THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 218-2011

CONSTRUCTION OF A COMBINED SEWER OVERFLOW STORAGE FACILITY AT THE UNIVERSITY OF WINNIPEG

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 CONSTRUCTION OF A COMBINED SEWER OVERFLOW STORAGE FACILITY AT THE UNIVERSITY OF WINNIPEG

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, April 5, 2011.

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

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

B3. SITE INVESTIGATION

B3.1 Further to C3.1, the Bidder may view the Site without making an appointment.

B4. ENQUIRIES

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

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

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

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

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

B5. ADDENDA

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

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

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

B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

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

B6. SUBSTITUTES

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

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

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

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

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

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

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

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

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

B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his 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 may base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.

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

B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B15.1(a).

B7. BID COMPONENTS

B7.1 The Bid shall consist of the following components:

(a) Form A: Bid;

(b) Form B: Prices;

(c) Bid Security

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

B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.

B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.

B7.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B7.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder’s Bid.

B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.

B7.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B15.1(a).

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

B7.8 Bids shall be submitted to:

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

B8. BID

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

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

(a) if the Bidder is a sole proprietor carrying on business in his 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 should be printed below such signatures.

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

B9. PRICES

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

B9.2 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.

B9.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. QUALIFICATION

B10.1 The Bidder shall:

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

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

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

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

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

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

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

(b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and

(c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba).

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

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

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

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

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

B11. BID SECURITY

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

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

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

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

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

B11.1.2 All signatures on bid securities shall be original.

B11.1.3 The Bidder shall sign the Bid Bond.

B11.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

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

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

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

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

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

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

B12.1.1 Bidders or their representatives may attend.

B12.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/default.stm

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

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

B13. IRREVOCABLE BID

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

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

B14. WITHDRAWAL OF BIDS

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

B14.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

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

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

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

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

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

B14.2 A Bidder who withdraws his 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, or acceptable deviation there from (pass/fail);

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

(c) Total Bid Price;

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

B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid 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.

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

B16. AWARD OF CONTRACT

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

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

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

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

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

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

(d) only one Bid is received; or

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

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

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

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.

C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm

C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix "**C**" designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the construction of a combined sewer overflow storage facility on The University of Winnipeg property between Langside Street and Young Street.

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

(a) Removal of existing features including fencing, electrical, and pavements.

(b) Construction of approximately 240 m of 1,500mm diameter HDPE pipe and fittings.

(c) Construction of control and access manholes complete with weirs, sluice and flap gates, and monitoring instrumentation and control.

(d) Construction of small diameter PVC SRS piping including connections and venting.

(e) Pavement restorations and new asphalt walkway.

(f) Site grading, and the supply and placement topsoil and sod.

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

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

(b) "**AWWA**" means American Water Works Association

(c) "**CSA**" means Canadian Standards Association

(d) "**CSO**" means Combined Sewer Overflow

(e) "**DR**" means Dimension Ratio

(f) "**HDPE**" means High Density Polyethylene

(g) "**PVC**" means Polyvinyl Chloride

(h) "**SDR**" means Standard Dimension Ratio

D4. CONTRACT ADMINISTRATOR

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

Eymond Toupin P.Eng
Municipal Engineer
99 Commerce Drive
Winnipeg, Manitoba R3P 0Y7

Telephone No. (204) 477-5381
Facsimile No. (204) 284-2040

D4.2 At the pre-construction meeting, Mr. Toupin 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 C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

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

The City of Winnipeg
Chief Financial Officer

Facsimile No.: (204) 949-1174

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
Legal Services Department
Attn: City Solicitor
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. AUTHORITY TO CARRY ON BUSINESS

D8.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D9. SAFE WORK PLAN

D9.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D9.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/Safety/default.stm

D10. INSURANCE

D10.1 The Contractor shall provide and maintain the following insurance coverage:

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

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

D10.2 Deductibles shall be borne by the Contractor.

D10.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.

D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D11. PERFORMANCE SECURITY

D11.1 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.

D11.1.1 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.

D11.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D12. SUBCONTRACTOR LIST

D12.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least

two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13. DETAILED WORK SCHEDULE

D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13.2 The detailed work schedule shall consist of the following:

(a) a Gantt chart for the Work based on the C.P.M. schedule; and

acceptable to the Contract Administrator.

D13.3 Further to D13.2(a), the Gantt chart shall clearly identify the start and completion dates of all the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

(a) Installation of Manholes 3, 4, 5 and 6 on Young Street

(b) Installation of 1,500 mm HDPE pipe and fittings between Young Street and Langside Street.

(c) Installation of Manholes 1 and 2 and piping on Langside Street.

(d) Site grading.

(e) Pavement restorations including new asphalt walkway.

D13.4 Further to D13.2(a), 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.

D14. SECURITY CLEARANCE

D14.1 Each individual proposed to perform the following portions of the Work:

(a) any Work on private property;

(b) communicating with residents and homeowners in person or by telephone;

shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his place of residence.

D14.2 Prior to the commencement of any Work specified in D14.1, 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 such Work.

D14.3 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 specified in D14.1.

D14.4 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.

D14.5 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 any Work specified in D14.1.

SCHEDULE OF WORK

D15. COMMENCEMENT

D15.1 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.

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

(a) the Contract Administrator has confirmed receipt and approval of:
  (i) evidence of authority to carry on business specified in D8;
  (ii) evidence of the workers compensation coverage specified in C6.15;
  (iii) the Safe Work Plan specified in D9;
  (iv) evidence of the insurance specified in D10;
  (v) the performance security specified in D11;
  (vi) the Subcontractor list specified in D12;
  (vii) the detailed work schedule specified in D13; and
  (i) the security clearances specified in D14.

(b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D15.3 The Contractor shall not commence the Work on the Site before July 1, 2011.

D16. WORKING DAYS

D16.1 Further to C1.1(gg), the Contract Administrator's determination of whether or not atmospheric and Site conditions are such that a Working Day is deemed to have elapsed may be based at one time on one type of work while at another time a Working Day may be based on another type of work. When more than one type of major work is involved, the quantity of equipment that must be able to work in order to meet the requirements of a Working Day may vary considerably from that specified in the General Conditions.

D16.2 In the event that incidental work is behind schedule which, in the opinion of the Contract Administrator, should have been or could have been carried out by the Contractor in conjunction with or immediately following work of a major type, the City hereby reserves the right to charge Working Days on the incidental work until such time as it is up to schedule.

D16.3 When the major type of work involves restoration of the site to the condition it was prior to rainfall, Working Days shall not be charged.

D16.4 The Contract Administrator will furnish the Contractor with a daily record for each major type of work showing various information concerning the equipment, the time it worked, could have worked and Working Days charged. This report is to be signed each day by an authorized representative of the Contractor.

D17. SCHEDULE RESTRICTIONS

D17.1 Closure of Young Street

(a) The closure of Young Street for the installation of manholes 3, 4, 5, and 6 will require coordination with the Public Works and Transit Departments of the City of Winnipeg. A minimum of two (2) weeks' notice shall be provided to the Contract Administrator for the planned closure of Young Street.

(b) One closure shall be permitted and it shall be restricted to the hours of 18:30 on Friday to 05:00 on the following Wednesday (i.e. a closure period of 106.5 hours).

(c) The closure shall not be allowed to proceed unless all manhole components required to complete the installation are on site to ensure traffic on Young Street can be restored within the timeframe noted in D17.1(b).

(d) At the end of the closure, the road surface shall be restored to allow traffic including Winnipeg Transit buses down Young Street.

(e) Closure of Young Street shall not coincide with the closure of the lane between Young Street and Langside Street.

D18. CRITICAL STAGES

D18.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) Pavement restorations and site grading - August 30, 2011.

(b) Restoration of Traffic on Young Street - within the timeframe noted in D17.1(b).

D19. SUBSTANTIAL PERFORMANCE

D19.1 The Contractor shall achieve Substantial Performance within thirty (30) consecutive Working Days of the commencement of the Work as specified in D15.

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

D19.3 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.

D20. TOTAL PERFORMANCE

D20.1 The Contractor shall achieve Total Performance within forty (40) consecutive Working Days of the commencement of the Work as specified in D15.

D20.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D20.3 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.

D21. LIQUIDATED DAMAGES

D21.1 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) Pavement restorations and site grading – One Thousand Five Hundred Dollars ($1,500);

(b) Restoration of traffic on Young Street – One Thousand Five Hundred Dollars ($1,500)

(c) Substantial Performance – One Thousand Five Hundred Dollars ($1,500);

(d) Total Performance – Five Hundred Dollars ($500).

D21.2 The amounts specified for liquidated damages in D21.1 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.

D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

D22. JOB MEETINGS

D22.1 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.

D22.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D23. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D23.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

MEASUREMENT AND PAYMENT

D24. PAYMENT

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

WARRANTY

D25. WARRANTY

D25.1 Warranty is as stated in C13.

