



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 717-2005**

**2005 OUTFALL MAINTENANCE PROGRAM – OUTFALL REPAIRS**

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## **PART B - BIDDING PROCEDURES**

### **B1. PROJECT TITLE**

B1.1 2005 OUTFALL MAINTENANCE PROGRAM – OUTFALL REPAIRS

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, January 4, 2006.

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

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

### **B3. SITE INVESTIGATION**

B3.1 Further to GC:3.1, the Bidder may view the Site without making an appointment.

B3.2 The Bidder is advised that site investigations should be performed prior to bidding to assess any restrictions to site access. CCTV inspection videotapes of the outfall pipes area available for viewing at the offices of KGS Group. The bidder may make an appointment to view these videotapes with the Contract Administrator.

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

**B6. SUBSTITUTES**

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
  - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
  - (c) identify any anticipated cost or time savings that may be associated with the substitute;
  - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
  - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative shall base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

## **B7. BID SUBMISSION**

- B7.1 The Bid Submission consists of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
  - (c) Form G1: Bid Bond and Agreement to Bond, or  
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or  
a certified cheque or draft.
- B7.2 All components of the Bid Submission shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely in ink, to constitute a responsive Bid.
- B7.3 The Bid Submission shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B7.3.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.
- B7.4 Bid Submissions submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.5 Bid Submissions shall be submitted to:
- The City of Winnipeg  
Corporate Finance Department  
Materials Management Branch  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1

## **B8. BID**

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

- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
  - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
  - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
  - (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid shall be printed below such signatures.
- B8.4.2 All signatures shall be original and shall be witnessed except where a corporate seal has been affixed.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid Submission and the Contract, when awarded, shall be both joint and several.

## **B9. PRICES**

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

## **B10. QUALIFICATION**

- B10.1 The Bidder shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;
  - (b) be responsible and not be suspended, debarred or in default of any obligation to the City;
  - (c) be financially capable of carrying out the terms of the Contract;
  - (d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;
  - (e) have successfully carried out work, similar in nature, scope and value to the Work;
  - (f) employ only Subcontractors who:

- (i) are responsible and not suspended, debarred or in default of any obligation to the City (a list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>); and
    - (ii) have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of performing the Work required to be done in accordance with the terms of the Contract;
  - (g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba);
- B10.2** Further to B10.1(g), the Bidder shall, within three (3) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:
- (a) a valid COR certification number under the Certificate of Recognition (COR) Program - Option 1 administered by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or
  - (b) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association; or
  - (c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.)
- B10.3** The Bidder shall be prepared to submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.
- B10.4** The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

## **B11. BID SECURITY**

- B11.1** The Bidder shall provide bid security in the form of:
- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
  - (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
  - (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.
- B11.1.1** If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.



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

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

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

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

## **B12. OPENING OF BIDS AND RELEASE OF INFORMATION**

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

B12.1.1 Bidders or their representatives may attend.

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

B12.2 After the public opening, the names of the Bidders and their Total Bid Prices as read out (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

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

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

## **B13. IRREVOCABLE BID**

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

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

## **B14. WITHDRAWAL OF BIDS**

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

- B14.1.1 Notwithstanding GC:23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials shall:
- (a) retain the Bid Submission until after the Submission Deadline has elapsed;
  - (b) open the Bid Submission to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
  - (c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.
- B14.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

## **B15. EVALUATION OF BIDS**

- B15.1 Award of the Contract shall be based on the following bid evaluation criteria:
- (a) compliance by the Bidder with the requirements of the Bid Opportunity (pass/fail);
  - (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
  - (c) Total Bid Price;
  - (d) economic analysis of any approved alternative pursuant to B6.
- B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements if the interests of the City so require.
- B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid Submission or in other information required to be submitted, that he is responsible and qualified.
- B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.
- B15.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

## **B16. AWARD OF CONTRACT**

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

- B16.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.
- B16.2.1 Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Work;
  - (b) the prices are materially in excess of the prices received for similar work in the past;
  - (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
  - (d) only one Bid is received; or
  - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.
- B16.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid.

## **PART C - GENERAL CONDITIONS**

### **C1. GENERAL CONDITIONS**

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

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

## PART D - SUPPLEMENTAL CONDITIONS

### GENERAL

#### D1. GENERAL CONDITIONS

- D1.1 In addition to the *General Conditions for Construction Contracts*, these Supplemental Conditions are applicable to the Work of the Contract.
- D1.2 The General Conditions are amended by striking out "The City of Winnipeg Act" wherever it appears in the General Conditions and substituting "The City of Winnipeg Charter".
- D1.3 The General Conditions are amended by striking out "Tender Package" wherever it appears in the General Conditions and substituting "Bid Opportunity".
- D1.4 The General Conditions are amended by striking out "Tender Submission" wherever it appears in the General Conditions and substituting "Bid Submission".
- D1.5 The General Conditions are amended by deleting GC:6.16 and GC:6.17. The City of Winnipeg is now within the jurisdiction of the Manitoba Ombudsman pursuant to The Ombudsman Act.

