THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 36-2006

WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

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PART B - BIDDING PROCEDURES

B1. PROJECT TITLE

B1.1 WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, September 21, 2006.

B2.2 Bid Submissions 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. BIDDERS' CONFERENCE

B3.1 Further to GC:3.1, the Contract Administrator will hold a Bidders' Conference at the Site from 10:00 a.m. to 12:00 Noon on September 6, 2006, commencing in the meeting room at UMA Projects site office.

B3.2 The Bidder is advised that, at the Bidders' Conference, site logistics, staging of the work and impacts on operations will be discussed.

B3.3 The Bidder shall not be entitled to rely on any information or interpretation received at the Bidders' Conference unless that information or interpretation 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. ADDENDA

B5.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.

B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.

B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Branch internet site for addenda shortly before submitting his Bid.

B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.

B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:

(a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;

(b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;

(c) identify any anticipated cost or time savings that may be associated with the substitute;

(d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;

(e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.

B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.

B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.

B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative shall base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.

B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID SUBMISSION

B7.1 The Bid Submission consists of the following components:

(a) Form A: Bid;

(b) Form B: Prices;

(c) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;

B7.2 All components of the Bid Submission 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 in ink, to constitute a responsive Bid.

B7.3 The Bid Submission shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B7.3.1 Samples or other components of the Bid Submission 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 Submission.

B7.4 Bid Submissions submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.5 Bid Submissions shall be submitted to:

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

B8. BID

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

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

(a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;

(b) if the Bidder is a partnership, the full name of the partnership shall be inserted;

(c) if the Bidder is a corporation, the full name of the corporation shall be inserted;

(d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

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

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

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

(a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;

(b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;

(c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;

(d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

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

B8.4.2 All signatures shall be original and shall be witnessed except where a corporate seal has been affixed.

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

B9. PRICES

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

B9.2 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.

B9.3 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. QUALIFICATION

B10.1 The Bidder shall:

(a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;

(b) be responsible and not be suspended, debarred or in default of any obligation to the City;

(c) be financially capable of carrying out the terms of the Contract;

(d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;

(e) have successfully carried out work, similar in nature, scope and value to the Work;

(f) employ only Subcontractors who:

(i) are responsible and not suspended, debarred or in default of any obligation 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 Branch internet site at http://www.winnipeg.ca/matmgt); and

(ii) have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of performing the Work required to be done in accordance with the terms of the Contract;

(g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba);

B10.2 The Bidder shall, within three (3) Business Days of a request by the Contract Administrator, provide the Contract Administrator with evidence of the qualification, including a complete list of relevant project experience and key project personnel whom the Bidder proposes to engage (Form L: Contractor Experience). Bidders shall complete Form L with, at a minimum, the following information:

(a) Details of three (3) projects including contact references that demonstrate the Bidder's or relevant Subcontractor's ability to successfully install large diameter concrete pipe (1372 mm or larger) or AWWA concrete pressure pipe (C300, C301, C302); and

(b) Details of one (1) project including contact references that demonstrate the Bidder's or relevant Subcontractor's ability to successfully install pressure pipe in diameters 600 mm or larger; and

(c) Resumes of key project personnel who will be dedicated to this Project, detailing relevant experience in meeting the technical requirements of sub-clauses a) and b) above. Key personnel shall be deemed to include General and/or Site Superintendents. A minimum of one (1) key personnel must have direct experience in the installation of AWWA concrete pressure pipe (C300, C301, C302); and

(d) Resumes of a minimum of one (1) supplier support personnel detailing relevant experience in installing large diameter AWWA concrete pressure pipe (C300, C301, C302), who will attend the site as specified herein.

B10.3 Further to B10.1(g), the Bidder shall, within three (3) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

(a) a valid COR certification number under the Certificate of Recognition (COR) Program - Option 1 administered by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or

(b) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association; or

(c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.)

B10.4 The Bidder shall be prepared to submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B10.5 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. BID SECURITY

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

(a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or

(b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or

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

B11.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B11.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B11.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

B12.1 Bid Submissions will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Branch, or in such other office as may be designated by the Manager of Materials.

B12.1.1 Bidders or their representatives may attend.

B12.1.2 Bid Submissions determined by the Manager of Materials, or his designate, to not include the bid security specified in B11 will not be read out.

B12.2 After the public opening, the names of the Bidders and their Total Bid Prices as read out (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 Branch internet site at http://www.winnipeg.ca/matmgt.

B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

B12.4 The Bidder is advised that any information contained in any Bid Submission may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B13. IRREVOCABLE BID

B13.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.

B13.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid.

B14. WITHDRAWAL OF BIDS

B14.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B14.1.1 Notwithstanding GC:23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials shall:

(a) retain the Bid Submission until after the Submission Deadline has elapsed;

(b) open the Bid Submission to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and

(c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.

B14.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

B15. EVALUATION OF BIDS

B15.1 Award of the Contract shall be based on the following bid evaluation criteria:

(a) compliance by the Bidder with the requirements of the Bid Opportunity (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);

(c) Total Bid Price and applicable taxes;

(d) economic analysis of any approved alternative pursuant to B6.

B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission 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 if the interests of the City so require.

B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid Submission or in other information required to be submitted, that he is responsible and qualified.

B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B15.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

B15.5 Further to B15.1(c), applicable taxes shall include Manitoba Retail Sales Tax (MRST, also known as PST).

B16. AWARD OF CONTRACT

B16.1 The City will give notice of the award of the Contract by way of a letter of intent, or will give notice that no award will be made.

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

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

(a) the prices exceed the available City funds for the Work;

(b) the prices are materially in excess of the prices received for similar work in the past;

(c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;

(d) only one Bid is received; or

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

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

PART C - GENERAL CONDITIONS

C1. GENERAL CONDITIONS

C1.1 The *General Conditions for Construction Contracts* (Revision 2000 11 09) are applicable to the Work of the Contract.

C1.1.1 The *General Conditions for Construction Contracts* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Construction Contracts*, these Supplemental Conditions are applicable to the Work of the Contract.

D1.2 The General Conditions are amended by striking out "The City of Winnipeg Act" wherever it appears in the General Conditions and substituting "The City of Winnipeg Charter".

D1.3 The General Conditions are amended by striking out "Tender Package" wherever it appears in the General Conditions and substituting "Bid Opportunity".

D1.4 The General Conditions are amended by striking out "Tender Submission" wherever it appears in the General Conditions and substituting "Bid Submission".

D1.5 The General Conditions are amended by deleting GC:6.16 and GC:6.17. The City of Winnipeg is now within the jurisdiction of the Manitoba Ombudsman pursuant to The Ombudsman Act.

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of construction of large diameter water overflow piping and reservoir outfall structure.

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

(a) Supply and installation of approximately 95 lineal metres of 1219 millimetre diameter and 240 lineal metres of 1372 millimetre diameter AWWA C301 Prestressed Concrete Cylinder pipe, fittings and appurtenances

(b) Supply, installation and removal of Excavation Shoring

(c) Removal of shoring left in place by previous contractors.

(d) Modification of a cast-in-place concrete chamber and installation of steel piping and fittings

(e) Construction of a cast-in-place overflow chamber at the top of the Cell 1 reservoir berm

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

(a) "AWWA" means American Waterworks Association

(b) "CSA" means Canadian standard Association

(c) "NSF" means National Sanitation Foundation

(d) "DBPS" means Deacon Booster Pumping Station.

(e) "ASTM**"** means American Society for Testing and Materials; and

(f) "CSA" means Canadian Standards Association

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is UMA Projects (CM) Ltd., represented by:

Lawrence Recksiedler, C.E.T.
Contract Administrator
1479 Buffalo Place
Winnipeg, MB. R3T 1L7
Telephone No. (204) 986-4246
Facsimile No. (204) 986-8393

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

D5. CONTRACTOR'S SUPERVISOR

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

D6. NOTICES

D6.1 Except as provided for in GC:23.2.2, 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.

D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3, D6.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D4.1.

D6.3 All notices of appeal shall be sent to the attention of the Chief Financial Officer at the following address or facsimile number:

The City of Winnipeg
Chief Administrative Officer Secretariat
Administration Building, 3rd Floor
510 Main Street
Winnipeg MB R3B 1B9

Facsimile No.: (204) 949-1174

D6.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following address or facsimile number:

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

Facsimile No.: (204) 947-9155

D7. FURNISHING OF DOCUMENTS

D7.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him at cost.

SUBMISSIONS

D8. SAFE WORK PLAN

D8.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D8.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

D9. INSURANCE

D9.1 The City shall provide and maintain the following Project Insurance Coverages:

(a) Builder's Risk Insurance in the amount of one hundred percent (100%) of the total project cost.

(i) The Contractor shall be responsible for deductibles up to $10,000.00 maximum of any one loss.

(b) Wrap-Up Liability Insurance in an amount of no less than 10 million dollars ($10,000,000.00)

(i) The Contractor shall be responsible for deductibles up to $10,000.00 maximum of any one loss.

D9.1.1 The City of Winnipeg will carry such insurance to cover all parties engaged in the Work in this Contract. Provision of this insurance by the City of Winnipeg is not intended in any way to relieve the Contractor from his obligations under the terms of the Contract. Specifically, losses relating to deductibles for insurance, as well as losses in excess of limits of coverage and any risk of loss that is not covered under the terms of the insurance provided by the City of Winnipeg remains with the Contractor.

D9.2 The Contractor shall provide and maintain the following insurance coverage at all times during the performance of the Work:

(a) Automobile liability insurance for owned and non-owned automobiles used for or in connection with the Work in the amount of at least two million dollars ($2,000,000.00).

(i) Deductibles shall be borne by the Contractor;

(ii) The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator;

D10. PERFORMANCE SECURITY

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

(a) 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.

D10.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D10.2 If the bid security provided in his Bid Submission was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D11. SUBCONTRACTOR LIST

D11.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D12. EQUIPMENT LIST

D12.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D13. DETAILED WORK SCHEDULE

D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule 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 GC:4.1 for the return of the executed Contract.

D13.2 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.

D13.3 Further to D13.2(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:

(a) Site Preparation and Mobilization

(b) Cast-in-Place Overflow Chamber Construction

(i) Shoring and Excavation

(ii) Chamber Construction

(c) Overflow Piping from Branch I Surge Tower to Overflow Chamber
  (i) Stage 1 from Wye to Toe of Cell 1 Berm
  (ii) Stage 2 from Toe of Cell 1 Berm to Overflow Chamber
  (iii) Stage 3 from Branch I Surge Tower to Wye

(d) GWWD Railway crossings (track outage)
  (i) Chemical Feed Spur
  (ii) Chlorine Spur
  (iii) Main Line

(e) Modification of Branch II Surge Tower Dissipation Chamber
  (i) Installation of Shoring
  (ii) Reinforcement of Discharge Chamber Wall
  (iii) Cutting Hole in Discharge Chamber
  (iv) Welding Steel Extension and Fitting to Existing Drop Pipe Stub
  (v) Forming and Pouring Concrete Cradle, Chamber Wall and Abandoning North East Portion of Existing Discharge Chamber
  (vi) Installing Dewatering Piping and Fittings, Access Ladder and Access Hatch

(f) Overflow Piping from Branch II Surge Tower to Wye
  (i) Pipe Installation

D13.4 Further to D13.2(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.

D13.5 The detailed work schedule shall be updated as the work requires and submitted to the Contract Administrator.

D13.6 While it is intended that the Contractor shall be allowed, in general, to carry on the Contract in accordance with such general plans as may appear to him to be most desirable, the Contract Administrator, at his discretion, may direct the order in which, and points at which, the work shall be undertaken.

D13.7 This control shall be exercised in the interests of the City so that the work or other Contractors who may be working on the site may be coordinated with the work on this Contract.

D13.8 The Contract Administrator shall be notified immediately when the work under the Contract Work Schedule will adversely affect the work of other Contractors and the critical path of the Project Master Schedule as the work under the Contractor's detailed work schedule is an integral part of the Project Master Schedule.