FORM H1: PERFORMANCE BOND
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(hereinafter called the "Principal"), and

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

_____

_____ dollars ($_____.____)

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

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

BID OPPORTUNITY NO. 218-2011

CONSTRUCTION OF A COMBINED SEWER OVERFLOW STORAGE FACILITY AT THE UNIVERSITY OF WINNIPEG

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

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

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

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

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

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

_____ day of _____ , 20____ .

SIGNED AND SEALED
in the presence of:

_____
(Witness as to Principal if no seal)

_____
(Name of Principal)

Per: _____ (Seal)

Per: _____

_____
(Name of Surety)

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

FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)
(See D11)

_____
(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 218-2011

CONSTRUCTION OF A COMBINED SEWER OVERFLOW STORAGE FACILITY AT THE UNIVERSITY OF WINNIPEG

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 D12)

CONSTRUCTION OF A COMBINED SEWER OVERFLOW STORAGE FACILITY AT THE UNIVERSITY OF WINNIPEG

Name	Address

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/Spec/Default.stm

E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 The following are applicable to the Work:

Drawing No.	Drawing Name/Title
	Cover Sheet
9566	Civil – CSO Right-of-Way – Langside Street to Young Street
9567	Civil – Pan/Profile – Langside Street & Young Street - 80 m N of Portage Avenue to 200 m S of Ellice Avenue
9568	Civil – Details & Sections 1
9569	Civil – Manholes 3, 4, 5 and 6
9570	Electrical – Site Plan
9571	Electrical – Service Details
9572	Electrical – Control Panel Layout
9573	Electrical – Loop Diagram – 120 VAC Power Supply
9574	Electrical – Loop Diagram – Panel Heater
9575	Electrical – Loop Diagram – 24 VDC Power Supply
9576	Electrical – Loop Diagram – PLC Power and Common Connections
9577	Electrical – Loop Diagram – Loop Isolator Power Feed
9578	Electrical – Loop Diagram – Control Panel Hart Interface
9579	Electrical – Loop Diagram – LIT-004A
9580	Electrical – Loop Diagram – LIT 004B
9581	Electrical – Loop Diagram – LIT 005
9582	Electrical – Loop Diagram – LIT 006
9583	Electrical – Loop Diagram – FCV-005 Valve Actuator

GENERAL REQUIREMENTS

E2. OFFICE FACILITIES

E2.1 The Contractor shall supply office facilities meeting the following requirements:

(a) The field office shall be conveniently located near the Site of the Work.

(b) The building shall have a minimum floor area of 20 square metres, with window area of 3 square metres and a door entrance with suitable lock satisfactory to the Contract Administrator.

(c) The building shall be suitable for all-weather use. It shall be capable of maintaining a temperature range between 16^{o}C and 25^{o}C.

(d) The building shall be supplied with adequate lighting and 120 Volt power supply.

(e) The building shall be furnished with one desk, one meeting table, one drafting table, one filing cabinet and six chairs, all satisfactory to the Contract Administrator.

(f) A separate toilet with door lock shall be supplied for the Contract Administrator.

(g) The field office shall be cleaned weekly immediately prior to the Job Site Meetings to the satisfaction of the Contract Administrator.

(h) The provision of the field office with the aforementioned furnishings and equipment shall also include maintenance and removal of the field office, operating costs and any service installation costs.

E3. TRAFFIC CONTROL

E3.1 Further to CW 1130 3.7, the City of Winnipeg Traffic Services Branch will erect and maintain traffic control on Regional Streets.

E3.2 All other traffic control and signing shall be provided in accordance to CW 1130 3.7.

E3.3 Proposed Traffic Staging is indicated on Figure 1 Traffic Staging, included in Appendix A. The Contractor shall review proposed staging, or propose alternate staging and submit a traffic staging plan to the Contract Administrator for review. In all cases, the Contractor shall be responsible for review of traffic staging to fit proposed construction sequencing. At a minimum the following traffic staging restrictions shall be incorporated:

(a) Single lane traffic, including bus traffic along Young Street, must be maintained at all times; except as noted herein.

(b) A single complete closure of Young Street will be allowed to facilitate installation of manholes 3, 4, 5 and 6 and associated piping. Closure is restricted to the hours of 18:30 on Friday to 05:00 on the following Wednesday. Local traffic access to Young Street north of the construction site shall be maintained via temporary re-routing to and from the lane between Young Street and Langside Street.

(c) Complete closure of the lane between Young Street and Langside Street will be allowed to facilitate installation of the 1,500 mm piping. Temporary access between the lane and Young Street along the north boundary of the construction site shall be constructed and maintained for the duration of the closure.

(d) A single complete closure of Langside Street south of Furby Place will be allowed to facilitate installation of manholes 1 and 2 and connecting piping. Access to Furby Place from Langside Street shall be maintained at all times.

E4. SITE SECURITY AND SAFETY

E4.1 The Contractor shall

(a) Be fully responsible for all aspects of site and public safety.

(b) Arrange for all required safety watches in the vicinity of buried and overhead hydro utilities, and pay all required safety watches.

E5. GRAVITY SEWERS

E5.1 Description

(a) This specification shall amend and supplement CW 2130 Gravity Sewers

E5.2 Materials

(a) Sewer Pipe

(i) 150 to 450mm sewer pipe SDR 35 polyvinyl chloride (PVC) pipe in accordance with CW 2130.

(ii) 150 to 375 mm sewer fittings shall be push-on style PVC injection moulded fittings in accordance with CW 2130.

(b) Large Diameter Profile Wall High Density Polyethylene (HDPE) Pipe

(i) 1,500 mm HDPE profile wall sewer pipe to ASTM F894.

(ii) Minimum Pipe Class Ring Stiffness Constant (RSC) as defined in ASTM F894 Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe.

(iii) The pipe shall only be manufactured from a high density polyethylene material which meets or exceeds the minimum cell classification for materials as specified in ASTM F894, 334433C or higher when classified in accordance with ASTM D3350.

(iv) Pipe ends shall be chamfered and permanently joined by extrusion welding in accordance with the manufacturer's recommended procedure. Material used for extrusion welding shall meet the requirements established for the base material. All joints shall be water tight.

(v) Acceptable Product:

(i) Weholite by KWH Pipe (Canada) Ltd.

(ii) Or Approved Equal in accordance with B6.

(c) Solid Wall High Density Polyethylene (HDPE)

(i) Pipe stubs for SDR 35 PVC connections shall be HDPE DR 17 to AWWA C906.

(ii) Minimum cell classification PE 334434C to ASTM D3350.

(d) Manholes

(i) Precast concrete sections meeting requirements of CW 2130 complete with precast or cast in place weirs as per Drawings.

(ii) Manholes on HDPE profile wall piping

(i) Shall be fabricated with 1,200mm riser pipe to ASTM F894 with a minimum pipe class ring stiffness constant (RSC) of 250.

(ii) Riser shall be extrusion welded to the 1,500 mm piping and water tight.

(iii) Transition from profile wall HDPE to concrete flat top reducer shall be as shown on the Drawings.

(b) Frame and cover as per CW 2130.

(c) Platform

(i) Platform for Manhole 5 shall be fabricated of 6351-T6 aluminum.

(ii) Aluminum surfaces in contact with concrete shall receive two (2) coats of bituminous paint.

(iii) Welding shall be completed by company certified to CSA W47.2 Certification of Companies for Fusion Welding of Aluminum and shall be to CSA W59.2 Welded Aluminum Construction.

(iv) Platform shall be rated for a minimum uniform load of 12 kPa. Maximum deflection with a concentrated load of 90 kg shall not exceed 1/160 of the span.

(v) Platform shall be attached to the interior of the manhole using Type 316 stainless steel 16 mm (5/8") by 95 mm (3 ¾") Hilti HVU chemical anchors.

(e) Circular Flap Gates

(i) Flap gates, including frames, gates, hinges, pivot arms and fasteners, shall be constructed of Type 316 stainless steel to ASTM A240.

(ii) Frame

(i) Shall be made of structural members or formed plate welded to form a rigid one-piece frame.

(ii) Shall be flanged back.

(iii) Frame for 250 mm diameter gate in Manhole 6 shall be suitable for mounting on round 1,200 mm diameter manhole and with an extra wide flange for mounting over PVC piping.

(iv) Frame for 450 mm diameter gate in Manhole 3 shall be suitable for mounting on concrete wall and with an extra wide flange for mounting over PVC piping.

(b) Gate shall be made of structural members or formed plate adequately reinforced to withstand seating head of 10 m without distortion.

(c) Seals shall be made of resilient neoprene attached to the body by means of a retainer ring.

(d) Hinges shall have stainless steel pin and ultra high molecular weight polyethylene bushing to ASTM D4020.

(e) Hinge arms shall be made of structural members or formed plates.

(f) An EPDM gasket shall be provided and installed between the frame and concrete mounting surface.