#### D2. SCOPE OF WORK

- D2.1 The Work to be done under the Contract shall consist of sewer outfall pipe renewal and repairs, outlet erosion protection, debris grating installation and surface restoration .
- D2.2 The major components of the Work are as follows:
- (a) Kennedy Street
    - (i) Remove existing 750mm diameter CMP and replace with 750mm diameter Trenchcoat pipe
    - (ii) Line existing 750mm Diameter CMP with 600mm diameter HDPE pipe
    - (iii) Supply and install 750mm debris grate
    - (iv) Supply and install Geotextile and Riprap
  - (b) Hargrave Street
    - (i) Remove existing 750mm diameter CMP and replace with 750mm diameter Trenchcoat pipe
    - (ii) Line existing 750mm Diameter CMP with 600mm diameter HDPE pipe
    - (iii) Supply and install 750mm debris grate
    - (iv) Supply and install Geotextile and Riprap
  - (c) Cloutier Drive
    - (i) Supply and Assemble 1500mm diameter liner plates and grout voids
    - (ii) Supply and Install 900, 300 and 375mm diameter Saddle plates to connect MH and sewer services to liner plates.
    - (iii) Supply and install 900mm Diameter CSP Riser
    - (iv) Supply and install 1200mm debris grate
  - (d) Dowker Avenue
    - (i) Line existing 900mm CSP with 800mm HDPE pipe
    - (ii) Replace existing 900mm CSP with 900mm Trenchcoat pipe
    - (iii) Supply and install 1200mm debris grate
    - (iv) Supply and install Geotextile and Riprap

- (e) Kildonan Park
  - (i) Supply and Install 250mm PVC pipe using trenchless techniques
  - (ii) Supply and install 300mm CSP
  - (iii) Supply and install Riprap
- (f) Falconer Bay
  - (i) Remove existing 1200mm CSP and replace with new 1200mm CSP with hugger band coupler
  - (ii) Supply and internal slip joint
- (g) Moore Bay
  - (i) Remove existing 1200mm CSP and replace with new 1200mm CSP with hugger band coupler
  - (ii) Supply and internal slip joint
  - (iii) Supply and install 1200mm debris grate
  - (iv) Supply and install Geotextile and Riprap

D2.3 Further to GC 6:12 the Contractor is not required to provide the following permits:

D2.3.1 Winnipeg Waterway Authority Permit

The Contract Administrator is in the process of obtaining the Winnipeg Waterway Authority Permit for the project. Once the permit is obtained the Contract Administrator shall provide the contractor with a copy of the permit for the project and the Contractor shall be governed by the Permit's requirements (relative to locations for stockpiling materials, etc.).

The Contractor is still responsible for the Waterways Construction Access Permit in accordance with section E4.

D2.3.2 DFO Permit

The Contract Administrator is in the process of obtaining the DFO Permit for this project. Once the permit is obtained the City shall provide the Contractor with a copy of the Permit for the project and the Contractor shall be governed by the Permit's requirements.

**D3. CONTRACT ADMINISTRATOR**

D3.1 The Contract Administrator is KGS Group, represented by:

Roy Houston, P.Eng  
Manager of Civil/Municipal Services  
3<sup>rd</sup> Floor- 865 Waverley Street

Telephone No. (204) 896-1209

Facsimile No. (204) 896-0754

D3.2 At the pre-construction meeting, Roy Houston 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 GC:23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.
- 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 attention of the Chief Financial Officer at the following address or facsimile number:
- The City of Winnipeg  
Chief Administrative Officer Secretariat  
Administration Building, 3rd Floor  
510 Main Street  
Winnipeg MB R3B 1B9  
Facsimile No.: (204) 949-1174
- 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  
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. SAFE WORK PLAN**

- D7.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.
- D7.2 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>.

### **D8. INSURANCE**

- D8.1 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) all inclusive, with The City of Winnipeg being added as an additional insured, with a cross-liability clause, such liability policy to also contain a contractual liability, an unlicensed motor vehicle liability and a products and completed operations endorsement to remain in place at all times during the performance of the Work and throughout the warranty period;
- (b) automobile liability insurance for owned and non-owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00) at all times during the performance of the Work and until the date of Total Performance;

D8.2 Deductibles shall be borne by the Contractor.

D8.3 The Contractor shall provide the City Solicitor with a certificate of insurance of each policy, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

D8.4 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.

## **D9. PERFORMANCE SECURITY**

D9.1 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.

D9.1.1 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.

D9.2 If the bid security provided in his Bid Submission was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in GC:4.1 for the return of the executed Contract.

## **D10. SUBCONTRACTOR LIST**

D10.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.

## **D11. SECURITY CLEARANCE**

D11.1 Each individual proposed to perform Work:



- (a) on private property;
- (b) within City facilities other than:
  - (i) an underground structure such as a manhole;
  - (ii) in areas and times normally open to the public;

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

- D11.2 Prior to the commencement of any Work, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform Work within City facilities or on private property.
- D11.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person, will not be permitted to perform any Work within City facilities or on private property.
- D11.4 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.
- D11.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform Work under the Contract within City facilities or on private property.

## **D12. DETAILED WORK SCHEDULE**

- D12.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the GC:4.1 for the return of the executed Contract

## **D13. EMERGENCY CONTACT LIST**

- D13.1 At least two (2) business days prior to the commencement of any Work on the site, the Contractor shall provide the Contract Administrator with a list of emergency phone numbers, including, but not limited to, the nearest hospital from each site, underground services contacts and the supervisor identified in D4 that can be contacted 24 hours a day to respond to an emergency.

## **SCHEDULE OF WORK**

### **D14. COMMENCEMENT**

- D14.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.
- D14.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
    - (i) evidence that the Contractor is in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act

(Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;

- (ii) evidence of the workers compensation coverage specified in GC:6.14;
- (iii) the Safe Work Plan specified in D7;
- (iv) evidence of the insurance specified in D8;
- (v) the performance security specified in D9;
- (vi) the Subcontractor list specified in D10;
- (vii) the security clearances specified in D11;
- (viii) the detailed work schedule specified in D12; and
- (ix) the emergency contact list specified in D13.

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

D14.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

D14.4 The City intends to award this contract by January 23, 2006.

#### **D15. SUBSTANTIAL PERFORMANCE**

D15.1 The Contractor shall achieve Substantial Performance by March 31, 2006.

D15.2 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.

D15.3 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.

#### **D16. TOTAL PERFORMANCE**

D16.1 The Contractor shall achieve Total Performance by June 1, 2006.

D16.2 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.

D16.3 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.

#### **D17. LIQUIDATED DAMAGES**

D17.1 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 (\$1000.00) per Calendar Day for each and every Calendar Day following the day fixed herein for Total Performance during which such failure continues.