D13.9 The Contractor shall be familiar with all other Contract Work Schedules as contracted by the City with other contractors and the critical path of the Project Master Schedule.

SCHEDULE OF WORK

D14. COMMENCEMENT

D14.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D14.2 The Contractor shall not commence any Work on the Site until:

(a) the Contract Administrator has confirmed receipt and approval of:

(i) evidence that the Contractor is 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;

(ii) evidence of the workers compensation coverage specified in GC:6.14;

(iii) the Safe Work Plan specified in D8;

(iv) evidence of the insurance specified in D9;

(v) the performance security specified in D10;

(vi) the subcontractor list specified in D11;

(vii) the equipment list specified in D12;

(viii) the Detailed Work Schedule specified in D13;

(ix) the security clearances specified in D25 and

(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.

D14.3 The City of Winnipeg will endeavour to award the Contract within 30 Calendar Days of the Submission Deadline. If award is not made within that time period, Contract Dates identified in D16 Critical Stages, D17 Substantial Performance, D18 Total Performance and D20 Liquidated Damages will be extended by an equivalent number of Calendar Days until such a time an award is made.

D15. SCHEDULE RESTRICTIONS

D15.1 Aqueduct, Yard Piping and Reservoir Operations

(a) Aqueducts, existing yard piping and reservoir shutdown periods are scheduled based on a number of factors including routine maintenance and repair work along the Aqueduct, water demand, weather, reservoir operation and other factors. The City shall endeavour to make the specified time periods available to the Contractor to schedule his work requiring removal of the Aqueduct, yard piping and reservoir from service, without limiting the City's control over the operation of the regional water infrastructure to complete other work, maintain adequate water supply and storage of water and maintain the integrity of the infrastructure. The City shall reserve the right to cancel and/or delay these schedule dates at any time, due to any circumstances that could adversely affect the Aqueducts or water supply, including but not limited to high water demand, abnormal weather, failures of related water system components and/or security concerns.

(b) Dewatering of Cell 1 will be completed by City forces once the period of high summer demands has passed. The City will endeavour to lower the water level down to 239.0 by October 1, 2006 to permit construction of the overflow chamber. The City will continue to lower the water level to complete other works within the Cell 1 Reservoir.

(c) The GWWD railway and spur lines will be removed and replaced by City forces as required for installation of pipelines. Schedule for removal of rail lines must be coordinated with the delivery of treatment chemicals and supplies via railway to the Deacon Booster Pumping Station, the Chemical Feed Facility and the Shoal Lake Aqueduct. Chemical and supply usage varies with water demand, but are typically replenished on a two to three month cycle. The Contractor shall provide the Contract Administrator with a minimum of fourteen (14) Calendar Days notice of requiring railway removals.

D15.2 Coordination with Others

(a) Branch I Surge Tower

(i) Construction of the Branch I Surge Tower, scheduled to take place in the fall of 2006 and winter/spring of 2007, will preclude simultaneous construction of the overflow piping from the Branch II Surge Tower.

(ii) Branch I Overflow Piping connection to the Surge Tower Overflow Pipe cannot be started until the Branch I Tower Overflow Pipe is installed. Installation of the Overflow Pipe is tentatively scheduled for February 2007.

(iii) Excavation for the installation of the Branch II Overflow Piping cannot be initiated until the backfill for the Branch I Surge Tower has been completed. The excavation for the Branch I Surge Tower is tentatively scheduled to be backfilled in May 2007.

(b) DBPS Pump and Process Installations

(i) DBPS Pump and Process Installations contract will commence in work in November 2006 and will require unrestricted truck access to the DBPS unloading bay.

(c) Water Treatment Plant Overflow

(i) The Water Treatment Plant Overflow contract will commence work on June 1, 2007 at the Branch II Surge Tower

(d) Standby Generator Building and Ancillary Buildings

(i) The construction of the Standby Generator Building and Ancillary Buildings will commence in October, 2006 and will require unrestricted access via the west access to the site. The west site access to the site may be interrupted for a duration of three days at a future time, to be arranged by the Contract Administrator, to permit the installation of the overflow piping that affects the west access.

D16. CRITICAL STAGES

D16.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) December 15, 2006 - Construction of the Cell 1 Overflow Structure

(b) April 20, 2007 – Completion of the connection to the Branch I Overflow Piping

(c) May 15, 2007 – Completion of the modifications to the Branch II Surge Tower and Stage One of the installation of the Branch 11 Overflow Piping.

(d) June 22, 2007 – Completion of the installation of the Branch II Overflow Piping.

D16.2 Where Critical Stages cannot be met due to delays beyond the Contractors control, such as delay of material delivery from sources outside of this Bid Opportunity or delay of preceding work by others, the dates for the Critical Stages will be adjusted by an equivalent amount of Calendar Days until such a time as materials or preceding work by others is competed satisfactorily.

D17. SUBSTANTIAL PERFORMANCE

D17.1 The Contractor shall achieve Substantial Performance by July 1, 2007.

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 re-inspected.

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 July 31, 2007.

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 re-inspected.

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 stages as specified in D16.1 - two thousand six hundred dollars ($2,600.00);

(b) Substantial Performance - two thousand six hundred dollars ($2,600.00);

(c) Total Performance – six hundred dollars ($600.00).

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.

CONTROL OF WORK

D20. JOB MEETINGS

D20.1 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.

D20.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D21. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D21.1 Further to GC:6.26, UMA Projects (CM) Ltd. 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).

D21.2 As Prime Contractor, UMA Projects (CM) Ltd. will administer a Project Health and Safety Management Plan. Compliance with this Plan will be mandatory for all personnel on the

construction site and orientation and certification of all staff by the Prime Contractor's Safety Officer will be required.

D22. PARTNERING

D22.1 In order to effectively and efficiently accomplish the Work of this Contract, The City of Winnipeg, Water and Waste Department is encouraging the formation of a cohesive, mutually beneficial working relationship with the Contractor and his Subcontractors. This working relationship will endeavour to draw on individual and corporate and community strengths, skills and knowledge to achieve a quality project to the benefit of all participants. The objective of Partnering is to build co-operative relationships, avoid or minimize disputes and actively pursue the attainment of common goals. Success will depend upon teamwork with open and effective communication while adhering to the highest professional standards.

D22.2 Participation in Partnering will not in any way affect the application or legal obligation of the Contract.

D22.3 The Partnering Initiation Workshop is typically a one and one-half (1 ½) day session for a project of this magnitude, which would be held in conjunction with the pre-construction meeting. The Partnering Initiation Workshop will be scheduled for a date in the last two weeks of October, 2006.

D22.4 The Partnering Initiation Workshop shall be carried out at no cost to the Contractor nor shall any payment be made for time and travel expenses incurred by the Contractor associated with participation in the Partnering Initiation Workshop. It shall be considered incidental to the Work included in this project.

D23. COOPERATION WITH OTHERS

D23.1 The Contractor shall note that several other contracts will be underway at the time of construction, including, but not limited to;

(a) Bid Opportunity 37-2006 Winnipeg Water Treatment Program – Surge Tower Construction

(b) Bid Opportunity 35-2006 Winnipeg Water Treatment Program – DBPS Pump and Process Installations

(c) Bid Opportunity 498-2006 Construction of Standby Generator Building and Ancillary Buildings

(d) Bid Opportunity 583-2005 WTP Foundations and Concrete Structures

(e) Bid Opportunity 742-2005 WTP Process Mechanical and Electrical

D23.2 The Contractor will not have exclusive use of the Site. The Contractor shall coordinate activities with others and minimize disruptions to others, where possible.

D23.3 Where existing site access routes require relocation for installation of Works, the Contractor shall construct suitable, all-weather detours, as required.

D23.4 The Contractor shall note that the Deacon Booster Pumping Station and surrounding compound will be in use during the construction period. The Contractor shall maintain reasonable access to all existing plant, valve chambers, rail, mechanical and electrical facilities at all times. The Contractor shall provide all reasonable assistance to Operations personnel to provide safe, secure access to operational facilities.

D23.5 The Contractor shall note that chemicals are delivered to the Deacon Booster Pumping Station compound by rail and there will be a chemical rail car delivery approximately once a month. The Contractor shall maintain rail car access to all existing plant for scheduled deliveries.

D24. SITE SECURITY

D24.1 Deacon Booster Pumping Station and compound is a fenced, secure site. The construction site and staging areas are fenced, and all access points controlled. The Contractor shall reinstate the fencing to maintain a fenced, secure site during non working hours.

D24.2 Personnel, material and equipment will only be permitted to access the Site via the main entrance gate, located west of Provincial Road 207, as indicated on Construction Site Layout Drawing CM-G001 Rev. 8. This gate will normally be staffed 24 hours a day, seven days a week. Access to the DBPS compound is normally through the main gate of the compound and is normally restricted to the hours of 7:00 am to 5:00 pm, Monday to Friday. Alternate site access arrangements can be made through the Contract Administrator. Access to the Site through other designated gates must be approved by the Contract Administrator.

D24.3 Twenty-four hour site security will be present on Site for the duration of the Contract. Security will be provided at the gated entry to Cell 1 reservoir off PR 207 to provide restricted access from 07:00 to 18:00 hours unless otherwise approved by the Contract Administrator.

D25. SECURITY CLEARANCE

D25.1 Each individual proposed to perform Work on the Site shall be required to obtain a Criminal Record Check Search Certificate from the Police Service having jurisdiction at his place of residence.

D25.2 Prior to the commencement of any Work, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform Work within City facilities or on private property.

D25.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person, will not be permitted to perform any Work within City facilities or on private property.

D25.4 Any Criminal Record Search Certificate obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.

D25.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform Work under the Contract within City facilities or on private property.

FORM H1: PERFORMANCE BOND
(See D10)

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(hereinafter called the "Principal"), and

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

_____

_____ dollars ($_____.____)

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

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

_____ day of _____ , 20____ , for:

BID OPPORTUNITY NO. 36-2006

WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

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)

_____
(Name of Principal)

Per: _____ (Seal)

Per: _____

_____
(Name of Surety)

By: _____ (Seal)
(Attorney-in-Fact)

FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)
(See D10)

_____
(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 36-2006

WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

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 (1993 Revision), International Chamber of Commerce Publication Number 500.

_____
(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM J: SUBCONTRACTOR LIST
(See D11)

WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

Name	Address

FORM K: EQUIPMENT
(See D12)

WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

1. Category/type: Excavation

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

2. Category/type: Crane / Lifting

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

3. Category/type: Compaction

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

FORM K: EQUIPMENT
(See D12)

WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

4. Category/type: Shoring /Piling

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

5. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

6. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

FORM L: CONTRACTOR EXPERIENCE
(See B10)

WINNIPEG WATER TREATMENT PROGRAM – CONSTRUCTION OF SURGE TOWER OVERFLOW PIPING

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

1. Project References: _____

Project Client/Contact: _____
(Name)
_____
(Address)

Year	Description of Project, including type of pipe	Value

2. Project References: _____

Project Client/Contact : _____
(Name)
_____
(Address)

Year	Description of Past Project, including type of pipe	Value

3. Project References: _____

Project Client/Contact: _____
(Name)
_____
(Address)

Year	Description of Past Project, including type of pipe	Value

4. Project References: _____

Project Client/Contact: _____
(Name)

_____
(Address)

Year	Description of Past Project, including type of pipe	Value

5. Project Personnel:

Name and Title:_____
(Name)

Qualifications: (attach resume and fill out information below)

Year	Description of Past Project	For Whom Work Was Performed	Value

6. Project Personnel:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

Year	Description of Past Project	For Whom Work Was Performed	Value

7. Project Personnel:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

Year	Description of Past Project	For Whom Work Was Performed	Value

8. Project Personnel:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

Year	Description of Past Project	For Whom Work Was Performed	Value

9. Project Personnel-Suppliers:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

Year	Description of Past Project	For Whom Work Was Performed	Value

10. Project Personnel-Suppliers:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

Year	Description of Past Project	For Whom Work Was Performed	Value

11. Project Personnel-Suppliers:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

Year	Description of Past Project	For Whom Work Was Performed	Value

_____
Name of Bidder

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.1.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt.

