



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 768-2013**

**AUBREY WASTEWATER PUMPING STATION UPGRADE**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 AUBREY WASTEWATER PUMPING STATION UPGRADE

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, July 10, 2014

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

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

### **B3. SITE INVESTIGATION**

B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site at 10 a.m. on June 27, 2014 to provide Bidders access to the Site at 1016 Palmerston Avenue, Winnipeg, MB.

- (a) Construction activities are currently underway and access to the Site outside the above stated time is restricted. Bidders accessing the Site must bring and wear their own PPE including CSA approved footwear, hard hat and reflective vest.

B3.2 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

### **B4. ENQUIRIES**

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

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

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

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

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

### **B5. CONFIDENTIALITY**

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

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

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

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

## **B6. ADDENDA**

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

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

B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>

B6.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B6.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B7. SUBSTITUTES**

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

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

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

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

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

- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B7.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B16.
- B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B7.10 Notwithstanding B7.2 to B7.9, and in accordance with B8.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B16.1(a).

## **B8. BID COMPONENTS**

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
  - (c) Bid Security
    - (i) Form G1: Bid Bond and Agreement to Bond, or  
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or  
a certified cheque or draft;
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B8.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B8.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B8.5 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.
- B8.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B8.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and

obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.

B8.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B8.8 Bids shall be submitted to:  
The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg, MB R3B 1J1

## **B9. BID**

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

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

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

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

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

B9.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:

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

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

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

## **B10. PRICES**

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

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

- B10.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B10.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

**B11. QUALIFICATION**

- B11.1 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.
- B11.2 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>
- B11.3 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).
- B11.4 Further to B11.3(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 copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (b) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (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/>).
- B11.5 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.



B11.6 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.

## **B12. BID SECURITY**

B12.1 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.

B12.1.2 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.

B12.1.3 All signatures on bid securities shall be original.

B12.1.4 The Bidder shall sign the Bid Bond.

B12.1.5 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B12.2 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.

B12.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B12.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B12.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B12.3 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.

## **B13. OPENING OF BIDS AND RELEASE OF INFORMATION**

B13.1 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.

B13.1.3 Bidders or their representatives may attend.

B13.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/default.stm>

B13.3 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/matmgmt/default.stm>

B13.4 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.

#### **B14. IRREVOCABLE BID**

B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.

B14.2 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.

#### **B15. WITHDRAWAL OF BIDS**

B15.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B15.1.1 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.

B15.1.2 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.

B15.1.3 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 B15.1.3(b), declare the Bid withdrawn.

B15.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B14.2 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.

#### **B16. EVALUATION OF BIDS**

B16.1 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 B11(pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

- B16.2 Further to B16.1(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.
- B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.
- B16.4 Further to B16.1(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.
- B16.4.1 Further to B16.1(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.

## **B17. AWARD OF CONTRACT**

- B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.
- B17.2 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.
- B17.2.1 Without limiting the generality of B17.2, 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.
- B17.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.
- B17.3.2 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

## **PART C - GENERAL CONDITIONS**

### **C0. GENERAL CONDITIONS**

- C0.1 The General Conditions for Construction (Revision 20061215) 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 a complete replacement of process pumping and piping systems, all electrical systems, along with a range of minor structural electrical room building rehabilitation works, and a short forcemain replacement.

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

- (a) Replacement of two (2) existing dry-pit wastewater sewage pumps and pump motors in the "dry-pit" section of the station with three (3) City supplied 75 HP dry-pit pumping units.
- (b) The third pump will require the purchase of a motor/shaft unit equal to the capacity of each of the other two motors already supplied by the City, and shall also include all drive shaft, safety feature, cable, conduit, motor controls, etc, to have this motor installed with the third pump.
- (c) Supply and installation of soft starters for all new pumps and motors
- (d) Supply and installation of three (3) flow meters (one for each individual pumping unit) and associated instrumentation;
- (e) Supply and installation of new process piping including suction and discharge piping, gate valves, check valves and other fittings;
- (f) Replacement of existing MCC (motor control centre) and associated electrical work;
- (g) Replace communicator chamber inlet valve and provide additional piping as shown;
- (h) Replacement of HVAC system;
- (i) Replacement of short forcemain on-site and restoration of site surface works;
- (j) Structural improvements to existing building;
- (k) Provision of main floor hoisting/craning device;
- (l) Provision of temporary by-pass pumping system.

#### **D3. EXTRA WORK ALLOWANCE**

D3.1 Description:

- (a) The extra work allowance is intended to address additional upgrade work authorized by the Contract Administrator that may be required due to uncertainties involved in working in an older facility, some areas of which will not be visible until project work is underway.
- (b) The City reserves the right to delete any or all of the Cash Allowance from the Contract if the Work intended to be covered by the Cash Allowance is not required, or if the Works intended are found to be more extensive than the provisional Cash Allowance.

D3.2 Method of Measurement and Basis of Payment

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

#### **D4. CONTRACT ADMINISTRATOR**

D4.1 The Contract Administrator is KGS Group , represented by:

Rudy Derksen, P.Eng.,  
Senior Mechanical Engineer

Telephone No. 204 478-3246

Facsimile No. 204 896-0754

*Email: rderksen@ksgsgroup.com*

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

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

#### **D5. CONTRACTOR'S SUPERVISOR**

D5.1 At the pre-construction meeting, the Contractor shall identify his/her designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

#### **D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE**

D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

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

D6.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;

- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
- (b) the Contract, all deliverables produced or developed; and
- (c) any statement of fact or opinion regarding any aspect of the Contract.

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

#### **D7. NOTICES**

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

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

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

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

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

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

#### **D8. FURNISHING OF DOCUMENTS**

- D8.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him/her at cost.

#### **SUBMISSIONS**

#### **D9. AUTHORITY TO CARRY ON BUSINESS**

- D9.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

#### **D10. SAFE WORK PLAN**

- D10.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D10.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Safety/default.stm>
- D10.3 Notwithstanding B11.4 at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

#### **D11. INSURANCE**

- D11.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;

- (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
- (c) all risks course of construction insurance in the amount of one hundred percent (100%) of the total Contract Price, written in the name of the Contractor and The City of Winnipeg, at all times during the performance of the Work and until the date of Total Performance.

D11.2 Deductibles shall be borne by the Contractor.

D11.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.

D11.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

## **D12. PERFORMANCE SECURITY**

D12.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
- (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
- (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

D12.1.2 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D12.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

## **D13. SUBCONTRACTOR LIST**

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

## **D14. DETAILED WORK SCHEDULE**

D14.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.



- D14.2 The detailed work schedule shall consist of the following:
- (a) a critical path method (C.P.M.) schedule for the Work;
  - (b) a Gantt chart for the Work based on the C.P.M. schedule;
- all acceptable to the Contract Administrator.
- D14.3 Further to D14.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:
- D14.4 Further to D14.2(b), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

## **SCHEDULE OF WORK**

### **D15. COMMENCEMENT**

- D15.1 The Contractor shall not commence any Work until he/she is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.
- D15.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
    - (i) evidence of authority to carry on business specified in D9;
    - (ii) evidence of the workers compensation coverage specified in C6.15;
    - (iii) the Safe Work Plan specified in D10;
    - (iv) evidence of the insurance specified in D11;
    - (v) the performance security specified in D12;
    - (vi) the Subcontractor list specified in D13;
    - (vii) the detailed work schedule specified in D14.
  - (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- D15.3 The Contractor shall not commence the Work on the Site before November 15, 2014.
- D15.4 The City intends to award this Contract by August 29, 2014.
- D15.4.3 If the actual date of award is later than the intended date, the dates specified for Commencement, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

### **D16. CRITICAL STAGE**

- D16.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
- (a) The contractor must ensure that a minimum two (2) new pumping units, motors and all related piping, fittings, etc. must be ready and put into service by March 15, 2015.

### **D17. SUBSTANTIAL PERFORMANCE**

- D17.1 The Contractor shall achieve Substantial Performance by April 15, 2015.

D17.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D17.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

#### **D18. TOTAL PERFORMANCE**

D18.1 The Contractor shall achieve Total Performance by June 30, 2015.

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

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

#### **D19. LIQUIDATED DAMAGES**

D19.1 If the Contractor fails to achieve Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

- (a) Critical Stage – one thousand five hundred dollars (\$1,5000.00)
- (b) Substantial Performance – one thousand five hundred dollars (\$1,5000.00)
- (c) Total Performance – five hundred dollars (\$500.00)

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

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

#### **D20. SCHEDULED MAINTENANCE**

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

- (a) Landscape Maintenance as specified in CW 3510 of the City of Winnipeg's Standard Construction Specifications

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

## **CONTROL OF WORK**

### **D21. JOB MEETINGS**

- D21.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D21.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

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

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

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

- D23.1 Further to B11.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B11.4.

### **D24. PAYMENT**

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

## **WARRANTY**

### **D25. WARRANTY**

- D25.1 Notwithstanding C13.2, the 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.
- D25.1.1 For the purpose of Performance Security, the warranty period shall be one (1) year.
- D25.2 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.
- D25.2.2 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

**FORM H1: PERFORMANCE BOND**  
(See D12)

KNOW ALL MEN BY THESE PRESENTS THAT

\_\_\_\_\_ ,  
(hereinafter called the "Principal"), and

\_\_\_\_\_ ,  
(hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), in the sum of

\_\_\_\_\_ dollars (\$ \_\_\_\_\_)

of lawful money of Canada to be paid to the Obligee, or its successors or assigns, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract with the Obligee for

BID OPPORTUNITY NO. 768-2013

AUBREY WASTEWATER PUMPING STATION UPGRADE

which is by reference made part hereof and is hereinafter referred to as the "Contract".

