



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 55-2008**

**INSTALLATION OF CATHODIC PROTECTION MONITORING STATIONS AND  
ANODES ON CAST-IRON WATERMAINS, 2008 PROGRAM, AREAS AF AG AJ –  
CONTRACT NO. 10**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 INSTALLATION OF CATHODIC PROTECTION MONITORING STATIONS AND ANODES ON CAST-IRON WATERMAINS, 2008 PROGRAM, AREAS AF AG AJ – CONTRACT NO. 10

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, April 3, 2008.

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 D3.1.

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

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

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

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

### **B5. ADDENDA**

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

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

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

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

## **B7. BID COMPONENTS**

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
  - (c) Form G1: Bid Bond and Agreement to Bond, or Form G2: Irrevocable Standby Letter of Credit and Undertaking, or a certified cheque or draft;
- B7.2 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, may result in the Bid being determined to be non-responsive.
- 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 Branch  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1

## **B8. BID**

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.
- B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, his name shall be inserted;
  - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
  - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
  - (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
  - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
  - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
  - (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid shall be printed below such signatures.
- B8.4.2 All signatures should be witnessed, except where a corporate seal has been affixed.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

## **B9. PRICES**

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

## **B10. QUALIFICATION**

- B10.1 The Bidder shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; 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 Branch internet site at <http://www.winnipeg.ca/matmgt>).
- 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 three (3) 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 Branch internet site 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, and shall be witnessed or sealed as required.

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 Branch, or in such other office as may be designated by the Manager of Materials.

B12.1.1 Bidders or their representatives may attend.

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

B12.2 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 Branch internet site at <http://www.winnipeg.ca/matmgt>.

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

B12.4 The Bidder is advised that any information contained in any Bid 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 (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.

## **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 Subject to B16.2, 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.

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 Branch internet site at <http://www.winnipeg.ca/matmgt>.
- 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 installation of cathodic protection anodes and monitoring stations on cast-iron and ductile iron watermains in various locations.

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

- (a) Hole excavation;
- (b) Welding of leads to cast-iron watermains;
- (c) Installation of anodes and watermains;
- (d) Backfilling of hole excavations and;
- (e) Restoration of boulevard areas.

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

D3.1 The Contract Administrator is:

Mr. Stacy Cournoyer, P. Eng.  
Design Engineer  
110-1199 Pacific Avenue, Wpg., MB, R3E 3S8  
Telephone No. (204) 986-2142  
Facsimile No. (204) 986-5345

D3.2 At the pre-construction meeting, the Contract Administrator will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

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

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

#### **D5. NOTICES**

D5.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

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

D5.3 All notices of appeal to the Chief Administrative Officer shall be sent to the following address or facsimile number:

The City of Winnipeg

Chief Administrative Officer Secretariat  
Attn: Chief Administrative Officer  
Administration Building, 3rd Floor  
510 Main Street  
Winnipeg MB R3B 1B9  
Facsimile No.: (204) 949-1174

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

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

## **D6. FURNISHING OF DOCUMENTS**

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

## **SUBMISSIONS**

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

- D7.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

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

- D8.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D8.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

### **D9. INSURANCE**

- D9.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;

- (b) automobile liability insurance for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00) at all times during the performance of the Work and until the date of Total Performance;
- (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.

D9.2 Deductibles shall be borne by the Contractor.

D9.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.

D9.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator.

## **D10. PERFORMANCE SECURITY**

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

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

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

D10.2 If the bid security provided in his Bid was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

## **D11. DETAILED WORK SCHEDULE**

D11.1 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 C:4.1 for the return of the executed Contract.

D11.2 The detailed work schedule shall consist of the following:

- (a) a Gantt chart for the Work;  
acceptable to the Contract Administrator.

D11.3 Further to D11.2(a), the Gantt chart shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work. The Gantt chart shall show the time on a weekly basis, required to carry out the Work at each location. The time shall be on the horizontal axis, and the Work at each location on the vertical axis.

## **D12. SECURITY CLEARANCE**

- D12.1 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.
- D12.2 Prior to the commencement of any Work specified in D12.1, 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.
- D12.3 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 D12.1.
- D12.4 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.
- D12.5 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 D12.1.