E1.1.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.1.3 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.2 The following Drawings are applicable to the Work:

Consultant Drawing No.	City Drawing No.	Drawing Title
CM G001-R9		CONSTRUCTION SITE LAYOUT (FOR INFORMATION ONLY)
CM G003-R2		CONSTRUCTION SITE LAYOUT (FOR INFORMATION ONLY)
WY-C0011	1-0601Y-C-C0011-001-00D	CIVIL - SURGE TOWER OVERFLOW PIPING - SITE PLAN - PLAN & COORDINATE GEOMETRY
WY-C0012	1-0601Y-C-C0012-001-00D	CIVIL - SURGE TOWER OVERFLOW PIPING - PLAN & PROFILE - 1219ø OVERFLOW PIPE TO 1372 x 1219 WYE
WY-C0013	1-0601Y-C-C0013-001-00D	CIVIL - SURGE TOWER OVERFLOW PIPING - PLAN & PROFILE - BRANCH 1 SURGE TOWER TO MATCH LINE STA 1+ 117.50
WY-C0014	1-0601Y-C-C0014-001-00D	CIVIL - SURGE TOWER OVERFLOW PIPING - PLAN & PROFILE – MATCH LINE STA 1+117.50 TO CELL 1 OVERFLOW STRUCTURE
WY-C0015	1-0601Y-C-C0015-001-00D	CIVIL - OVERFLOW CHAMBER TO CELL 1 RESERVOIR - PLANS, SECTIONS AND DETAILS
WY-C0016	1-0601Y-C-C0016-001-00D	CIVIL - DISCHARGE CHAMBER MODIFICATIONS - PLANS, SECTIONS AND DETAILS
WY-C0017	1-0601Y-C-C0017-001-00D	CIVIL - SURGE TOWER OVERFLOW PIPING - MISCELLANEOUS SECTIONS AND DETAILS
WY-C0018	1-0601Y-C-C0017-002-00D	CIVIL - SURGE TOWER OVERFLOW PIPING - MISCELLANEOUS SECTIONS AND DETAILS

E2. SOILS INVESTIGATION REPORT

E2.1 Further to GC:3.1, a copy of the geotechnical information is available on the Winnipeg Water Treatment Program – Project Site Information page at the City of Winnipeg, Corporate Finance, Materials Management Branch internet site at http://www.winnipeg.ca/matmgt/projects.

E2.2 Test Hole Logs

E2.2.1 Geotechnical information has been compiled from various sources to summarize subsurface conditions within the Work area. Test_Hole_Logs-Set1.pdf at the aforementioned internet site contains the following test hole logs.

(a) By UMA Engineering

(i) TH's 04-01 to 04-10, 04-12 to 04-24, 04-31, and 04-33 to 04-50 (2004)

(ii) TH's 1 to 3 (1996)

(iii) TH's 06-73 to 06-78

(b) By Others

(i) TH's 3 to 6, and R-5 by RM Hardy & Associates Ltd. (1977)

(ii) TH's 1 and 2 by Dyregrov Consultants (1993)

(iii) TH A13 by KGS Group (1991)

(c) Within the City of Winnipeg Water Treatment Plant Preliminary Design Report – Section 14 Geotechnical Investigation (2005), UMA Test Hole information is considered accurate at the locations drilled and at the time of the investigations. The inclusion of test hole data recorded by others does not represent any guarantees to the accuracy of this data.

(d) Test hole information is provided to assist the Bidder's evaluation of subsurface conditions and the Bidder shall solely be responsible for any interpretation that they make from this information. Variations in soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities or operation of the Floodway.

E2.3 Test Pile Driving Records

E2.3.1 Test_Pile_Driving_Records-Set1.pdf at the internet site identified in E2.1 shows data recorded by UMA Engineering Ltd. During driving of ten (10) test piles at the site in March, 2005.

E2.4 Surge Tower Overflow Testhole Logs

E2.4.1 Additional geotechnical information for the Surge Tower Overflow Piping is provided at the internet site, identified as Test Hole Logs-Set 3.

E2.5 Clearwell Pile Driving Records

E2.5.1 Pile Driving Records for the Clearwell are provided at the internet site, identified as Clearwell Pile Driving Records.

E2.6 Reports

(a) Additional reports and geotechnical information listed as follows are available for viewing at the offices of UMA Engineering Ltd., 1479 Buffalo Place, Winnipeg, Manitoba.

(i) The City of Winnipeg Water Treatment Plant Preliminary Design Report – Section 14 Geotechnical Investigation (2005)

(ii) Water Impounding Reservoir - Cell #2 and Booster Pumping Station Deacon Manitoba by RM Hardy & Associates Ltd. (1977)

(iii) Proposed Venturi Chambers Deacon Reservoir by Dyregrov Consultants (1993)

(iv) Deacon Reservoir Expansion Proposed Groundwater Monitoring Program by KGS Group (1993)

(v) Shoal Lake Aqueduct Program 5 – Deacon Drainage Improvements by UMA Engineering Ltd. (1996)

(vi) Pile Driving records from Deacon Booster Pumping Station by RM Hardy and Associates Ltd. (1979).

(b) Information in these reports has been provided to assist in the Bidder's evaluation of subsurface conditions and the Bidder shall solely be responsible for any interpretation that they make from this information.

GENERAL REQUIREMENTS

E3. OFFICE FACILITIES

E3.1 The Contractor will be permitted to erect a site office in a suitable area to the west of the chlorine spur line as shown on Construction Site Layout Drawing CM G001 Rev 9.

E3.2 The Contractor will be permitted to use lay down areas for staging as identified on Construction Site Layout CM G001 Rev 9 and Construction Site Layout Drawing CM G003 Rev 2.

E3.3 The Contractor shall supply office facilities for the Contract Administrator. The facilities shall be situated at the area designated on the drawings or as directed by the Contract Administrator.

(a) Facilities for the Contract Administrator:

(i) The minimum facility floor area shall be 12 square metres

(ii) The facility shall have a door with lockable hardware

(iii) The facility shall have lighting, heating and cooling provisions to maintain a temperature between 15C and 25C,

(iv) The facility shall have a desk, chair and plan table

E4. CONDITION, PROTECTION OF AND ACCESS TO THE AQUEDUCT AND FACILITIES

E4.1 Condition of the Aqueduct and Existing Yard Piping

E4.1.1 The Deacon Booster Pumping Station and area contains numerous water conduits of various constructions and vintages. All are critical components of the City of Winnipeg Water Supply and shall be treated with the utmost caution. Work around any of these pipelines shall be well planned and executed to ensure that the Aqueduct is not subjected to construction related loads, including excessive vibrations and concentrated or asymmetrical lateral loads during backfill placement.

E4.1.2 The Deacon Booster Pumping Station and water distribution lines must remain in use during construction, unless otherwise indicated. Access to the Deacon Booster Pumping Station, the Chemical Feed Facility and the DBPS chlorine room must be maintained at all times, and capable of access for City of Winnipeg service vehicles. Temporary access as indicated on the Drawings must be in place and acceptable to the Contract Administrator prior to disrupting primary access to these facilities.

E4.1.3 The Shoal Lake Aqueduct, north of the main access road is a cast-in-place reinforced concrete pipe, vintage 1916-1917. The Branch I Aqueduct running east to west, immediately south of the Booster Pumping Station, commencing at the existing main entrance to the station, is constructed of precast reinforced concrete pipe, vintage 1918-1919. The Branch II Aqueduct, running southerly from the surge tower structure, is constructed of AWWA C301 pre-stressed concrete cylinder pipe vintage 1958-1960. Other

existing water transmission lines within the Deacon Booster Pumping Station compound, consist of AWWA C301 pre-stressed concrete cylinder pipe vintage 1970-1995.

E4.2 Protection of the Aqueducts and Water Transmission Lines

E4.2.1 Contractors carrying out repair work or working in the vicinity of the Aqueducts and transmission lines shall ensure that:

(a) Equipment shall only be permitted to cross the pipes at designated locations.

(b) Granular material, construction material, soil or other material shall not be stockpiled on the Aqueduct or within 5 metres of the Aqueduct centerline.

(c) Construction practices shall not subject the Aqueduct to asymmetrical loading at any time.

(d) Construction practices or procedures at or near the Aqueduct shall not impart excessive vibration loads on the Aqueduct and/or cause settlement of the subgrade below the Aqueduct.

(e) Asymmetrical water pressures shall not be permitted to build up on one side of the Aqueduct arch.

(f) Further to CW 2030-R6, only smooth edged excavation buckets, soft excavation or hand excavation shall be used for excavation adjacent to and over the pipelines.

(g) Install watertight bulkheads at all locations where the pipes are exposed, or removed.

E4.2.2 It is the Contractors' responsibility to ensure that all work crew members understand and observe the requirements of E4.1 and E4.2. Prior to commencement of on-site work, the Contractor's superintendent, foreman and heavy equipment operators shall attend an orientation meeting that will outline restrictions for working on and around the Aqueduct. Failure to comply with these restrictions will be grounds for removing the offending personnel from the Site.

E4.3 Operational Safety Lockouts

(a) Install Contractor's locks on City installed lock-out devices, on all valve, sluice gates, and pumps (closed position) prior to commencement of operations involving connection to existing pipelines at the following and other locations designated by the City;

(i) Cell 1 Overflow Chamber

Cell 1 Outlet Sluice Gates (3 units)

Cell 2 Outlet Sluice Gates (2 units)

Drain Valve between Cells 1 and 2

Cell 1 Inlet Valve

(ii) Branch II Overflow

Branch II Pumps (3 units)

Branch I Pumps (2 units)

(b) The City of Winnipeg will provide access to gate, valve and pump locations. The Contractor shall name a primary contact and backup personnel, available on a 24 hour per day basis, with access to lockout keys, in the event on an emergency.

E5. ENVIRONMENTAL PROTECTION

E5.1 The Contractor shall be aware that the Shoal Lake Aqueduct and Deacon reservoir areas are for potable water supply and no contamination by fuel, chemicals, etc. shall be permitted at any time. Fuels or chemicals shall not be stored within 30 metres of the Aqueduct, reservoirs or pipelines.

E5.2 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the environmental protection measures as herein specified.

E5.3 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

E5.3.1 Federal

(a) Canadian Environmental Protection Act (CEPA) c.16

(b) Transportation of Dangerous Goods Act and Regulations c.34

E5.3.2 Provincial

(a) The Dangerous Goods Handling and Transportation Act D12

(b) The Endangered Species Act E111

(c) The Environment Act c.E125

(d) The Fire Prevention Act F80

(e) The Manitoba Nuisance Act N120

(f) The Public Health Act c.P210

(g) The Workplace Safety and Health Act W120

(h) And current applicable associated regulations.

E5.4 The Contractor is advised that the following environmental protection measures apply to the Work.

E5.4.1 Materials Handling and Storage

(a) Construction materials shall not be stored within five (5) metres of the Aqueduct centerline.

E5.4.2 Fuel Handling and Storage

(a) The Contractor shall abide by the requirements of Manitoba Environment for handling and storage of fuel products.

(b) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.

(c) Fuels, lubricants, and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.

(d) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.

(e) Products transferred from the fuel storage area(s) to specific work sites shall not exceed the daily usage requirement.

(f) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheet of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill.

(g) Refueling of mobile equipment and vehicles shall take place at least 30 metres from a watercourse or reservoir, but in no case within the Cell 1 Dyke area.

(h) The area around storage sites and fuel lines shall be distinctly marked and kept clear of snow and debris to allow for routine inspection and leak detection.

