailed Work schedule shall consist of the following:
- (a) A Gantt chart for the Work acceptable to the Contract Administrator.
- D12.3 Further to D12.2(a), the Gantt chart schedule shall clearly identify dates of all the following activities/tasks making up the Work as well as showing these activities/tasks on the critical path for each Gate Chamber.
- (a) Flap gates and sluice gates:
    - (i) Submit shop drawings;
    - (ii) Delivery;
    - (iii) Installation

show separate tasks for wall thimbles, flap gate, and sluice gate, if different dates apply.
  - (b) Gate chamber excavation and shoring:
    - (i) Mobilization;
    - (ii) Submit construction method;
    - (iii) Submit shoring shop drawings;
    - (iv) Dewatering (if required);
    - (v) Excavation and shoring.
  - (c) Gate chamber construction:
    - (i) Submit required shop drawings;
    - (ii) Construct hoarding;
    - (iii) Construct floor;
    - (iv) Install wall thimbles;
    - (v) Construct walls (indicate separate pour);
    - (vi) Construct roof;
    - (vii) Remove shoring and backfill;
    - (viii) Install miscellaneous metals;
    - (ix) Install gates (show separate tasks for wall thimbles, flap gates, and sluice gates, if different dates apply);
    - (x) Test gates;
    - (xi) Surface restoration and landscaping.
- D12.4 Further to D12.2(a), the Gantt chart shall show the time on a weekly basis required to carry out each Work activity. The time shall be on the horizontal axis, and the activity shall be on the vertical axis.

## **D13. COMMENCEMENT**

- D13.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.
- D13.2 The Contractor shall not commence any Work on the Site until:



- (a) the Contract Administrator has confirmed receipt and approval of:
  - (i) evidence of authority to carry on business specified in D7;
  - (ii) evidence of the workers compensation coverage specified in C6.15;
  - (iii) the Safe Work Plan specified in D8;
  - (iv) evidence of the insurance specified in D9;
  - (v) the performance security specified in D10;
  - (vi) the Subcontractor list specified in D11;
  - (vii) the Schedule of Work specified in D12; and
  - (viii) evidence that the manufacturing of long-term manufactured items has been ordered with a specific date established for delivery
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- (c) Commencement of the Work shall be at the discretion of the Contractor provided the commencement date will allow the achievement of Substantial Performance of the Work in accordance with D14 and Total Performance of the Work in accordance with D15.

#### **D14. SUBSTANTIAL PERFORMANCE**

- D14.1 The Contractor shall achieve Substantial Performance within forty (40) working consecutive Working Days of the commencement of the Work as specified in D13 or by March 1, 2012, whichever occurs first.
- D14.2 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.
- D14.3 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.

#### **D15. TOTAL PERFORMANCE**

- D15.1 The Contractor shall achieve Total Performance by June 30, 2012.
- D15.2 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.
- D15.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

#### **D16. LIQUIDATED DAMAGES**

- D16.1 If the Contractor fails to achieve Substantial Performance and/or Total Performance in accordance with the Contract by the days fixed herein for Substantial Performance and Total Performance, the Contractor shall pay the City the following amounts per Working Day for each

and every Working Day following the day fixed herein for Substantial Performance and/or Total Performance during which such failure continues.

- (a) Substantial Performance - One Thousand Dollars (\$1,000.00)
- (b) Total Performance - Five Hundred Dollars (\$500.00)

D16.2 The amount specified for liquidated damages in D16.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance and/or Total Performance by the day fixed herein for same.

D16.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

#### **D17. SCHEDULED MAINTENANCE**

D17.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

- (a) Landscaping maintenance is specified in CW3510.

D17.2 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**

##### **D18. JOB MEETINGS**

D18.1 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.

D18.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

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

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

##### **D20. TRAFFIC CONTROL AND MAINTENANCE OF ACCESS**

D20.1 Comply with the requirements of CW1130 for traffic control and maintenance of access.

D20.2 Do not park construction vehicles in a manner that will block traffic on streets adjacent to the Site.

D20.3 Provide flag persons to direct traffic around construction vehicles that are unloading equipment and materials at the Site.

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- D20.4 Do not stockpile material in a location and manner that will obstruct the safe operation of motor vehicles past the Site.
- D20.5 Submit a Traffic Management Plan for review by the Traffic Management Engineer of the Public Works Department two (2) weeks prior to commencing the Work on Pembina Highway.

## **MEASUREMENT AND PAYMENT**

### **D21. PAYMENT**

- D21.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

## **WARRANTY**

### **D22. WARRANTY**

- D22.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) year thereafter, except where longer warranty periods are specified in the respective Specification sections, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.
  - D22.1.1 For the purpose of Performance Security, the warranty period shall be one (1) year.
- D22.2 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if a 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.
  - D22.2.1 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 D10)

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. 600-2011

2011 OUTFALL GATE CHAMBER UPGRADES –  
CONTRACT NO. 24

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.