NOW THEREFORE the condition of the above obligation is such that if the Principal shall:

- (a) carry out and perform the Contract and every part thereof in the manner and within the times set forth in the Contract and in accordance with the terms and conditions specified in the Contract;
- (b) perform the Work in a good, proper, workmanlike manner;
- (c) make all the payments whether to the Obligee or to others as therein provided;
- (d) in every other respect comply with the conditions and perform the covenants contained in the Contract; and
- (e) indemnify and save harmless the Obligee against and from all loss, costs, damages, claims, and demands of every description as set forth in the Contract, and from all penalties, assessments, claims, actions for loss, damages or compensation whether arising under "The Workers Compensation Act", or any other Act or otherwise arising out of or in any way connected with the performance or non-performance of the Contract or any part thereof during the term of the Contract and the warranty period provided for therein;

THEN THIS OBLIGATION SHALL BE VOID, but otherwise shall remain in full force and effect. The Surety shall not, however, be liable for a greater sum than the sum specified above.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable as Principal, and that nothing of any kind or matter whatsoever that will not discharge the Principal shall operate as a discharge or release of liability of the Surety, any law or usage relating to the liability of Sureties to the contrary notwithstanding.

IN WITNESS WHEREOF the Principal and Surety have signed and sealed this bond the

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

**SIGNED AND SEALED**  
in the presence of:

\_\_\_\_\_  
(Witness as to Principal if no seal)

\_\_\_\_\_  
(Name of Principal)

Per: \_\_\_\_\_ (Seal)

Per: \_\_\_\_\_

\_\_\_\_\_  
(Name of Surety)

By: \_\_\_\_\_ (Seal)  
(Attorney-in-Fact)

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT  
(PERFORMANCE SECURITY)**  
(See D12)

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

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 768-2013  
AUBREY WASTEWATER PUMPING STATION UPGRADE

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

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

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

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

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

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

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

Partial drawings are permitted.

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

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

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

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

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

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

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

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

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

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

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

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





## PART E - SPECIFICATIONS

### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Specification No.</u>	<u>Specification Title</u>
	Table of Contents
01 00 00	General Provisions
04 04 99	Masonry for Minor Works
07 21 13	Board Insulation
07 61 00	Sheet Metal Roofing
09 91 99	Painting for Minor Work
09 96 05	Graffiti-Resistant Coatings
10 44 22	Fire Extinguishers
22 10 10	Sump Pump
22 11 18	Domestic Water Piping
22 13 18	Domestic Waste and Vent Piping - Plastic
22 42 01	Plumbing Specialties and Accessories
23 05 00	Common Work Results for HVAC
23 05 13	Common Motor Requirements for HVAC Equipment
23 05 54	Mechanical Identification
23 05 93	Testing, Adjusting and Balancing for HVAC
23 07 13	Duct Insulation
23 31 14	Metal Ducts– Low Pressure to 500 PA
23 33 00	Air Duct Accessories
23 33 14	Dampers- Balancing
23 33 15	Dampers– Operating
23 34 00	HVAC Fans
23 37 13	Diffusers, Louvres and Grilles
23 44 00	HVAC Air Filtration
25 05 01	Controls General Requirements
25 05 54	Controls Identification
25 30 01	RTU Control Panel
25 30 02	Controls Instrumentation
26 05 01	Common Work Results – Electrical
26 05 20	Wire and Box Connectors 0-1000 V
26 05 21	Wires and Cables 0-1000 V
26 05 28	Grounding – Secondary
26 05 29	Hangers and Supports for Electrical Systems
26 05 31	Splitters, Junction, Pull Boxes and Cabinets
26 05 32	Outlet Boxes, Conduit Boxes and Fittings
26 05 34	Conduits, Conduit Fastenings and Conduit Fittings
26 24 02	Service Entrance Board
26 24 17	Panelboards Breaker Type
26 24 19	Motor Control Centres

26 27 26	Wiring Devices
26 28 21	Moulded Case Circuit Breakers
26 28 23	Disconnect Switches – Fused and Non-Fused
26 29 03	Control Devices
26 29 10	Motor Starters to 600 V
26 36 23	Manual Transfer Switch and Generator Termination Panel

Appendix A	City Supplied Pump/Motor System Information
Appendix B	Temporary Pumping – Additional Site Drawing
Appendix C	Waterways Permit Application Complete with Soil Logs
Appendix D	Existing Station Drawings
Appendix E	Electrical Design Guide
Appendix F	Identification Standard

**City of Winnipeg  
 Drawing No.**

**Drawing Name/Title**

1-0116L-D0001-001	Aubrey Wastewater Pumping Station Upgrade - Cover Sheet
1-0116L-C0001-001	Aubrey Wastewater Pumping Station Upgrade - Forcemain Replacement Plan
1-0116L-C0002-001	Aubrey Wastewater Pumping Station Upgrade - Forcemain Replacement Sections and Details
1-0116L-S0001-001	Aubrey Wastewater Pumping Station Upgrade - Plans & Work Schedule
1-0116L-S0002-001	Aubrey Wastewater Pumping Station Upgrade - Elevations & Section
1-0116L-S0003-001	Aubrey Wastewater Pumping Station Upgrade - Sections and Details – Sheet 1 of 3
1-0116L-S0003-002	Aubrey Wastewater Pumping Station Upgrade - Sections and Details – Sheet 2 of 3
1-0116L-S0003-003	Aubrey Wastewater Pumping Station Upgrade - Sections and Details – Sheet 3 of 3
1-0116L-M0001-001	Aubrey Wastewater Pumping Station Upgrade - Demolition – Main Floor & Lower Level 1
1-0116L-M0002-001	Aubrey Wastewater Pumping Station Upgrade - Demolition – Motor Room, Pump Room & Comminutor Room
1-0116L-M0003-001	Aubrey Wastewater Pumping Station Upgrade - Process Piping - Pump Room Plan
1-0116L-M0004-001	Aubrey Wastewater Pumping Station Upgrade - Process Piping - Motor Room Plan
1-0116L-M0005-001	Aubrey Wastewater Pumping Station Upgrade - Process Piping – Plan & Sections
1-0116L-M0006-001	Aubrey Wastewater Pumping Station Upgrade - Process Piping – Comminutor Chamber
1-0116L-M0007-001	Aubrey Wastewater Pumping Station Upgrade - HVAC & Plumbing - Plans
1-0116L-M0008-001	Aubrey Wastewater Pumping Station Upgrade - HVAC & Plumbing - Section
1-0116L-E0001-001	Aubrey Wastewater Pumping Station Upgrade - Single Line Diagram
1-0116L-E0002-001	Aubrey Wastewater Pumping Station Upgrade - Pump P-L01 - Starter Schematic & Wiring Diagram
1-0116L-E0003-001	Aubrey Wastewater Pumping Station Upgrade - Pump P-L02 - Starter Schematic & Wiring Diagram
1-0116L-E0004-001	Aubrey Wastewater Pumping Station Upgrade - Pump P-L03 - Starter Schematic & Wiring Diagram
1-0116L-E0005-001	Aubrey Wastewater Pumping Station Upgrade - Heater HCE-L62 - Schematic & Wiring Diagram
1-0116L-E0006-001	Aubrey Wastewater Pumping Station Upgrade - Miscellaneous Wiring Schematics
1-0116L-E0007-001	Aubrey Wastewater Pumping Station Upgrade - Site Plan
1-0116L-E0008-001	Aubrey Wastewater Pumping Station Upgrade - Power Plans
1-0116L-E0009-001	Aubrey Wastewater Pumping Station Upgrade - Lighting Plans
1-0116L-E0010-001	Aubrey Wastewater Pumping Station Upgrade - Instrumentation Plans
1-0116L-E0011-001	Aubrey Wastewater Pumping Station Upgrade - Miscellaneous Details
1-0116L-E0012-001	Aubrey Wastewater Pumping Station Upgrade - Demolition Plans
1-0116L-E0013-001	Aubrey Wastewater Pumping Station Upgrade - Schedules
1-0116L-E0014-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 120 VAC Power and Fuse Distribution
1-0116L-E0015-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 24 VDC Power and Fuse Distribution - Sheet 1 of 2
1-0116L-E0015-002	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 24 VDC Power and Fuse Distribution - Sheet 2 of 2

1-0116L-E0016-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel – Digital Input DI 09-10 - UPS Alarm And Power Distribution
1-0116L-E0017-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel – Level Controller Pump Runs - Precision Digital (PD6000)
1-0116L-E0018-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel – Pump Call To Run Contacts - Pumps P-L01, P-L02 & P-L03
1-0116L-E0019-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel – CSO Flow Transmitter & Pump Current Signals
1-0116L-E0020-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel – 5606 I/O Board - Discrete Inputs
1-0116L-E0021-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board - Analog Inputs
1-0116L-E0022-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board - Analog Outputs
1-0116L-E0023-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board - Discrete Inputs - Sheet 1 of 2
1-0116L-E0023-002	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board - Discrete Inputs - Sheet 2 of 2
1-0116L-E0024-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board - Discrete Outputs
1-0116L-E0025-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board - Analog Inputs
1-0116L-E0026-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board - Analog Outputs
1-0116L-E0027-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board No. 2 - Discrete Inputs - Sheet 1 of 2
1-0116L-E0027-002	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board No. 2 - Discrete Inputs - Sheet 2 of 2
1-0116L-E0028-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board No. 2 - Discrete Inputs (Outputs)
1-0116L-E0029-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board No. 2 - Analog Inputs
1-0116L-E0030-001	Aubrey Wastewater Pumping Station Upgrade - RTU Panel - 5606 I/O Board No. 2 - Analog Outputs

## **E2. SOILS INVESTIGATION REPORT**

- E2.1 Further to C3.1, Waterways Permit Application complete with test hole logs for the project site are attached in Appendix C.