(i) A sufficient supply of materials, such as absorbent material and plastic oil booms, to clean up minor spills shall be stored nearby on-site. The Contractor shall ensure that additional material can be made available on short notice.

E5.4.3 Waste Handling and Disposal

(a) The construction area shall be kept clean and orderly at all times during and at completion of construction.

(b) At no time during construction shall personal or construction waste be permitted to accumulate for more than one day at any location on the construction site, other than at a dedicated storage area as may be approved by the Contract Administrator.

(c) Indiscriminate dumping, littering, or abandonment shall not take place.

(d) No on-site burning of waste is permitted.

(e) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.

E5.4.4 Dangerous Goods/Hazardous Waste Handling and Disposal

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

(b) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations.

E5.4.5 Emergency Spill Response

(a) The Contractor shall ensure that due care and caution is taken to prevent spills.

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

(c) The Contractor shall designate a qualified supervisor as the on-site emergency response coordinator for the project. The emergency response coordinator shall have the authority to redirect manpower in order to respond in the event of a spill.

(d) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-site emergency response coordinator:

(i) Notify emergency-response coordinator of the accident:
- identify exact location and time of accident
- indicate injuries, if any
- request assistance as required by magnitude of accident (Manitoba Environment 24-hour Spill Response Line (204) 945-4888, Police, Fire Department, Ambulance, company backup)

(ii) Assess situation and gather information on the status of the situation, noting:
- personnel on site
- cause and effect of spill
- estimated extent of damage
- amount and type of material involved
- proximity to waterways and the Aqueduct

(iii) If safe to do so, try to stop the dispersion or flow of spill material:
- approach from upwind
- stop or reduce leak if safe to do so
- dyke spill material with dry, inert sorbent material or dry clay soil or sand

- prevent spill material from entering waterways and utilities by dyking
- prevent spill material from entering Aqueduct manholes and other openings by covering with rubber spill mats or dyking

(iv) Resume any effective action to contain, clean up, or stop the flow of the spilled product.

(e) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to the Manitoba Environment according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.

E5.4.6 Controlled Products

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

(b) Notwithstanding the aforementioned requirement, materials have been tested by an ANSI accredited laboratory and meet the requirements of ANSI/NSF 60, "Standard for Drinking Water Treatment and Chemicals – Health Effects", and ANSI/NSF 61, "Standard for Drinking Water System Components – Health Effects", as specified in the Specifications, shall be permitted inside the Aqueduct.

E6. SITE DRAINAGE

E6.1 The Contractor shall be responsible for drainage of all excavations associated with the Work from Award until Total Performance.

E6.2 Provision of adequate site drainage during the performance of the Contract shall be the Contractor's responsibility. The Contractor shall maintain site grading as necessary to provide for proper drainage away from the excavated areas. This water is to be re-directed into ditches outside of the site. Silt fences shall be properly erected and keyed into the primary ditches to prevent eroded materials from leaving the site. No extra payment or time extension will be granted as a result of difficulties associated with site access resulting from poor site drainage during any part of the performance of the Work.

E7. WASTE CONTAINER

E7.1 A waste container to dispose of garbage produced from the site shall be provided by the Contractor. It shall be located in a safe, convenient location, and be emptied as necessary by the Contractor. The provision, maintenance and removal of a waste container shall be considered a subsidiary obligation of the Contractor.

E8. SANITATION FACILITY

E8.1 Portable toilets may be provided by the Contractor. Any portable toilet shall be cleaned on a weekly basis and provided with regular maintenance as required to ensure proper operation.

E8.2 Portable toilets shall be located in an area acceptable to the Contract Administrator.

E9. SITE RESTORATION

E9.1 The Contractor shall remove the temporary Site office and storage facilities prior to Total Performance being issued.

E9.2 The Contractor shall be responsible for Site restoration of all disturbed areas, as determined necessary by the Contract Administrator. The Contractor shall restore all disturbed previously grassed areas within the Cell 1 Reservoir with sod in accordance with CW 3510.

E9.3 The Contractor shall be responsible for any damage caused by his forces on roadways or accesses and shall repair damaged areas to prior condition as determined necessary by the Contract Administrator.

E10. CONSTRUCTION SEQUENCING AND AQUEDUCT OPERATION

E10.1 Description

(a) This specification shall generally outline construction sequencing, Aqueduct operation, and Aqueduct shutdown criteria.

(b) Construction sequencing shall take into account operations of the Regional Water infrastructure and operations of other contractors.

E10.2 Construction Sequencing

The following construction sequences must be incorporated into the Contractor's schedule and work plan.

(a) Branch I Surge Tower

(i) Coordinate activities with surge tower construction contractor.

(ii) Installation of the surge tower shoring, excavation and construction of the surge tower shall be completed by others. Once overflow steel pipe is installed and concrete thrust block has achieved sufficient strength, the Contractor will be permitted to complete installation of the Branch I Surge Tower overflow piping from the wye to the Branch I Surge Tower overflow pipe.

(iii) Once main excavation for Branch I surge tower has been backfilled, installation of the Branch II Surge Tower overflow piping can begin.

(b) Cast-in Place Overflow Chamber

(i) Construction of cast-in-place overflow chamber cannot begin until Cell 1 has been isolated and dewatered to an elevation of 239.0 m or less.

(ii) Salvage and stockpile existing rip rap

(iii) Excavate.

(iv) Construct overflow chamber.

(v) Backfill and restore rip rap.

(c) Branch I Surge Tower Overflow Piping

(i) Install Branch I Surge Tower overflow piping from wye to Overflow Chamber.

(ii) Install bulkhead on wye branch to Branch II Surge Tower overflow piping.

(iii) Install Branch I Surge Tower overflow piping from wye to Branch I Surge Tower

(iv) Connect pipe to stub of steel overflow pipe at Branch I Surge Tower using coupling.

(v) Remove shoring left in place by other contractor at the Branch I Surge Tower overflow pipe, backfill and place granular or sod finishes

(vi) Installation of piping at railway crossings by open cut will need to be coordinated with operation of the GWWD railway.

(d) Modifications to Branch II Surge Tower Discharge Chamber

(i) Install excavation shoring and excavate to 230.5 metres.

(ii) Reinforce discharge chamber by installing channels and column supports

(iii) Cut hole in wall for installation of overflow pipe extension.

(iv) Weld extension to steel overflow piping and fitting.

(v) Form and pour thrust block and chamber wall.

(vi) Abandon northeastern portion of chamber.

(vii) Install drain piping and fittings and fill in 1500Ø opening in south wall.

(viii) Install piping from tower up to compound 41° bend.

(ix) Backfill excavation and remove shoring.

(e) Branch II Surge Tower Overflow Piping

(i) Install Piping from Branch II Surge Tower to Wye Connection with Branch I Surge Tower overflow piping

(ii) Remove bulkhead.

(iii) Complete closure of Branch II Surge Tower overflow pipjng.

E11. CONSTRUCTION OF CAST-IN-PLACE OVERFLOW CHAMBER AND MODIFICATIONS TO BRANCH II SURGE TOWER DISCHARGE CHAMBER

E11.1 Description

E11.1.1 This specification shall cover construction of cast-in-place overflow chamber and shall supplement, revise and amend CW2160.

E11.2 Materials

(a) Formwork, Reinforcing Steel and Concrete

(i) As per City of Winnipeg CW 2160-R6.

(b) Concrete Mix Design

(i) Concrete Mix Design as per Table CW 2160.1, Type A mix.

(c) Water Stops

(i) As indicated on the Drawings.

(d) Fabricated Stainless Steel Flap Gates

(i) Fabricated Stainless Steel Flap Gates shall be in accordance with E16 of this specification.

(e) Miscellaneous Metals and Accessories

(i) In accordance with E17of this specification and as shown on the Drawings.

(f) Miscellaneous Valves and Fittings

(i) In accordance with E12 of this specification and as shown on the Drawings.

E11.3 Submittals

(a) Submit reinforcing steel shop drawings and concrete mix design in accordance to CW 2160.

(b) Submit fabricated steel and ductile iron water pipe fittings shop drawings.

E11.4 Construction Methods

(a) Cast–in-place concrete as per CW 2160.

E11.5 Method of Measurement and Basis of Payment

(a) Construction of Overflow Chamber shall be measured on a lump sum basis, for chamber construction in accordance to these specifications. The lump sum price shall include excavation, backfill, rip rap and road restoration, cast-in-place concrete works, installation of prestressed concrete chamber piping, supply and installation of flap gates and frames,

appurtenances, and miscellaneous metals. Chamber piping shall be considered all piping within the chamber, to the outside face of the chamber wall.

(b) Modifications to the Branch II Surge Tower Discharge Chamber shall be measured on a lump sum basis, for chamber reconstruction in accordance to these specifications. The lump sum price shall include excavation, demolition, backfill, road restoration, cast-in-place concrete works, welding and installation of fabricated steel chamber piping, supply and installation of miscellaneous valves, appurtenances, miscellaneous metals, and interior plumbing. Chamber piping shall be considered all piping within the chamber, to the connection with the prestressed concrete cylinder piping outside the chamber wall.

E12. MISCELLANEOUS PIPE, VALVES AND FITTINGS

E12.1 Materials

(a) Ball Valves

(i) Ball valves shall be epoxy coated cast iron, 100 mm diameter with ANSI B16.1 flange connections for 100 mm ductile iron piping c/w 50 mm square operating nut and valve stem extension and rated for minimum 1.0 MPa. Direction of opening shall be counter clockwise.

(ii) Acceptable Manufacturer: American Valve or approved equal in accordance with B6.

(b) Ductile Iron Piping, Fittings and Flanges

(i) Ductile iron piping shall conform to ANSI/AWWA C115/A21.15 with flange dimensions and drilling in accordance with ANSI B16.1 - 125#.

(ii) Fittings shall be ductile iron with flange dimensions and drilling in accordance with ANSI B16.1 - 125#.

(c) Steel Piping, Fittings and Flanges

(i) Small diameter steel piping, fittings and flanges (100 mm and less) shall be in accordance with ANSI B16.5 – Class 150 for flanges and fittings, and ANSI B36 Schedule 80 for pipe. All pipe and fittings shall be epoxy coated.

(ii) 1372Ø steel pipe and fittings for Branch II surge tower chamber shall be designed and supplied in accordance with E13. Pipe and fitting shall be installed in accordance with E14.

(d) Paint

(i) Paint for exposed metal surfaces shall be in accordance to AWWA C210.

(ii) Coating shall be two (2) or more layers (5 mils minimum each coat) Polyamide Epoxy, Amerlock 400, Tnemec Series 140F Pota-Pox Plus, Devoe Bar-Rust 233-H or approved equal in accordance with B6.

(e) Fasteners

(i) All fasteners shall be 316 stainless steel.

E12.2 Construction Methods

(a) Flanged Valves and Fittings

(i) Isolate dissimilar metal flanges with gaskets, insulating bolt sleeves and non metallic washers.

(b) Painting

(i) All exposed metal surfaces including valves, fittings, anchor bolts, flange bolts etc. where not specified to be copper, brass or galvanized, and all galvanized surfaces exposed by welding connections shall be painted.

(ii) Metal surfaces shall be cleaned thoroughly by wire brushing or abrasive blasting.

(iii) Paint exposed surfaces in accordance to AWWA C210.

(c) Welding

(i) Steel pipe shall be accurately measured, cut and installed by a certified welder.

(ii) Completed field welds shall be inspected by a certified welding inspector, using magna-flux methods or other methods approved by the Contract Administrator. A detailed inspection report including test data shall be submitted to the Contract Administrator within 5 Business Days of completion of testing.

E12.3 Method of Measurement and Basis of Payment

(a) Supply and Installation of Miscellaneous Pipe, Valves and Fittings

(i) Supply and Installation of Miscellaneous Pipe, Valves and Fittings will not be measured for payment. They are to be included in the price for "Modifications to the Branch II Surge Tower Discharge Chamber".