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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 D10)

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

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 600-2011  
  
2011 OUTFALL GATE CHAMBER UPGRADES –  
CONTRACT NO. 24

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.

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

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

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

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

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

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

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

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

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





## PART E - SPECIFICATIONS

### GENERAL

#### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
600-2011-Drawing_LD-5666	Deer Lodge Place (East Leg) – Outfall Gate Chamber Plan/Profile
600-2011-Drawing_LD-5667	Deer Lodge Place (East Leg) – Outfall Gate Chamber Details
600-2011-Drawing_LD-5668	Douglas Park Road – Outfall Gate Chamber Plan/Profile
600-2011-Drawing_LD-5669	Douglas Park Road – Outfall Gate Chamber Details
600-2011-Drawing_LD-5670	Lotus Lane – Outfall Gate Chamber Plan/Profile
600-2011-Drawing_LD-5671	Lotus Lane – Outfall Gate Chamber Details
600-2011-Drawing_LD-5672	Pembina Highway at Rue des Trappistes – Outfall Gate Chamber Plan/Profile
600-2011-Drawing_LD-5673	Pembina Highway at Rue des Trappistes – Outfall Gate Chamber Details

#### E2. GEOTECHNICAL INFORMATION

- E2.1 Further to C:3.1, of the General Conditions, geotechnical test holes have been drilled in the vicinity of the proposed Works to determine the character of the subsurface soil to facilitate the design of the Work. The information is considered accurate at the locations indicated 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. Test hole logs are included in Appendix A.
- E2.2 Bidders are responsible for any interpretation they place on the supplied information and are expected to make such additional investigation of the soil as they feel necessary to satisfy themselves.
- E2.3 Any test borings made by the Contractor 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. PROTECTION OF EXISTING TREES

- E3.1 Do not remove existing trees and take the following precautionary steps to avoid damage from construction activities to existing boulevard trees within the limits of the construction area:

- E3.1.1 Do not stockpile materials and soil or park vehicles and equipment within 2 metres of trees.
- E3.1.2 Strap mature tree trunks with 25 x 150 x 2400 wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.
- E3.1.3 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.
- E3.1.4 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.
- E3.1.5 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.
- E3.2 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, Forestry Branch at the Contractor's expense.
- E3.3 Costs for protection of trees shall be considered incidental to the work.

#### **E4. DANGEROUS WORK CONDITIONS**

- E4.1 Further to clause GC 6.26 of the General Conditions, the Contractor shall be aware that underground chambers, manholes, 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.
- E4.2 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.
- E4.3 The air in a confined space must be tested before entry and continuously during the time that personnel are inside the space. Equipment for continuous monitoring of gases must be explosion-proof and equipped with a visible and audible alarm. The principal tests are for oxygen deficiency, explosion range and toxic gases. Testing equipment must be calibrated in accordance with manufacturer's specifications.
- E4.4 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.
- E4.5 Workers must wear a respirator or supplied air at all times when entering a chamber, manhole or sewer where live sewage is present.
- E4.6 The Contractor shall provide a photoionization detector (PID) on Site at all times to monitor potential hydrocarbon vapours in the confined spaces. The gas detector and safety equipment conforming to the Act shall be made available to the Contract Administrator for his use during inspections. In addition, the Contract Administrator shall collect discrete air samples for laboratory analysis.
- E4.7 The Contract Administrator may issue a Stop Work order to the Contractor if the above guidelines are not being followed. The Contractor shall not resume his operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to the Stop Work order for not following these safety guidelines.

## **E5. WATERWAY BY-LAW**

- E5.1 The Contractor shall note that all Works within 107 meters (350 feet) of a riverbank are within the jurisdiction of the Waterway By-law. The Contractor Administrator will apply and pay for required Waterway Permits for the project. The Contractor shall adhere to restrictions imposed by the permit.
- E5.2 Under no circumstances will stockpiling of any material be permitted within 107 meters of a riverbank or dyke.

## **E6. SHOP DRAWINGS**

### **E6.1 Description**

- (a) This Specification shall revise, amend and supplement the requirements of CW 1100.
- (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 shown on all submissions for Engineering review.
- (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 Structural Professional Engineer who is a member of the Association of Professional Engineers and Geoscientists of the Province of Manitoba (APEGM).
    - (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:
    - (a) Field Measurements
    - (b) Field Construction Criteria
    - (c) 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 Contract Administrator gives written acceptance of specified deviations.