## **E3. EXISTING PUMPING STATION DRAWINGS**

- E3.1 Existing station drawings are included in Appendix D to provide some additional insight into existing site conditions. However actual site conditions may differ.

## **E4. HAZARDOUS MATERIALS**

- E4.1 If asbestos or other hazardous materials are encountered during the Work of the Contract, the Contractor shall stop all work and notify the Contract Administrator immediately. Removal of hazardous materials shall be dealt with by the City and the Contractor shall await further instruction by the Contract Administrator.

## **E5. SPECIFIC REQUIREMENTS**

- E5.1 The Contractor shall provide all materials, fabrications, finishes, temporary installation, documentation, shop drawings, means and methods necessary to fully install all of the new works identified on the contract drawings in a safe manner, fit-for-purpose intended. The description of work provided herein is intended to be a general description of work activities, and is not intended to be an exhaustive listing of all tasks necessary to complete the scope of installations given on the drawings or specifications.
- E5.2 Exercise care where cutting holes in existing concrete elements so as not to damage existing reinforcing.
- (a) For reinforced concrete floors, locate existing reinforcing utilizing a reinforcing bar locator and mark out on the surface of the concrete prior to cutting.
    - (i) Mark the location of the proposed hole and all adjacent bar.
    - (ii) Obtain approval from the Contract Administrator prior to cutting.

- E5.3 The Contractor shall exercise care where installing anchors into existing concrete elements so as not to damage existing reinforcing. All anchors shall be installed utilizing carbide tip drill bits. The existing reinforcing shall be located utilizing a reinforcing bar locator and marked out on the surface of the concrete. The drill holes shall be advanced to the required depth for installation of the anchors. Should reinforcement be encountered while drilling, terminate the hole and reposition to clear the reinforcement. Do not use core bits that can easily intercept and damage/cut the reinforcing during drilling.
- E5.4 The Contractor shall abide by the Arc Flash PPE requirements of CSA-Z462, Workplace Electrical Safety, and the arc flash labels on existing facility equipment.
- E5.5 Wire nuts
- (a) Wire nuts are not permitted in conduit bodies.
  - (b) Wire nuts are permitted in junction boxes for lighting and receptacle wiring only. Wire nuts are not permitted for automation wiring.
- E5.6 All conduit routes shall be approved by the Contract Administrator prior to installation of new conduit.
- E6. SURVEYING**
- E6.1 There are surveying requirements within the Work. All surveying requirements are the responsibility of the Contractor.
- E7. PROCESS PUMP/MOTOR SYSTEMS**
- E7.1 The City has already purchased three (3) dry pit pump systems along with two (2) shaft/motor assemblies. They will be made available to the Contractor for installation on this project. The original intent was to hold the third pump as a spare. However as part of this project, the intent is for the Contractor to also supply and install those parts required to install the third pump into the station so that it is identical to pumping unit 1 and 2. Information on the City supplied pump systems is included in Appendix A.
- E7.2 The Contractor shall supply the following third pump motor and components to complete the third pumping unit so that it will be identical to pumping units 1 and 2.
- (a) Teco Optim HE+75hp 1200 rpm 575V P-base motor.
  - (b) Johnson Power VA48 x 56.61" driveshaft assembly with motor and pump companion flanges. The assembly shall be dynamically balanced.
  - (c) Flowserv 10 x 12 suction elbow assembly with hand access port and drain valve.
  - (d) Flowserv motor base.
  - (e) Flowserv coupling guards and hardware.
  - (f) all cabling, conduit and other misc. components required for installation.
- E7.3 The Contractor shall pick-up the City supplied pump/motor systems from their storage building on McPhillips Ave. Any concerns regarding the suitability of the pump/motor systems shall be identified before the contractor accepts them from the City. Once the systems are accepted by the Contractor he will be responsible for their care. Any damage during transport and installation will be the Contractor's responsibility.
- E7.4 The Contractor shall assemble and install the pumping/motor systems.
- E7.5 Note the shafts have been supplied with excess length. Cut the shafts to suit final site conditions. Then rebalance the shaft system. This work shall be done by the pump supplier for the Contractor. Final shaft length shall be determined by the Contractor.
- E7.6 The pumping system supplier shall review the installation prior to startup and confirm the pumping/motor systems have been satisfactorily installed.

- E7.7 The pump supplier shall witness pump operation and confirm all 3 pumps are performing satisfactorily.
- E7.8 The Contractor will not be required to warranty the pump/motor systems supplied by the City, but only the items supplied by the Contractor.
- E7.9 Inspection of installation of the pumping units, upon completion, will be performed by a qualified technical representative from the manufacturer of the pumping units.
- E7.10 The Contract Administrator will supply arc flash stickers for the electrical equipment.

## **E8. EQUIPMENT AND MATERIALS**

- E8.1 The Contractor shall supply all equipment and materials necessary to execute the work, except for the equipment and material listed in E7.2.
- E8.2 Existing equipment and materials may be re-used only as specifically indicated in these specifications, as shown on the Drawings or as approved by the Contract Administrator.

## **E9. SECURITY**

- E9.1 The Contractor is responsible for all material and equipment stored on the site.
- E9.2 Provide a chain-link fence around the construction site and lock after working hours. Supply five (5) copies of the key to the City.
- E9.3 The Contractor is responsible for ensuring the security of the pumping station and related temporary pumping systems.

## **E10. SALVAGE**

- E10.1 All salvaged equipment and materials as determined by the Contract Administrator shall remain property of the City unless specifically noted otherwise. The Contractor shall deliver salvaged equipment and materials to the City of Winnipeg's "Y Yard" outdoor storage compound located at the North East corner of the intersection of Dugald Road and Van Bellegham Avenue, Winnipeg, Manitoba.
- E10.2 The Contractor shall notify the Contract Administrator at least 48 hours prior to delivery of salvaged equipment to allow for arrangements to be made to receive the salvaged equipment. All deliveries shall be made between 8:00 am and 3:30 pm on Business days.
- E10.3 The Contractor shall remove and haul all rejected salvage from the site and legally dispose of it.
- E10.4 Removal and delivery of salvageable and non-salvageable equipment and material shall be considered incidental to the Contract Work and no additional payment will be made for such Work.

## **E11. DANGEROUS WORK CONDITIONS**

- E11.1 Further to clause C 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.
- E11.2 The Contractor shall be aware of the potential hazards that can be encountered in underground chambers, manholes and sewers such as explosive gases, toxic gases and oxygen deficiency. The Contractor's Safe Work Plan should address these issues.

- E11.3 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.
- (a) The Contractor is responsible for all testing requirements.
- E11.4 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.
- E11.5 Workers must wear a respirator or supplied air at all times when entering an underground chamber, manhole or sewer where live sewage is present.
- E11.6 The Contractor shall provide a photo-ionization detector (PID) and toxic gas detector on site at all times to monitor potential hydrocarbon vapours and hydrogen sulphide 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.
- E11.7 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 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.

## **E12. WATERWAY BY-LAW**

- E12.1 The Contractor shall note that all Works within 107 metres (350 feet) of a riverbank are within the jurisdiction of the Waterway By-Law. The City of Winnipeg, Water and Waste Department, will apply and pay for any Waterway Permits for the project, as required. The Contractor shall adhere to restrictions imposed on the permit. A copy of the permit application is attached in Appendix C.
- E12.2 Under no circumstances will stockpiling of any material be permitted within 107 metres of a riverbank or dike.
- (a) The Contractor is responsible for removing excavated materials from the Site immediately.
- (b) The Contractor is responsible for utilizing and placing any backfill brought to the Site immediately.

## **E13. PROTECTION OF EXISTING TREES**

- E13.1 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.
- E13.1.1 Do not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
- E13.1.2 Strap mature tree trunks with 25 x 150 x 2400 wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.
- E13.1.3 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.
- E13.1.4 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.

- E13.1.5 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.
- E13.1.6 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.
- E13.2 All damage to existing trees due to construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Parks and Recreation Department, Forestry Branch at the Contractor's expense.

#### **E14. TEMPORARY USE OF CITY EQUIPMENT**

- E14.1 City facilities, systems and equipment shall not be used during construction without the Contract Administrator's written permission. The Contract Administrator reserves the right to withdraw said permission if, in his opinion, proper care and maintenance are not provided.

#### **E15. WASTEWATER TEMPORARY BY-PASS PUMPING**

- E15.1 Description – Because the project involves complete replacement of station mechanical and electrical pumping systems, and various works inside the wet well and comminutor chamber, the existing station will have to be completely shut-down for an extended period to permit rehabilitation works to be completed. During this period the Contractor will be required to take over responsibility for pumping wastewater for the duration of the project works, from the day the responsibility for station flow pumping is turned over to the contractor, until the new mechanical and electrical systems have been commissioned and proven to be operating reliably.
- E15.2 Provide a 24 hour contact person who can address any issues with the temporary pumping system.
- E15.3 Provide a complete fully automatic pumping system that includes a minimum of two submersible pumps, each with a capacity equal to or greater than the listed PDWF for that station. Expected PDWF is 158 l/s (2500 usgpm). Both pumps are to be installed, connected to power and discharge piping and available for operation at all times. A replacement pump of equal capacity shall be immediately provided if one of the two original pumps has to be removed from the site for repairs.
- E15.4 A combination of smaller sized pumps may be used concurrently if the total discharge flow of the pumps meets the PDWF volumes identified providing replacement pumps are available on-site to maintain the PDWF volume.
- E15.5 Surface mount, vertical lift suction pumps are not acceptable.
- E15.6 The temporary pumping system can be installed at either of the following locations: Manhole "A" or the gate chamber upstream of the flap gate as shown on the drawings. The pumps shall discharge into manhole "B". A schematic of the site underground piping is included in Appendix B.
- E15.7 Provide a flow control plan to the Contract Administrator for review before construction starts. It shall provide detailed information for pumping equipment to be used including pump capacity and dimensions, depth of submergence, pump controls and installation details. Also include discharge piping details, arrangements to protect manhole openings required to run piping and power to the pumps and power supply details.
- E15.8 Power supply to the temporary by-pass pumps may be obtained from the following locations:
- (a) Existing wall mounted CSTE; contractor would be required to provide a suitably sized circuit breaker or fused disconnect switch complete with weatherproof enclosure.