D17.2 The amount specified for liquidated damages in D17.1 is based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.

D17.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

#### **D18. SCHEDULED MAINTENANCE**

D18.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) Maintenance as specified in CW 3510 ;

D18.2 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**

##### **D19. JOB MEETINGS**

D19.1 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.

D19.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

##### **D20. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)**

D20.1 Further to GC:6.26, 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).

#### **WARRANTY**

##### **D21. WARRANTY**

D21.1 Notwithstanding GC:13.2, the warranty period shall begin on the date of Substantial Performance and shall expire one (1) year thereafter unless extended pursuant to GC:13.2.1 or GC:13.2.2, in which case it shall expire when provided for thereunder.

**FORM H1: PERFORMANCE BOND**  
(See D9)

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. 717-2005

2005 OUTFALL MAINTENANCE PROGRAM – OUTFALL REPAIRS

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 D9)

\_\_\_\_\_  
(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. 717-2005  
2005 OUTFALL MAINTENANCE PROGRAM – OUTFALL REPAIRS

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, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.
- E1.1.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.1.3 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.2 The following drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
Drawing_00	Cover Sheet
LD-3228	Site Location Plans
LD-3229	Kennedy Street Outfall (AS-91)
LD-3230	Hargrave Street Outfall (AS-93)
LD-3231	Cloutier Drive Outfall (RR-7)
LD-3232	Falconer Bay Outfall (RR-24)
LD-3233	Moore Avenue Outfall (RR-25)
LD-3234	Dowker Avenue Outfall (RR-28)
LD-3235	Kildonan Park Outfall (RR-97)
LD-3236	Debris Grate Detail
LD-3237	Silt Fence Detail & Miscellaneous Details

#### E2. SOILS INVESTIGATION REPORT

- E2.1 Further to GC:3.1, geotechnical information from the testholes located in the Work area are included as Test Hole Logs

#### E3. REVIEW OF SHOP DRAWINGS AND MATERIALS

- E3.1 Shop Drawings
- Further to CW 1110, the Contractor will be allowed one submission of Shop Drawings for review by the Contract Administrator and a second review for confirmation of revisions only. Subsequent reviews will be made at the Contractors expense.

### GENERAL REQUIREMENTS

#### E4. SITE DEVELOPMENT AND RESTORATION

- E4.1 Description
- This Specification shall cover all aspects of the Site Development and restoration Work, including equipment mobilization and demobilization, erection and maintenance and removal of safety fencing, sediment control Works, snow clearing, general access development, access maintenance and removal, and Site restoration.

## E4.2 Materials

### E4.2.1 Equipment

All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

## E4.3 Construction Methods

### E4.3.1 Site and Construction Access

The Contractor shall be responsible to develop suitable Site access, this shall include but is not limited to, temporary bridging over structures, temporary removal and reinstallation of fencing, any landscaping and grading repairs, restoration of sod, etc. necessary to restore any Site and construction access areas to their pre-existing condition.

The Contractor is responsible for obtaining all required permits and permissions that are necessary for Site access, including a Waterways Construction Access Permit, if required by the Waterways Authority. All construction access ramps from the top bank area down to the edge of the river shall be constructed by excavating to the necessary ramp grade and disposing of the material off Site. Under no circumstances will the excavated material or any additional materials be placed as fill in the ramp area. Detailed construction access ramp drawings are to be submitted to the Contract Administrator for approval a minimum seven (7) days prior to any construction activity on Site.

The locations of the Contractor's construction access ramps shall be restored to the same condition or better than it was prior to the initiation of any Work.

### E4.3.2 Frozen Waterways Permit

The Contractor is responsible for obtaining the required Frozen Waterways Permits. Contact the City of Winnipeg Harbour Partol at 986-8504.

### E4.3.3 Vegetation Removal

Some vegetation (small trees and sod) removal will be permitted in order to facilitate Site access. Existing vegetation shall not be remove without prior approval from the Contract Administrator. The Contractor shall load and haul any removed vegetation, and dispose of the material off Site immediately upon collection. Stockpiling shall not be permitted.

### E4.3.4 Snow and Ice Removal

Snow cover shall be cleared from the riverbank prior to placement of the rockfill riprap. The methodology to clear the snow shall be subject to the approval of the Contract Administrator. The Contractor will also be responsible for all snow clearing along Site access points for equipment access.

Ice at the shoreline of the River shall be broken and cleared before the placement of riprap below ice level. Care shall be taken to ensure that the ice is removed, and does not become trapped below rockfill riprap placement, as identified in E6 Rockfill Riprap of this Specification.

#### E4.3.5 Safety Fence

The Contractor shall erect and maintain for the duration of the project, a safety fence acceptable to the Contract Administrator to restrict access to all areas of activity, construction including but not limited to ice removal for riprap placement. For areas of excavation the fencing shall enclose all areas of construction with appropriate gates or openings that are closed at the end of each Workday. Appropriate signs shall be erected to warn all recreational users of the river that an open water hazard exists. This shall include but not be limited to snowmobilers and skiers. The installed fencing shall consist of Dupont Number L70 orange plastic safety fence or approved equal, with a mesh spacing of 45 mm and a minimum height of 1.2 meters supported by steel posts driven into the ice surface. If ice conditions will not support the posts, temporary supports shall be provided. The steel posts shall be sized and capable of maintaining the snow fence material upright, regardless of conditions. Upon completion of the Work, the fence shall be removed and disposed of off Site.