- (vi) Responsibility for errors and omissions in submission is not relieved by 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 previous submission.
  - (viii) After Contract Administrator's review and return of copies, distribute copies to sub trades as appropriate.
  - (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 14 Calendar Days before dates reviewed submissions will be needed, and allow for a 14 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:
    - (a) Date
    - (b) Project title and Bid Opportunity number
    - (c) Contractor's name and address
    - (d) Number of each shop drawing, product data and sample submitted
    - (e) Specification Section, Title, Number and Clause
    - (f) Drawing Number and Detail/Section Number
    - (g) Other pertinent data
  - (iv) Submissions shall include:
    - (a) Date and revision dates.
    - (b) Project title and Bid Opportunity number.
    - (c) Name of:
      - (a) Contractor
      - (b) Subcontractor
      - (c) Supplier
      - (d) Manufacturer
      - (e) Separate detailer when pertinent
    - (d) Identification of product of material.
    - (e) Relation to adjacent structure or materials.
    - (f) Field dimensions, clearly identified as such.
    - (g) Specification section name, number and clause number or drawing number and detail/section number.

- (h) Applicable standards, such as CSA or CGSB numbers.
  - (i) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents.
- (e) Other Considerations
- (a) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
  - (b) 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.
  - (c) Incomplete shop drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.
  - (d) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions and review of shop drawings.

## **E7. FLOW CONTROL**

- E7.1 Land drainage and storm relief sewers can receive flow of an undetermined amount from groundwater infiltration, watermain breaks, snow melt and other unforeseen sources.
- E7.2 Provide flow control measures to contend with and maintain flow in the land drainage and storm relief sewers that are directed to the location where gate chambers are being constructed. Flow control measures shall include but not be limited to diversions, flumes, plugs, bulkheads and by-pass pumping.
- E7.3 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
- E7.4 Provide a flow control plan for each gate chamber location to the Contract Administrator for review before removing any existing sewer pipe.
- E7.5 Costs for flow control will be included in gate chamber construction.
- E7.6 In the event the river level becomes higher than the gate chamber activation level and/or 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 and temporarily shutdown of the site. Suspension of the activities will continue until the river level drops below flood pumping activation level and the high flow diminishes to acceptable levels in the sewer.
- E7.7 If in the opinion of the Contract Administrator suspension of Work activities that require temporary by-pass pumping and shutdown of the site may cause a delay in completion of the Work through no fault of the Contractor, the completion date of the Work will be adjusted accordingly

## **E8. INSTALLATION OF SILT FENCE**

- E8.1 Description
- E8.1.1 This Specification covers the erection of temporary silt fencing, which shall be installed and maintained for the Work near the La Salle River at Pembina Highway.

- E8.1.2 The scope Work included in this specification is as follows:
- (a) Supply and Install temporary silt fencing at the locations as indicated on the Drawings, in accordance with the detail drawings provided, prior to undertaking any other activities on the Site where silt fencing is required.
  - (b) Maintain the silt fencing in serviceable condition throughout the entire duration of activities at the Site where silt fencing is required, including final restoration and cleanup of the construction Site.
  - (c) Remove the silt fencing and restore the area where the fencing was installed, without further disturbing the area and without releasing any deleterious substances to the adjacent watercourse.

E8.1.3 Submit a Siltation Control Plan for review two (2) weeks prior to commencing the Work on Pembina Highway.

**E8.2 Materials**

**E8.2.1 Fences Posts**

- (a) Fence posts shall be 100 mm diameter untreated wood posts or 50 mm diameter steel.

**E8.2.2 Filter Fabric**

- (a) Filter Fabric shall be a woven geotextile material specifically designed for silt fence applications, meeting the following minimum requirements:

Property	Test Method	Value
Grab Tensile Strength	ASTM D 4632	0.55 kN
Grab Tensile Elongation	ASTM D 4632	15%
Mullen Burst	ASTM D 4786	2060 kPa
Puncture	ASTM D 4833	0.285 kN
Trapezoid Tear	ASTM D 4533	0.285 kN
UV Resistance	ASTM D 435	5 80 % @ 500 hrs
Apparent Opening Size (AOS)	ASTM D 4751	0.60 mm
Flow Rate	ASTM D 4491	405 l/min/m <sup>2</sup>

Acceptable Product: "Amoco 2130 Silt Fence Fabric" or approved equal in accordance with B6.

**E8.2.3 Wire Mesh**

- (a) Wire mesh shall be galvanized or plain metal with wire gauge = 3.0 mm, wire spacing @ 150 mm o/c.

**E8.2.4 Fencing Material Fasteners**

- (b) Staples or wire ties of sufficient strength and spacing to withstand 500 N (100 lbf) pull test at any point on the wire mesh.