Location of breaker or disconnect to be determined by contractor. Wall mount enclosure to the existing lift station or provide a self-supporting stand would be acceptable.

- (b) Load side of existing padmounted transformer: contractor would be required to provide a suitably sized circuit breaker or fused disconnect switch, utility meter socket and enclosure for metering transformers. All equipment to be housed within a weatherproof enclosure and wall mounted to the existing lift station or mounted on a self-supporting stand.

Contractor will be responsible for coordination with Manitoba Hydro for all controlled power outages required for connection of temporary power supply, and reconnection of new power supplies to lift station and flood pumping station.

All power supply connections shall be approved by the Contract Administrator before set-up.

- E15.9 All power outages shall be approved by the Contract Administrator. Provide on-site power generation where power outages are expected for a duration of 30 minutes or longer.
- E15.10 Provide suitable traffic ramps approved by the Contract Administrator if the by-pass pumping discharge pipe and power supply cables are laid across vehicle or pedestrian traffic areas on the pumping station site.
- E15.11 Provide a check valve on the by-pass pumping discharge pipe of each pipe.
- E15.12 Power supply for the pumps must be suitably sized for pumping equipment complete with all required automatic controls. Pumps shall alternate duty cycle. Should one pump not perform, the second pump shall start. Under this condition, an alarm shall be raised to the contractor's representative and the City's emergency contact number.
- E15.13 If the first pump cannot maintain level, the second pump shall come on. That is the temporary pumping system shall have the capability to run the design capacity pumps and full standby capacity pumps at the same time.
- E15.14 Fittings, couplings and appurtenances to be used for repairs to existing forcemains and sewers to be approved products for underground use in the City of Winnipeg.
- E15.15 Inflatable Rubber Sewer Plugs
  - (a) Made of rubber, capable of remaining in place when inflated to the pressure required to withstand the expected sewer levels.
  - (b) Provided with an inflation/deflation hose, monitoring pressure valve, removal rope or cable and safety chain, all of sufficient length to reach ground elevations for monitoring and removal.
- E15.16 Inflatable Sewer Plugs
  - (a) Only inflatable rubber sewer plugs shall be used to plug sewers.
  - (b) Clean sewer pipe as required to properly install inflatable sewer plug(s) in accordance with the manufacturer's instructions.
  - (c) Secure inflatable sewer plugs at or near the ground surface.
  - (d) Continuously monitor air pressure while sewer plug is in place and have proper inflation equipment available at all times.
- E15.17 Provide all pumping and dyking inside the trunk sewer required to install temporary pumping systems, sewer plugs or other temporary measures required to install the temporary pumping system.
- E15.18 The Contractor shall be required to construct a Temporary dike on the existing weir in the gate chamber of a sufficient height to accommodate by-pass pumping operations. The dike height must provide an additional 300 mm above the high water alarm level.



- E15.19 System Operation – On a rise in the manhole water level to a predetermined point , the temporary pumping system shall come on automatically. Maintain the level of sewage in existing sewers below the critical basement elevation. Critical Basement elevation is 227.81 m. The Contract Administrator will provide a mark at a convenient location for reference.
- E15.20 Monitor the upstream system at all times to ensure the stored level of wastewater does not exceed the critical basement elevation of 227.81 m.
- E15.21 Provide an alarm when the water level rises to 150 mm above pump start elevation. Send this alarm via cell phone to the contractor's office and at the same time to the designated City emergency contact number.
- E15.22 The expected peak dry weather flow (PDWF) to the Station is 158 l/s (2500 usgpm). Each installed pump shall have the capacity to pump this flow to the discharge manhole.
- E15.23 Sewers can receive flow of an undetermined amount from watermain breaks, snow melt, rain and other unforeseen sources. The Contractor will be responsible to monitor the flow in the sewer and adjust work activities accordingly, such as putting the spare standby by-pass pump into operation to handle any excessive flows due to unforeseen flow above the amount identified for PDWF.
- E15.24 There shall be no claim for additional costs or time due to increased standby pumping operations from high wet weather flows.
- E15.25 Cooperate and coordinate with the City to allow full access at all times for City staff to carry out maintenance and operational duties on the site.
- E15.26 The Contractor shall ensure temporary by-pass pumping equipment and materials will be properly insulated and heated, if required, to be protected from freezing and to maintain proper functioning during cold weather.
- E15.27 Temporary pumping equipment and materials shall remain on-site until station construction is completed as described in these Specifications and to the satisfaction of the Contract Administrator.
- E15.28 All site wastewater system gate operation on the site shall be by the City only.
- E15.29 Provide a battery powered wireless transmitter and two float switches within the Combined Sewer Outfall (CSO) chamber. Supply a wireless receiver compatible with the transmitter, to be installed by City within the flood pumping station.

**E16. TEMPORARY SHUTDOWN OF THE PUMPING STATION**

- E16.1 All gate operation and other control relating to the wastewater process will be by the City.
- E16.2 Water and Waste Department, Collection System personnel will be available to provide assistance to the Contractor for shutdown of the wastewater pumping station to facilitate transition of station pumping to the Contractor's temporary pumping system.

## **E17. EXCAVATION**

- E17.1 Remove existing surface installations as shown on the project drawings, as required to allow the excavation work to proceed without damage to existing installations. For installations that are to be reinstalled after completion of the work, store all materials in a secure location, away from the work area.
- E17.2 All excavation work to be in accordance with CW 2030.
- E17.3 All working areas below grade shall be kept adequately and securely supported during and after excavation until the shoring and bracing is in place to prevent loss of ground and injury to any person from falling or caving material.

## **E18. PROCESS PUMP START UP**

- E18.1 Pumps shall not be started up by the Contractor without approval from the Contract Administrator. The Contractor shall provide the Contract Administrator his proposed schedule for each pump start up at least one week in advance.
- E18.2 If any new pumping equipment (pump, pump controller, motor or drive shaft) fails to operate or perform properly and has to be removed for service as determined by the Contract Administrator, the Contractor shall remove the equipment that fails and deliver it to a location in Winnipeg for remedial work as required. This work along with reinstallation of the removed parts would be extra to this Contract.
- E18.3 The pumping equipment supplier and contact for this Contract is:

Power and Mine Supply Company Ltd.  
4 – 75 Meridian Drive  
Winnipeg, Manitoba  
Attention: Cam Wilson, P. Eng.  
Telephone (204) 694-9300

## **E19. WORK PLAN**

- E19.1 The Contractor is required to develop a detailed work plan and submit to the Contract Administrator for review. The work plan is to include:
- (a) The proposed construction sequence to be followed including all methods to be employed to ensure that no damage occurs to existing structures or adjacent properties within or adjacent to an excavation.
  - (b) Detailed design and installation drawings for the excavation shoring system that is to be used for construction.
  - (c) A description of all proposed methods of construction to be implemented.
  - (d) Specialized equipment that may be used.
  - (e) Any design revisions proposed to accommodate the Contractor's proposed method of construction.
  - (f) Water control methods to be utilized during construction, including the Contractor's proposed method for draw down and depressurization of the groundwater till pressures in the area of the excavation and any required surface runoff control measures.
  - (g) The Contractor shall respond to any concerns that may be raised by the Contract Administrator's review of the Contractor's construction methods submission.
- E19.2 Do not install any electrical or automation equipment within the pumping station until the exposed sewage within the comminutor chamber is enclosed in pipework.

## **E20. SITE RESTORATION**

### **E20.1 Description**

E20.1.1 This specification shall cover surface restoration and associated items of Work for existing surfaces disturbed by construction activities, as well as fencing.

### **E20.2 Construction Methods**

- E20.2.1 Restoration of all existing surface areas disturbed by construction activities including but not limited to; operation of construction equipment, placement of field office or equipment trailer, snow clearing and where construction materials were stockpiled, shall be restored as follows.
- (a) Grassed areas: sodding using imported topsoil in accordance with CW 3510.
  - (b) Gravel surfaces: in accordance with CW 3150.
  - (c) Asphalt surfaces: match existing base course and asphalt thickness or provide a minimum of 150 millimetres of base course and 75 millimetres of Type 1A Asphaltic concrete whichever is greater, in accordance with CW 3410.
  - (d) Pavement slabs in accordance with CW 3310.
  - (e) Miscellaneous concrete slabs (median slab, sidewalk, bullnose: in accordance with CW3235.
  - (f) Concrete curb and gutter: in accordance with CW 3240.