#### E4.3.6 Environmental Regulations

- (a) The Contractor shall adhere to all relevant Federal and Provincial environmental regulations during the entire duration of the construction process.
- (b) The Contractor shall plan to Work in accordance with the current environmental regulations of "Manitoba Stream Crossing Guidelines for Protection of Fish and Fish Habitat", Fisheries and Oceans, and Manitoba Natural Resources.
- (c) The Contractor will supply, in writing, prior to commencement of Work on-Site, a detailed plan for sediment control on this project.
- (d) The Contractor shall ensure that a sufficient supply of suitable spill kits are on Site to cleanup minor spills, should they occur. The Contractor shall supply the name, address and phone number of a local supplier, where additional kits are available on short notice, on the Emergency Phone List specified in D13

#### E4.3.7 General Site Cleanup

All areas of the construction Site shall be restored to a condition at least equivalent to its original condition prior to initiation of Work. This may include, but is not necessarily limited to the Contractor's lay down area and removal of all temporary fencing.

#### E4.4 Method of Measurement and Payment

##### Site Development and Restoration

The Site development and restoration will be paid for at the Contract Unit Price for each "Site Development and Restoration", which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.

### **E5. GEOTEXTILE**

#### E5.1 Description

This Specification shall cover the supply and placement of the geotextile fabric to be used as a separator between the rockfill riprap and the surrounding native soil material.

The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

#### E5.2 Materials

#### E5.2.1 Handling and Storage of Materials

All materials shall be handled and stored in a careful and professional manner, to the satisfaction of the Contract Administrator.

#### E5.2.2 Testing

There shall be no charge for any materials taken by the Contract Administrator for testing purposes.

#### E5.2.3 Geotextile

The geotextile material shall be a non-woven geotextile filter fabric at least 4.6 m in width. All physical property requirements are minimum average roll values and shall conform to:

- (a) Tensile Strength 890 N (ASTM D4632 Grab test or CSGB Standard 4-GP-2, Method 9.2);
- (b) Trapezoid Tear 360 N (ASTM D4533 or CSGB Standard 4-GP-2, Method 11.2);
- (c) Equivalent Opening Size 0.210 mm (ASTM D 4751);

Acceptable products shall be Amoco 4553, Armtec 250, or approved equal.

#### E5.2.4 Submittals

The Contractor shall submit all manufacturer recommendations for storage, handling, installation and splicing to the Contract Administrator.

#### E5.2.5 Equipment

All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order and have sufficient standby equipment available at all times, as required.

### E5.3 Construction Methods

#### E5.3.1 General

All Work related to the geotextile storage, handling, and installation shall comply with the procedures and recommendations of the manufacturers.

#### E5.3.2 Placing of Fabric

Prior to laying the fabric, the riverbank shall be cleared of snow and all deleterious materials (rocks, roots, branches, bricks, glass, etc.) down to the bare in-situ soil surface, and graded to provide a smooth uniform surface to prevent puncturing or tearing of the fabric.

The fabric shall be loosely laid in order to allow conformity to the riverbank surface. Folds and wrinkles in the fabric shall be avoided. Pins, nails or weights, as recommended by the manufacturer, shall be installed to hold the fabric in place. A minimum of 300 mm of rockfill riprap material shall be placed over the fabric prior to any equipment passage. The fabric shall be overlapped in a downstream direction (upstream panel overtop of downstream panel). All joints shall be overlapped a minimum of 600 mm. The overlap shall be pinned or secured.

Damaged geotextile shall be repaired immediately. All fill material shall be cleared a minimum of 1 m around the damaged area. The damaged area shall be covered with a geotextile patch extending 1 m beyond the perimeter of the damage. The fill material shall be replaced and compacted to the specific density.

#### E5.3.3 Inspection

Workmanship and materials used and placed under this Specification are subject to inspection and testing by the Contract Administrator, including all operation from the selection and separation of the materials, through to final acceptance of the specified Work. The Contractor shall be responsible for the control of all operations incidental thereto, notwithstanding any inspection or approval that may have previously been given. The Contract Administrator reserves the right to reject any materials or Works which are not in accordance with the requirements of this Specification. The Contract Administrator shall approve all materials at least five (5) days before any construction is undertaken.

**E5.3.4 Access**

The Contract Administrator shall be afforded full access for the inspection and control testing of materials at the Site to determine whether the material is being selected and placed in accordance with this Specification.

**E5.4 Method of Measurement and Payment**

**E5.4.1 Geotextile**

The supply and placement of the geotextile will be measured on an area basis. The area to be paid for shall be the total number of square meters of ground covered by the geotextile (i.e. Overlap, at all joints shall be considered a single layer), placed in accordance with this Specification, acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

Geotextile will be paid for at the Contract Unit Price for "Geotextile", measured as specified herein, which price shall be payment in full for performing all operations and providing all other items incidental to the Work included in this Specification.

**E6. ROCKFILL RIPRAP**

**E6.1 Description**

This Specification shall cover the supply and placement of the rockfill riprap material.

The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for an incidental to the satisfactory performance and completion of all Work as hereinafter specified.

**E6.2 Materials**

**E6.2.1 Handling and Storage of Materials**

All materials shall be handled and stored in a careful and professional manner, to the satisfaction of the Contract Administrator.

**E6.2.2 Testing and Approval**

All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials supplied for testing purposes.

**E6.2.3 Rockfill Riprap**

The rockfill material for use as riprap shall consist of a clean free draining material, free from organics, roots, silts, sand, clay, snow, ice or any other material that would detract

from the strength and drainage characteristics of clean rockfill. The rockfill material shall meet the following requirements:

- (a) Maximum aggregate size of 450 millimetres;
- (b) Minimum bulk specific gravity of 2.6 (ASTM C127);
- (c) Maximum Los Angeles abrasion loss of 30% (ASTM C131);
- (d) Maximum soundness loss of 13% (ASTM C88);
- (e) Gradation requirements as measured in the smallest dimension:

<u>Canadian Metric Sieve Size (mm)</u>	<u>Percent of Total Dry Weight Passing Each Sieve</u>
450	100%
300	50-70%
200	25-40%
100	10-20%
50	0-5%

The riprap shall be durable, comprised of limestone, granite or other quality dense crushed rock. Should the Contractor choose to use limestone, it shall be durable white crystalline limestone. Softer buff to yellow dolomite or dolostone will not be accepted. No rockfill will be permitted for use without providing the source and supplier.