**E8.3 Construction Methods**

E8.3.1 Ensure that no deleterious substances are discharged into the pond at any time during construction activities.

**E8.3.2 Silt Fence Installation**

- (a) Excavate 150 x 150 anchor trench along alignment of silt fence as indicated.

- (b) Install fence posts as indicated. Ensure that fence posts are firmly driven into undisturbed soil, or are completely and firmly backfilled if installed via auger methods. Attach wire mesh as support backing for silt fence filter fabric with fasteners as specified in E8.2.4. Attach silt fence filter fabric on top of wire mesh in similar fashion. Overlap any fence seams (wire mesh or filter fabric) by 450 mm minimum. Ensure that wire mesh and filter fabric are installed on the upslope side of the post and are fully laid in anchor trench as shown.
- (c) Install and compact impermeable excavated materials into anchor trench and slope as indicated. Compact to 95% of maximum dry density (ASTM D-698).

#### E8.3.3 Silt Fence Maintenance

- (a) Inspect silt fence daily, prior to starting any other construction activities. If fence posts are found loose or not upright, repair in accordance with installation procedure as specified in E8.3.2. If silt fence is found to be loose or torn, repair or replace as necessary to comply with E8.3.2.
- (b) If silt deposition at the fence is 300 mm or more in depth, carefully remove and dispose of silt offsite without disturbing silt fence.

#### E8.3.4 Silt Fence Removal

- (a) The silt fence shall remain in place until new vegetation growth has established on the bank, as determined by the Contract Administrator.
- (b) Upon authorization of the Contract Administrator, remove all fence posts, wire mesh, fabric, and fasteners from Site.
- (c) Restore areas disturbed area to a condition equal or better to the preconstruction condition without releasing any deleterious substances to the adjacent watercourse.

#### E8.4 Measurement and Payment

- E8.4.1 The supply, installation and removal of temporary silt fencing will be included in gate chamber construction.

### **E9. COLD WEATHER REQUIREMENTS**

#### E9.1 Description

- (a) Should any concrete Work be required to be carried out when the mean daily temperature is below 5°C or anticipated to be below 5°C within the next 24 hours, cold weather requirements will be specified herein.
- (b) All freshly placed concrete shall be protected from the elements and from defacements due to construction operations.

#### E9.2 Construction Methods

- (a) 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 expense to the City;
  - (i) Before any concrete is placed, all ice, snow, and frost shall be completely removed from all form work, 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.

- (ii) Concrete aggregates and water 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.
- (iii) 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.
- (iv) The Contractor shall inform the Contract Administrator well in advance as to the methods of enclosure and frost protection he proposes to employ.

### E9.3 Measurement and Payment

- E9.3.1 Cold weather requirements shall be considered incidental to the construction of cast-in-place concrete and no measurement or payment will be made for this item.

## **E10. PRE-CAST CONCRETE GATE CHAMBER CONSTRUCTION**

### E10.1 Description

- (a) General
- (b) This specification shall cover the construction of pre-cast concrete gate chambers.

### E10.2 Materials

- (a) Pre-cast concrete manhole sections used for gate chambers shall be in accordance with section 2.7 of CW 2130.
- (b) Flexible Transition Pipe Couplings
  - (i) Flexible transition pipe couplings shall be in accordance with Clause 2.1 and 2.6 of CW 2130.
- (c) Manhole Frames and Covers
  - (i) Cover: Unmarked Tital TF-114 cast iron solid cover
  - (ii) Frame: 125 millimeter high cast iron frame
- (d) Cast Iron Sluice Gates
  - (i) Cast iron sluice gates, wall thimbles, mechanical lift operators, stems and accessories shall be in accordance with E13 of this specification.
- (e) Cast Iron Flap Gates
  - (i) Cast iron flap gates and wall thimbles shall be in accordance with E14 of this specification.
- (f) Cast Iron Gate Valves
  - (i) Gate valves shall be bronze mounted, cast iron body with flanged ends equipped with:
    - (i) Outside rising stem, screw and yoke
    - (ii) Bronze trimmed cast iron wedge
    - (iii) Bronze stem
    - (iv) Double O-ring stem seals
  - (ii) Flanges shall conform in dimension and drilling to ANSI/ASME B15.1, Class 150.
  - (iii) Direction of opening shall be counter clockwise and shall be clearly stamped or indicated with raised letters and arrow