## **SCHEDULE OF WORK**

### **D13. COMMENCEMENT**

- D13.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.
- D13.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
    - (i) evidence of authority to carry on business specified in D7;
    - (ii) evidence of the workers compensation coverage specified in C6.15;
    - (iii) the Safe Work Plan specified in D8;
    - (iv) evidence of the insurance specified in D9;
    - (v) the performance security specified in D10;
    - (vi) the detailed work schedule specified in D11; and
    - (vii) the security clearances specified in D12.
  - (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.
- D13.2.1 Further to D13.2(a)(vii), subject to all other requirements being met, the Contractor may commence Work that does not require contact with residents or homeowners or entrance in to private property prior to submitting the security clearances.
- D13.3 The Contractor shall commence the Work on the Site at such a date that will allow for the achievement of Substantial Performance by the date specified in D14, taking in to account days where work cannot be performed due to adverse weather conditions.

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

- D14.1 The Contractor shall achieve Substantial Performance within fifty (50) consecutive Working Days of the commencement of the Work as specified in D13 or by May 23, 2008 whichever occurs first.
- D14.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.
- D14.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

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

- D15.1 The Contractor shall achieve Total Performance by June 13, 2008.
- D15.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.
- D15.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

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

- D16.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City one-thousand dollars (\$1000) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.
- D16.2 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City three-hundred dollars (\$300) per Working Day for each and every Working Day following the day fixed herein for Total Performance during which such failure continues.
- D16.3 The amounts specified for liquidated damages in D15.1 and D15.2 are based on genuine pre-estimates of the City's damages in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.
- D16.4 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

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

- D17.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
- (a) Landscape maintenance as specified in CW 3510.
- D17.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be



completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

## **CONTROL OF WORK**

### **D18. JOB MEETINGS**

- D18.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D18.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

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

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

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

- D20.1 Traffic control shall be carried out in accordance with Section 3.7 of CW 1130 of the General Requirements.
- D20.2 Further to D20.1, should the Contract Administrator require that Work on Regional Streets be carried out at night, on Sundays, on public holidays or that Work be restricted or suspended during peak traffic hours, the Contractor shall comply without additional compensation being considered to meet these requirements.
- D20.3 Construction activities on Regional Streets shall be restricted to the closed lanes between 07:00 to 09:00 hours and 15:30 to 17:30 hours Monday to Friday and other hours as directed by the Contract Administrator.
- D20.4 The Contractor will have access to the open lanes of traffic during non-restricted hours provided flag persons are used in accordance with Section 3.12 of The City of Winnipeg, "Manual of Temporary Traffic Control in Work Areas on City Streets" to maintain traffic safety.
- D20.5 Further to Section 3.6 of CW 1130 of the General Requirements, the Contractor shall maintain safe pedestrian crossing at intersections at all times. If possible, only one pedestrian crossing at an intersection is to be blocked by construction at any one time. If more than one pedestrian crossing is blocked by construction at an intersection at the same time the Contractor shall provide flag persons to safely escort pedestrians across the intersection. The Contractor shall leave pedestrian crossing locations safe and free of equipment that may hamper pedestrians when no construction activities are being performed at a particular crossing location.
- D20.6 The Contractor shall not park company or private vehicles inside the barricaded work zone in a manner that will block sightlines for vehicles and pedestrians approaching and crossing intersections.

## **MEASUREMENT AND PAYMENT**

### **D21. PAYMENT**

D21.1 Further to C12, effective January 1, 2007 the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

## **WARRANTY**

### **D22. WARRANTY**

D22.1 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

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

D22.1.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

**FORM H1: PERFORMANCE BOND**  
(See D10)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

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

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

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

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, for:

BID OPPORTUNITY NO. 55-2008

INSTALLATION OF CATHODIC PROTECTION MONITORING STATIONS AND ANODES ON CAST-IRON WATERMANS, 2008 PROGRAM, AREAS AF AG AJ – CONTRACT NO. 10

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

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

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

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

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

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

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

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

\_\_\_\_\_  
(Witness)

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

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

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

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

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

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

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

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 55-2008

INSTALLATION OF CATHODIC PROTECTION MONITORING STATIONS AND ANODES ON CAST-IRON WATERMAINS, 2008 PROGRAM, AREAS AF AG AJ – CONTRACT NO. 10

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)