E13. SUPPLY AND DELIVERY OF PRESTRESSED CONCRETE PIPE AND APPURTENANCES

E13.1 Description

(a) This Specification supplements and amends AWWA Specification C301-99, AWWA Manual M9 Concrete Pressure Pipe, and AWWA C304-99 Design of Prestressed Concrete Cylinder Pipe.

E13.2 Materials

(a) Prestressed Concrete Pressure Pipe

(i) Prestressed concrete pressure pipe shall be either lined-cylinder pipe (LCP) or embedded-cylinder pipe (ECP).

(b) Cement

(i) Portland Cement shall be Type 50 Sulphate resistant Cement.

(ii) External mortar coating shall contain 10 percent silica fume by weight of cement.

(iii) Approval in writing is required if the Contractor proposed to use fly ash or pozzolan as a supplementary cementing material in conformance with AWWA Standard C301, Section 4.4.1.

(iv) Approval requests should be accompanied by a submission from an independent testing laboratory complete with sampling and testing results of the material conforming to ASTM Standard C311.

(c) Bell and Spigot Joint Rings

(i) All new Bell and Spigot Joint Rings shall be shall be testable, double 'O' ring joints.

(ii) Where indicated on the drawings, restrained joints shall be harnessed clamp joints.

(d) Fittings

(i) Fittings shall be manufactured using minimum steel thicknesses specified in Table 1, Section 4.7 of AWWA C301-99 except for the 1372Ø fitting for Branch II surge tower chamber.

(ii) The thickness and diameter of the 1372Ø fitting for the Branch II surge tower shall match the thickness and diameter of the existing Branch II surge tower overflow pipe and shall be field confirmed.

(iii) The interior of the 1372Ø fitting for the Branch II surge tower shall not be lined with cement mortar. The exterior of the 1372Ø fitting for the Branch II surge tower including the adaptor ring and bell for 1219 mm interior diameter prestressed concrete cylinder pipe which will not be encased in concrete shall be coated in cement mortar.

(iv) Flanges for fittings shall be AWWA C207-01 minimum Class B Flanges.

(e) Pipe Marking

(i) Each section of pipe and each fitting shall be plainly marked with a waterproof marking material both inside, on the bell or spigot end, and outside, at the pipe's midspan, the classification, the date of manufacture and marks of identification sufficient to show its proper location in the line by the reference to the laying schedule specified. The point of maximum bevel shall be marked on the end of the spigot on each piece of bevelled pipe. All bends shall be marked on the ends with the angle of deflection. The manufacturer's proposed marking system shall be included with the "Data to be Supplied by Contractor" in E13.4. Colour coded markings shall be required when there is more than one pipe classification.

(f) Closures

(i) Buried pipe closures shall be welded split steel sleeve closures.

(ii) The plain steel end of each closure piece shall extend 150mm longer than the required length of the piece to provide an overlap in order to compensate for any correction required when installed.

(iii) The Contractor shall be responsible for any interior or exterior mortar coating damage.

(iv) Each pipe run shall be designed with a minimum of one (1) closure section. The closure section location will be left to the Contractor, subject to review and acceptance of the Contract Administrator, to best suit proposed installation sequencing.

(g) Pipe Couplers

(i) Victaulic Depend-o-Lok, Type 2-RC coupling or approved equal in accordance with B6.

(ii) Pipe couplers shall generally conform to the requirements of the latest revision of AWWA C-219 for bolted, Sleeve Type Couplers for Plain End Pipe. Minimum requirements are:

Minimum sleeve length 250 mm

Couplings capable of accommodating up to 2 degrees deflection

Bolts and nuts to be 316 Stainless Steel.

(iii) Couplings to be supplied with di-electric insulating boots for all metallic pipe connections, including AWWA C301 plain end pipe.

(iv) Couplings to be fusion bonded epoxy coated to AWWA C213, and meeting the requirements of ANSI/NSF 61 "Standard for Drinking Water System Components – Health Effects"

E13.3 Design Requirements

(a) Pipe Size

(i) The minimum pipe sizes shall be as indicated on the drawings. Upsizing of the pipe diameters will be permitted upon acceptance of the Contract Administrator. The Contractor shall be responsible for all redesign of pipe and fittings to accommodate increase pipe size, including but not limited to, revising laying schedule, pipe loadings, reconnection design to connect to the existing pipe size and restraint calculations, and bear all additional costs associated with the design, fabrication, transportation and installation of the pipe.

(b) Pipe Design

(i) The Contractor shall submit details of the pipe design for review and acceptance of the Contract Administrator prior to manufacture. Where pipe runs contains more than one pipe class, the pipe marking system shall clearly indicate different pipe classes.

(ii) All pipe and fittings shall be design and constructed to withstand maximum design surface water geodetic elevation of 262.5 metres, plus forty percent transient allowance, and all external pressures caused by overburden, traffic or other loads to which the pipe might be subjected, all in accordance with the applicable requirements of AWWA Standard C301 and C304.

(iii) Trench loadings shall be calculated and based on a trench width equal to transition width or positive projection embankment loading, a soil weight of 1925 kilograms per cubic metre, AWWA M9 R90 bedding, earth cover as indicated on the drawings (minimum earth cover of 2000 millimetres) and a Kμ' = 0.110 in Marston's formula. Depth of cover requirements shall use a 0.5 metre berm allowance plus the maximum of proposed final grades or original ground grades. Live loading under existing roadways shall allow for CAN/CSA-SA-00 CL-625 highway loading. Live loading under existing railways shall allow for Cooper E80 design loading.

(iv) The steel cylinder shall be a minimum of 1.6 millimetre thickness (No. 16 gauge) and the minimum thickness of the high tensile reinforcing wire shall be 4.2 millimetres thick (No. 8 gauge).

(v) Mortar coating shall be a minimum of 24 millimetres thick measured from the outside of the high tensile wire.

(c) Laying Schedule

(i) Minor revisions to the design drawings will be permitted to accommodate standard pipe lengths.

(ii) Pipe laying schedule shall incorporate a short pipe length of approximately 1.5 times the diameter, immediately outside of the overflow chamber, and Branch I and II Surge Towers.

(d) Fitting Design

(i) All vertical bends shall be designed with restrained harness joints. Sufficient pipe joints shall be restrained to withstand design forces, as shown on the Drawings.

(ii) Flanged pipe access points shall be installed at locations indicated on the Drawings. Access diameter shall be a minimum of 500 millimetres.

(iii) Fittings shall be designed with sufficient stiffener rings, crotch plates, collars and/or wrappers to withstand proposed design loads. The design procedure shall be as described in AWWA Manual M9 Concrete Pressure Pipe.

(iv) The 1372Ø Wall Piece for the Overflow Chamber shall be designed with a 13 mm thick by 50 mm (minimum) high steel waterstop for embedment in the chamber wall.

E13.4 Data to be Supplied by Contractor

(a) Sufficient numbers of copies of all drawings and laying schedules as specified in Specification CW1110, Clause 1.5, shall show full details of reinforcement, concrete and joint dimensions for the straight pipe, specials and connections and shall be furnished by the Contractor for the review by the Contract Administrator. No pipe shall be manufactured until the drawings have been entirely reviewed and accepted by the Contract Administrator.

(b) The data submitted by the Contractor shall include a tabulated laying schedule with reference to the stationing and grade lines shown on the Drawings. This schedule shall show the locations and length of each class of pipe which the Contractor proposes to furnish, and the point of change from one class to the next shall be clearly indicated by station number. The area of steel per linear metre and such other details as are required shall be listed for each of the pipe classes proposed by the Contractor.

(c) The Contractor shall be responsible for the accurate details, fabrication and fit of the pipe and specials.

(d) The Contractor shall submit to the Contract Administrator for review, design calculations for the determination of the details of the pipe reinforcement prior to the manufacture of any pipe. The manufacturer of the pipe shall have sufficient data to verify all design strengths.

(e) The Contractor shall provide complete Record Drawings for the pipe, including revised laying schedules, closure lengths for field trimmed pieces or other modifications required for the pipe installation.

E13.5 Delivery of Pipe

(a) Contractor is required to coordinate manufacture and delivery of the pipe with his sub-contractor (the manufacturer) and to meet project scheduling requirements.

(b) Delivery of the pipe shall be in accordance with AWWA M9 Manual – Concrete Pressure Pipe.

(c) The Contractor shall attend a delivery inspection with the Contract Administrator. Any defects noted at the delivery inspection shall be noted and rectified by the Contractor.

Any defects or concerns noted during installation inspections shall immediately be brought to the attention of the Contract Administrator.

E13.6 Construction Methods

(a) Pipe Length

(i) Standard pipe lengths shall be used, except where special lengths are required by a laying schedule, accepted by the Contract Administrator.

(b) Tolerances

(i) In addition to the requirements noted in Section 4.5 of AWWA C301-01, the overall length of pipe measured from the end of the spigot to the seat of the bell at any point around the circumference shall not vary more than +/- 3 millimetres.

(ii) The Contractor shall accurately measure and confirm pipe bell and spigot tolerances, and ensure pipe mating, prior to shipping pipe. The Contractor shall provide a written report of pipe bell and spigot measurements to the Contract Administrator.

E13.7 Quality Control

(a) Inspection

(i) The Contractor shall afford the Contract Administrator every facility to access and inspect all plant to be provided, work to be performed, materials to be supplied and equipment or machinery to be installed in accordance with the provisions of GC 5.03.

(b) Testing of Pipe and Materials

(i) The Contractor shall provide access to the Contract Administrator or his appointed representative to conduct plant inspections, in accordance to Section 5.1 of AWWA C301-99. The Contractor shall provide a minimum of 7 calendar days notice of commencement of pipe manufacture, for the purposes of scheduling plant inspections.

(ii) The Contract Administrator reserves the right to conduct third party quality control testing.

(iii) The Contractor shall make, conduct, arrange, make available, obtain and provide for all testing as described in Section 5.2 AWWA Standard C301-99. The reports shall be made available to the Contract Administrator on request. All testing of concrete, steel, prestressing wire and absorption shall be traced to manufactured pipe components by Mark number, serial number and/or dates of manufacture.

(iv) Absorption tests shall be carried out by the Contractor on specimens of the exterior coating of the pipe. These tests shall be carried out in accordance with ASTM Standard C497 Method of Testing Concrete Pipe, Sections or Tile, method A.

Notwithstanding AWWA C301-99 4.6.8.3, no individual absorption test may exceed 10%.

Notwithstanding AWWA C301-99 4.6.8.3, mortar tests shall be conducted on a daily basis for the entire production run.

Every effort shall be taken to limit this absorption to 8% as measured in accordance with the ASTM Standard C497. The City will not accept pipe with an absorption rate in excess of 10. No pipe shall be shipped until the absorption results related to the particular shipment have been obtained and are satisfactory to the Contract Administrator.

(c) Testing of Fittings and Special Pipe

(i) Fittings and special pipe shall be tested in the same manner as pipe except that fittings and special pipe shall be tested for tightness by the dye penetrant method as specified in Section 4.7.2.22 of AWWA Standard C301-99.

(d) Quality Control Report

(i) The Contractor shall provide a complete quality control report, compiling all project quality control records, including steel tests, concrete compressive strength tests, mortar absorption tests, cylinder pressure tests, coating thickness tests, bell and spigot ring dimensional records and any other quality control records normally documented during manufacture process. Where possible, quality records shall cross reference pipe manufacture by date, and/or pipe serial or mark numbers.

(e) Affidavit of Compliance

(i) An affidavit of compliance signed by an officer of the pipe manufacturing company shall be provided stating that the pipe and fittings comply with this Specification, in accordance with Section 6.3 of AWWA C301-99.

E13.8 Method Measurement and Basis of Payment

(a) Prestressed Concrete Pressure Pipe

(i) The supply and delivery of prestressed concrete pressure pipe and related work specified herein will not be measured for payment. The supply and delivery of prestressed concrete cylinder pipe shall be included in the price for “Supply and Installation of AWWA C301 Pipe”.