- (iv) Manufacturer's nameplate shall be attached to the valve body with stainless steel fasteners.
- (v) Gate valves shall be manufactured by Crane, Jenkins, Kennedy, Mueller, Clow or approved equal.
- (vi) Submit shop drawings of gate valves in accordance with E7 of this specification.
- (g) Gate Valve Stem Extension
  - (i) Gate valves stem extension shall be 38 millimeters diameter ASTM A276 Type 304 stainless steel, schedule 40 pipe with a 50 mm square operating nut.
  - (ii) Submit shop drawings of the valve extension in accordance with E7 of this specification
- (h) Stem Extension Guide and Wall Brackets
  - (i) Stem extension guide and wall brackets to be ASTM Type 304 stainless steel, suitable for keeping the stem plumb and centered in the valve box while not interfering with the operation of the valve stem
  - (ii) Submit shop drawings of the stem extension guides and wall brackets in accordance with E7 of this specification
- (i) Flange Adapter
  - (i) Vanstone Flange or approved equal
- (j) Miscellaneous Metals and Accessories
  - (i) Miscellaneous metals and accessories shall be as shown on the Drawings and in accordance with E15 of this specification.

#### E10.3 Construction Methods

- (a) Install pre-cast concrete gate chambers as shown on the Drawings in accordance with Clause 3.8 and 3.9 of CW 2130.
- (b) Install land drainage sewer piping as shown on the Drawings to make connections between pre-cast concrete gate chambers, pre-cast concrete weir manholes, 1200 mm base manholes, and connections to existing manholes and sewers as required
- (c) Gate Valve Installation
  - (i) Install gate valves, flange adaptors and valve stems as shown on the Drawings
  - (ii) Gate valves shall be left in the open position as all times except when on site working on the valve.
- (d) Flap Gate Installation
  - (i) Install flap gates and wall thimbles as shown the Drawings and in accordance with E14 of this specification
- (e) Miscellaneous Metal Fabrications
  - (i) Install miscellaneous metal fabrications as shown on the Drawings and in accordance with E15 of this specification

#### E10.4 Measurement and Payment

- E10.4.1 Construction of pre-cast concrete gate chambers, including all connection piping, will be measured on a unit basis and paid for at the Contract Unit Price for "Pre-cast Concrete Gate Chamber". The number of units to be paid for will be the total number of pre-cast concrete gate chambers constructed in accordance with this specification, accepted and measured by the Contract Administrator.

## **E11. PRE-CAST CONCRETE GATE WEIR MANHOLE CONSTRUCTION**

### **E11.1 Description**

#### **(a) General**

- (b) This specification shall cover the construction of pre-cast concrete weir manholes.

### **E11.2 Materials**

- (a) Pre-cast concrete manhole sections used for weir manholes shall be in accordance with section 2.7 of CW 2130.
- (b) Weir shall be pre-cast into the manhole base section as per the dimension on the Drawings
- (c) Flexible Transition Pipe Couplings
  - (i) Flexible transition pipe couplings shall be in accordance with Clause 2.1 and 2.6 of CW 2130.
- (d) Manhole Frames and Covers
  - (i) Cover: Unmarked Tital TF-114 cast iron solid cover
  - (ii) Frame: 125 millimeter high cast iron frame
  - (iii) Submit shop drawings of gate valves in accordance with E7 of this specification.

### **E11.3 Construction Methods**

- (a) Install pre-cast concrete gate chambers as shown on the Drawings in accordance with Clause 3.8 and 3.9 of CW 2130.

### **E11.4 Measurement and Payment**

- E11.4.1 Construction of pre-cast concrete gate chambers will be measured on a unit basis and paid for at the Contract Unit Price for "Pre-cast Concrete Weir Manhole". The number of units to be paid for will be the total number of pre-cast concrete gate chambers constructed in accordance with this specification, accepted and measured by the Contract Administrator.

## **E12. CAST IRON SLUICE GATES**

### **E12.1 Description**

#### **(a) General**

- (i) This specification shall cover the supply, delivery, installation and testing of cast iron sluice gates, wall thimbles, mechanical lift operator, stems wall brackets and accessories

#### **(b) General Design:**

- (i) Leakage Rate Specification Standard: AWWA C560
- (ii) Type: Rising stem with stop nut, flange back with standard bottom closure
- (iii) Mounting: Type F wall thimble
- (iv) Seating Head: Maximum design seating head for all sluice gates will be from centerline of the gate to the top of the gate chamber unless noted otherwise on the Drawings.
- (v) Operator and Lift: Enclosed gear with pedestal.  
Operator to be finished with a 50 mm x 50 mm square nut suitable for attachment of an electric portable drill for opening.  
Operator shall turn counter clockwise to open.