## **E21. FORCEMAIN INSTALLATION**

### **E21.1 Scope of Work**

- (a) Design, Supply and install temporary shoring systems necessary for an open excavation to the depths and dimensions necessary to install the new 400 mm forcemain. Temporary shoring shall be in accordance with the latest revision of the "Construction Safety Act" of the Province of Manitoba Department of Labour and in accordance with the province of Manitoba "W210 workplace Safety and Health Act" and Guideline for Excavation Work".
- (b) Cut through roof of existing motor room at location of 400mm diameter discharge pipe. Coordinate the cut with the final location of the mechanical discharge pipe.
- (c) Install the new forcemain as indicated on the Drawings.
- (d) Re-construct reinforced concrete roof at forcemain connection complete with water stop and waterproofing membrane.
- (e) Connect Forcemain to existing Manhole
- (f) Backfill around the vertical forcemain pipe with stabilized fill. Bedding and backfill around the horizontal pipes as per City of Winnipeg Specification CW2030.
- (g) Restore surface works to preconstruction condition

### **E21.2 Specifications**

#### **E21.2.1 Backfill**

- (a) Place and compact backfill material as indicated on the Drawings in accordance with CW 2030. Do not place backfill material in a frozen state. Supply heating and hoarding in accordance with CW 2160 if required to ensure material does not freeze before compaction is complete.

#### **E21.2.2 Excavation Security Fence**

- (a) Further to Clause 3.1 of CW 1130, completely cover the excavation and provide a security fence to completely surround the excavation when unattended in accordance with the following:

- (i) Security fence shall be chain link fence or approved equal, a minimum 1.80 metres high with metal support posts embedded far enough into the ground and spaced close enough together so the fence will not sag or collapse.
- (ii) Attach fencing securely to posts.
- (iii) Secure the gate or end of the fencing to a post with chain and a padlock.
- (iv) Provide alternate security fence proposal to Contract Administrator for approval.

## **E22. ARCHITECTURAL AND STRUCTURAL WORKS**

### **E22.1 Scope of Work – Architectural**

- (a) Removal of the existing asphalt shingles and roofing materials to expose bare roof sheathing. Cut existing roof sheathing for new ridge vent. Install self-adhered metal roofing underlayment and prefinished standing seam metal roof.
- (b) Remove existing fascia and install new wood fascia board around the entire building, covering new fascia with prefinished bent metal roofing.
- (c) Install new pre-finished perforated soffit over the existing wood soffit. Drill holes in the existing wood soffit for venting.
- (d) Replace existing damaged masonry with new masonry to match existing.
- (e) Prepare and paint existing wood architectural details, door, existing masonry and concrete foundation above grade.
- (f) Apply anti-graffiti coating on masonry and concrete foundation.
- (g) Existing rigid 'SM' insulation on the ceiling of the electrical room is to remain, however it must be covered with a thermal barrier. Install poly vapour barrier and gypsum board below existing 'SM' insulation, finish and paint.
- (h) Removal all 'SM' insulation from walls of building and below grade and replace with rigid mineral wool insulation, wood strapping, poly and painted plywood.
- (i) Prepare and paint lower level 1, the motor room and the pump room. Colour(s) to match existing.
- (j) Prepare and paint all existing ladders

### **E22.2 Scope of Work – Structural**

- (a) Motor Room
  - (i) Install new handrail with spring loaded gate at the northwest ladder opening of the electrical room.
  - (ii) Remove the existing plywood hatch and cover on the south side of the electrical room and replace with a bolted aluminum cover.
  - (iii) Modify the existing W150x22 lifting beam and install new CM-Cyclone 1.5 ton trolley hoist with 15.2 m (50 ft) lift and attached chain container.
  - (iv) Remove existing S150x19 lifting beam.
- (b) Lower Level 1
  - (i) Install new handrail with spring loaded gate at the northwest ladder opening of lower level 1.
  - (ii) Install new fall arrest anchor above the comminutor hatch in lower level 1.
  - (iii) Reinforce the underside of the floor slab above the comminutor room and widen the opening to the comminutor room. Install a new aluminum frame within the opening complete with a new hinged aluminum hatch cover.
  - (iv) Seal existing penetrations and core new penetrations as required.

- (c) Motor Room
  - (i) Install new handrail with spring loaded gate at the southwest ladder opening of the motor room.
  - (ii) Remove and patch existing epoxy injection ports on the arched opening of the motor room.
  - (iii) Repair the leaks in the walls with water reactive polyurethane resin injection techniques.
  - (iv) Replace the lifting bracket at the motor room arched entrance.
  - (v) Complete spall repairs to the underside of the slab (in the pump room) and install reinforcement to the motor room floor prior to any motor room piping/equipment work.
  - (vi) Seal existing abandoned motor penetrations and core new piping and motor penetrations.
  - (vii) Install new housekeeping pads.
  - (viii) Install new lifting anchors. Remove all existing lifting bolts and U-bolt.
- (d) Pump Room
  - (i) Install new lifting anchors. Remove all existing lifting bolts.
  - (ii) Remove concrete thrust block in the northwest corner of the pump room. Abandon the existing force main piping as per municipal drawings.
  - (iii) Core existing intake pipes and install new pipes into wet well.
  - (iv) Install new grated cover on sump pit.
- (e) Comminutor Chamber
  - (i) Demolish concrete as required and remove existing embedded comminutor ring. Install new embedded thimble.
  - (ii) Install pipe supports as required for new 750 mm piping.
  - (iii) Install new infill concrete.

## **E23. CONCRETE REPAIR**

### **E23.1 Description**

- (a) Concrete repairs shall include internal repairs to the interior of the wastewater pumping station by man entry techniques. The repairs shall include repair of cracks, delaminated, spalled and deteriorated areas of the existing concrete. Concrete repair Works shall be carried out at the locations noted on the drawings and indicated by the Contract Administrator at the Site. The Contractor will review the repairs and method of repairs with the Contract Administrator prior to starting the work.

### **E23.2 Materials**

- (a) The Contractor shall implement the materials and construction methods as described below to complete the works. Equivalent products and/or alternative construction methods shall be approved by the Contract Administrator prior to repairs. The Contractor shall supply to the Contract Administrator, Material Data Sheets and Product Information prior to commencing repairs for review and approval.

### **E23.3 Construction Methods**

- (a) Concrete Spall Repairs
  - (i) Identify all spalled areas scheduled for repair as identified by the Contract Administrator.
  - (ii) Saw cut the perimeter of the patch to a minimum of 13 mm outside the limits of the spalled/deteriorated area designated for repair.

- (iii) Chip and remove the delaminated concrete until sound concrete is encountered to provide a solid bond.
  - (iv) Remove any coatings that may reduce bond between the existing concrete and repair mortar/grout.
  - (v) Remove a minimum of 25 mm of concrete from around all encountered rebar to provide a solid bonding area.
  - (vi) Surface prepare reinforcement to SSPC-SP3 (power tool cleaning).
  - (vii) Repair overhead and sidewall patches using a non-shrink repair mortar; SikaRepair 223 if the depth of patch is 50 mm or less. The approved product shall be prepared and installed according to the manufacturer's instructions.
  - (viii) For patches 50 mm to 100 mm deep, use a non-shrink, cementitious grout; Sika 212. This procedure shall require that the repair area be formed and the approved product be prepared and pumped into place as per the manufacturer's instructions.
- (b) Concrete Crack Repairs
- (i) Identify all cracks scheduled for repair as identified by the Contract Administrator.
  - (ii) Remove any loose material from concrete surface adjacent to cracks by wire brushing a 50 to 75 mm wide strip along the cracks, and vacuuming all dust from the surface.
  - (iii) Install surface ports for injection along the cracks at spacing ranging from 100 to 300 mm depending on the width of the crack. The base plate of each entry port shall be adhered onto the concrete surface using Kemko 022, Sikadur 33. The ports shall be coated with the same material over the top of the base plate to assure a good seal and stability of the port during the injection process.
  - (iv) Surface seal material with paste adhesive Kemko 022, Sikadur 33. Paste shall be applied to the face of the crack between injection ports to build a confinement area for the liquid epoxy resin.
  - (v) After curing of the surface seal, a two-component epoxy resin/hardener suitable for the structural repair of cracks and delaminations in concrete; Kemko 038, Sikadur 52 shall be injected into the crack starting at the lowest injection port. The injection will continue at the same port until there is an appearance of epoxy resin at the next port adjacent to the entry port being pumped. The injection epoxy resin shall be selected based on the thickness of the crack (for hairline cracks Kemko 068 or Sikadur 55 will be used).
  - (vi) When epoxy adhesive travel is indicated by appearance at the next adjacent port, injection can be discontinued on the entry port being pumped and epoxy injection shall be transferred to the next adjacent port where epoxy adhesive has appeared. The first entry port must be plugged. The epoxy injection on any intermediate entry port being pumped shall not be discontinued unless the injection pressure reaches 150-160 psi or directed by the Contract Administrator. The above steps will be repeated until cracks are completely filled along their length.
  - (vii) As soon as the crack is full and all injection ports are blocked, the pump shall be run for several seconds to create a pressure of 100 psi in the crack that will be maintained for one (1) minute. Once the epoxy adhesive in the crack is pressurized and no leaks are observed, the pump shall be disconnected from the port and the injection port shall be plugged.
  - (viii) The above steps shall be repeated for all cracks or set of cracks that are connected, until all cracks are injected.
  - (ix) For every day that injection work is performed, an Injection Report shall be completed to document type of injection equipment, location, quantity of materials, and amount of crack length injected each day.

- (x) After all injection work is completed and cured, the crack seal shall be removed (after 12 hours) by grinding to obtain a smooth concrete surface.
- (xi) Cleanup work area and demobilize.
- (c) Wall Leakage Repair
  - (i) Identify leaking cracks and construction joints on the walls of the structure as identified by the Contract Administrator.
  - (ii) Remove any loose material from the surface of the concrete by wire brushing.
  - (iii) Inject crack with Flexible Water-Reactive Polyurethane Resin as produced by Multiurethanes. Preparation and application of the product to follow the manufacturer's specifications and directions for use.