(g) Acceptable Product:

(i) Fontaine Series 60 Circular Flap Gates.

(ii) Or Approved Equal in accordance with B6.

(f) Sluice Gates

(i) Shall be to AWWA C561 Fabricated Stainless Steel Slide Gates.

(ii) Gates shall be non-rising stem type and fabricated of Type 316 stainless steel.

(iii) Frame:

(i) Shall be made of structural members or formed plate welded to form a rigid one-piece frame.

(ii) Shall be flange back design.

(iii) Frame for 250 mm by 250 mm gate in Manhole 5 shall be suitable for mounting on round 1,800 mm diameter manhole and with an extra wide flange for mounting over PVC piping. Frame shall extend into manhole such that centreline of stem is a minimum of 325 mm from the inside face of the manhole.

(iv) Frame for 375 mm by 375 mm gates in Manholes 3 and 4 shall be suitable for mounting on concrete wall and with an extra wide flange for mounting over PVC piping.

(b) Slide

(i) The slide shall be fabricated of a flat plate reinforced with formed plates or structural members to limit deflection to 1/720 of the gate's span under the design head of 10 m.

(c) Guides and Seals:

(i) The guide slot shall be made of ultra high molecular weight polyethylene.

(ii) The guides shall be of ultra high molecular weight polyethylene and shall be of such length as to retain and support at least two thirds (2/3) of the vertical height of the slide in the fully open position.

(iii) Side and top seals shall be made of ultra high molecular weight polyethylene. The sealing system shall maintain efficient sealing in any position of the gate and allow flow only in the opened portion of the gate.

(iv) The bottom seal shall be made of resilient neoprene set into the bottom member of the frame and shall form a flush bottom.

(d) Operating Stem:

(i) The operating stems shall be of 316 stainless steel designed to transmit in compression at least 2 times the rated output of the operating mechanism. The stem shall have a slenderness ration (L/r) of less than 200. Stems shall be one piece.

(ii) Stem guides shall be fabricated of 316 stainless steel and shall be equipped with an ultra high molecular weight polyethylene bushing. Guides shall be spaced in accordance with the manufacturer's recommendation.

(iii) Stem extension for the 375 mm by 375 mm gate in Manhole 4 shall be fitted with a standard City of Winnipeg 38 mm square operating nut.

(iv) Stem extension for the 250 mm by 250 mm gate in Manhole 5 shall be mated with the electric actuator.

(e) An EPDM gasket shall be provided and installed between the frame and concrete mounting surface.

(f) Acceptable Product:

(i) Fontaine Series 20 Flow Control Sluice Gates.

(ii) Or Approved Equal in accordance with B6.

(g) Electric Gate Actuator

(i) Specification is supplementary to and shall be read together with the latest revision of AWWA C540, "Power-Actuating Devices for Valves and Sluice Gates."

(ii) Electric actuator to be supplied and installed under this Contract shall be designed and manufactured by a company having at least five (5) years prior experience in manufacturing these types of products in the size as those specified herein.

(iii) All technologies and devices used in the actuator shall have a minimum of five (5) years of commercial operating experience for that specific manufacturer. This is to include torque and position sensing, lubrication, and electrical compartment design.

(iv) Acceptable Products:

(i) Rotork IQ Range

(ii) Or Approved Equal in accordance with B6.

(v) Design Requirements

(i) Gate Size: 250 mm by 250 mm Slide Gate

(ii) Service: Throttling, On-Off & Inching Duty (actuator for position operation to limit positions and to intermediate positions, valve position measured continuously).

(iii) Opening: Multiturn, Counter Clockwise to Open

(iv) Electric Motor: 240 Volts AC, Single Phase, 60 Hz Power Supply

(v) Service Temperature: -20°C to 60°C (-4°F to +140°F)

(vi) Environment: Actuator shall be certified for use in hazardous area to CSA C22.2 No. 30 Explosion-Proof Enclosures for Use in Class I Hazardous Locations.

(b) Actuator Sizing

(i) Electric actuator shall be sized to provide the torque required to close or open the gate for full bi-directional flow of 0.250 m^3/s. The maximum thrust output of the actuator shall not exceed the valve and stem shaft torque capability.

(c) Mounting:

(i) Electric actuator shall be designed and constructed for remote mounting within Manhole 5 as shown on Drawings. Actuator shall be supplied with 316 stainless steel mounting bracket and fasteners to be attached to the interior wall of the manhole. Bracket shall be designed to support and restrain the actuator under anticipated static and dynamic loads Bracket shall be fastened using chemical type anchors.

(ii) Actuator shall be positioned as close a practically possible to the underside of the manhole flat top reducer.

(d) Motor

(i) Motor shall be CSA approved, single phase capacitor run/start reversing squirrel cage induction type motor with Class 'F' insulated windings incorporating thermostat protection.

(ii) Suitable for operation at 10% above or below normal 240 Volt and at 5% above or below 60 cycle power supply.

(iii) Motor bearings shall be permanently lubricated.

(e) Manual Operation

(i) Actuator shall be provided with a handwheel, which shall not rotate during motor operation. The handwheel operation shall be accomplished by a declutch lever, capable of lockout by padlock. The handwheel shall disengage automatically from the operating mechanism once the motor is capable of operation.

(ii) The handwheel shall be fitted with a standard City of Winnipeg 38 mm square operating nut to allow operation from the surface via a valve box centred over the handwheel.

(iii) The declutch lever shall be configured to allow operation from the ground surface via a separate valve box.

(f) Integral Starter and Transformer

(i) The reversing starter, control transformer, and local controls shall be integral with the valve actuator, suitably housed to prevent breathing and condensation build-up. The starter shall be solid state type suitable for sixty (60) starts per hour, and of rating appropriate to motor size. It shall have the necessary tappings and be adequately rated to provide power for energization of the contactor coils, 24 Volt DC output where required for remote controls, and for supply for all the internal electrical circuits.

(ii) The windings shall be protected by easily replaceable fuses.

(g) Turns Limit and Torque Limit Switches to be adjustable as follows:

(i) Position setting range: 2.5 to 100,000 turns, with resolution to 15° of actuator output.

(ii) Torque setting: 40% to 100% rated torque.

(iii) Torque sensing shall be by purely electric or electronic methods. Extrapolation of torque from mechanically measured motor speed will not be acceptable.

(h) Remote Valve Position Indication

(i) Four contacts shall be provided to indicate fully open and fully closed positions, local selected, and thermostat tripped.

(ii) Contacts to be rated at 5A, 250 VAC, 30 DC.

(iii) Analog position feedback shall be provided with 4-20 mA output proportional to position.

(i) Local Position Indication

(i) The actuator shall incorporate an illuminated, mechanical dial indicator or digital readout to show continuous movement from fully open to fully closed in 1% increments. The digital display shall be maintained even when the power to the actuator is isolated.

(j) Push Buttons and Selector Switches

(i) Actuator shall be complete with a local Open-Stop-Close push-button station with external Red-Open, Green-Closed and Yellow-Mid-Travel indicating lights and a Local-Off-Remote selector switch padlockable in any one of the following three positions:

- Local Control Only
- Off (No Electrical Operation)
- Remote Control

(k) The internal control and monitoring circuits shall operate at nominal 24 Volt DC or 120 Volt AC. Customer control interface shall operate at 120 Volt AC. All necessary transformers shall be provided.

(l) Monitoring Facilities

(i) Facilities shall be provided for monitoring actuator operation and availability as follows:

- Motor (availability) relay, having one normally open contact, the relay being energized from the control transformer only when the Local/Off/Remote selector switch is in the remote position to indicate that the actuator is available for remote (control room) operation.
- Where required, it shall be possible to provide indication of thermostat trip and "Remote" selected as discrete signals.

(m) Wiring and Terminals

(i) Internal wiring shall be of CSA approved insulated stranded cable of appropriate size for the control and single phase power. Each wire shall be clearly identified at each end. Permanent heat shrunk labelling shall be used.

(ii) The terminals shall be embedded in terminal block of high tracking-resistance compound.

(iii) The terminal compartment shall be separated from the inner electrical components of the actuator by means of a watertight 'O' ring seal.

(iv) The terminal compartment of the actuator shall be provided with a minimum of two (2) threaded cable entries.

(v) All wiring supplied as part of the actuator shall be contained within the main enclosure for physical and environmental protection. External conduit connections between components will not be acceptable.

(vi) Control logic circuit boards and relay boards shall be mounted on plastic mounts to comply with double insulated standards. No more than a single primary size fuse shall be provided to minimize the need to remove single covers for replacement.

(vii) A durable terminal identification card showing plan of terminals shall be attached to the inside of the terminal box cover indicating:

- Serial number
- External voltage values
- Wiring diagram number
- Terminal layout

(viii) The identification card shall be suitable to inscribe cable core identification alongside terminal numbers.