- (vi) Stem Cover: Gear lift to be complete with stem cover with acrylic window with gradations in suitable increments for the entire range of gate operation
- (vii) Stem Guides: Adjustable in both the horizontal and vertical directions

#### E12.2 Materials

- (a) Frame, Slide, Guides and Yoke ASTM A48 Cast Iron, Class 30
- (b) Seating Faces ASTM B21 Naval Bronze, Alloy 482
- (c) Wall Thimble ASTM A48 Cast Iron, Class 30
- (d) Wedges ASTM B564 Manganese Bronze, Alloy 865
- (e) Wedge Blocks ASTM A48 Cast Iron, Class 30
- (f) Fasteners and Anchors ASTM A276 Type 316 Stainless Steel
- (g) Stem ASTM A276 Type 304 Stainless Steel
- (h) Stem Couplings ASTM A276 Type 304 Stainless Steel
- (i) Stem Guide ASTM A48 Cast Iron, Class 30 with Bronze bushings
- (j) Operator Pedestal ASTM A48 Cast Iron, Class 30 or Steel
- (k) Stem Cover Aluminum or galvanized steel
- (l) Shop Drawings
  - (i) Submit shop drawings of cast iron sluice gates, wall thimbles, mechanical lift operator, stems, wall brackets and accessories in accordance with E7 of this specification.
- (m) Operating and Maintenance Manuals
  - (i) Provide five (5) copies of all the manufacturer's brochures and technical literature detailing correct installation procedure and recommended operating and maintenance instructions. Manuals should be bound with the project title and gate description identified on the front cover. One set of manuals shall be provided for each size of gate. Final payment for sluice gates will not be made until the above information has been provided to the Contract Administrator.
- (n) Delivery and Shipping
  - (i) The Contract Administrator will examine the sluice gate assemblies, thimbles, frames, stems, operators and accessories upon delivery and will reject any equipment that is found to be damaged to the extent that, in the Contract Administrator's opinion, it cannot be put to the use for which it was intended. The Contract shall arrange with the gate supplier to repair any superficially damaged equipment to the satisfaction of the Contract Administrator.
  - (ii) It shall be the responsibility of the Contractor to negotiate any claims for damage with the carrier and to make arrangements to have any rejected equipment replaced as soon as possible at no extra expense to the City.

#### E12.3 Construction Methods

- (a) Installation
  - (i) Install cast iron sluice gates, wall thimbles, mechanical lift operators, stems, wall brackets and accessories as shown on the Drawings and in accordance with the manufacturer's recommendations.
  - (ii) Make arrangements to have a qualified field representative of the sluice gate supplier/manufacturer inspect the installation during and after completion and provide a Certificate of Satisfactory Installation to the Contract Administrator.

- (b) Shop Testing
  - (i) The fully assembled gates shall be shop inspected, adjusted and tested for operation and leakage at the design head before shipping.
  - (ii) Provide the following information to the Contract Administrator prior to delivery of the sluice gates and operator assemblies:
    - (v) A certified copy of the Chemical and Physical Analysis on all materials used in the manufacture of the sluice gates, wall thimbles, stems, operator and accessories or certification that the materials used are in strict accordance with this specification.
    - (vi) Copies of the test reports for Performance and Leakage tests. Included on the report shall be the signature of the official who is responsible for the gate assembly and testing.
- (c) Field Testing
  - (i) Perform leakage tests in the Contract Administrator's presence once sluice gates have been installed to ensure compliance with the allowable leakage rate indicated in AWWA C501-92.
  - (ii) Arrange for a qualified field representative of the sluice gate supplier/manufacturer to be present during field testing.
  - (iii) 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.
  - (iv) 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.
  - (v) The test for unseating head will be performed by closing the sluice gate and flap gate, filling the chamber between the gates with water to the specified head and measuring the leakage rate through the gate.
  - (vi) The Contractor will be responsible to pump river water or supply water from a hydrant into the chamber for testing purposes.
  - (vii) If a gate fails the field leakage test, the Contractor shall undertake adjustments, replacements or other modifications recommended by the sluice gate supplier/manufacturer's field representative and repeat the test. The sequence shall be repeated until the gate passes the allowable leakage rate.
- (d) Measurement and Payment
  - (i) Supply, installation and testing of cast iron sluice gates, wall thimbles, mechanical lift operator, stems, wall brackets and accessories will be included in gate chamber construction.

## **E13. CAST IRON FLAP GATES**

### **E13.1 Description**

- (a) General
  - (i) This specification shall cover the supply, delivery, installation and testing of cast iron flap gates and wall thimbles.
- (b) General Design:
  - (i) Leakage Rate Specification Standard: AWWA C560
  - (ii) Type: Flange Back for mounting on a wall thimble or flat concrete wall
  - (iii) Mounting: Type F wall thimble

- (iv) Seating Head: Maximum design seating head for all flap gates will be from centerline of the gate to the top of the gate chamber unless noted otherwise on the Drawings.
- (v) Cover: One piece cast iron with lifting eye for manual operation.
- (vi) Seat: One piece cast iron raised surface and inclined to assure positive closure.
- (vii) Links: Complete with grease nipples at pivot points and adjusting screws to align seating face
- (viii) Pivot Lugs: One piece cast iron adjustable in the horizontal plane without removal of cover, complete with grease nipples.