## 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 Branch internet site at <http://www.winnipeg.ca/matmgt>.
- E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
	Cover Sheet
D-10906	Bronstone Blvd - West Fernwood Ave To St. Mary's Rd West Fernwood Ave - Dunkirk Dr To St. Mary's Rd Westdale Pl - West Fernwood Ave To St. Mary's Rd Norberry Dr - Dunkirk Dr To St. Mary's Rd
D-10907	Glen Ave - 110.0 W Of St. Mary's Rd To St. Mary's Rd Nichol Ave - Killarney St To St. Mary's Rd Nichol Ave - Dunkirk Dr To 70.0 E Of Dunkirk Dr
D-10908	Pulberry St - Bethune Wy To St. Michael Rd Parkville Dr - Pulberry St To St. Mary's Rd
D-10909	River Rd - Falconer By To Kilmarnock By Falconer By - River Rd To River Rd Kilmarnock By - River Rd To River Rd River Rd - St. Vital Rd To River Park Cs Darwin St - Arden Ave To Bethune Wy River Park Cs - River Rd To End
D-10910	Iowa St - Abbotsford Cr To Greenwood Ave Wyoming St - Vista Ave To Woodydell Ave Vista Ave - Wyoming St To End Hazelwood Cr - Iowa St To 30.0 E Of Iowa St Woodydell Ave - Iowa St To Wyoming St Iowa St - Hazelwood Cr To Vista Ave Iowa St - Woodydell Ave To Vista Ave
D-10911	Blue Spruce Cr - At Weeping Willow Dr Riel Ave - Winslow Dr To Minnetonka St Minnetonka St - Blue Spruce Cr To Riel Ave Millfield Dr - Millfield Dr To Minnetonka St Cromer By - Avalon Rd To End Darwin St - Bright Oaks By To Riel Ave
D-10912	Vista Ave - St. Marys Rd To Novavista Dr Vista Ave - Novavista Dr To Wisconsin St Woodlawn Ave - Minnetonka St To Bramton St Woodlawn Ave - Bramton St To St. Marys Rd

- D-10913 Grendell Ave - Glen throne Cr To St. Marys Rd  
River Rd - Grendell Ave To Nicollet Ave  
Nicollet Ave - River Rd To Darwin St
- D-10914 Dells Cr - Hazelwood Ave To Hazelwood Ave  
Wales Ave - Dakota St To Wakopa St  
Greenwood Ave - Dakota St To Dells Cr  
Hazelwood Ave - Dakota St To Dells Cr  
Dells Cr - Wales Ave To Greenwood Ave  
Wakopa St - Greenwood Ave To Hazelwood Ave
- D-10915 Olivewood Cr - Bernadette Ave To Willowmeade Cr  
Ashworth St - Sterling Ave To Knightsbridge Dr  
Meadowood Dr - Knightsbridge Dr To St. Annes Rd  
Gascon Rd - Forrester Ave To Wales Ave
- D-10916 Exploratory Holes (Provisional Anodes and Monitoring Stations)  
Hollyhock Rd - Bernadette Ave To Willowmeade Cr  
Brentford Rd - Willowmeade Cr To Meadowood Dr  
Brentford Rd - Wales Ave To Greenwood Ave
- D-10917 Exploratory Holes (Provisional Anodes and Monitoring Stations)  
Sandralin By - At Avalon Rd To End  
Warrendale PI - At Avalon Rd To End
- D-07799 Detail Sheet

## **E2. PROVISIONAL ITEMS**

- E2.1 The Provisional Items listed in the Schedule of Prices are a part of the Contract.
- E2.2 The Contractor shall not perform Work included in the Provisional Items without prior authorization from the Contract Administrator. All Work included in the Provisional Items will be carried out within the construction areas shown on the Drawings.
- E2.3 Notwithstanding C7, the City reserves the right to diminish all or any portion of the Items of Work listed in the Provisional Items and no claim shall be made for damages on grounds of loss of anticipated profit or for any other reason.

## **E3. PROTECTION OF EXISTING TREES**

- E3.1 The Contractor shall take the following precautionary steps to avoid damage from his construction activities to existing boulevard trees within the limits of the construction area:
- (a) Do not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
  - (b) Strap mature tree trunks with 25 x 150 x 2400 wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.
  - (c) Excavations shall be located and carried out in a manner to minimize damage to existing root systems. Where roots must be cut to facilitate an excavation they shall be neatly pruned at the face of the excavation.
  - (d) Work on site shall be carried out in a manner to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch.
  - (e) American elm trees shall not be pruned between April 1<sup>st</sup> and August 1<sup>st</sup> and Siberian elm trees between April 1<sup>st</sup> and July 1<sup>st</sup> of any year under provisions of The Dutch Elm Disease Act.
- E3.2 All damage to existing trees due to the Contractor's construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Public Works Department, Forestry Branch.



E3.3 No separate measurement or payment will be made for protection of trees.

#### **E4. CATHODIC PROTECTION OF CAST-IRON AND DUCTILE IRON WATERMAINS**

##### E4.1 Description

E4.1.1 This specification covers installation of anodes and monitoring stations and related work for cathodic protection of cast iron and ductile iron watermains.