Individual particles shall be shaped such that the longest dimension does not exceed two times the minimum dimension. Flat, platy, or elongated particle shapes shall not be acceptable. Rounded fieldstones will not be acceptable.

#### E6.2.4 Submittals

Rock samples shall be submitted for approval (min. 500kg) to the lab, determined by the Contract Administrator, a minimum of ten (10) days prior to their use, or the Contract Administrator at his discretion, shall visit the quarry for inspection a minimum of ten (10) days prior to use.

#### E6.2.5 Equipment

All equipment implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

### E6.3 Construction Methods

#### E6.3.1 General

The rockfill shall be sub-cut into the bank as shown on the drawings and pushed or rolled into place in such a manner that the large rocks are uniformly distributed and the smaller rocks serve to fill the places between the larger stones, and that excessive segregation of the various particle sizes does not occur. Sufficient levelling shall be done to procure a neat and uniform surface, conforming to the shape and dimensions shown on the drawings, and accepted by the Contract Administrator. The allowable fill tolerances shall be within 50 mm of the grade and thickness as shown on the drawings. Care shall be taken when placing the outside edges of the riprap to provide a smooth flow transition from the existing river bottom to the riprap areas, as identified on the drawings.

#### E6.3.2 Inspection

All Workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through the final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given.

**E6.3.3 Access**

The Contract Administrator shall be afforded full access for the inspection and control testing of materials as the Site to determine whether the material is being selected and placed in accordance with this Specification.

**E6.4 Method of Measurement and Payment**

**E6.4.1 Rockfill Riprap**

The supply and placement of the Rockfill Riprap will be measured on a weight basis. The weight to be paid for shall be the total number of metric tonnes of Rockfill Riprap material, supplied and placed in accordance with the Specification, acceptable to the Contract Administrator, as measured on a certified weight scale.

The Contractor shall provide the weigh tickets to the Contract Administrator for the material supplied to the Site at the time of delivery. No payment will be made for any weigh tickets that are not supplied at the time of delivery.

Rockfill Riprap will be paid for at the Contract Unit Price for "Rockfill Riprap", measured as specified herein, which price shall be payment in full for performing all operations and providing all other items incidental to the Work included in this Specification.

**E7. OUTFALL SEWER REPAIRS**

**E7.1 Description**

This Specification shall amend and supplement Standard Specifications CW 2130, CW 2160, and CW 3610.

The Work to be done by the Contract under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for an incidental to the satisfactory performance and completion of all Work hereinafter specified.

**E7.2 Materials**

**E7.2.1 Handling and Storage of Materials**

All materials shall be handled and stored in a careful and professional manner, to the satisfaction of the Contract Administrator.

**E7.2.2 Testing and Approval**

All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials supplied for testing purposes.

**E7.2.3 Slip Joint**

Shop drawings shall be submitted for all slip joints. The slip joint shall be installed as shown on the drawings. Galvanizing shall be hot-dip conforming to the requirements of CSA G164-N1981, to a minimum net retention of 600 g/m<sup>2</sup>. All bolts and nuts shall be

galvanized steel conforming to ASTM A-325. All welding shall be fully approved by the Canadian Welding Bureau in conformance with CSA Standard W.47.1. Welding splatter and other fabricator burrs, where exposed, shall be ground off and/or field smooth, and left ready for subsequent operations. All miscellaneous metal, after fabrication, shall be hot-dip galvanized.

E7.2.4 Galvanized Primer

Galvanized primer for repair of damaged coating shall be zinc rich, ready mix to CGSB-1-GP-181M.

E7.2.5 Bedding and Backfill Material

Sand bedding and Modified Class 2 backfill material as per CW 2030, modified to have 0.6 m of compacted excavated Site select material as opposed to the detailed 0.3 m of compacted excavated material.

E7.2.6 CSP Outfall Pipe and CSP Manhole Riser

- a) Shall be the wall thickness as shown on the construction drawings, CSP as per Clause 5.3 of CW 3610.
- b) CSP manhole riser to be premanufactured complete with rungs and top ring suitable to accept a C.O.W. SD-104 frame and cover.

E7.2.7 Connection to Existing CSP

- a) Material types for connecting to existing CSP shall be in accordance to CW3610.

E7.2.8 Connecting New Sewers and Catch Basin Leads to Existing Manholes, Catch Basins and Catch Pits

- a) Connection of new sewers and catch basin leads to existing manholes, catch basins and catch pits shall follow CW 2130.

E7.2.9 CSP Couplers, CSP Saddles Concrete Transition Coupler and Sealing of Connection Joints

- a) Material for CSP to CSP connections shall conform to CSA Specification CAN3-G401. Standard or dimpled with bolt and angle attachments.
- b) Material for CSP saddle connections shall conform to CSA Specification CAN3-G401. Galvanized primer for repair of damaged coating shall be zinc rich, ready mix to CGSB-1-GP-181M.
- c) Material for concrete transition collars shall be in accordance with Table CW 2160.1 Type B concrete.
- d) Material for sealing connection joints between HDPE liner pipe and adjacent pipes to be approved by the Contract Administrator

E7.2.10 Debris Grating

Shop drawings shall be submitted for the debris gratings and shall be installed as shown on the drawings. Galvanizing shall be hot-dip conforming to requirements of CSA G164-N1981 to a minimum net retention of 600g/m<sup>2</sup>. All bolts and nuts shall be typical steel, conforming to ASTM A-320 Grade B8M. All welding shall be fully approved by the Canadian Welding Bureau in conformance with CSA Standard W47.1. Welding shall be done by currently licensed welders only. Welding splatter and other fabricator burrs, where exposed, shall be ground off and/or filed smooth, and left ready for subsequent operations.