#### E13.2 Materials

- (a) Cast Iron Pieces ASTM A48 Cast Iron, Class 30
- (b) Seating Faces ASTM B21 Naval 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) Shop Drawings
  - (i) Submit shop drawings of cast iron flap gates and wall thimbles in accordance with E7 of this specification.
- (h) Operating and Maintenance Manuals
  - (i) Provide five (5) copies of all the manufacturer's brochures and technical literature detailing correct installation procedure and recommended operating and maintenance instructions. Manuals should be bound with the project title and gate description identified on the front cover. One set of manuals shall be provided for each size of gate. Final payment for sluice gates will not be made until the above information has been provided to the Contract Administrator.
- (i) Delivery and Shipping
  - (i) The Contract Administrator will examine the sluice gate assemblies, thimbles, frames, stems, operators and accessories upon delivery and will reject any equipment that is found to be damaged to the extent that, in the Contract Administrator's opinion, it cannot be put to the use for which it was intended. The Contract shall arrange with the gate supplier to repair any superficially damaged equipment to the satisfaction of the Contract Administrator.
  - (ii) It shall be the responsibility of the Contractor to negotiate any claims for damage with the carrier and to make arrangements to have any rejected equipment replaced as soon as possible at no extra expense to the City.

#### E13.3 Construction Methods

- (a) Installation
  - (i) Install cast iron flap gates and wall thimbles as shown on the Drawings and in accordance with the manufacturer's recommendations.
  - (ii) Make arrangements to have a qualified field representative of the flap gate supplier/manufacturer inspect the installation during and after completion and provide a Certificate of Satisfactory Installation to the Contract Administrator.
- (b) Shop Testing

- (i) The fully assembled gates shall be shop inspected, adjusted and tested for operation and leakage at the design head before shipping.
- (ii) Provide the following information to the Contract Administrator prior to delivery of flap gates and wall thimbles:
  - (vii) A certified copy of the Chemical and Physical Analysis on all materials used in the manufacture of the flap gates and wall thimbles or certification that the materials used are in strict accordance with this specification.
  - (viii) Copies of the test reports for Performance and Leakage tests. Included on the report shall be the signature of the official who is responsible for the gate assembly and testing.
- (c) Field Testing
  - (i) Perform leakage tests in the Contract Administrator's presence once flap gates have been installed to ensure compliance with the allowable leakage rate of 1.24 L/min per meter of seated perimeter at any head.
  - (ii) Arrange for a qualified field representative of the sluice gate supplier/manufacturer to be present during field testing.
  - (iii) 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 gate.
  - (iv) The Contractor will be responsible to pump river water or supply water from a hydrant into the chamber for testing purposes.
  - (v) If a gate fails the field leakage test, the Contractor shall undertake adjustments, replacements or other modifications recommended by the flap gate supplier/manufacturer's field representative and repeat the test. The sequence shall be repeated until the gate passes the allowable leakage rate.
- (d) Measurement and Payment
  - (i) Supply, installation and testing of cast iron flap gates and wall thimbles will be included in gate chamber construction.

## **E14. METAL FABRICATIONS**

### **E14.1 Description**

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

### **E14.2 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) Steel pipe: to ASTM A53/A53M, seamless, galvanized, as specified by item.
- (e) Welding materials: to CSA W59.
- (f) Hot dipped galvanized steel repair manual: Galvalloy and Gal-Viz.
- (g) Stud Anchors: to ASTM A108, Grade 1020.

- (h) 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.
- (i) Isolating sleeves shall be "Nylite" - headed sleeve as manufactured by SPAE-Naur of Kitchener, Ontario, or approved equal.
- (j) 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.

#### E14.3 Construction Methods

##### (a) Submittals

- (i) The Contractor shall submit the qualifications of the fabricator and welders to the Contract Administrator for acceptance.
- (ii) Submit shop drawings in accordance with E7 clearly indicating material, core thickness, finishes, connections, joints, methods of anchorage, number of anchors, supports, reinforcement, details and accessories. Indicate field measurements on shop drawings.