##### E4.2 Materials

E4.2.1 The City of Winnipeg will supply the following material for this work:

- (a) Monitoring stations complete with box, lid, PVC pipe, No. 8 AWG cables, steel studs, terminal board, terminal lug connectors and electrical shunts.
- (b) 40 kilogram zinc anodes, bare and packaged complete with anode lead cable.
- (c) Bagged gypsum backfill.
- (d) No. 10 AWG insulated copper watermain lead cables complete with steel studs.
- (e) Cable warning tape.
- (f) C-Tap copper connectors colour key – grey.
- (g) Sand backfill: to CW 2030.

##### E4.3 Construction Methods

###### E4.3.1 Pick Up of Materials Supplied by City

- (a) Make arrangement with Contract Administrator and provide necessary equipment to pick up and load material supplied by the City from the storage facility identified in the construction specifications and deliver to the work site. Contractor will be restricted to one (1) pick up per day between 9:00 a.m. and 4:00 p.m. Monday to Friday.
- (b) Bring to Contract Administrator's attention any material that is in a damaged condition at the time of pick up at the storage facility and acknowledge in writing the quantity and condition of material taken.
- (c) Replace material that is lost or damaged after pick up until acceptably installed. Store materials that can be damaged by exposure to the elements in a clean, dry enclosure.
- (d) Anode lead cables removed from the storage facility by the Contractor must be individually tightly coiled before being accepted as returned. The returned cables must be packaged with no more than 100 cables per box.
- (e) Handle anodes by the body only.

###### E4.3.2 Excavation Equipment

- (a) Use hydro excavation and power auger equipment boom mounted to a loader, backhoe or truck capable of excavating a neat vertical hole having a minimum diameter of 150 millimetres and a maximum diameter of 300 millimetres plumb and true to a maximum depth of 3.6 metres.

###### E4.3.3 Grinding Equipment

- (a) Grinding equipment to be capable of removing surface coatings and graphitized layer on cast iron and ductile iron watermain pipes while operating in a hole of the specified size and depth.

###### E4.3.4 Welding Equipment

- (a) Nelson or TRW Miller capable of outputting 450 to 500 Amps while welding.

###### E4.3.5 Watermain and Water Service Location Equipment

- (a) Electronic locating equipment to be capable of locating cast iron and ductile watermains and copper and lead water services pipes within +/- 0.50 metres.

#### E4.3.6 Monitoring Station and Anode Layout

- (a) Layout monitoring station and anode locations with marking paint on boulevard or curb after existing utilities have been marked out and review with Contract Administrator before excavating holes. Monitoring station and anode locations shown on construction drawings are for general reference only and will be adjusted depending on locations of existing utilities.
- (b) Locate monitoring stations and anodes as follows.
  - (i) 600 millimetres from a water service or watermain valve.
  - (ii) One metre from base of a tree.
  - (iii) Clear of sidewalks, street pavement, driveways and utilities.
- (c) Space monitoring stations a minimum of 100 metres and maximum of 150 metres apart in multiples of the "Maximum Anode Spacing" chart shown on the construction drawings for the existing watermain diameter found during watermain verification.
- (d) Space anodes in accordance with the "Maximum Anode Spacing" chart shown on the construction drawings for existing watermain diameter found during the watermain verification process.
- (e) Offset anodes a minimum of 1000 millimetres from watermains except where in conflict with a utility or pavement alignment as shown on Detail Drawing D-7799.
- (f) Offset anodes in conflict with utilities a minimum of 300 millimetres from watermains as shown on Detail Drawing D-7799 for "Alternative Anode Layout". Obtain approval from Contract Administrator before using "Alternative Anode Layout".
- (g) Bank multiple anodes as shown on Detail Drawing D-7799 for 300 millimetre diameter watermains and on one or both sides of pavement when an anode or several anodes would be located under pavement with the normal spacing indicated for the watermain size.

#### E4.3.7 Exposing Existing Utilities

- (a) Expose existing utilities by a means acceptable to that utility where watermain or anode hole is located within a utility "hand dig" zone.

#### E4.3.8 Watermain Verification

- (a) Watermain verification is to be done before excavating watermain and anode installation holes for all proposed watermains for cathodic protection.
- (b) Hydro excavate watermain verification holes on the alignments shown on the construction drawings +/- 0.50 metres and to a depth of up to 3.3 metres to determine location, depth, size and type of existing watermain. Holes excavated beyond these limits will be considered exploratory holes and require approval from the Contract Administrator before excavating.