All miscellaneous metal, after fabrication, shall be hot-dip galvanized. No separate measurement will be made for hot-dip galvanizing.

E7.2.11 Trenchcoat Pipe

(a) Pipe

Drainage pipe shall be Armtec Polymer Coated Trenchcoat Hel-Cor Lockseam Corrugated Steel Pipe (CSP) or approved equivalent, of diameter, corrugation and wall thickness as shown on the drawings.

(b) Coupling

Coupling Systems for the pipe are to be Armtec Polymer Coated Trenchcoat H500 Hugger Band Couplers complete with O-ring Elastomeric Gaskets, or approved equivalent.

E7.2.12 Equipment

All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

E7.3 Construction Methods

E7.3.1 Bedding

Ensure bedding is thoroughly tamped and that the pipe is uniformly supported throughout and completed in accordance with CW 2030, unless otherwise indicated by the Contract Administrator.

E7.3.2 Backfill

Backfill around the pipe, in maximum 300-mm lifts, alternating from side to side. At no time should the difference in backfill elevation on either side of the pipe be greater than 450 mm. Work must be completed in accordance with CW 2030, unless otherwise indicated by the Contract Administrator.

Backfilling above the pipe shall be in accordance with CW 2030 for Modified Class 2 backfill. The top 600-mm of backfill is to be Site select excavated material, as approved on Site by the Contract Administrator, not the standard 300 mm excavated material. The Contractor shall ensure the compaction equipment utilized, is consistent with degree of compactive effort required to achieve the specified densities, and adequately protects against overloading the pipe.

E7.3.3 Excavation

Where construction operations are restricted by existing trees and structures, the minimum required trench width shall be dug and maintained using a wood or steel shoring, designed and sealed by a Structural Professional Engineer who is a member of the Association of Professional Engineers and Geoscientists of the Province of Manitoba (APEGM). The Contractor shall provide shop drawings to the Contract Administrator, for review, prior to the start of excavation. Design and construction of the trench structure shall be considered incidental to the cost of the pipe installation and no payment will be made for this Work. Work must be completed in accordance with CW 2030, unless otherwise indicated by the Contract Administrator.

The Contractor shall take precautionary steps to prevent damage from construction activities to adjacent private property. All damage to adjacent private property caused by the Contractor's activities shall be repaired to, equal or better condition than prior to

construction, as approved by the Contract Administrator. No separate measurement or payment will be made for the protection of adjacent private property.

#### E7.3.4 Diversion of Flows

Flows such as snowmelt, rainfall, a watermain break, or any other flow travelling through the outfall shall be diverted during construction. The cost of the flow diversion is considered incidental to the installation of the pipe.

#### E7.3.5 Temporary Shoring

Any temporary shoring installed during the construction operations must be removed upon completion of construction and is considered incidental to the installation of the pipe.

#### E7.3.6 Removal and Installation of CSP

CSP field cuts shall be straight circumferential cuts. Clean all ends free of burrs etc., and touch up all areas affected by Work with galvanized primer.

Work performed on Asbestos Cement Pipe shall be in accordance with current Workplace Safety and Health regulations.

The Contractor shall excavate and dispose of the existing outfall piping and debris grate in accordance with the Standard Construction Specifications.

All outfall pipes shall be installed as shown on the drawings and in accordance with CW 3610.

All pipes shall be laid to the established line and grade.

#### E7.3.7 Connections

Where the drawings indicate connection to an existing pipe, the Contractor shall carefully expose the end of the existing pipe.

Where the existing pipe has a damaged end, sufficient length of the damaged pipe shall be removed to provide a straight end in acceptable condition. The cut end of the CSP pipe shall be coated with a galvanizing compound approved by the Contract Administrator.

Where a concrete transition collar is required connect the new pipe to the existing pipe using the concrete transition collar as shown on the drawings.

Method for sealing connection joints between HDPE liner pipe and adjacent pipes to be approved by the Contract Administrator

Slip joints are to be internal unless noted otherwise on the drawings. The receiving pipes are to be cleaned of all surface debris, including but not limited to frozen backfill, ice and internal sediment.

The slip joints are to be installed in locations as shown on the drawings and as directed by the Contract Administrator. Angle brackets are to be located at the 9:00 and 3:00 o'clock position unless approved otherwise by the Contract Administrator. Bolts are to be tightened evenly throughout the coupler.

#### E7.3.8 HDPE Liner Pipe Connections at Existing Manholes and Chambers

The annulus between the HDPE liner pipe and the existing host pipe is to be filled with polyurethane soaked oakum within the first 300mm from the face of the manhole or chamber. The Contractor is to use Strata-Tech Canada Products; ST 591Oakum and ST 504 polyurethane resin. These products shall be mixed and applied as per the Manufacturers recommended methods. An approved equal or better product may be used. The HDPE liner pipe shall be installed to extend 100mm beyond the internal face of the manhole or chamber.

E7.3.9 HDPE Pipe Installation

Refer to E17 High Density Polyethylene Pipe

E7.3.10 Trenchcoat Pipe

- (a) Trenchcoat pipe shall be installed in accordance with the manufacturer's instructions.
- (b) All pipe and couplers shall conform to CSA G401-01 "Corrugated Steel Pipe Products".
- (c) Field cutting and welding of pipe will require repairs to the Trenchcoat polymer coating. All field welds and cuts on the Trenchcoat polymer coated pipe shall be repaired using Ranbar Tri-spec-515-7 black synthetic coating or approved equivalent. Surfaces are to be clean and dry and free from grease, oil, dirt and rust. Following the repair process, the field coating must be fully cured prior to exposure to water, soil or debris.

All repairs to be in accordance with CSA G401-01, Section 5.3.

E7.3.11 Installation of Debris Grate

Debris Grates shall be installed in the location as shown on the drawings.

E7.3.12 Shop Drawings

Submit prepared shop drawings for the: slip joint, debris grate, and plate sleeve details in accordance with Clause 1.5 of CW 1110.