(n) Enclosure

(i) Actuators shall be O-ring sealed, watertight to NEMA 6/IP68 as well as have an inner watertight and dustproof O-ring seal between the terminal compartment and the internal electrical elements of the actuator, fully protecting the switch mechanism, motor and all other internal electrical elements of the actuator from ingress of moisture and dust when the terminal cover is removed on site for cabling.

(ii) Actuators shall be provided with an internal motor and compartment heater.

(iii) All external fasteners shall be of 316 stainless steel.

(o) Start-up Kit

(i) Each actuator shall be supplied with a start-up kit comprising installation instructions, electrical wiring diagram, and sufficient space cover screws and seals to make good any site losses during the commissioning period.

(h) Pipe Transition Couplings

(i) Couplings for transition from HDPE to PVC or steel piping shall be bolted sleeve type for plain end pipe to AWWA C219. Coupling shall be fusion bonded epoxy coated to AWWA C213 and supplied with 316 stainless steel fasteners.

(ii) Stainless steel (Type 316) stiffener inserts shall be used inside HDPE pipe at all coupling connections.

(iii) Acceptable Products:

(i) Robar 1506/1506R.

(ii) Romac 501/RC501.

(iii) Or Approved Equal in accordance with B6.

(i) Vent Piping and Fittings

(i) Vent piping shall be fabricated of DR 18 PVC piping conforming to AWWA C900 and schedule 40 galvanized steel piping as shown on the Drawings.

(ii) Tees, crosses and reducers shall be injection moulded or fabricated PVC fittings.

(iii) Valve box assembly shall be in accordance with CW 2110. Hinged lids shall be lockable type with raised letter "S" on top.

(j) Adjustable Weir Plate

(i) Adjustable weir shall be fabricated of 6 mm (¼") Type 316 stainless steel plate.

(k) Bedding

(i) For 1,500 mm HDPE and 200 mm PVC air vent piping, bedding and initial backfill for Class B Bedding, as defined in City of Winnipeg Standard Detail SD-001, shall be sand to CW 2030

(ii) In all shafts for small diameter PVC sewer pipe and manholes, bedding and initial backfill for Class B Bedding, as defined in City of Winnipeg Standard Detail SD-001, shall be Type 3 material to CW 2030.

(l) Backfill

(i) Backfill excavations for small diameter PVC sewer pipe and manholes within 1 metre of pavements and roadways shall be Type 1 to CW 2030 installed to Class 3 standards in accordance with City of Winnipeg Standard Detail SD-002.

(ii) Backfill for 1,500 mm HDPE pipe shall be Type 1 to CW 2030 installed to Class 2 standards in accordance with City of Winnipeg Standard Detail SD-002. In future grass or asphalt walkway areas 300 mm of compacted excavated material shall be placed immediately below the specified restoration in accordance with SD-002.

E5.3 Submittals

(a) Submit detailed Shop Drawings in accordance with CW 1110 for the following:

(i) HDPE pipe layout, proposed laying lengths, field welds, location and detail drawings of all pipe fittings and specials, field welding procedures and any specialized connections.

(ii) Submit pipe design information including HDPE pipe wall cross-section configuration, area and moment of inertia. Provide design review that proposed pipe meets the following design conditions:

(i) Ring deflection <5%

(ii) Compressive ring thrust within allowable limits

(iii) Safety factor of 2.0 to allowable constrained buckling

(iv) Soil bulk density of 1,920 kg/m^3 (120 lb/ft^3)

(v) Pipe cover as shown on Drawings

(vi) Static groundwater level at grade

(vii) Modulus of soil reaction (E') 6,900 kPa (1,000 psi)

(viii) Deflection lag factor of 1.0 using prism load

(iii) Submit shop drawings of manholes showing pipe openings, reinforcing and joint details.

(iv) Submit reinforcing steel and concrete mix design for cast-in-place concrete works in accordance to CW 2160.

(v) Submit shop drawings and details of flap gates, sluice gates and stem extensions, pipe transition couplings, HDPE stainless steel stiffener inserts, all pipe fittings and specials, and adjustable weir plate.

(vi) Submit aluminum platform design and erection shop drawings and details.

(vii) Submit shop drawings and details of actuator, support bracket, stem extension and gate valve assembly. Provide gate torque calculations for operating conditions listed.

E5.4 Construction Methods

(a) Excavation, bedding and backfill to CW 2030.

(i) Remove two (2) existing trees as shown on the Drawings.

(ii) Remove existing wood fencing including hydro conduit and wiring along fence up to electrical panel.

(iii) Remove existing bollards.

(iv) Remove existing lamp, including wiring to electrical panel, as shown on the Drawings.

(v) Parking ticket dispenser, hydro service pole and panel to be removed by others.

(vi) Remove existing curb and sidewalk and replace with temporary granular ramp at location shown on Drawings. Temporary ramp to be constructed of base course material to CW 3110 placed over geotextile fabric. Temporary ramp shall be maintained until the lane is restored. Temporary ramp shall be removed prior to restoring curb, sidewalk and boulevard.

(vii) Temporarily relocate garbage and recycling bins along lane south of construction site to front of Langside Street until lane is restored. Replace bins to original locations once lane is restored.

(viii) Protect and support existing fibre optic which crosses 1,500 HDPE pipe in two (2) 50 mm HDPE conduits. Exact depth of fibre optic is unknown, estimated to be 1.5 m below surface. Fibre optic is active and cannot be taken out of service.

(ix) Backfill for small diameter PVC sewer pipe and manholes within 1 metre of pavements and roadways shall be to Class 3 standards in accordance with City of Winnipeg Standard Detail SD-002.

(x) Backfill for 1,500 mm HDPE pipe shall be to Class 2 standards in accordance with City of Winnipeg Standard Detail SD-002. In future grass or asphalt walkway areas 300 mm of compacted excavated material shall be placed immediately below the specified restoration in accordance with SD-002.

(b) 1,500 mm HDPE Pipe Installation

(i) Pipe to be installed in an open trench.

(ii) Pipe shall be installed on a 150 millimetre thick bed of sand placed in the bottom of the excavation prior to the installation of the pipe. Shape bed true to grade to provide continuous, uniform bearing surface for pipe exterior. Do not compact middle third of pipe diameter.

(iii) Compact the bedding and initial backfill in 150 millimetre lifts to at least 95% standard proctor maximum dry density to 300 millimetres above the crown of the pipe. Monitor pipe deflection (horizontal and vertical dimension) while placing and compacting bedding and initial backfill to ensure pipe remains round.

(iv) Lay and join pipes in accordance with CW 2030 and manufacturer's recommendations.

(v) Handle pipe with approved equipment. Do not use chains or cables passed through the pipe bore so that the pipe weight bears upon pipe ends.

(vi) Lay pipes on prepared bed, true to line and grade, with pipe invert smooth and free of sags or high points. Ensure barrel of each pipe is in contact with shaped bed throughout its full length.

(vii) Position and join pipes with approved equipment.

(viii) Pipe jointing for profile wall HDPE shall be full wall extrusion welds conforming to manufacturer's recommendations. Where automatic full wall extrusion welds are not possible, inner and outer wall extrusion welds shall be completed in accordance to manufacturer's recommendations. Joint integrity shall be designed and constructed to maintain internal pressure of 100 kPa.

(ix) Pipe deflection testing shall be carried out a minimum of 30 days after completion of the final backfill operations. Vertical and horizontal internal pipe dimensions shall be measured at each end and in the middle of each pipe segment or at a maximum spacing of 7.5 metres, whichever is less. Pipe shall be deemed acceptable if measured deflection is less than 5% of the nominal pipe diameter. Irrespective of deflection measurements any observations of wall dimpling, localized buckling or other signs of unacceptable levels of pipe stress will be grounds for rejection.

(x) Pipe shall be visually or CCTV inspected for leaks by infiltration a minimum of 180 days after completion of the final backfill operations. No leaks should be observed. If a leak is observed, it will be necessary to lower the water table below the area of the leak, and to completely dry and clean the area prior to undertaking a repair weld.

(c) Sluice and Flap Gate Installation

(i) Where sluice and flap gates are to be installed, ensure the manhole wall is true and uniformly constructed within gate installation tolerances as specified by the gate manufacturer. High spots less than 6 millimetres in depth may be removed by grinding. Low areas shall be levelled with an approved epoxy grout.

(d) Bollard Installation

(i) Install bollards at locations and according to details shown on Drawings.

E5.5 Measurement and Payment

(a) Plugging or Maintaining Existing Sewer Flows, Flow Control, Diversions and Bypass Pumping

(i) Plugging or Maintaining Existing Sewer Flows, Flow Control, Diversions and Bypass Pumping required to complete the Works in the Contract shall be incidental to the Contract as per Clause 4.16.1 of CW 2130.