##### (b) Fabrication

- (i) 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 disfigurement will show in the finished Work, or impair the strength.
- (ii) Confirm measurements for all fabrications before fabricating.
- (iii) Cut aluminum plate with edges straight and true, and as far as practical, maintain continuity of the pattern at abutting edges.
- (iv) Pieces shall be of the sizes indicated on the Drawings and shall not be built up from scrap pieces. Confirm sizes with field measurements.
- (v) Where possible, fit Work and shop assemble, ready for erection.
- (vi) 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.
- (vii) Remove and grind smooth burrs, filings, sharp protrusions, and projections from metal fabrications to prevent possible injury. Correct and dangerous or potentially harmful installations as directed by the Contract Administrator.
- (viii) 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.
- (ix) All aluminum welding shall be in accordance with the requirements of CSA W59.2. The fabricator shall be fully certified in conformance with CSA Standard 47.2. 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.
- (x) Ensure exposed welds are continuous for the length of each joint. File or grind exposed welds smooth and flush.
- (xi) All steel shall be hot-dipped galvanized after fabrication, in accordance with CAN/CSA-G164, to a minimum net retention of 600 g/sq.m.
- (xii) Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1.
- (xiii) Use self-tapping, shake-proof, flat-headed screws on items requiring assembly by screws.

##### (c) Erection

- (i) Do steel welding Work in accordance with CSA W59 and aluminum welding Work in accordance with CSA W59.2.
- (ii) Erect metal Work in accordance with reviewed shop drawings, square, plumb, straight and true, accurately fitted, with tight joints and intersections.
- (iii) Provide suitable means of anchorage acceptable to the Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles where not specifically indicated on the Drawings.
- (iv) Provide components for building in accordance with shop drawings and schedule.
- (v) Make field components with bolts to CAN/CSA-S16, or weld.
- (vi) Touch-up rivets, bolts and burnt or scratched surfaces that are to receive paint finish, with zinc primer after completion of erection.
- (vii) 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. Temperature shall be kept below 177°C (350°F) at all times. All heating of structural steel Work shall be done in the presence of the Contract Administrator.
- (viii) Install access hatch frames square and level at the locations shown on the Drawings. Embed anchors in concrete as shown on the Drawings. Install covers and adjust hardware to proper function.
- (ix) All aluminum surfaces in contact with concrete shall be isolated using alkali-resistance bituminous paint meeting the requirements of CGSB 31-GP-3M.
- (x) Install electrochemical isolation gaskets and sleeves to electrically isolate dissimilar metals.

E14.4 Measurement and Payment

- (a) Supply, fabrication, transportation, handling, delivery and placement of metal fabrications will be included in gate chamber construction.

**E15. EXISTING GATE VALVES**

E15.1 The existing gate valve on the overflow line from an existing gate chamber shall be removed or abandoned as follows:

- (a) Where the valve is located within 3 m of the outside wall of the proposed gate chamber, the valve and the sewer between the valve and the gate chamber shall be removed and replaced with new sewer pipe of the same diameter
- (b) Where the valve is located more than 3 m from the outside wall of the proposed gate chamber, the valve shall be abandoned by fully opening the valve and removing the valve box and spindle. The Contractor shall verify that the valve is fully open with CCTV inspection. The Contractor shall give the Contract Administrator 24 hours notice of the inspection.

E15.2 Measurement and Payment

- (a) Removal and abandonment of existing gate valves, removal of existing sewer pipe between existing gate valves and new pre-cast concrete gate chambers, and CCTV inspection shall be included in gate chamber construction.



**E16. TEMPORARY SURFACE RESTORATION AND MAINTENANCE**

- E16.1 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 for payments owed.
- E16.2 Costs for temporary restoration and maintenance of disturbed surfaces will be included in gate chamber construction.
- E16.3 The existing gate valve on the overflow line from an existing gate chamber shall be removed or abandoned as follows:
- (a) Grassed areas: sodding using imported topsoil in accordance with CW 3510.
  - (b) Gravelled surfaces: in accordance with CW 3150.
  - (c) Asphalt surfaces: match existing base course and asphalt thickness or a minimum of 150 mm of base course and 75 mm of Type 1A Asphaltic concrete whichever is greater, in accordance with CW 3410.
  - (d) Pavement slabs (including private approaches): in accordance with CW 3230.
  - (e) Miscellaneous concrete slabs (median slab, sidewalk, bullnose): in accordance with CW 3235.
  - (f) Concrete curb and gutter: in accordance with CW 3240.
- E16.4 Restore berms constructed sound finished gate chambers with sod using imported topsoil in accordance with CW 3510.
- E16.5 Costs for permanent surface restoration will be included in gate chamber construction.

**E17. TRAFFIC CONTROL**

- E17.1 Cost for Traffic Control shall be included in gate chamber construction.

**E18. TEMPORARY SUPPORTS**

- E18.1 The Contractor shall arrange for temporary support for any hydro poles, light standards, or other infrastructure where required with the appropriate utility or jurisdiction.
- E18.2 Cost for Temporary Supports for hydro poles, light standards, or other infrastructure shall be included in gate chamber construction.