#### E4.3.9 Watermain and Anode Hole Excavation

- (a) Excavate the watermain and anode holes from pavement areas only in a manner that will not damage boulevards, tree trunks and branches.
- (b) Watermain holes to be maximum 300 millimetre diameter. Anode holes to be maximum 150 millimetre diameter.
- (c) Excavate watermain holes to top of watermain using hydro excavation methods or by augering to within 600 millimetres of the top of the watermain and hydro excavating the remaining 600 millimetres.
- (d) Excavate anode holes to the required depth using hydro excavation or power augering methods.
- (e) Angle excavate watermain holes from the boulevard at locations where the watermain is under pavement and is within 0.5 metres from the back of curb.
- (f) Hydro excavate exploratory holes 150 millimetres in diameter at various locations as directed and approved by the Contract Administrator.

- (g) Excavate holes a maximum of one block ahead of the anode installation. Cover holes in a safe manner approved by the Contract Administrator until anode installation starts.
- (h) Temporarily backfill holes to the surface with sand when anode and monitoring installation will not be completed the same day as holes are excavated.

#### E4.3.10 Exploratory Holes

- (a) Hydro excavate watermain exploratory holes on the alignments +/- 0.50 metres for the watermains shown on Drawings D-10916 and D-10917, and to a depth of up to 3.3 metres to determine the material of the existing watermain.
- (b) If the watermain is determined to be cast-iron or ductile iron, install cathodic protection anodes and monitoring stations at the locations shown on the drawings or as directed by the Contract Administrator, and in accordance with this specification.

#### E4.3.11 Monitoring Station and Anode Installation

- (a) Complete the installation of monitoring stations before installing anodes.
- (b) Install anodes and monitoring stations as shown on Detail Drawing D-7799.
- (c) Ensure minimum depth from top of anode to grade is 2.1 metres.
- (d) Pull anode and watermain lead cables into monitoring station and leave enough slack in cables to allow connection to terminal board at a later date by others.
- (e) Allow a minimum of five (5) calendar days after the installation of the monitoring stations for the completion of a close potential (baseline) survey by others before starting anode installation.
- (f) Monitoring stations must be confirmed by the Contract Administrator to be operational before anode installation starts.
- (g) Install bare anodes in anode hole locations. Install packaged anodes at watermain/sewer service repair locations.

#### E4.3.12 Anode and Monitoring Station Lead Cable Attachment

- (a) Preparation of Watermain
  - (i) Expose top half of the watermain and remove standing water in the hole before grinding. Remove coatings, dirt, grime, grease and graphitized layer of pipe from the watermain at the stud weld location using approved grinding equipment. Continue grinding until the pipe surface is clean and bare metal free of serious pits and flaws is visible.

#### E4.3.13 Attachment of Watermain Lead Cable to Pipe

- (a) Obtain approval from the Contract Administrator that the watermain is properly cleaned before welding the lead cable to the watermain.
- (b) Attach two (2) copper stranded No. 10 AWG cables, colour coded black, a minimum of 100 millimetres apart to the watermain at each anode location by stud welding.
- (c) Attach two (2) copper stranded No. 8 AWG cables, non-black in colour, a minimum of 100 millimetres apart to the watermain at each monitoring station location by stud welding.
- (d) Locate stud welds on the top portion of the watermain as shown on Detail Drawing D-7799.
- (e) Attach only one cable per weld.
- (f) Perform stud welding using standard welding techniques and practices recommended by Nelson and TRW Miller. Repeat unsuccessful welds a maximum of three (3) times at the same location. Repeat grinding of watermain and welding at a new location within the same hole a minimum of 100 millimetres away after three (3) failed welding attempts at the same location.

#### E4.3.14 Testing of Welds

- (a) Test weld connection strength by a strong pull of approximately one half (1/2) kN on the watermain lead cable after the weld has cooled and before backfilling,. Re-weld and re-test welds failing pull test. Repeat until weld passes pull test.
- (b) Electrical resistance tests will be performed by the Contract Administrator to verify cables are electrically continuous with the watermain after the watermain weld connection is initially backfilled with sand. Remove backfill and re-weld connection if resistance value between the two adjacent leads exceeds 1/2 ohm three to five minutes after completion of the weld.

#### E4.3.15 Monitoring Station Assembly

- (a) Securely fasten the PVC pipe to the bottom of the monitoring station head with a minimum of three (3) self-tapping stainless steel screws as shown on Detail Drawing D-7799.