(b) Combined Sewer Overflow Storage Pipe/Tanks

(i) 1500 mm RSC 250 HDPE Pipe

(i) 1500 mm RSC 250 HDPE Pipe shall be measured for payment on a length basis as per Clause 4.1 of CW 2130 and shall include the supply and installation of 1500 mm RSC 250 HDPE pipe, removal of existing trees, wood fencing, lamp, electrical conduit and wiring, bollards, construction and removal of the temporary access ramp, temporary relocation of garbage and recycling bins, and the supply and installation of all HDPE fittings, risers and pipe stubs and all couplings required to connect to storm relief sewers and vent piping.

(ii) 1500 mm RSC 250 HDPE Header Pipe

(i) 1500 mm RSC 250 HDPE Header Pipe shall be measured for payment on a length basis as per Clause 4.1 of CW 2130 and shall include all HDPE fittings, risers and pipe stubs and all couplings required to connect storm relief sewers.

(c) Storage Pipe/Tank Air Vent Header

(i) 200 mm DR 18 PVC Header

(i) 200 mm DR 18 PVC Header shall be measured for payment on a length basis as per Clause 4.1 of CW 2130 and shall include the supply and installation of all fittings and piping.

(ii) 200 mm Schedule 40 Galvanized Steel Air Vent c/w 90° and 180° Elbows and Screen

(i) 200 mm Schedule 40 Galvanized Steel Air Vent c/w 90° and 180° Elbows and Screen shall be measured for payment on a lump sum basis and shall include the supply and installation of galvanized steel piping and fittings and coupling for connection to the HDPE piping.

(iii) Valve Box Assembly c/w Lockable Lid

(i) Valve Box Assembly c/w Lockable Lid shall be measured for payment on a unit basis and each unit shall include the supply and installation of a complete valve box assembly including lower and upper casing and lockable lid.

(d) Manholes

(i) SD-010

(i) 1200 mm diameter (MH 1 and 2) shall be measured and paid as per CW 2130.

(ii) 1800 mm diameter (MH 5) c/w Aluminum Platform shall be measured for payment on a lump sum basis and shall include supply and installation of frame, cover, rungs, risers, flat top reducer, base, aluminum platform, and valve boxes.

(iii) 1800 mm diameter (MH 3) c/w Weir Wall and S.S. Adjustable Plate shall be measured for payment on a lump sum basis and shall include supply and installation of frame, cover, rungs, risers, flat top reducer, base, concrete weir wall, adjustable stainless steel plate and valve box.

(e) New Manholes on Existing Sewers

(i) SD-010

(i) 1200 mm diameter (MH6) shall be measured and paid as per CW 2130.

(ii) 1800 mm diameter (MH 4) c/w Weir Wall and S.S. Adjustable Plate shall be measured for payment on a lump sum basis and shall include supply and installation of frame, cover, rungs, risers, flat top reducer, base, concrete weir wall, adjustable stainless steel plate, valve box, removal and disposal of existing manhole, and pipe, couplings and connections to existing sewer.

(f) New HDPE Access Manholes c/w Concrete Transition

(i) New HDPE Access Manholes c/w Concrete Transition shall be measured for payment on a unit basis and shall include supply and installation of frame, cover, risers, concrete flat top reducer, concrete foundation ring, HDPE top plate and 1200 mm ID RSC 160 riser.

(g) Supply and Installation of Fabricated Sluice Gates

(i) 250 mm on Round MH Wall (MH 5) c/w Electric Actuator shall be measured for payment on a lump sum basis and shall include the supply and installation of the stainless steel fabricated sluice gate, stem extension, actuator and support brackets.

(ii) 375 mm on Flat Weir Wall shall be measured for payment on a unit basis and each unit shall include the supply and installation of stainless steel fabricated sluice gate, and stem extension.

(h) Supply and Installation of Circular Flap Gates

(i) 250 mm on Round MH Wall shall be measured for payment on a unit basis and each unit shall include the supply and installation of stainless steel fabricated flap gate.

(ii) 450 mm on Flat Concrete Wall shall be measured for payment on a unit basis and each unit shall include the supply and installation of stainless steel fabricated flap gate.

(i) Bollards,

(i) Bollards shall be measured for payment on a unit basis and each unit shall include the supply and installation of a bollard as detailed on the Drawings.

(j) Fittings and Specials

(i) Fittings and specials will not be measured for payment. They will be included in the price paid for sewer installation.

(k) Disposal of Unsuitable or Surplus Excavated Material

(i) There shall be no measurement of surplus soil material disposed of at any disposal site. No additional payment will be made for disposal of surplus soil materials. It shall be considered incidental to the cost of the Work.

E6. SUPPLY AND INSTALL DETECTABLE WARNING SURFACE TILES

E6.1 Description

(a) This specification covers the supply and installation of detectable warning surface tiles in sidewalk ramps and multi-use path ramps.

E6.2 Specifications and Drawings

(a) Referenced Standard Construction Specifications and Standard Details
  (i) CW 3235 - Renewal of Existing Miscellaneous Concrete Slabs
  (ii) CW 3240 - Renewal of Existing Curbs
  (iii) CW 3310 - Portland Cement Concrete Pavement Works
  (iv) CW 3325 - Portland Cement Concrete Sidewalk
  (v) SD-229C - Curb Ramp for Concrete Pavement
  (vi) SD-229D - Curb Ramp for Asphalt Overlay

(b) Attached; SDE Drawings and Installation Manual
  (i) SDE-229A - Curb Ramp Layout for Intersections
  (ii) SDE-229AA - Detectable Warning Surface in Curb Ramps for Intersections
  (iii) SDE-229AB - Curb Ramp Layout for Offset Intersections
  (iv) SDE-229BB - Detectable Warning Surface in Curb Ramps for Medians
  (v) SDE-229E - Curb Ramp Depressed Curb
  (vi) Manufacturer's Installation Manual – Armor-Tile Cast in Place Inline Dome Detectable/Tactile Warning Surface Tile.

E6.3 Materials

E6.3.1 Acceptable Detectable Warning Surface Tile product is:

2'x 4' (610 x 1220mm) Armor-Tile Cast in Place (yellow).

Available from:

Engineered Plastics Inc.
1400 Cornwall Road Unit 6
Oakville, Ontario L6J 7W5

Attention: Manny Burgio
Ph: 800-682-2525
Fax: 800-769-4463

or

Alsip's Building Products
1 Cole Avenue
Winnipeg, Manitoba

Attention: Jason Alsip
Ph. 204-667-3330

E6.3.2 Detectable warning surface tiles shall be Highway Yellow (USA) or Safety Yellow (Canada).

E6.3.3 Detectable warning surface tiles shall be cast in place type.

E6.3.4 Truncated domes on detectable warning surface tiles shall be in accordance with ADA Accessibility Guidelines (ADAAG).

E6.4 Construction Methods

E6.4.1 General

(a) Construct curb ramps, sidewalk ramps and multi-use path in accordance with referenced Standard Construction Specifications, Standard Details, and SDE drawings (attached).

(b) Construct the lip of the depressed curb in accordance with SDE–229E.

(c) Construct sidewalk ramp grades in accordance with SD-229C and SD-229D.

(d) Install the detectable warning surface tile in accordance with the amended Manufacturer's Installation Manual (attached). Drill additional 6mm air vent holes in ribs under the tile as required and use vibration to help seat the tile, to facilitate the installation process.

(e) Trim the corner of the tile at radii in accordance with SDE-229A, SDE-229AA and SDE-228AB

(f) Install and orient the detectable warning surface tiles as shown on the referenced drawings or as directed by the Contract Administrator.

E6.4.2 Medians and Refuge Islands:

(a) Where the distance from back of curb to back of curb is 1.32m or greater, install one detectable warning surface tile 50mm from the back of each curb.

(b) Where the distance from back of curb to back of curb is less than 1.32m, leaving 50mm between the back of curb and the tile, cut the tile(s) to fill the remaining area between the curbs.

E6.4.3 Multi-use Paths

(a) Construct a curb ramp with a depressed curb to the full width of the multi-use path in accordance with SDE-229E.

(b) Construct a concrete ramp the width of the multi-use path and a minimum of 1.50m deep from back of curb in accordance with SD-229C and SD-229D.

(c) Install two (2) tiles in each concrete ramp, one (1) on each side for each direction. Place the short edge of each tile 150mm from the edge of the concrete ramp, with both tiles in line with each other transversely across the concrete ramp. The tile(s) nearest the curb must be 50mm from back of curb similar to tile placement in SDE-229A.

(d) Saw cut the middle of the concrete slab, perpendicular to the curb and to a depth of D/4. Cut additional sawcuts as directed by the Contract Administrator.