(b) Fittings and Specials

(i) The supply and delivery of fittings and specials and related work specified herein will not be measured for payment. The supply and delivery of fittings and specials shall be included in the price for “Supply and Installation of AWWA C301 Fittings and Specials”.

E14. INSTALLATION OF PRESTRESSED CONCRETE PIPE AND APPURTENANCES

E14.1 Description

E14.1.1 This Specification shall cover the preparation of the pipe bed, including the supply of bedding materials and the placement of all pipe and accessories including fittings, as specified or shown on the Drawings.

E14.2 Testing Apparatus

E14.2.1 The Contractor shall provide testing apparatus suitable for testing of double ‘O’ ring gasket joints.

E14.3 Materials

E14.3.1 Paint

(a) Paint for exposed metal surfaces shall be in accordance to AWWA C213.

(b) Interior coatings shall comply with ANSI/NSF 61 "Drinking Water System Components – Heath Effects"

(c) Coating shall be two (2) or more layers (5 mils minimum each coat) Polyamide Epoxy, Amerlock 400, Tnemec Series 140F Pota-Pox Plus, Devoe Bar-Rust 233-H or approved equal in accordance with B6.

E14.3.2 Bentonite and Sand Blend

(a) Well blended mixture of a minimum of eight (8) percent sodium bentonite and well graded sand, providing a permeability of 1×10^{-7} centimetres per second or lower.

E14.4 Submittals

(a) The Contractor shall submit a bentonite and sand mix design including sand gradation and proposed blending method prior to construction.

E14.5 Construction Methods

E14.5.1 Excavation

(a) Excavation shall be in accordance with Specification CW2030, "Excavation, Bedding and Backfill". Over-excavated material shall be replaced with compacted, well-graded crushed limestone having a maximum aggregate size of 50 mm.

(b) It shall be incumbent on the Contractor to ensure that excavated trench widths do not exceed design trench widths. If the Contractor proposes trench widths in excess of the trench widths specified, he shall be responsible for ensuring the pipe manufacturer designs pipe sections accordingly. Under no circumstances shall pipe installation be accepted if trench widths exceed design widths. The Contractor shall take into account use of trench shields and/or shoring systems in selection of trench width. In the event that trench widths are excavated in excess of the design trench width use the manufacturer's pipeline design, due to the Contractor's negligence in advancing or excavating the trench, the Contractor shall be responsible for resolving the pipe installation condition to ensure the pipe design strength is not exceeded. Remediation measures shall be approved by the pipe manufacturer and acceptable to the Contract Administrator, and may include but are not limited to increasing class of pipe bedding, increasing compaction requirements or concrete encasement of the pipeline.

E14.5.2 Installation of Pipe

(a) All pipes shall be installed on a 150 millimetre thick bed of sand placed in the bottom of the trench prior to the installation of the pipe in accordance with AWWA M9 Manual, Type R5 Bedding. The sand bedding shall be levelled such that it forms a continuous solid bedding for the full length of the pipe except at the midpoint of each pipe and at the joints. A small groove shall be left at the midpoint to facilitate the removal of the sling after the pipe has been laid. Another groove shall be provided at each joint to facilitate placing of a "diaper" band around the joint. Both grooves shall be filled with compacted sand after the removal of the sling and after placing of the diaper band. Compacted sand backfill shall be placed above the pipe to a depth of 200 millimetres above the top of the pipe, for the full trench width. The sand for bedding and backfill shall be supplied by the Contractor and shall conform to the requirements as specified in Specification CW2030, "Excavation, Bedding and Backfill". The Contractor shall ensure that disturbance of the pipe or damage to the pipe coating does not occur during sand bedding and backfilling operations.

(b) The pipe shall be laid and fitted together so that when complete, the pipe will have a smooth and uniform invert. The trench shall be free of water while the pipe is being installed. The excavation of the trench shall be fully completed a sufficient distance in advance so as not to interfere with the laying of the pipe.

(c) Prestressed concrete pressure pipe shall be installed utilizing trench methods. Coring, augering or jacking methods shall not be undertaken without approval of the Contract Administrator.

(d) The exposed end of the pipe shall be fully protected with an approved stopper to prevent foreign matter from entering the pipe. The interior of the pipe shall be kept free of all dirt, concrete or superfluous material as the Work proceeds.

E14.5.3 Jointing

(a) Immediately prior to connecting two lengths of concrete pressure pipe, the spigot end of the pipe shall be thoroughly cleaned. Prior to insertion of the rubber gasket in the spigot groove, the spigot grove shall be lubricated with vegetable soap. The gasket shall then be thoroughly cleaned and then lubricated with a vegetable soap approved by the pipe manufacturer. In stretching the gasket, care shall be exercised to maintain a uniform tension or volume of rubber around the whole circumference of the spigot. The bell of the pipe already in place shall be carefully cleaned and lubricated with vegetable soap. The spigot shall then be pushed into the bell and against steel inserts placed between the top of the spigot and the shoulder of the bell to provide a space for inserting the feeler gauge. The entire circumference of the joint shall be gauged to determine that the rubber gasket is in its proper position. If the gasket cannot be felt all around the pipe, the pipe shall be withdrawn and the gasket examined for cuts. If the gasket is undamaged it may be reused, but only after the bell ring and gasket have been lubricated with soap again, as previously specified, before the pipe is re-laid. When it has been determined that the gasket is in its proper position, the steel inserts shall be removed and the pipe pushed completely “home”.

(b) The outer joint of the concrete pipe shall be made using diaper bands approved by the pipe manufacturer and shall be made of burlap or other approved porous material. Diaper bands to hold grout in place shall be used according to the manufacturer’s instructions. Immediately before pouring cement grout, the entire joint shall be thoroughly wetted. A cement grout of one part Sulphate-Resistant cement to two parts sand shall be poured between the burlap bag and the pipe, to ensure a thorough sealing of the joint around the portion of the pipe covered by the band. Silt, slush, water or polluted mortar grout shall be carefully forced out by the pouring and removed. The upper portion of the joint shall then be filled with mortar and a bead made around the outside of the top half of the pipe joint with a sufficient amount of additional mortar. The completed joints shall immediately be protected from the air, sun or cold with proper coverings and shall be kept protected for such a period as necessary to secure satisfactory curing of the mortar. No backfilling around joints shall be done until the joints have been fully inspected and accepted by the Contract Administrator.

(c) The inside joint recess of the concrete pipe, sizes 600 millimetres and larger, shall be completely filled with mortar made from one part cement and one part sand so as to provide a smooth continuous flush surface across the joint. The Contractor shall comply with all requirements and regulations of the Workplace, Safety and Health Division concerning air supply for workers performing operations inside the pipe and any associated costs shall be considered incidental to the installation.

(d) Grouting and diapering of short pipe joints immediately outside of chamber shall be delayed until completion of construction and partial backfill of chamber, to allow maximum differential deflection and settlement prior to final backfill.

E14.5.4 Closures

(a) Buried pipe closures shall be accurately measured, cut and installed. Welded Split Sleeve closures shall be installed by a certified welder.

(b) Completed field welds shall be inspected by a certified welding inspector, using magna-flux methods or other methods approved by the Contract Administrator. A detailed inspection report including test data shall be submitted to the Contract Administrator within 5 Business Days of completion of testing.

E14.5.5 Field Welding

(a) Field welding of the 1372Ø Branch II surge tower pipe and fitting segments shall conform to AWWA C206.

(b) The 1372Ø Branch II surge tower pipe shall be joined to the existing stub with an expandable steel insert of the same thickness as the pipe welded at each end with two full fillet single welds. Once welded in place the gap in the expandable steel insert shall not exceed 100 mm in width. A steel plate shall then be welded to fill the expansion gap.

(c) The method desribed in E14.5.5(b) shall also be used to join the 1372Ø pipe of the Branch II surge tower overflow piping to the top segment of the 90° fabricated bend.

(d) Any other welded joints for the 1372Ø Branch II surge tower fitting shall be complete joint penetration butt welds.

E14.5.6 Frost Conditions

(a) No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Contract Administrator shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation. Every precaution must be taken to prevent frost from penetrating the ground to depths below the foundations during construction. Any pipe which, in the opinion of the Contract Administrator, shall have been injured through neglect of this provision of the specifications, shall be removed and replaced by the Contractor and at the Contractor's expense.

(b) Heating of the pipe, sand, mortar and gaskets shall commence when the ambient temperature falls below -5 C. The pipe shall be heated throughout with a low heat immediately prior to installation (warm to the touch).

(c) All mortar for joints shall be heated, and heated sand shall be placed around the pipe for the full height of the specified bedding and initial backfill and to at least 600 millimetres on either side of the joint.

E14.5.7 Thrust Blocks

(a) Thrust blocks shall be installed at locations shown on the Drawings. Thrust blocks shall consist of concrete as specified in Specification CW2160 and shall be installed as shown on the Drawings. The thrust block shall bear against undisturbed soil and the soil shall be cut smooth and at the proper angle to the pipe. No horizontal struts or braces required for trench bracing shall remain in the concrete thrust block. A bond breaker consisting of 0.20 millimetre (8 mil) polyethylene sheeting shall be installed between fittings, valves or plugs and the concrete of the thrust block to allow future removal of the thrust block without disturbing the fitting, valve or plug. Before any concrete is placed, all thrust block formwork shall be inspected and approved by the Contract Administrator.

E14.5.8 Restrained Pipe Joints

(a) Restrained pipe joints shall be used for thrust restrained where indicated on the Drawings.

E14.5.9 Bentonite Seepage Collars

(a) Bentonite seepage collars shall be constructed as shown on the Drawings. Cut-off collars shall consist of a sand/bentonite mixture extending the width of the trench, a length of 1500 mm and shall extend from the bottom of the sand bedding (i.e. from undisturbed earth) to a minimum of 1 m above the top of the pipe. The cut-off collar shall be keyed into the sides and bottom of the trench a minimum of 300 mm.

E14.5.10 Connection to Branch I Surge Tower

(a) Connection to the Branch I Surge Tower shall be made at the location shown on the Drawings.

(b) Connection shall be made by the installation of a Victaulic Depend-o-Lok coupling.

E14.5.11 Flange and Closure Assembly Protection

(a) All flange and closure assemblies not in valve, meter or offtake chambers shall be coated in accordance to AWWA C213 on all exposed metal surfaces. The entire flange and closure assembly shall then be coated with a minimum 50 millimetre thickness of sulphate-resistant cement mortar, reinforced with a light wire mesh approved by the Contract Administrator.

E14.5.12 Painting

(a) All exposed metal surfaces including valves, fittings, anchor bolts, flange bolts etc. where not specified to be copper, brass or galvanized, and all galvanized surfaces exposed by welding connections shall be painted.

(b) The interior of the 1372Ø pipe and fitting for the Branch II surge tower chamber shall be painted.

(c) Metal surfaces shall be cleaned thoroughly by wire brushing or abrasive blasting.

(d) Paint exposed surfaces in accordance to AWWA C210.

E14.5.13 Change in the Laying Schedule

(a) If the Contractor requests changes in the laying schedule, that is relocation of items such as offtakes, closures, valve chambers or any other alteration of the laying schedule, all costs associated with these changes shall be paid for by the Contractor.

E14.6 Quality Control

E14.6.1 Inspection

(a) The Contractor shall afford the Contract Administrator every facility to access and inspect all plant to be provided, work to be performed, materials to be supplied and equipment or machinery to be installed.

(b) The Contractor shall ensure that the pipe supplier support personnel attend the site on a minimum of two (2) separate site visits, to certify that the pipe is being installed as per the pipe design requirements. Visits shall be coordinated at the commencement of pipe laying operations, and at approximately half way through the installation process. Each visit shall be a miminum of one (1) Working Day. The pipe supplier shall provide a written report to the Contract Administrator, noting the details of the pipe installation, date, time and location of the installation, and whether the pipe installations inspected generally met the pipe supplier's design criteria and intent. No payment will be made for provision of pipe supplier support personnel. It will be considered incidental to the installation of the pipe.