#### E4.3.16 Connecting Anode and Watermain Lead Cable to the Monitoring Station

- (a) Provide a minimum of 300 millimetres of slack for wires terminating at monitoring stations. Connect terminal lug connectors to the end of the cables as shown on Detail Drawing D-7799 Leave cables in a state to allow connection to the terminal board by others, at a later date.

#### E4.3.17 Splicing Anode Lead Cable to Watermain Lead Cable

- (a) Make a high voltage waterproof underground splice as shown on Detail Drawing D-7799 and as follows.
  - (i) Bring anode and watermain lead cables to surface allowing 600 millimetres of slack in each cable.
  - (ii) Cut cable ends back approximately 300 millimetres, strip ends and connect lead cables with a C Tap (Colour Key Gray) sized for No. 10 AWG cables. Ensure cable ends are completely clean and dry before splicing cables together.
  - (iii) Wrap and seal each individual cable to ensure the splice is completely waterproof and there is no bare copper wire exposed.
  - (iv) Tape and waterproof completed splice as shown on Detail Drawing D-7799.
- (b) At locations selected by Contract Administrator, before backfilling, cut lead wires 50 millimetres on either side of completed splice and provide splice to Contract Administrator for testing. Test samples will be taken from selected locations before backfilling lead cable trench. Re-splice lead cables at locations where test samples were taken from as specified in E4.3.17.
- (c) If testing determines the splice is not waterproof expose, cut out and provide 2 additional completed splices, one either side of the failed sample to the Contract Administrator for testing. Repeat procedure as specified in E4.3.17 until splices are waterproof.

#### E4.3.18 Lead Cable Trench

- (a) Hydro excavate a maximum 200 millimetre wide by 600 millimetre deep trench between the watermain hole and anode hole and place lead cables in bottom of trench. Place cable warning tape in trench from watermain hole to anode hole directly over cables and 300 millimetres below grade.

#### E4.3.19 Repairs to Damaged Lead Cable

- (a) Repair damaged lead cables by making a high voltage waterproof underground splice as shown on Detail Drawing D-7799 and as follows:
  - (i) Cut lead cable with wire cutter only.
  - (ii) Clean lead cable ends with rapid drying solvent that will not leave a residue such as natural spirits.
  - (iii) Remove only enough insulation from lead cables ends to join together.

- (iv) Twist wire strands together and connect with a C Tap of the correct size for the lead cable being spliced.
- (v) Fit heat shrink sleeve over splice and apply heat source to tighten sleeve.

#### E4.3.20 Backfilling Watermain and Anode Holes

- (a) Backfill anode holes initially with 2 bags of powdered gypsum and bentonite blend provided by the City to a minimum thickness of 50 millimetres above the top and below the bottom of the anodes. Provide additional gypsum and bentonite backfill of a type approved by the Contract Administrator required to fill holes excavated larger than 150 millimetres in diameter.
- (b) Pour a minimum of 75 litres of clean potable water into hole to completely saturate the backfill. Add additional water as directed by Contract Administrator.
- (c) Backfill remainder of anode holes, watermain holes and lead cable trenches with sand compacted by flooding to a density equal to the surrounding undisturbed soil. Protect anode and lead cables from damage while backfilling.
- (d) Backfill holes to grade the same day they are excavated.

#### E4.3.21 Restoration

- (a) Restore grassed areas using sod and imported topsoil in accordance with CW3510 or by transplanting the existing grass if it has been neatly removed with roots intact and is undamaged.
- (b) Replace re-used sod with sod and imported topsoil if there is no sign of re-growth within 10 days of transplanting.

### E4.4 Measurement and Payment

#### E4.4.1 Hole Excavation

- (a) Excavation, backfilling and restoration of holes will be measured for payment on a unit basis for each type and paid for at the Contract Unit Price for Items of Work listed. Number of units to be paid for will be total number of units constructed in accordance with this specification as measured and accepted by the Contract Administrator.
- (b) Items of Work
  - (i) Watermain Hole
  - (ii) Anode Hole
  - (iii) Angle Hole
  - (iv) Exploratory Hole
  - (v) Utility Hole
- (c) No payment will be made for excavation of anode holes if the watermain hole was excavated after the anode holes and found not to be cast iron or ductile iron or not in service.
- (d) Watermain verification holes will be included in with the installation of the cathodic protection anodes.

#### E4.4.2 Anode Installation

- (a) Anode installation will be measured for payment on a unit basis and paid for at the Contract Unit Price for "Anode Installation. Number of units to be paid for will be total number of units installed in accordance with this specification as measured and accepted by the Contract Administrator.
- (b) Payment will include repeated attempts to obtain a successful weld.