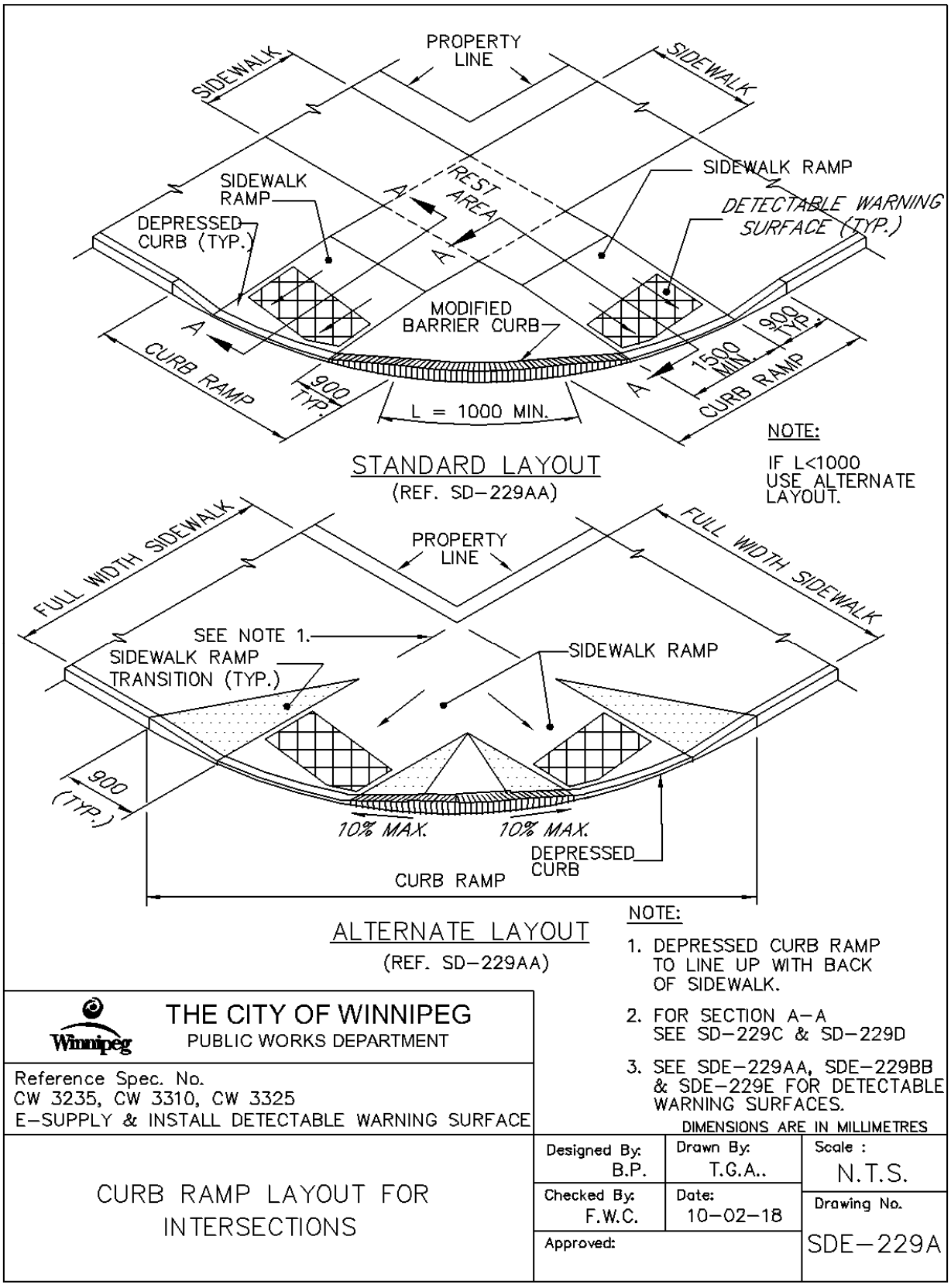
E6.5 Measurement and Payment

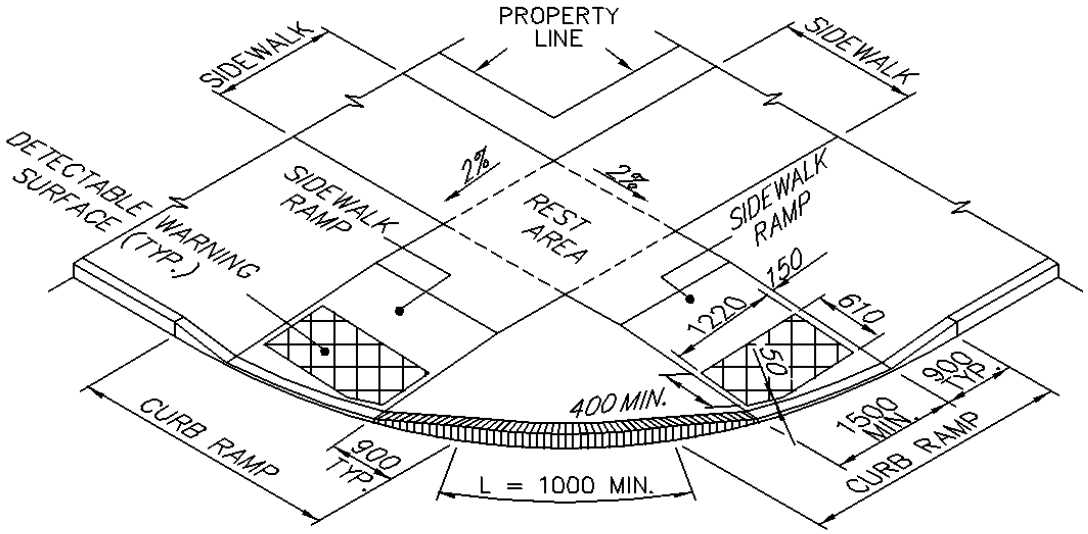
E6.5.1 Supply and installation of detectable warning surface tiles will be measured on a unit basis and paid for at the Contract Unit Price for "Detectable Warning Surface Tiles". The number of units to be paid for will be the total number of full or trimmed tiles supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E6.5.2 The area under the detectable warning surface tile is part of the concrete sidewalk ramp and will be paid in accordance with CW 3235.

E6.5.3 Curb ramp will be paid in accordance with CW 3240.

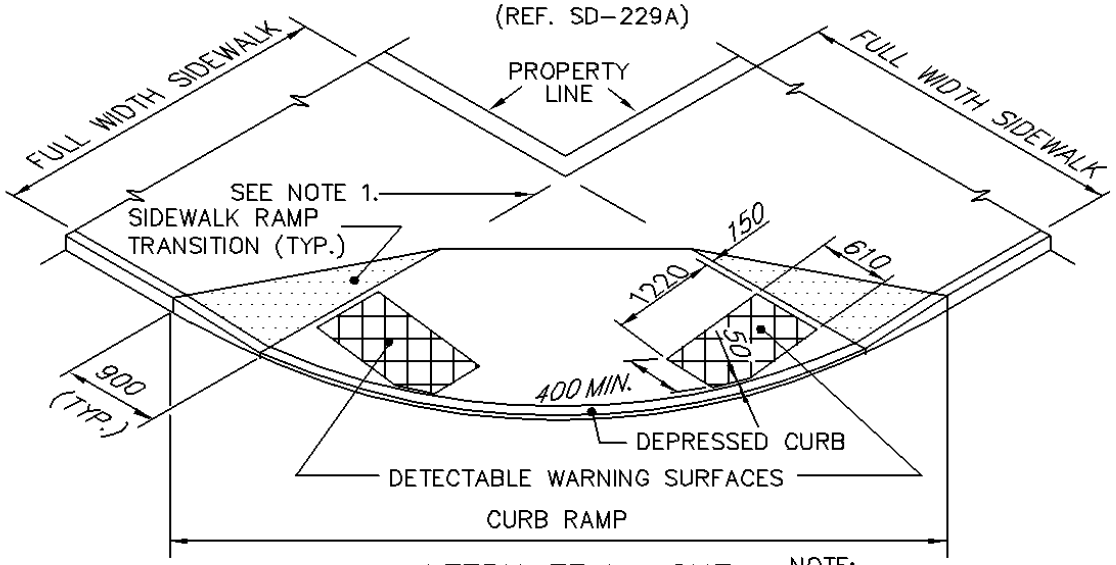
E6.6 Drawings and Installation Manual





STANDARD LAYOUT

(REF. SD-229A)



ALTERNATE LAYOUT

(REF. SD-229A)

NOTE:

1. DEPRESSED CURB RAMP TO LINE UP WITH BACK OF SIDEWALK.
2. FOR A 1.83m WIDE SIDEWALK USE A DETECTABLE WARNING SURFACE MEASURING 610 X 1520