E14.6.2 Line and Grade

(a) The pipe shall be installed to the line and grade shown on the Drawings and as set in the field by the Contract Administrator. Vertical variance from grade shall not exceed 25 millimetres and horizontal variance from line shall not exceed 100 millimetres. Sharp bends will not be permitted even though the pipe remains within these

tolerances. Alignment corrections allowed in main line piping but not at closures. Tees and bends shall be installed to the grades and at the locations shown on the Drawings or where required to connect to existing pipelines.

E14.6.3 Testing

(a) Further to CW 2125, hydrostatic leakage testing will not be required.

(b) Testing shall be completed by means of double 'O' ring testable joints. Joint Testing shall be conducted with compresses air, at a test pressure of 1.5 times the maximum operating pressure for the line.

(i) Test Procedure

All testing to be conducted in the presence of the Contract Administrator

Initial testing shall be conducted as pipe is laid, after initial haunching is placed. If initial test fails, the Contractor shall disassemble the joint, inspect bell, spigot and 'O' rings, and reassemble joint.

Final testing shall be conducted after pipe is backfilled.

Remove steel plug and 'O' Ring

Connect air supply and slowly pressurize joint cavity to specified test pressure (Maximum 380 KPa). Close off air supply.

Hold test for five (5) minutes. Maximum loss in pressure is thirty five (35) KPa.

On successful pressure test, remove test assembly, reinsert steel plug and 'O' ring. Grout joint ant test plug.

E14.6.4 Disinfection of Watermains

(a) Further to CW 2125, disinfection of watermains shall be completed by swabbing as outlined in Section 3.3.16 of CW 2125. Any debris adhered to the pipe wall shall be completely removed. The completed pipeline shall be swept clean of dust, mud, stones, excess grout, standing water and other contaminants, prior to disinfection. The pipeline shall be completely wetted with disinfection solution.

(b) Disinfection operations shall be completed in accordance to confined entry procedures and Workplace Health and Safety Legislation. Air quality monitoring shall be conducted at all times during disinfection operations.

E14.7 Method of Measurement

E14.7.1 Supply and Installation of AWWA C301 Pipe

(a) Supply and installation of prestressed concrete cylinder pipe and related work specified herein will be measured on a length basis and paid at the Contract Unit Price for "Supply and Installation of AWWA C301 Pipe". The length to be paid for shall be the total number of linear metres acceptably supplied and installed as to each size, class, type of backfill and method of installation of surge tower overflow piping including pipe testing and disinfection, road restoration, and rail embankment restoration up to and including sub-ballast, measured horizontally, at grade, above the centreline of the pipe, as computed by measurements made by the Contract Administrator. The length measured and paid will be from the connection to the steel piping outside the surge towers, through all fittings and specials to the outside face of the overflow chamber wall. Measurement will be from face of spigot to face of spigot. Payment will be made on the following payment schedule:

(i) Forty percent (40%) payment upon supply and delivery of pipe to the jobsite

(ii) Ninety-five percent (95%) payment upon successful installation of pipe in accordance to the Specifications

(iii) Ninety-nine percent (99%) payment upon successful testing and disinfection of the pipe in accordance to these specifications.

(iv) One hundred percent (100%) payment upon receipt of satisfactory pipe manufacture quality control records and report.

E14.7.2 Supply and Installation of AWWA C301 Fittings and Specials

(a) Supply and installation of fittings and specials shall be on a unit basis and paid for at the Contract Unit Price for "Supply and Installation of AWWA C301 Fittings and Specials". The price shall be payment for supply and installation of each class and type in accordance with this Specification, accepted and measured by the Contract Administrator. Payment will be in addition to the payment measured and paid for the "Supply and Installation of AWWA C301 Pipe". Payment for fittings and special will be made on the following payment schedule:

(i) Forty percent (40%) payment upon delivery of fittings and specials to the jobsite

(ii) Ninety-five percent (95%) payment upon successful installation of the fittings and specials in accordance to the Specifications

(iii) One hundred percent (100%) payment upon successful testing, disinfection and recommissioning of the pipe, in accordance to these Specifications.

E14.7.3 Bentonite Seepage Collars

(a) Bentonite seepage collars shall be measured on a unit basis, and paid for at the Contract Unit Price for "Bentonite Seepage Collars". The units to be paid shall be the total number of collars made, in accordance with this Specification, accepted and measured by the Contract Administrator.

E14.7.4 Thrust Blocks

(a) Thrust blocks shall be measured on a unit basis, and paid for at the Contract Unit Price for "Thrust Blocks". The units to be paid shall be the total number of thrust blocks made, in accordance with this Specification, accepted and measured by the Contract Administrator.

E15. EXCAVATION, BEDDING AND BACKFILL

E15.1 Submittals

E15.1.1 Shop drawings for all excavation shoring shall be prepared and submitted in accordance with CW 1100. All shop drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in the design of excavation shoring systems.

E15.2 Shoring Design

E15.2.1 Excavation shoring shall be designed to accommodate staged excavation, as explained in E10.2. Shoring components, bracing and walers shall be designed to accommodate installation of all pipe and fittings and temporary pipe support structures.

E15.3 Materials

E15.3.1 Granular base for riprap shall meet the following gradation:

Sieve Size	Permissible Range (% by weight passing)
75 mm	100
38 mm	75-95
19 mm	55-80

9.5 mm	38-64
4.8 mm	25-50
2.0 mm	15-35
0.420 mm	3-15
0.149 mm	0-5

The granular material shall be free of organic material and the clay content shall be limited to 5% by weight of the material.

E15.3.2 Rail track ballast shall meet the following gradation (using ASTM C136):

Sieve Size	Permissible Range (% by weight passing)
50 mm	100
38 mm	90-100
25 mm	20-55
20 mm	0-15
9.5 mm	0-5
0.080 mm	0-2

Deleterious substances shall not be present in the ballast in excess of the following amounts (ASTM C142):

Soft and friable pieces	5.0%
Clay lumps	5.0%

Material finer than No. 200 Sieve 2.0% (ASTM C117)

The ballast shall also meet the following criteria:

Resistance to Abrasion	<30% (ASTM C535 – Grading 3)
Soundness Loss	<13% (ASTM C88)
Flat or Elongated Particles	<25%
Fractured Faces	>60% with 2 or more freshly fractured faces
Bulk Specific Gravity	Minimum 2.6 (ASTM C127)

E15.3.3 Rail track sub-ballast shall meet the City of Winnipeg CW 3110 standards for 50 millimetre maximum aggregate crushed sub-base material.

E15.4 Excavation

E15.4.1 The Contractor shall note that bulk excavation to the approximate grades indicated on the Construction Drawings will be completed adjacent to the Surge Tower, by others, prior to construction of this Contract. Additional excavations required for construction staging shall be designed and constructed by the Contractor, and submitted for review by the Contract Administrator. Temporary work pads, sub-cut excavations and ramps shall in no way adversely affect access to existing operational facilities, or hinder other Contractors operations.

E15.4.2 Excess excavation from trenching operations shall be disposed of at the excavation dumpsite immediately west of the Deacon Booster Pumping Station compound. The

Contractor will be permitted to retain on Site, sufficient excavated material to backfill all excavations.

E15.4.3 The Contractor shall supply and install a 150 millimetre granular layer which shall serve as a base for the riprap layer as shown on the drawings. The granular layer shall be compacted to a SPMDD of 95%.

E15.4.4 Existing riprap shall be salvaged, stockpiled in such a way as to prevent the contamination with fines and organic material, and re-installed to a minimum nominal thickness of 450 millimetre or as indicated on Drawings. The riprap shall not be compacted, but shall be dumped and graded off in such a manner as to ensure that segregation does not occur. The larger rock fragments shall be uniformly distributed, with smaller rock fragments serving to fill the spaces between the larger in such a manner as will result in compact uniform layers of riprap with no unreasonable large voids, and as will ensure that the completed riprap is stable, with no tendency to slide. Rip rap shall be placed as soon as possible after the 150 millimetre granular layer as specified in E15.4.3 is completed and placing methods shall be such as to ensure that the underlying granular layer is not disturbed unduly but retains the density and uniform thickness specified. Equipment will not be permitted to travel on the placed rip rap materials unless approved by the Contract Administrator.

E15.4.5 The Contractor shall support all existing cables that cross the excavation in a manner acceptable to the Contract Administrator. The Contractor shall prepare and submit shop drawings for methods of cable support.

E15.4.6 The Contractor shall install temporary road access as instructed by the Contract Administrator. The temporary road access shall be 4.0 metres in width and a minimum of 200 millimetres in thickness of 50 millimetre down granular material placed on geotextile.

E15.4.7 The Contractor is permitted to remove and stockpile existing ballast and subballast from railway crossings for re-use. The Contractor shall take care not to contaminate the materials during excavation and stockpile operations.

E15.4.8 The Contractor shall supply and stockpile ballast for re-installation of the rail track, immediately adjacent to the track bed for installation by City forces.

E15.5 Backfill

E15.5.1 Backfill under all roads, parking areas and railway tracks shall be completed to City of Winnipeg CW 2030 Class 2 standards.

E15.5.2 Backfill under cables shall be completed to City of Winnipeg CW 2030 Class 2 standards.

E15.5.3 Backfill in all other areas shall be completed to City of Winnipeg CW 2030 Class 4 standards

E15.5.4 Backfill on the Cell 1 reservoir dyke shall be compacted to a density of the equivalent surrounding material which is estimated to be between 95 and 100 % of Standard Proctor Maximum Dry Density.

E15.6 Measurement and Payment

E15.6.1 Excavation and shoring for pipe installation, construction of the overflow chamber and modifications to the Branch II surge tower discharge chamber, temporary cable supports, and salvaging, stockpiling and re-installation of riprap and sub-ballast will not be measured for payment. Costs for excavation and shoring for pipe installation, construction of the overflow chamber and modifications to the Branch II surge tower discharge chamber, temporary cable supports, and salvaging, stockpiling and re-installation of riprap and sub-ballast shall be included in the price for installation of pipe, construction of the overflow chamber and modifications to the Branch II surge tower discharge chamber.

E15.6.2 The supply and installation of the granular layer shall be measured on an area basis, and paid for at the Contract Unit Price for "Supply and Installation of Granular Layer". The area to be paid for shall be the total number of square metres acceptably supplied and installed as computed by measurements made by the Contract Administrator.

E15.6.3 The supply and installation of temporary road access shall be measured on a length basis, and paid for at the Contract Unit Price for "Supply and Installation of Temporary Road Access". The length to be paid for shall be the total number of linear metres acceptably supplied and installed as computed by measurements made by the Contract Administrator.

E15.6.4 The supply of ballast shall be measured on a weight basis, and paid for at the Contract Unit Price for "Supply of Ballast". The weight to be paid for shall be the total number of tonnes supplied in accordance with this Specification and accepted by the Contract Administrator, as measured on a certified weigh scale.

E16. STAINLESS STEEL RECTANGULAR FLAP GATES

E16.1 General

(a) This Specification shall cover the supply, delivery, installation and of fabricated type 304 stainless steel rectangular flap gates and frames.

(b) Provide Shop Drawings of the equipment.

(c) Fabricate and factory test the equipment, shop assemble, and inspect flap gates.

(d) Provide Operation and Maintenance Manuals.

(e) Produce as-built drawings.

(f) Provide written operator training and maintenance instructions.

(g) Manufacturer to provide written installation instructions and inspect installation of the equipment.

(h) Provide technical support and remedy defects during the warranty period.