E7.4 Method of Measurement and Payment

E7.4.1 Removal and Installation of CSP

The removal and installation of the CSP shall be measured on a linear basis. The length to be paid for shall be the total number of linear meters of CSP complete with couplers and necessary hardware, measured from the tie-in point to the tip of the manufactured bevelled end section, horizontally above the centre of the pipe installed in accordance with this Specification and acceptable to the Contract Administrator. The bevelled end section, and removal of both the existing CSP and existing debris grate shall be considered incidental to the installation of the CSP and no separate payment will be made.

Removal and installation of CSP will be paid for at the Contract Unit Price for "Removal and Installation of CSP", measured specified herein, which price shall be payment in full for performing all operations described and all other items incidental to the Work included in this Specification.

E7.4.2 Supply and Installation of Slip Joints

The supply and installation of Slip Joints shall be measured on a unit basis. The Contractor shall be paid for the total number of slip joints installed in accordance with this Specification, as measured by the Contract Administrator.

E7.4.3 HDPE Liner Pipe Connections at Existing Manholes and Chambers

Measurement for all connections required for the installation of the HDPE liner pipe will be considered incidental to the installation of the HDPE pipe.

E7.4.4 Connecting to Existing CSP

Measurement and Payment for connections to existing CSP shall be in accordance to CW 3610.

E7.4.5 Connecting New Sewers and Sewer Services to Existing Manholes, Catch Basins and Catch Pits

Connecting new sewers and sewer services to existing manholes, catch basins and catch pits will be measured for payment on a unit basis for each size and type of connection and paid for at the Contract Unit Price for the Items of Work listed below. Number of units to be paid for will be the total number of connections supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Connecting to Existing Manhole

**E7.4.6** Supply and Installation of Debris Gate

The supply and installation of the Debris Gate shall be measured on a unit basis. The units to be paid for shall be the total number of Debris Gate installed in accordance with this Specification and acceptable to the Contract Administrator as computed from measurements made by the Contract Administrator.

Supply and installation of Debris Gate will be paid for at the Contract Unit Price for "Supply and Installation of Debris Gate", measured specified herein, which price shall be payment in full for performing all operations described and all other items incidental to the Work included in this Specification.

**E7.4.7** Supply and Installation of Concrete Transition Collar

The supply and installation of concrete transition collars will be measured on a unit basis and paid for at the Contract Unit Price for "Concrete Transition Collar". The number of units to be paid for will be the total number of concrete transition collars constructed in accordance with this specification, accepted and measured by the Contract Administrator.

**E7.4.8** Supply and Installation of Trenchcoat Pipe

Supply and installation of the Trenchcoat pipe shall be measured on a linear basis. The length to be paid for shall be the total number of linear meters of Trenchcoat pipe complete with couplers and necessary hardware, measured from the tie-in point to the tip of the manufactured bevelled end section. The length shall be measured horizontally above the centre of the pipe installed in accordance with this Specification and acceptable to the Contract Administrator. The bevelled end section, and removal of both the existing CSP and existing debris grate shall be considered incidental to the installation of the CSP and no separate payment will be made.

Supply and installation of Trenchcoat pipe will be paid for at the Contract Unit Price for "Supply and Install Trenchcoat Pipe", measured specified herein, which price shall be payment in full for performing all operations described and all other items incidental to the Work included in this Specification.

**E8. TRENCHLESS SEWER INSTALLATION**

**E8.1** Trenchless sewer installation shall be in accordance with CW 2130. Trenchless methods are to be used where indicated on the drawings.

**E9. CHANNEL PROTECTION**

The ice surface and riverbank channel shall be cleared of construction materials prior to ice break-up. The Contractor shall clean up all materials, including but not limited to: soil, snow fence, construction debris, etc. from this construction activity. All items that will have an adverse impact on the channel shall be removed. Channel Protection shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

## **E10. TOPSOIL AND SODDING**

Topsoil and sod to be installed in accordance with CW 3510. A limited amount of topsoil and sod has to be included in the Contract for the restoration above the overflow pipe. All other areas to be restored to existing condition or better. No payment will be made for topsoil and sod outside of the limit for the overflow easement.

## **E11. IMPORTED FILL MATERIAL**

Imported Fill Material shall be installed in accordance with CW 3110. A limited amount of clay backfill has to be included in the Contract for the restoration existing failures. All other areas to be restored to existing condition or better. No payment will be made for imported fill outside of the limit for the existing failures

## **E12. PROTECTION OF EXISTING TREES**

- E12.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing trees within the limits of the construction area:
- (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 meters of trees.
  - (b) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400 mm wood planks, or suitably protected as approved by the Contract Administrator.
  - (c) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches), with the outcome read in feet, from the closest edge of the truck. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
  - (d) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the Work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
  - (e) Work on-Site shall be carried out in such a manner so as to minimise damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.
- E12.2 All damage to existing trees caused by the Contractors activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his designate.
- E12.3 No separate measurement or payment will be made for the protection of trees.
- E12.4 Elm trees cannot be trimmed between April 1 and July 31, inclusive.

## **E13. AUTHORIZED WORK ON PRIVATE PROPERTY**

Further to GC 6.28, the Contractor shall confine his Works to the right-of-way or easements. Where Work is required to be done on private property the Contract Administrator will authorize such Work in writing after the Contractor has provided in writing to the Contract Administrator the permission of the property owner.

## **E14. COLD WEATHER REQUIREMENTS**

Should any concrete Work be required to be carried out when the mean daily temperature is below 5°C or anticipated to be below 5°C within the next 24 hours, cold weather requirements will be specified herein.

All freshly placed concrete shall be protected from the elements and from defacements due to construction operations.