#### E4.4.3 Completed Splice Test Samples

- (a) Completed splice test samples will be measured for payment on a unit basis and paid for at the Contract Unit Price for "Splice Test Samples". Number of units to be paid for

will be total number of units provided in accordance with this specification as measured and accepted by the Contract Administrator.

- (b) Exposing and providing additional splices for testing due to first sample failing will not be measured for separate payment.

#### E4.4.4 Monitoring Station Assembly

- (a) Assembly of monitoring stations will not be measured for separate payment and will be included in payment for "Monitoring Station Installation".

#### E4.4.5 Monitoring Station Installation

- (a) Installation of monitoring stations will be measured for payment on a unit basis and paid for at the Contact Unit Price for "Monitoring Station Installation". Number of units to be paid for will be total number of units installed in accordance with this specification as measured and accepted by the Contract Administrator.

#### E4.4.6 Lead Cable Trench

- (a) Excavation, backfilling and restoration of lead cable trenches will not be measured for separate payment and will be included in payment for "Hole Excavation".

#### E4.4.7 Restoration

- (a) Restoration of grassed areas will not be measured for separate payment and will be included in payment for "Hole Excavation".

### **E5. EXISTING INFRASTRUCTURE**

#### E5.1 Water Services

E5.1.1 The Contractor shall be responsible to trace and mark all the water services prior to laying out the monitoring station layout anode spacing on each block. The water services on the watermain side of the street shall be marked from the curb stop to the watermain. The water services on the side opposite to the watermain need only be marked from the watermain to the curb on the watermain side.

E5.1.2 Any damage to water services due to the Contractor's construction activities shall be repaired immediately by the Contractor at his expense in accordance with CW 2110.

#### E5.2 Watermain Breaks

E5.2.1 Further to CW 2110, the Contractor shall immediately repair any watermain breaks which may occur during the installation of the monitoring stations and/or anodes. The Contractor shall notify all residents and businesses of the shutdown. If the break must be repaired with a length of PVC pipe, then the Contractor shall install a copper conductivity cable (No. 8 AWG RWU 90) between the metallic pipe ends on either side of the new PVC watermain.

E5.2.2 The cable must be of a type that conforms to E5.4. Connection of the cable ends shall be by the stud welding techniques outlined in E4.3.13. Splices, if required, shall be performed as outlined in E4.3.17. The cost of installing the cable and anode shall be considered incidental to the watermain repair. If the break can be repaired with a stainless steel repair clamp, then the closest anode shall be located a minimum of 300 mm from the edge of the clamp. All anodes installed at a watermain break shall be the packaged type and will be supplied by the City at no expense to the Contractor.

E5.2.3 Should there be three (3) or more watermain breaks occurring along a block, the Contract Administrator may direct the Contractor to move his work crews to the next block. A decision will then be made as to whether that section will be deleted from this Contract. No claims for compensation for work deleted from the Contract in this fashion shall be submitted by the Contractor.