**E24. CAST-IN-PLACE CONCRETE CONSTRUCTION**

E24.1 Description

E24.1.1 This specification will cover construction of cast-in-place concrete and shall supplement, revise and amend CW 2160.

E24.2 Materials

(a) Concrete Mix Design

- (i) The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this Specification. Concrete shall be supplied in accordance with the requirements of CSA A23.1-04, with the minimum properties as provided below:

Sewage Exposure Concrete

Class of Exposure	S-1
Maximum Size of Aggregate	19 mm
Cement Type	Type 50
Maximum Water/Cementing Materials Ratio	0.45
Compressive Strength at 28 Days	35 MPa
Slump (before admixtures)	80 mm +/- 20 mm
Air Content	6.5% +/- 1.5%

Lean Mix Concrete

Maximum Size of Aggregate	19 mm
Cement Type	Type 10
Compressive Strength at 28 Days	5-10 MPa
Slump/Flow (Prior to adding admixture)	100 mm +/- 50 mm
Air Content	n/a
Maximum Water/Cementing Materials Ratio	0.49

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

- (c) Admixtures
  - (i) All admixtures shall be compatible.
  - (ii) Air entraining agent shall meet ASTM C260.
  - (iii) Chemical water reducing admixtures shall meet ASTM C494.
- (d) Grout
  - (i) Grout shall be Sika Grout 212 SR for wastewater exposed areas and Sika Grout 212 HP for dry areas.
- (e) Reinforcing Steel
  - (i) Bar accessories:
    - To be made of a non-corroding material
    - Shall not stain, blemish or spall the concrete surface for the life of the concrete
    - Shall be approved by the Contract Administrator
    - Bar chairs shall be PVC.
- (f) Bonding Agent shall be Sika Latex R, Acryl 60, Intralok or approved equivalent in accordance with B6.
- (g) Shop Drawings:
  - (i) Provide shop drawings in accordance with this specification.
  - (ii) Submit shop drawings for reinforcing steel a minimum of two (2) weeks prior to the fabrication of any reinforcing steel.

#### E24.3 Construction Methods

##### E24.3.1 Construction Method Submission

- (a) No Work shall commence on construction of cast-in-place concrete until after the Contract Administrator's review of the Contractors Construction Method submission.
- (b) The Contractor shall prepare for the Contract Administrators review a Construction Method submission detailing:
  - (i) Construction sequence to be followed including all methods to be employed.
  - (ii) Specialized equipment to be used.
  - (iii) Any design revisions proposed to accommodate the Contractor's proposed construction method.
- (c) The Contractor shall respond to any concerns that may be raised by the Contract Administrator after review of Construction Method submission.

##### E24.3.2 Cast-in-place Concrete Construction

- (a) Construct cast in place concrete in accordance with CW 2160, except as supplemented, revised or amended in this specification and as indicated in the construction notes on the Drawings.
- (b) Adjust the location of reinforcing steel adjacent to openings to frame those openings in accordance with good practice, and maintain the bar spacing intent.
- (c) Do not use welded splices for reinforcing steel.
- (d) Order all wall reinforcement steel in lengths to best suit the spacing of walers so that reinforcing bars will not be bent or misformed in order to remove the walers.



## **E25. METAL FABRICATIONS**

### **E25.1 Description**

#### **E25.1.1 General**

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

### **E25.2 Materials**

E25.2.1 All material shall be of a type acceptable to the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.

E25.2.2 Material intended for use in the various assemblies shall be new, straight, and clean with sharply defined profiles.

E25.2.3 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.

E25.2.4 Steel Pipe: to ASTM A53/A53M, seamless, galvanized, as specified by item.

E25.2.5 Welding materials: to CSA W59.

E25.2.6 Hot dipped galvanized steel repair material: Galvalloy and Gal-Viz.

E25.2.7 Steel Stud Anchors: to ASTM A449, Type 1 (Plain Carbon), or ASTM A325, Type 1 (Medium Carbon)

E25.2.8 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.

E25.2.9 Isolation sleeves shall be "Nyltite" – headed sleeves as manufactured by SPAE-Naur of Kitchener, Ontario, or approved equal.

E25.2.10 Stainless Steel Anchor bolts and fasteners: ASTM A276, Type 316, of ample section to safely withstand the forces created by operation of the equipment or the load to which they may be subjected.

E25.2.11 Paint: Bar Rust 235 Epoxy or approved equivalent in accordance with B6; Colour: neutral grey.

### **E25.3 Construction Methods**

#### **E25.3.1 Submittals**

- (a) The Contractor shall submit the qualifications of the fabricator and welders to the Contract Administrator for acceptance. Submit shop drawings in accordance with these Specifications 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.

#### **E25.3.2 Fabrications**

- (a) Fabricate Work square, true, straight and accurate to required size, with joints close fitted and properly secured. Assemble Work in such a way that no disfigurements show in the finished Work, or impair the strength.
- (b) Confirm measurements for all fabrications before fabricating.
- (c) Cut aluminum plate with edges straight and true, as far as practical, maintain the continuity of the pattern at abutting edges.
- (d) Pieces shall be of the sizes indicated on the Drawings and shall not be built up from scrap pieces. Confirm sizes with field measurements,
- (e) Where possible, fit Work and shop assemble, ready for erection.

- (f) Remove and grind smooth burrs, filings, sharp protrusions, and projections from metal fabrications to prevent possible injury. Correct any dangerous or potential harmful installations as directed by the Contract Administrator.
- (g) Angle frames shall be of the same material as the cover plate (except for existing frames designated on the drawings for re-use), 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.
- (h) All steel welding shall conform to CSA Standard W.59. Fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with CSA Standard W.47.1. Welding shall be done by currently licensed welders only.
- (i) All aluminum welding shall be in accordance with the requirements of CSA W59.2. The fabricator shall be fully certified in conformance with CSA Standard W47.2. All welding shall be done in a licensed welding shop, and no field welding will be permitted unless approved in writing, in advance, by the Contract Administrator.
- (j) Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- (k) Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1.
- (l) Use self-tapping shake-proof flat-headed screws on items requiring assembly by screws.

#### E25.3.3 Coatings

- (a) Surface prepare steel fabrications requiring epoxy coating to SSPC SP6 (Commercial Blast).
- (b) Apply two coats of Bar Rust 235 Epoxy paint, 150 µm per coat dry film thickness. Colour: Neutral Grey.
- (c) Recoating and curing times shall be as per coating manufacturers recommendations.

#### E25.3.4 Erection

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

- (i) All aluminum surfaces in contact with concrete shall be isolated using alkali resistant bituminous paint meeting the requirements of CGSB 31-GP-3M.
- (j) Install electrochemical isolation gaskets and sleeves to electrically isolate dissimilar metals.

## **E26. WET WELL CLEANOUT**

- E26.1 The Contractor shall be responsible for the clean out of the wet well at the beginning of work and again at completion of construction. Clean out shall be done by mechanical or manual methods and shall remove grit, tallow and other build-ups to the satisfaction of the Contract Administrator.
- E26.2 The current level of accumulation in the wet wells is not known. Higher levels of accumulation, above that anticipated by the Contractor will not be eligible for additional payments.
- E26.3 The Contractor shall also ensure that all construction material and debris are removed from the wet well after completing the works and prior to startup and commissioning of the new pumps.
- E26.4 Schedule upstream work that may produce debris prior to wet well final cleanout.
- E26.5 Provide evidence of the wet well clean out in the form of photographs, or other suitable means, acceptable to the Contract Administrator.

## **E27. PROCESS MECHANICAL WORK**

- E27.1 Description
  - E27.1.1 This Specification covers the process piping, equipment, materials and structural modifications to the existing Aubrey Wastewater Pumping Station. HVAC and plumbing systems are addressed in specification Division 22 and 23.
  - E27.1.2 Remove the existing pumping units, motors, piping, equipment and materials as required and install new pumping units, piping, equipment and materials as shown on the drawings and specifications.
  - E27.1.3 All equipment and material shall be supplied by the Contractor except as listed in E7.
  - E27.1.4 Make reference to electrical, mechanical and structural drawings when setting out Work. Consult with respective Divisions and the Contract Administrator to ensure valve stem orientations for example are correctly installed. Jointly resolve all conflicts on-site before fabricating or installing any materials or equipment.
  - E27.1.5 Accuracy of dimensions for new piping, flanges, valves and other equipment items is the Contractor's responsibility. Any fit issues between Site conditions and new materials to be installed remain with the Contractor.
  - E27.1.6 Where dimensional details are required, collect Site dimensions and coordinate with the applicable structural / mechanical drawings. However responsibility for dimensional accuracy remains with the Contractor.
- E27.2 Process Pump/Motor Systems
  - E27.2.1 See Section E7 for information on supply and installation of the pump/motor systems.
- E27.3 Gate Valves
  - E27.3.1 Unless noted otherwise, double rating disc or solid disc, ductile iron body with flanged ends, rising stem, bronze trimmed ductile iron wedges; 304 stainless steel stem, double O-ring stem seals and handwheel operator. Valve body shall have interior and exterior epoxy coating.