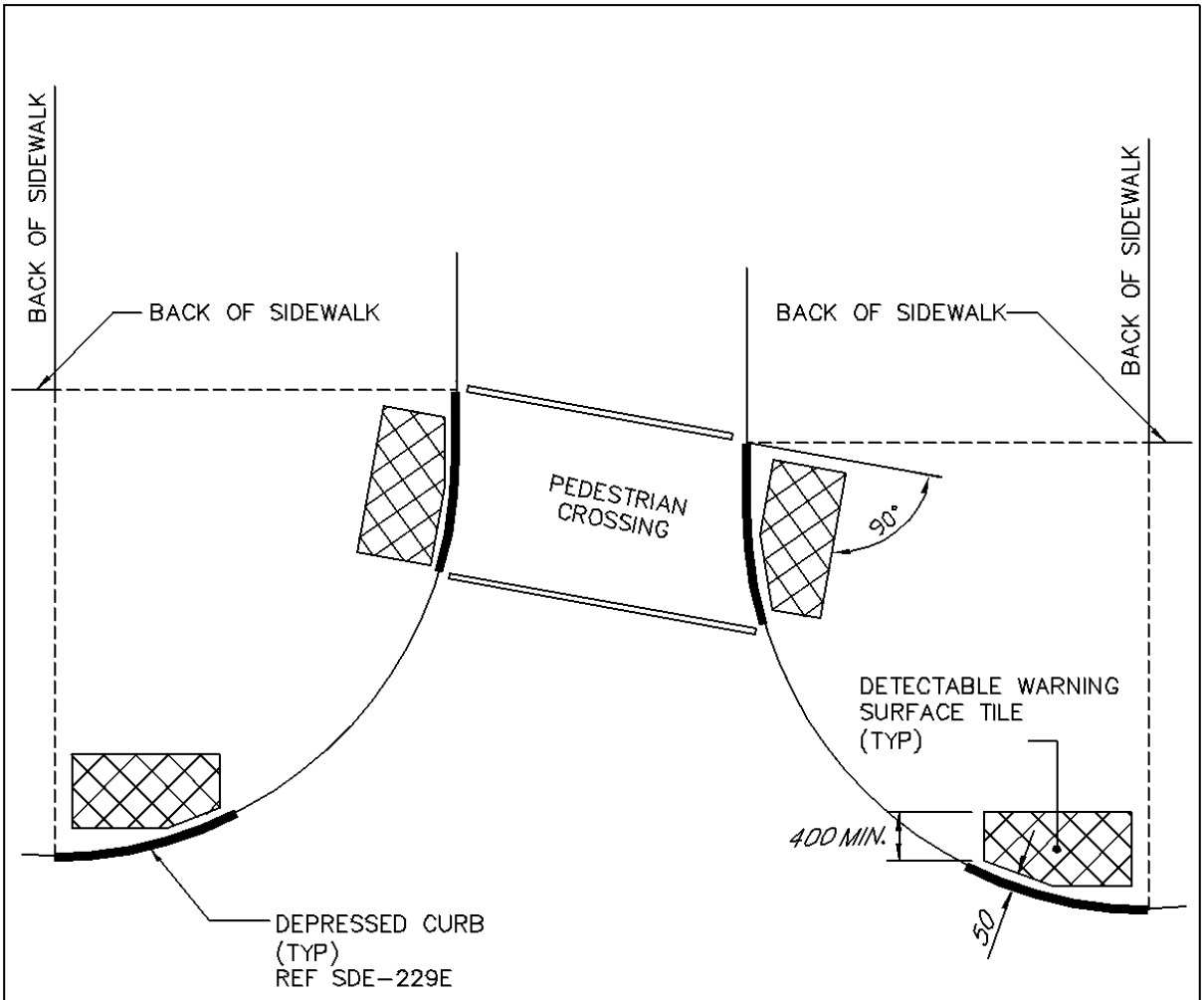
DIMENSIONS ARE IN MILLIMETRES

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Reference Spec. No.
CW 3235, CW 3310, CW 3325
E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE

DETECTABLE WARNING SURFACE IN CURB RAMPS FOR INTERSECTIONS

Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229AA
Approved:		



NOTES:

1. LOCATE GRATINGS, ACCESS COVERS AND OTHER APPURTENANCES OUTSIDE OF CURB RAMPS, DEPRESSED CURBS, CLEAR SPACE LANDINGS AND GUTTERS AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
2. LOCATE END OF DEPRESSED CURB IN LINE WITH PROJECTED BACK OF SIDEWALK.

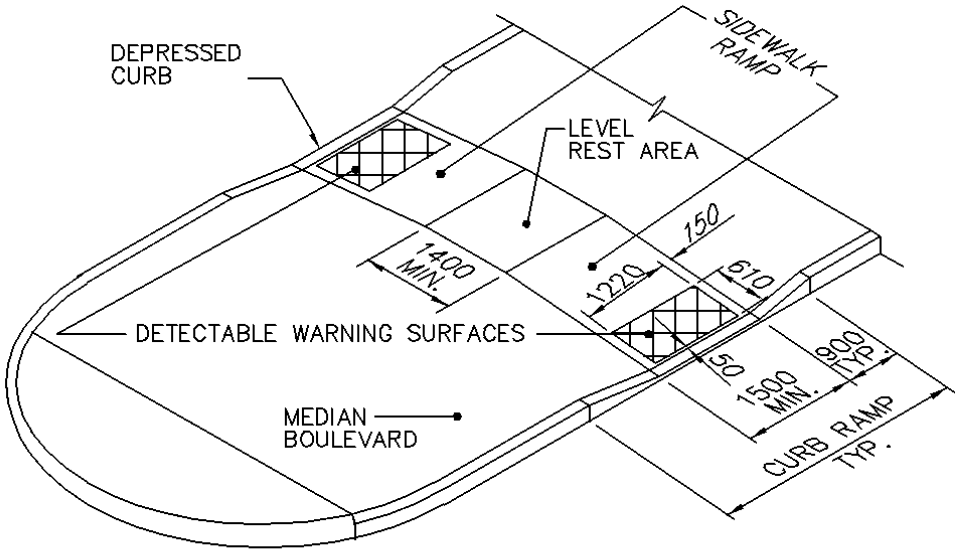
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Reference Spec. No.
CW 3235, CW 3310, CW 3325
E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE

DIMENSIONS ARE IN MILLIMETRES

CURB RAMP LAYOUT
FOR OFFSET INTERSECTIONS

Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229AB
Approved:		



MEDIAN SIDEWALK CROSSING

(REF. SD-229B)

NOTE:

1. FOR NARROW MEDIANS AND REFUGE ISLANDS < 1.32m IN WIDTH, PLACE DETECTABLE WARNING SURFACE FULL WIDTH, MAINTAINING 50mm SPACING FROM BACK OF CURB.

2. DETECTABLE WARNING SURFACE SHALL NOT BE PLACED AT PRIVATE APPROACHES OR ALLEYS.

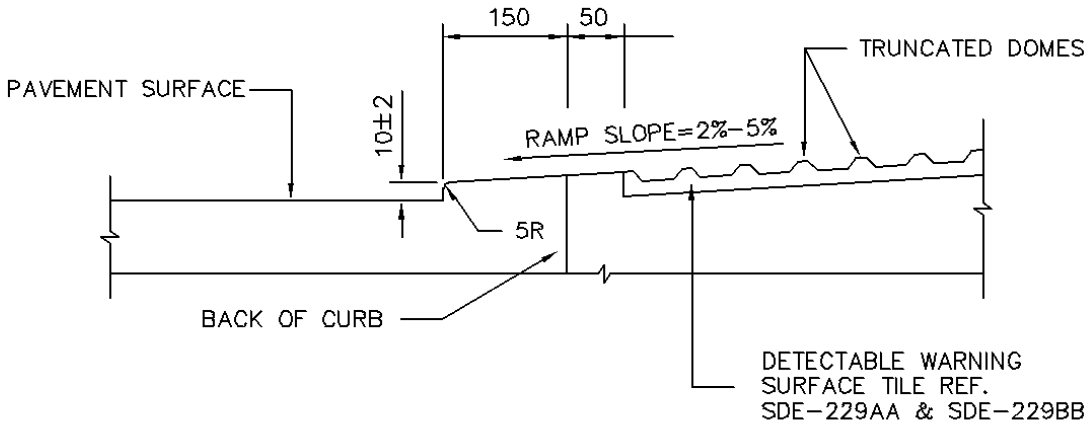
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

Reference Spec. No.
CW 3235, CW 3310, CW 3325
E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE

DIMENSIONS ARE IN MILLIMETRES

DETECTABLE WARNING SURFACE IN CURB RAMPS FOR MEDIANS

Designed By:	Drawn By:	Scale :
B.P.	T.G.A.	N.T.S.
Checked By:	Date:	Drawing No.
F.W.C.	10-12-18	
Approved:		SDE-229BB



DEPRESSED CURB

NOTES:

1) SIDEWALK RAMP SURFACE SHALL BE GIVEN A PARALLEL TEXTURED BROOM FINISH.
2) INSTALL DETECTABLE WARNING SURFACE SO THAT THE TOP OF THE TRUNCATED DOMES ARE FLUSH WITH THE SURFACE FO THE ADJACENT SIDEWALK.

THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT			
Reference Spec. No. CW 3235, CW 3310, CW 3325 E–SUPPLY & INSTALL DETECTABLE WARNING SURFACE	DIMENSIONS ARE IN MILLIMETRES		
CURB RAMP DEPRESSED CURB	Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
	Checked By: F.W.C.	Date: 10–02–18	Drawing No. SDE–229E
	Approved:		

Manufacturer's Installation Manual
Armor-Tile Cast In Place
Inline Dome Detectable/Tactile Warning Surface Tile

A. During Cast In Place Detectable/Tactile Warning Surface Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

B. The specifications of the structural embedment flange system and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers. Not recommended for asphalt applications.

C. The physical characteristics of the concrete shall be consistent with the contract specifications ~~while maintaining a slump range of 4 - 7 to permit solid placement of the Cast In Place Detectable/Tactile Warning Surface Tile system.~~ An overly wet mix will cause the tile to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (25 lb) shall be placed on each tile.

D. Prior to placement of the Cast In Place Detectable/Tactile Warning Surface Tile system, the contract drawings shall be reviewed.

E. The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, 25 lb. weights, and a large non-marring rubber mallet are specific to the installation of the Cast In Place Detectable/Tactile Warning Surface Tile system. A vibrating mechanism such as that manufactured by Vibco can be employed, if desired. The vibrating unit should be fixed to a soft base such as wood, at least 1 foot square.

F. The factory-installed plastic sheeting must remain in place during the entire installation process to prevent the splashing of concrete onto the finished surface of the tile.

G. When preparing to set the tile, it is important that NO concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids under the tile. Holes in the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each embedment flange on the underside of the tile. This will lock the tile solidly into the cured concrete.

H. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved. The tile shall be placed in accordance with the contract drawings. The Cast In Place Detectable/Tactile Warning Surface Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The embedment process should not be accomplished by stepping on the tile as this may cause uneven setting which can result in air voids under the tile surface. ~~The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.~~

I. In cold weather climates it is recommended that the Cast In Place Detectable/Tactile Warning Surface Tiles be set deeper such that the top of domes are level to the adjacent concrete on the top and sides of ramp and that the base of domes to allow water drainage. This installation will reduce the possibility of damage due to snow clearing operations.

J. Immediately after placement, the tile elevation is to be checked to adjacent concrete. The elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates.

K. While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.

L. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external force placed on the tile that may rock the tile causing a void between the underside of tile and concrete.

M. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 25 lb each shall be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.

N. Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.

O. If desired, individual tiles can be bolted together using ¼ inch or equivalent hardware. This can help to ensure that adjacent tiles are flush to each other during the installation process. Tape or caulking can be placed on the underside of the bolted butt joint to ensure that concrete does not rise up between the tiles during installation. Any protective plastic wrap which was peeled back to facilitate bolting or cutting, should be replaced and taped to ensure that the tile surface remains free of concrete during the installation process.

P. Tiles can be cut to custom sizes, or to make a radius, using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.

~~Q. Any sound-amplifying plates on the underside of the tile, which are dislodged during handling or cutting, should be replaced and secured with construction adhesive. The air gap created between these plates and the bottom of the tile is important in preserving the detectability properties of the Armor-Tile system as required in various jurisdictions.~~

E7. ELECTRICAL WORK

E7.1 The Contractor shall:

(a) Perform all Work in accordance with the Plans, Specifications and the latest edition of the City of Winnipeg Electrical Code.

(b) Arrange and pay for all required electrical permits, inspections, fees required.

E7.2 Scope

(a) Install underground 120/240VAC service to new control panel. Work shall include all trenching, cabling and backfilling.

(b) Supply and install custom control panel as indicated on Drawings.

(c) Supply and install radar level sensors, including all conduit, trenching and backfilling.

(d) Wire and connect valve actuator, including all conduit, trenching and backfilling.

(e) Setup and calibration of valve actuator and level sensors.

(f) Commissioning.

E7.3 Area Classification

(a) The manholes are classified as Class 1, Zone 1.

(b) All work and materials inside the manholes shall meet the requirements for the area classification.

E7.4 Submittals

(a) Submit shop drawings for the following:

(i) Custom control panel and all components.

(ii) Level transmitters.

E7.5 Quality Assurance

(a) Qualifications: electrical work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license in accordance with authorities having jurisdiction as per the conditions of Provincial Act respecting manpower vocational training and qualification.

E7.6 Permits, Fees and Inspection

(a) Submit to Electrical Inspection Department and Supply Authority necessary number of drawings and specifications for examination and approval prior to commencement of Work.

(b) Pay associated fees.

(c) Contract Administrator will provide Drawings and Specifications required by Electrical Inspection Department and Supply Authority at no cost.

(d) Notify Contract Administrator of changes required by Electrical Inspection Department prior to making changes.

(e) Furnish Certificates of Acceptance from authorities having jurisdiction on completion of Work to Contract Administrator.

E7.7 System Start-up

(a) Instruct Contract Administrator and operating personnel in operation, care and maintenance of systems, system equipment and components.

(b) Arrange and pay for services of Manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.

(c) Arrange and pay for services of an instrumentation technician to check, adjust, balance and calibrate components and instruct operating personnel.

(d) Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant will aspects of its care and operation.

E7.8 Materials and Equipment

(a) Material and equipment to be CSA certified.

(b) Material and equipment shall be new and free from all defects.

(c) Factory assembled control panels and component assemblies.

E7.9 Grounding

(a) Supply and install complete grounding system consisting of 3m copper clad ground rods, ground cable, ground bus and inter-connections to provide a complete system. Measured resistance to ground of the network shall not exceed 5 ohms.

(b) All above ground conductors shall be green insulated.

E7.10 Conduits

(a) Excavation, bedding and backfill to CW 2030.

(b) Epoxy coated conduit to CSA C22.2 No. 45, with zinc coating and corrosion resistant epoxy finish inside and outside shall be used for raceway from control panel to manholes.

(c) Epoxy coated conduit fittings.

(d) Conduits shall be installed a minimum of 900mm below grade. Conduit shall be installed on a 100mm deep bed of sand and covered with 100 mm of sand. Marking tape shall be installed directly above conduit at 450 mm below grade.

(e) Install dedicated insulated #12 awg copper ground conductor in each conduit.

E7.11 Cabling

(a) TECK Cable for electrical service.

(b) Instrumentation Cable: 16 awg, twisted pair, braided shield, 300V insulation. Direct burial rated.

(c) Power Cable: Minimum #12 awg, stranded copper, 300V insulation. Direct burial rated.

E7.12 Installation of Cables in Ducts

(a) Install cables as indicated on Drawings in ducts.

(b) Do not pull spliced cables inside ducts.

(c) Install multiple cables in duct simultaneously.

(d) Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

(e) After installation of cables, seal duct ends with duct sealing compound.

E7.13 Custom Control Panel

(a) Manufactured by Manco Control Systems or Celco Control Systems.

(b) Panel as indicated on Plans.

(c) Provide shop drawings including panel layout, component cutsheets, etc.

(d) Terminal blocks shall be Weidmuller W Series.

(e) Identification of terminal strips and wiring.

(f) Install panel securely on 150mm by 150mm pressure treated posts and aluminum unitstrut. Posts shall be extend a minimum of 1500mm below grade

(g) All field wiring shall be labelled and terminated on terminal strips.

E7.14 PLC

(a) Control Microsystems SCADAPack 334.

(b) Provide basic configuration for IP address, analog scaling, I/O base address assignment.

(c) Confirm communications via Cellular radio

(d) Programming by others.

E7.15 Cellular radio

(a) Ethernet radio using MTS cellular network.

(b) Provide all accessories including external antenna, antenna surge protector, and cabling.

E7.16 Ethernet Switch

(a) Industrial rated, DIN rail mounted, 5 port 10/100 unmanaged Ethernet switch.

E7.17 Level Transmitters

(a) Siemens Sitrans LR200 radar level transmitter, complete with integral display.

(b) HART communication for diagnostics.

(c) CSA Class 1, Zone 1 rated.

(d) Mount instruments securely using 316 stainless steel materials.

(e) Instruments shall be located/mounted to allow access from manhole opening without entering space.

(f) Level instruments shall be mounted to minimize interference of objects in manhole.

(g) Calibrate level instruments to block signals from interfering objects.

(h) Supply and install cable kelm grips to support cables inside manholes.

E7.18 Valve Actuator Installation

(a) Mount instruments securely using 316 stainless steel materials.

(b) Supply and install cable kelm grips to support cables inside manholes.

(c) Provide calibration and commissioning services.

E7.19 Measurement and Payment

(a) Electrical Work shall be measured and paid for on a lump sum basis and shall include the supply and installation of all wiring, cabling, conduit, control panels, PLC, level transmitters, cellular radio, Ethernet switch, permits ,fees, setup and calibration of actuator and level transmitters, and commissioning.