#### E5.3 Sewer Service Repairs

- E5.3.1 In addition to the requirements of CW 2130, connections between proposed and existing pipe shall be made by removing the damaged section of pipe and making plain end to plain end connections with the appropriate approved transition coupling.
- E5.3.2 The Contractor shall be responsible for any sewer service repairs caused by the installation of anodes from this Contract for one year from achieving Total Performance.
- E5.3.3 The Contractor shall begin on-site work on the repair within 24 hours after notification. If the utility clearances have expired, the Contractor shall contact all utilities and arrange for clearances. The Contractor shall begin on-site work within 24 hours of all utilities being marked. On-site work shall be deemed to be full mobilization of equipment to the site and the commencement of excavation operations.
- E5.3.4 If the Contractor cannot repair a sewer service immediately because of utility clearances or any other reason, he shall provide a portable toilet facility for the resident. The portable toilet shall remain on-site until the sewer service is operational. The Contractor shall deliver the portable toilet to the resident, unload, setup in a location agreeable to the resident, keep stocked with toilet paper, and remove when the repair is complete. The toilet shall be cleaned before utilizing it at another location.
- E5.3.5 If an anode is required at the repair location, the Contractor shall place a packaged anode in the excavation parallel to and 1.0 m from the watermain and connect the lead cable as specified in E4.3.13. The Contractor shall splice the anode lead cable to the watermain lead as specified in E4.3.17 ensuring that the cable ends are both dry and clean prior to splicing.
- E5.3.6 Upon completion of the sewer repair and anode installation by the Contractor, the Contract Administrator will inspect the sewer repair, weld and anode installation. The Contractor shall complete the weld in the presence of the Contract Administrator.
- E5.3.7 The Contractor shall not backfill the excavation until the repair has been inspected by the Contract Administrator. The Contractor shall inform the Contract Administrator two hours in advance of when the repair will be complete. If the Contractor will not have the repair complete until after hours, then he shall make arrangements for an inspection with the Contract Administrator before the end of that day for first thing the next Working Day. The Contractor shall leave the excavation in a safe condition overnight.
- E5.3.8 Acceptance criteria for line and grade of the repaired sewer service shall conform to CW 2130 including the requirement that sharp bends shall not be permitted even through adherence to line and grade may be within specified tolerances. In this context this shall include defects such as offsets and misalignment at the point of reconnection to the existing sewer.
- E5.3.9 The Contractor shall not be responsible for defects in existing sewer lines in disrepair unless those defects are a direct result of the Contractor's operation. The Contractor shall notify the Contract Administrator at the time of inspection of any of these defects.
- E5.3.10 If deficiencies are found in the repaired section, the Contractor shall bear all costs of correcting the deficiencies.
- E5.3.11 The Contractor shall rectify all settlement deficiencies before the end of the Warranty period.
- E5.4 Conductivity Cable on Isolated Non-Metallic Watermain Repairs
- E5.4.1 If, during the course of installing anodes, it is determined that a section of no more than 5.0 m of cast iron watermain has been replaced with PVC pipe by others, the Contractor shall connect a copper conductivity cable (No. 8 AWG RWM 90) onto the metallic pipe ends on both sides of the PVC watermain by means of hydro excavation. A trench, maximum 200 mm wide by 600 mm deep, shall be excavated by hydro excavation over the PVC pipe section. The cable leads shall be spliced as outlined in E4.3.17 and shown on the Detailed Drawing D-7799 and shall be placed into the bottom of the trench between the two excavation holes. The Cable Warning tape shall be placed directly over the cable in the trench and watermain holes at a depth of 300 mm below grade.

**E5.5 Method of Measurement and Basis of Payment**

**E5.5.1 Water Service Tracing**

- (a) Water service tracing will be included in the installation of the anodes.

**E5.5.2 Water Service Repairs**

- (a) No measurement or payment will be made for water service repairs.

**E5.5.3 Watermain Repairs**

- (a) Watermain repairs shall be measured and paid for in accordance with CW 2110.

**E5.5.4 Sewer Service Repairs**

- (a) Sewer service repairs shall be measured on a per location basis and paid for at the Contract Unit Price for "Sewer Service Repairs". Amount to be paid for will be the total number of sewer service repairs completed in accordance with this specification, accepted and measured by the Contract Administrator.
- (b) There shall be no measurement or payment made for the placement of anodes, connection of lead cables to watermains and splicing of cables as well as the supply, delivery, placement, maintenance and removal of temporary portable toilets associated with the sewer service repair locations. These items shall be included in the price for the sewer service repair.

**E5.5.5 Conductivity Cable on Isolated Non-Metallic Watermain Repairs**

- (a) The installation of conductivity cable at isolated non-metallic watermain repairs shall be measured on a per location basis.
- (b) Payment shall be made at the Contract Unit Price for "Installation of Cable at Isolated Watermain repairs" for each location. Price shall be payment in full for providing all materials, performing all operations herein described and all other items incidental to the work included in this Specification.
- (c) There shall be no measurement or payment made for the trenching between excavation holes, the connection of lead cables to watermains, splicing of cables, the placement of cable warning tape as well as the backfilling and restoration. These items shall be considered incidental to the work.
- (d) Excavation, backfilling and restoration of excavation holes will be measured and paid for at the Contract Unit Price for the total number of holes excavated as specified in E4.4.1.

**E5.5.6 Restoration**

- (a) There will be no payment for sod restoration. Restoration shall be considered incidental to the water service repairs, watermain repairs, sewer service repairs and the installation of conductivity cable on isolated non-metallic watermain.

**E6. COOPERATION WITH OTHERS**

- E6.1** Further to C6.23, the Contractor's attention is directed to the fact that other Contractors, the personnel of other utilities and the staff of the City may be working in the areas on or adjoining the site. The activities of these agencies may coincide with the Contractor's execution of the Work, and it will be the Contractor's responsibility to cooperate to the fullest extent with personnel working in the area, and such cooperation is an obligation of the Contractor under the terms of this contract.