- E27.3.2 The 500 mm gate valve for the comminutor chamber shall be a non-rising stem type complete with remote manual pedestal operator. The Contractor is responsible for all measurements regarding valve stem/spindle length and ensuring valve flange pattern fits existing wall insert bolt pattern.
- E27.3.2.1 The 500 mm gate valve pedestal mounted valve operator shall meet the following criteria:
- a. Ductile iron or steel body with epoxy coating.
  - b. Indicator gauge with a travelling pointer to show if valve is open, closed or a position in between. Place gauge closed tag to suite specific valve supplied.
  - c. Bushings to be bronze and all bolting hardware to be Type 304 stainless steel.
  - d. Contractor to verify all field measurements prior to manufacture to ensure proper function and fit for the pedestal mounted operator.
  - e. Direction of opening shall be counter clockwise and shall be clearly stamped or indicated with raised letters and arrow.
  - f. Actuator to have a 2" (50 mm) AWWA operating nut and min. 18" (450 mm) handwheel.
  - g. Contractor to verify operating torque requirements for valve and to size stem/spindle accordingly. Provide valve stem/spindle guides.
  - h. Fasten extension stem to top of the valve's 2" (50 mm) nut.
  - i. Secure extension item to wall as recommended by stem and floorstand system supplier.
- E27.3.3 Manufacturer's nameplate shall be attached to the valve body with stainless steel fasteners.
- E27.3.4 Acceptable product: Valve – American R/D Series 50, Mueller Series 0125-F, Crane Figure 465 ½, or approved equal.  
Acceptable product: Floorstand – Trumbull or approved equal.
- E27.4 Check Valves
- (a) Ductile iron body with flanged ends and removable inspection cover manufactured and tested in accordance with AWWA C508.
  - (b) Flanges shall conform in dimension and drilling to ASME B16.1, Class 125.
  - (c) ASTM D2000-BG, Buna - N (NBR) sewage resistant rubber flap and Type 302 stainless steel disc accelerator.
  - (d) Attach manufacturer's nameplate to the valve body with stainless steel fasteners.
  - (e) Provide backflow actuator and mechanical indicator.
  - (f) Acceptable product: Val-Matic Series 500 or approved equal.
- E27.5 Drain and Vent Valves
- (a) 860 kPa minimum working pressure, stainless steel body and ball, 2 pc body, full port, NPT connections, PTFE seat.
  - (b) Acceptable Product: Flow-Tek, MAS, Apollo, or approved equal.
- E27.6 Piping and Fittings
- (a) Unless noted otherwise, all piping shall be Class 52 ductile iron or ASTM A53 Carbon steel Grade B Schedule 80 wall thickness.
  - (b) Ductile Iron fittings shall conform to AWWA C110.

- (c) Fabricated fittings shall conform to ASTM A53 carbon steel grade B, Schedule 80 wall thickness.
- (d) Steel fittings shall be ASTM A234 grade B carbon steel, Schedule 80 wall thickness. Dimensions shall be to ANSI B16.9.
- (e) All welded steel flanges shall be in conformance with AWWA C207, Class B.

#### E27.7 Large Diameter Flanges and Adaptor Flanges

- (a) Thread-on flanges for Ductile Iron Pipe: AWWA C115 or ASME B16.1
- (b) Adaptor flanges: Ductile Iron, Grade 65-45-12, conforming to the current ASTM Standard A536 for Ductile Iron Castings. Bolt holes shall be drilled in accordance with AWWA C115 or ASME B16.1.
- (c) Clamping screws on adaptor flanges shall be zinc-plated, heat treated steel with a minimum tensile strength of 28 Mpa.
- (d) Submit shop drawings.

#### E27.8 Pipe Supports and Hangers

- (a) Pipe supports and hangers to be as shown on the Drawings.

#### E27.9 Fasteners

- (a) Flangenuts and bolts shall be ASTM A276, Type 316 stainless steel sized to requirements of flange. Thread-on bolts to extend past nut a minimum of 6 millimetres.
- (b) Anchors shall be Kwik-bolt or Rawl Stud ASTM A276, Type 316 stainless steel. Embedment depth and size, where not shown on the Drawings, to be as required for load being carried or resisted.

#### E27.10 Gaskets

- (a) Flange gaskets shall be full faced rubberized cloth gaskets, 3mm in thickness.
- (b) Rubber gaskets for adaptor flanges shall conform to AWWA C111, Standard for Rubber-gasket Joints for Cast Iron and Ductile Iron Pressure Pipe and Fittings.

#### E27.11 Cast-in-Place Concrete

- (a) Concrete to be in accordance with CW 2160 and CSA A23.1.
- (b) Concrete mix design shall be in accordance with performance alternative and shall have the following properties:
  - (i) Class of exposure: S-1
  - (ii) Minimum compressive strength at 28 days: 35 MPa
  - (iii) Maximum lump: 80mm ( $\pm 20$ mm) (before admixtures)
  - (iv) Air Content: 5%–8%
  - (v) Maximum Water/Cement Ratio: 0.40
- (c) Lean-Mix concrete design for proportioning of fine aggregate, coarse aggregate, cement, and water shall be as follows:
  - (i) Cement: Type 50
  - (ii) Minimum compressive strength at 28 days: 15 MPa
  - (iii) Slump: 80mm
  - (iv) Air Content: nil
  - (v) Maximum Water/Cement Ratio: 0.49

E27.12 Grout

- (a) Grout to be Sika 212 SR for wet areas and Sika 212 for dry areas.

E27.13 Bonding Agent

- (a) Bonding agent to be Sika Latex R or approved equal.

E27.14 Pipe Paint

E27.14.1 Provide a 3 year warranty from project substantial performance date for entire painting system.

E27.14.2 Paint the following both inside and outside.

- (a) Pump inlet piping
- (b) Pump discharge piping system inside the pump room and motor room.
- (c) Pump discharge elbow floor support stands.
- (d) Comminator room wastewater piping.

E27.14.3 For painting pipe interior, use Devoe Devgrip 238 abrasion resistant coating or equal on products listed in Item .2 above.

E27.14.4 Conform to Devoe and Intergard requirements regarding:

- (a) Surface preparation including sand blasting.
- (b) Conditions under which painting system can be applied.
- (c) Prime and final coat thicknesses.

E27.14.5 For painting piping material exterior surface, use prime coat Interzinc 52 (2.5 mil) and then apply a finish coat Intergard 345 high build epoxy (6 mil) or equal in accordance with B7.

E27.14.6 Confirm exterior finish coat colour with the Contract Administrator before proceeding.

E27.14.7 Perform surface preparation and painting off site. Then deliver finished products to the Site for final assembly. Only touch-up surface preparation and painting will be permitted on-site.

E27.14.8 Handle piping with care during delivery to Site, storage and installation so as to minimize touch-up required.

E27.14.9 After piping system installation is complete, touch up paint to original condition.

E27.14.10 Do not paint on raised flange faces where gaskets will be applied.

E27.15 Welding

- (a) Piping and fitting welds shall be full penetration butt type in accordance with ANSI/ASME B31.9. Welders shall be fully qualified and licensed by Provincial Authorities. Welds which do not penetrate fully will not be accepted.
- (b) Weld steel flanges on both the inside and the outside in conformance with AWWA Standard C207.
- (c) All pipe and equipment shall be adequately protected from on-site welding procedures.

## E27.16 Concrete Work

- (a) Make neat openings in walls and floor slabs using concrete coring and cutting equipment and methods.
- (b) Fill openings left in concrete after removal of piping or other equipment with watertight, non-shrink grout. Finish new surfaces flush with the existing surface and match the surrounding surface texture. Primer and paint shall be applied in accordance with painting specifications if the surrounding surfaces have a paint finish.
- (c) Mix and apply grout in accordance with the manufacturer's instructions.
- (d) Mix and apply bonding agent in accordance with the manufacturer's instructions.
- (e) Neatly grout any concrete surface that has been broken and had the aggregate exposed with a smooth finish similar in texture to that of the surrounding concrete.
- (f) Apply concrete bonding agents between new concrete or grout and existing concrete surfaces. Remove all loose, pitted and scaled concrete and apply bonding agent in accordance with the manufacturer's instructions
- (g) De-scale exposed reinforcing steel and have all rust removed before applying grout.

## E27.17 Cleanup

- (a) Cleanup construction debris and materials inside the Station, including the wet-well at the end of each day and before pumping station operation is restored.

## E28. FLOW METERS

### E28.1 Description and General

- E28.1.1 Supply and deliver three (3) 250 mm dia. magnetic flow meters, each consisting of a separate flow tube and remote transmitter, complete with cabling.
- E28.1.2 Submit shop drawings in accordance with The City of Winnipeg Standard Construction Specifications Section CW1110 – General Instructions.
- E28.1.3 Operation and Maintenance Manuals
- (a) Include the following in the Operations and Maintenance Manuals:
    - (i) Reviewed shop drawings of all equipment;
    - (ii) Certified factory test results;
    - (iii) All flowmeter settings.
    - (iv) Instructions for maintenance, entering settings, etc.
    - (v) Manufacturer operations and maintenance manuals.

### E28.2 Materials

#### E28.2.1 Service:

- (a) Fluid: Wastewater
- (b) Fluid Temperature: -10°C to 50°C
- (c) Ambient Temperature (flowtube): -30°C to 50°C
- (d) Ambient Temperature (transmitter): 0°C to 40°C
- (e) Pressure: 0 to 100 kPa

#### E28.2.2 Accuracy:

- (a) 0.5% of rate  $\pm 1.0$  mm/sec from 0.01 to 2 m/s
- (b) 0.5% of rate  $\pm 1.5$  mm/sec. above 2 m/s

- (c) Specified accuracy to include flow rate the combined effects of linearity, hysteresis, repeatability, and calibration uncertainty.
- (d) The electronics must be temperature compensated to maintain system accuracy of 0.5% or better across the stated temperature range.