E16.2 Acceptable Manufacturers

(a) H. Fontaine Ltd Series 70 Rectangular Flap Gates

(b) Waterman Industries Inc. Series RF fabricated stainless steel

(c) Hydrogate

(d) Or approved equal in accordance with B6

E16.3 Design:

(a) Gates shall be designed to the following size schedule and hydrostatic heads:

Gate No.	Size (W x H) (millimetres)	Gate Invert (metres)	Maximum Water Elevation (Ground Level) (Metres)	Maximum Seating Head (metres)	Design Flow (Megalitres per day per gate)
Overflow Chamber	2500 x 750	241.5	242.5	3.0	150 Mld

(b) Gates shall be double pivot hinge design. Pivot hinges shall be adjustable to permit sensitivity of opening to unseating head.

(c) Gate design shall incorporate a device to prevent gate from overturning or staying open.

(d) Gate shall be designed to minimize headloss. Maximum headloss due to gate losses to be no more that 100 millimetres at maximum design flow.

(e) Gate shall be substantially watertight under seating head equivalent to 50 percent of the gate height to maximum design head.

(f) Gate shall be flat back flange design suitable for direct mounting to concrete wall.

(g) Gate shall incorporate a lifting lug(s) on flap

(h) Seating face shall be vertically inclined an minimum of 2.5 degrees from vertical, to ensure seating.

(i) Frame seat shall be synthetic EDPM rubber, Frame seat shall be mechanically attached to the frame and be serviceable without gate removal

(j) All flap gates shall be suitably designed for a continuous immersion in up to 5 mg/L chlorine and chloramines concentration. All sluice gates shall also be suitable for non-continuous immersion of 50 mg/L of chlorine and chloramines.

E16.4 Materials

(a) Stainless Steel Gates shall be as per the following:

Part	**Material**
Frame	Stainless steel ASTM A-240 304L
Gate	Stainless steel ASTM A-240 304L
Seats	EDPM Rubber ASTM D2000
Hinge Bushings	Ultra high molecular weight polyethylene (UHMWPE), ASTM D-4020-96 or Bronze
Anchor Bolts and Fasteners	Stainless Steel ASTM F593 or F594 GR2 304, chemical anchors Hilti HVU or approved equal in accordance with B6

E16.5 Fabrication

(a) The manufacturer's shop welds, welding procedures and welders shall be qualified and certified in accordance with the requirements of the latest edition of ASME, Section IX.

(b) Gate shall be fabricated to dimensional tolerance within 3.2 millimetres of squareness, flatness and opening size.

E16.6 Equipment Delivery

(a) The Contractor shall provide a detailed delivery schedule within 15 calendar days after notification of acceptance.

(b) The delivery schedule shall allow for:

(i) A period for the Contract Administrator [allow two(2) weeks] to review and comment on the Contractor's Shop Drawings for the equipment to be supplied.

(c) The Contractor shall deliver the gates to the site, using methods, which do not damage castings or protective coatings. The Contractor shall provide off-loading requirements and procedures to the Contract Administrator well in advance of the arrival of the equipment.

E16.7 Installation

(a) Before commencing installation of equipment, the Manufacturer shall provide written instructions in the methods, techniques, precautions, and any other information relevant to the successful installation of the equipment.

(b) The Contractor shall inform the Contract Administrator, in writing, of the attendance at the site of any Manufacturer's Representative for installation training at least fourteen (14) days prior to arrival.

(c) When the Manufacturer's Representative is satisfied that the Installer is aware of all installation requirements, he shall so certify by completing Form 101.

(d) The completed form shall be delivered to the Contract Administrator prior to departure of the Manufacturer's Representative from the site.

(e) Installation of the equipment shall not commence until the Contract Administrator has advised that he has received the completed Form 101.

(f) Separate copies of Form 101 shall be used for different equipment.

(g) If necessary, or if so directed by the Contract Administrator during the course of installation, the Contractor shall contact the Manufacturer to receive clarification of installation procedures, direction, or any other additional information necessary to continue or complete the installation in an appropriate manner.

(h) If it is found necessary, or if so directed by the Contract Administrator, the Contractor shall arrange for the Manufacturer's Representative to visit the site to provide assistance during installation, all at no cost to the City.

(i) Prior to completing installation, the Contractor shall arrange for the attendance at the site of the Manufacturer's Representative to verify successful installation.

(j) The Manufacturer’s Representative shall conduct a detailed inspection of the installation to ensure successful operation of the equipment.

(k) The Manufacturer’s Representative shall identify any outstanding deficiencies in the installation.

(l) The deficiencies shall be rectified by the Contractor and the Manufacturer’s Representative shall re-inspect the installation, at the Contractor’s cost.

(m) When the Manufacturer’s Representative accepts the installation, he shall certify the installation by completing Form 102, attached to this specification.

(n) Deliver the completed Form 102 to the Contract Administrator prior to departure of the Manufacturer's Representative from the site.

(o) Provide separate copies of Form 102 for different equipment.

E16.8 Training and Maintenance

(a) The Contractor shall include provide written training instructions on the Operation and Maintenance of the equipment.

E16.9 Measurement and Payment

(a) Flap gates shall be measured on a unit basis, and paid for at the Contract Unit Price for “Supply and Installation of Stainless Steel Rectangular Flap Gates”. The units to be paid shall be the total number of flap gates supplied and installed, in accordance with this Specification, accepted and measured by the Contract Administrator.

E17. METAL FABRICATIONS

E17.1 Description

E17.1.1 General

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

E17.2 Materials

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

(b) Material intended for use in the various assemblies shall be new, straight, clean, with sharply defined profiles.

(c) Steel Sections and Plates: to CAN/CSA G40.20/G40.21, Grade 300 W, except W, HP and HSS sections, which shall be Grade 350 W.

(d) Steel Pipe: to ASTM A53/A53M, seamless, galvanized, as specified by item.

(e) Welding materials: to CSA W59.

(f) Hot dipped galvanized steel repair material: Galvalloy and Gal-Viz

(g) Stud Anchors: to ASTM A108, Grade 1020.

(h) Aluminum: to CAN/CSA S157 and the Aluminum Association 'Specifications for Aluminum Structures'. Aluminum for plates shall be Type 6061-T651. Aluminium plate shall have an approved raised oval or multi-grip pattern.

(i) Isolating sleeves shall be "Nylite" – headed sleeve as manufactured by SPAE-Naur of Kitchener, Ontario, or approved equal in accordance with B6.

(j) Anchor bolts and fasteners: ASTM A276, Type 316 stainless steel, of ample section to safely withstand the forces created by operation of the equipment or the load to which they will be subjected.

E17.3 Construction Methods

E17.3.1 Submittals

(a) The Contractor shall submit the qualifications of the fabricator and welders to the Contractor Administrator for acceptance.

(b) Submit shop drawings clearly indicating materials, core thickness, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and, accessories. Indicate field measurements on shop drawings.

E17.4 Fabrication

(a) Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured. Assemble work in such a way that no disfigurements will show in the finished work, or impair the strength.

(b) Confirm measurements for all fabrications before fabricating.

(c) Cut aluminium plate with edges straight and true, and as far as practical, maintain continuity of the pattern at abutting edges.

(d) Pieces shall be of the sizes indicated on the Drawings and shall not be built up from scrap pieces. Confirm sizes with field measurements.

(e) Where possible, fit work and shop assemble, ready for erection.

(f) Angle frames shall be of the same material as the cover plate, and cover plates shall be hinged and be supplied with lifting handles, as shown on the Drawings. Exterior covers shall be supplied with a hasp for a padlock.

(g) Remove and grind smooth burrs, filings, sharp protrusions, and projections from metal fabrications to prevent possible injury. Correct any dangerous or potentially harmful installations as directed by Contract Administrator.

(h) All steel welding shall conform to CSA Standard W.59. Fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with CSA Standard W.47.1. Welding shall be done by currently licensed welders only.

(i) All aluminium welding shall conform to Welding shall be in accordance with the requirements of CSA W59.2. The fabricator shall be fully certified in conformance with CSA Standard W47.2. All welding shall be done in a licensed welding shop, and no field welding will be permitted unless approved in writing, in advance, by the Contract Administrator.

(j) Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

(k) All steel shall be hot-dip galvanizing after fabrication, in accordance with CAN/CSAG164, to a minimum net retention of 600 gm/m^2.

(l) Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1.

(m) Use self-tapping shake-proof flat-headed screws on items requiring assembly by screws.

E17.5 Erection

(a) Do steel welding work in accordance with CSA W59 and aluminium welding work in accordance with CSA W59.2

(b) Erect metalwork in accordance with reviewed shop drawings, square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

(c) Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles where not specifically indicated on the Drawings.

(d) Provide components for building in accordance with shop drawings and schedule.

(e) Make field connections with bolts to CAN/CSA-S16, or weld.

(f) Touch-up rivets, bolts and burnt or scratched surfaces that are to receive paint finish, with zinc primer after completion of erection.

(g) Repair damaged galvanized surfaces and field welds with self-fluxing, low temperature, zinc-based alloy rods in accordance with ASTM A780, Repair of Damaged Hot Dip Galvanizing Coatings. The general procedure shall be to allow a small amount of the repair alloy to flow then spread by brushing briskly with a wire brush. Brushing shall be sufficient to obtain a bright finish. Repeat process three times to ensure a proper thickness is achieved. Temperatures shall be kept below 177ºC (350ºF) at all times. All heating of structural steelwork shall be done in the presence of the Contract Administrator.

(h) Install access hatch frames square and level at the locations show on the Drawings. Embed anchors in concrete as shown on the Drawings. Install covers and adjust hardware to proper function.

(i) All aluminium 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.

E17.6 Measurement and Payment

(a) Supply, fabrication, transportation, handling, delivery and placement of metal fabrications will be considered incidental to the Cast-in-Place Overflow Chamber and Modifications to the Branch II Surge Tower Discharge Chamber construction works.

E18. CHAIN LINK FENCING

E18.1 Description

(a) This Specification supplements and amends City of Winnipeg Specification CW 3550.

E18.2 Construction Methods

(a) The temporary access gate to the Chemical Feed Facility shall be installed between the existing line posts. Existing fabric shall be removed, salvaged, and re-installed upon removal of the temporary gate.

(b) Where surge tower overflow pipe installation crosses fencing, fence fabric shall be rolled back during working hours. Temporary line posts shall be installed and the fencing restored to the satisfaction of the Contract Administrator to maintain a fenced, secure site during non working hours.

(c) Upon completion of overflow piping installation and surface restoration line posts shall be replaced to original condition and fence fabric shall be reinstalled. In the event that the position of an existing line post conflicts with the alignment of the overflow piping, the line post will be replaced with two line posts installed on either side the overflow piping.

E18.3 Measurement and Payment

(a) Temporary gates shall be measured on a unit basis, and paid for at the Contract Unit Price for “Installation and Removal of Temporary Access Gates”. The units to be paid shall be the total number of temporary access gates supplied, installed and removed, including removal and replacement of existing fabric, and removal of temporary access road and culvert, in accordance with this Specification, accepted and measured by the Contract Administrator.

(b) Installation of temporary fencing and replacement of line posts, fence fabric, gates, and cast-in-place concrete curb where overflow piping crosses existing fencing shall be considered incidental to the Supply and Installation of AWWA C301 Pipe.

**CERTIFICATE OF READINESS TO INSTALL -
FORM 101**

I have familiarized the Installer of the specific installation requirements related to the equipment listed below and am satisfied that he understands the required procedures.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Authorized Signing Representative of the Manufacturer) Date

I certify that I have received satisfactory installation instructions from the equipment Manufacturer/Contractor.

_____ _____
(Authorized Signing Representative of the Installer) Date

CERTIFICATE OF SATISFACTORY INSTALLATION - FORM 102

I have completed my check and inspection of the installation listed below and confirm that it is satisfactory and that defects have been remedied to my satisfaction except any as noted below:

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

OUTSTANDING DEFECTS: _____

_____ _____

(Authorized Signing Representative of the Manufacturer) Date

_____ _____

(Authorized Signing Representative of the Installer) Date