E28.2.3 Flow tube Requirements:

- (a) Size: 600mm
- (b) Flange Material: Carbon Steel
- (c) Flange Type: Class 150
- (d) Junction Box Enclosure: NEMA 4X
- (e) Design: flanged and all welded flanged flow tube bodies must be a fully welded steel design, and must not rely on gaskets to fully protect the coils and electrode wiring
- (f) Electrodes: 316L Stainless Steel or Tantalum
- (g) Electrode Housing: Sealed, welded housing
- (h) Lining: Neoprene or Teflon
- (i) Grounding: Grounding Rings (to be included)
- (j) Hazardous Area Approvals: Class I, Zone 2
- (k) Approvals: CSA or equivalent
- (l) The transition between the flow tube and the junction box must be potted to prevent process fluids from reaching the electronics or conduit in the event of a lining or electrode failure.
- (m) The field termination and electronics must be in separate, fully isolated compartments to prevent moisture or contamination to enter these compartments.
- (n) All flow tubes must be hydrostatically tested to 1.5 times their rated pressure.
- (o) Provide epoxy paint coating for the entire flowtube.

E28.2.4 Transmitter Requirements:

- (a) Mounting: Wall (remote from flow tube)
- (b) Local Display: LCD, capable of indicating flow rates, flow totalizer, etc., and display 2 lines of a minimum of 20 characters.
- (c) Local Control: Keypad
- (d) Programming and configuration:
  - (i) Fully configurable via transmitter keypad
  - (ii) Configurable via HART field communicator on 4 to 20mA output loop
- (e) Units of Operation:
  - (i) Flow Rate: l/s
  - (ii) Flow Totalizer: m3
- (f) Power Supply: 120 VAC
- (g) Output:
  - (i) 4 to 20mA (with HART protocol) for flow rate, configurable as active or passive.
  - (ii) Pulse output for flow totalization (24VDC), independently scalable
- (h) Enclosure: NEMA 4X rated



- (i) Approvals: CSA or equivalent
- (j) Contain non-volatile memory for all data, including the totalizer.

**E28.2.5 Cable Requirements (between flow tube and transmitter):**

- (a) The remote mounted transmitter shall utilize readily available Belden cables between the flow tube and the transmitter.
- (b) Installation: Conduit
- (c) Purpose: Signal and coil drive (between flow tube and transmitter)
- (d) Size: As per manufacturer's recommendations for the length specified.
- (e) Ratings: Wet and dry, Class I, Zone 2 (in conduit)
- (f) Length: 10 meters (per flow meter)

**E28.2.6 Acceptable Products**

- (a) Rosemount 8705 flow tube with Rosemount 8712E transmitter
- (b) Endress& Hauser Promag 50W with remote transmitter
- (c) Krohne OPTIFLUX 2000 with IFC 100 remote transmitter

**E28.3 Execution**

**E28.3.1** Provide for a factory-trained representative who shall give instructions regarding the installation of the equipment.

**E28.3.2** The factory-trained representative shall visit the site as required to ensure that the installation work is being performed in a proper and workmanlike manner. Allow for a minimum of one (1) full working day.

**E28.3.3** The factory-trained representative shall be present to supervise the commissioning, initial operation, and functional testing of the equipment.

**E28.4 Training**

**E28.4.1** Provide the Contract Administrator with a training plan a minimum of two (2) weeks prior to training.

**E28.4.2** The Contractor shall include costs for providing training to City staff by a factory-trained representative on the operation and maintenance of the equipment.

**E28.4.3** Training for the equipment shall be conducted on site, in conjunction with commissioning. The Contractor shall provide a qualified instructor as well as the necessary course materials.

**E28.4.4** Training shall be provided in one (1) session for operation and maintenance staff. And one (1) session for Electrical and Instrumentation staff.

**E29. HOIST REPLACEMENT**

**E29.1 Scope of Work**

- (a) Supply and install a 1000 kg rated hoist as per Section E22.

**E30. HVAC**

**E30.1 Scope of Work**

- (a) Provide new ventilation and heating system including, but not limited to the following:
  - (i) Demolition of the existing supply fan and associated ductwork

- (ii) One supply fan including motor.
- (iii) Ductwork, grilles, louvers, and actuator controlled dampers.
- (b) Supply and installation of fire extinguishers as shown on the drawings.

### **E31. ELECTRICAL – 600V DISTRIBUTION, GROUNDING, AND MISCELLANEOUS**

#### **E31.1 Scope of Work**

- E31.1.1 Remove existing CSTE, direct buried cables between CSTE and Manitoba Hydro service transformer, and conduit and feeder cables between the CSTE and the existing lift station disconnect switch.
- E31.1.2 Remove cable and conduit associated with existing ventilation supply fan.
- E31.1.3 Remove all 600 V distribution equipment within lift station.
- E31.1.4 Supply, install, and test the following:
  - (a) A 600V motor control centre, MCC-L71, on the main floor complete with three soft starters with bypass FVNR starters and other equipment as per drawings.
  - (b) A 600 V distribution panel, DP-F70, complete with a pad-mounted CSTE and metering equipment outside next to the existing transformer.
  - (c) A manual transfer switch, MTS-L70, located as indicated on drawings.
  - (d) Direct buried feeder cables from the DP-F70 to transfer switch MTS-L70 and to MCC-L71 complete with Roxtec cable seals at wall penetration.
  - (e) Cabling between MCC-L71 and the new fan SF-L61.
  - (f) A temporary generator junction box and associated cabling, connected to manual transfer switch MTS-L70.
  - (g) A dedicated ground bus.
- E31.1.5 Remove existing conduit and cable associated with two (2) wastewater lift pump motors.
- E31.1.6 Remove two existing wastewater lift pump motors and turn over to the City, or dispose of, as directed by the Contract Administrator.
- E31.1.7 Disconnect existing flood pumping station supply cable from existing CSTE and reconnect to new CSTE.
- E31.1.8 Install new grounding as shown on the drawings.
- E31.1.9 Supply and install temporary electrical provisions as required to complete the work as specified.
- E31.1.10 Install arc flash labels. Text for arc flash labels shall be provided by Contract Administrator.

### **E32. ELECTRICAL – PUMPS P-L01, P-L02 AND P-L03**

#### **E32.1 Scope of Work**

- E32.1.1 Supply, install, and test the following:
  - (a) Three new 56 kW (75 HP) soft starters complete with FVNR starters for bypass. Starters shall be integral with MCC-L71.
  - (b) Cabling between MCC-L71 and the field disconnect switches.
  - (c) Cabling between the field disconnect switches and the pump motors.
  - (d) Automation cabling to the RTU.

E32.1.2 Install and test three (3) wastewater lift pump motors. Two (2) pump motors shall be City supplied while the third shall be supplied by the Contractor.

E32.1.3 Install arc flash labels. Text for arc flash labels shall be provided by Contract Administrator.

### **E33. ELECTRICAL – 120/208V WORK**

#### **E33.1 Scope of Work**

E33.1.1 Supply, install, test, and commission the 120/208V electrical work as per drawings and specifications. Work shall include, but not be limited to the following items.

E33.1.2 Remove the following existing equipment:

- (a) Transformer
- (b) Panelboard
- (c) Lighting
- (d) Switches
- (e) Receptacles
- (f) Pull boxes
- (g) Conduit, junction boxes, wiring, and any other component of the existing electrical distribution within the station.

E33.1.3 Supply, install, and connect as required for a complete installation:

- (a) Lighting fixtures
- (b) Switches
- (c) Lighting contactors
- (d) Receptacles
- (e) Pull boxes
- (f) Field device junction boxes
- (g) Conduit

E33.1.4 Supply, install, connect and test the following:

- (a) Lighting contactor panel and switches.
- (b) Ventilation motor starter.
- (c) Emergency lighting systems.

E33.1.5 Install arc flash labels. Text for arc flash labels shall be provided by Contract Administrator.

### **E34. AUTOMATION – GENERAL**

#### **E34.1 Scope of Work**

E34.1.1 Supply, install, test, and commission the complete automation system as per drawings and specifications. Work shall include, but not be limited to the following items.

E34.1.2 Connect, wire, setup, calibrate, and commission all existing and new instrumentation.

E34.1.3 Supply and install the RTU control panel complete with wireless modem and antenna.

E34.1.4 Supply and install telephone network termination panel.

E34.1.5 Supply and install automation field junction boxes as indicated in the drawings.

- E34.1.6 Install automation wiring to the soft starters. Test and commission.
- E34.1.7 Install automation wiring to the ventilation motor starter. Test and commission.
- E34.1.8 Install automation wiring to the sump pump starter. Test and commission.
- E34.1.9 Supply, install, and commission all instruments.
- E34.1.10 The following instrumentation is existing:
  - (a) Contractor to maintain all instrumentation within the combined sewer overflow chamber and reconnect the new RTU panel.
- E34.1.11 Supply and install equipment identification lamacoids per the Lamacoid Schedule.

### **E35. AUTOMATION – PROGRAMMING, TRAINING AND COMMISSIONING**

- E35.1 Scope of Work
  - (a) Program, test, and commission the Remote Terminal Unit (RTU) and touch-panel Human-Machine Interface (HMI).
  - (b) Demonstrate all aspects of the automation programming at a Factory Acceptance Test.
  - (c) Provide a commissioning plan including detailed commissioning checklists. Submit to the Contract Administrator for review.
  - (d) Provide training sessions for City personnel.
  - (e) Provide on-site commissioning of the RTU/PLC, HMI, and all associated equipment and instrumentation.
  - (f) Complete commissioning forms.
  - (g) Provide a commissioning report.