The following are minimum requirements for protecting concrete during and after placement during freezing weather, but mere adherence to these requirements will not relieve the Contractor of the necessity for producing concrete which has not been weakened or injured by frost or freezing, or replacing such damaged Work at no additional expense to the City;

- (i) Before any concrete is placed, all ice, snow, and frost shall be completely removed from all formwork, and other surfaces against which concrete temperatures of such surfaces raised above 7°C for twenty-four (24) hours minimum prior to concreting. Where concrete Work is to come in contact with the earth, the surface of the earth shall be completely free of frost when concrete is placed thereon.
- (ii) Concrete aggregates and water shall be heated to not over 80°C. Concrete shall be not less than 20°C or more than 30°C in temperature when deposited. Concrete when placed during freezing weather, or if freezing is anticipated during curing period, shall be fully enclosed and the temperature of same maintained at not less than 20°C for five (5) days nor less than 5°C for an additional five (5) days.
- (iii) Heating enclosures shall be strong and wind-proof, well ventilated with heating units so located as to prevent local overheating or drying of the concrete or damage from combustion gases. Only indirect fired heaters will be accepted. Units must be vented outside the enclosure. No direct fired units will be accepted.
- (iv) The Contractor shall inform the Contract Administrator well in advance as to the methods of enclosure and frost protection he proposes to employ.

Cold weather requirements shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

## **E15. SILT FENCE**

### **E15.1 Description**

E15.1.1 This specification covers the erection of temporary silt fencing, which shall be installed and maintained at the locations shown on the drawings to control runoff and minimize the release of detrimental silt loading to watercourses.

E15.1.2 The scope Work included in this specification is as follows:

- (a) Supply and Install temporary silt fencing at locations as indicated, in accordance with the detailed drawing provided, prior to undertaking any other activities on the Site where silt fencing is required.
- (b) Maintain the silt fencing in serviceable condition throughout the entire duration of activities at the Site where silt fencing is required, including final restoration and cleanup of the construction Site.

- (c) Remove the silt fencing and restore the area where the fencing was installed, without further disturbing the area and without releasing any deleterious substances to the adjacent watercourse.

**E15.2 Materials**

**E15.2.1 Fences Posts**

- (a) Fence posts shall be 100 mm untreated wood posts or 50 mm steel posts, minimum length of 1.1 m.

**E15.2.2 Filter Fabric**

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

Property	Test Method	Value
Grab Tensile Strength	ASTM D 4632	0.55 kN
Grab Tensile Elongation	ASTM D 4632	15%
Mullen Burst	ASTM D 4786	2060 kPa
Puncture	ASTM D 4833	0.285 kN
Trapezoid Tear	ASTM D 4533	0.285 kN
UV Resistance	ASTM D 4355	80 % @ 500 hrs
Apparent Opening Size (AOS)	ASTM D 4751	0.60 mm
Flow Rate	ASTM D 4491	405 l/min/m <sup>2</sup>

Acceptable Product: "Amoco 2130 Silt Fence Fabric" or approved equal.

**E15.2.3 Wire Mesh**

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

**E15.2.4 Fencing Material Fasteners**

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

**E15.3 Construction Methods**

**E15.3.1 Ensure that no deleterious substances are discharged into the adjacent watercourse at any time during construction activities.**

**E15.3.2 Silt Fence Installation**

- (a) Excavate 150 x 150 anchor trench along alignment of silt fence as indicated.
- (b) Install fence posts as indicated. Ensure that fence posts are firmly driven into undisturbed soil, or are completely and firmly backfilled if installed via auger methods. Attach wire mesh as support backing for silt fence filter fabric with fasteners as specified in section 2.4 of this specification. Attach silt fence filter fabric on top of wire mesh in similar fashion. Overlap any fence seams (wire mesh or filter fabric) by 450 mm minimum. Ensure that wire mesh and filter fabric are installed on the upslope side of the post and are fully laid in anchor trench as shown.
- (c) Install and compact impermeable excavated materials into anchor trench and slope as indicated. Compact to 95% of maximum dry density (ASTM D-698).

**E15.3.3 Silt Fence Maintenance**

- (a) Inspect silt fence daily, prior to starting any other construction activities. If fence posts are found loose or not upright, repair in accordance with installation procedure as specified in section 3.2 of this specification. If silt fence is found to be loose or torn, repair or replace as necessary to comply with E17.3.2.
- (b) If silt deposition at the fence is 300 mm or more in depth, carefully remove and dispose of silt off Site without disturbing silt fence.

#### E15.3.4 Silt Fence Removal

- (a) Following completion of all Site construction activities (including final restoration and cleanup), remove all fence posts, wire mesh, fabric and fasteners from Site.
- (b) Restore areas disturbed in accordance with E4, without releasing any deleterious substances to the adjacent watercourse.

#### E15.4 Method of Measurement and Basis of Payment

##### E15.4.1 Supply and Install Silt Fence

A limited amount of silt fence has been included in the contract for the control of runoff. All other areas effected by the Contractor will be at the Contractors own cost. No payments will be made for additional sediment and erosion control outside of the quantities provided for in the contract.

- (a) Supply, installation, maintenance and removal of temporary silt fencing for control of runoff and deleterious material discharge to adjacent water courses shall be measured on a linear basis. The length to be paid for shall be the total number of lineal meters of silt fencing acceptably supplied, installed, maintained and removed.
- (b) Payment shall be made at the Contract unit price bid for "Supply and Install Silt Fence", which shall be payment in full for supplying, installing, maintaining and removing the silt fence, and all other items incidental to the Work covered under this specification.

#### **E16. LINER PLATES**

##### E16.1 Description

This specifications covers cold-formed steel, two-flange tunnel liner plates, fabricated to permit in-place assembly of a continuous steel support system.

The tunnel or relined structure shall be of diameter and/or shape and gage as shown on the plans.

##### E16.2 **Material**

###### E16.2.1 Liner Plates

- (a) Liner plates shall be fabricated from structural quality, hot-rolled carbon steel sheets or plates conforming to ASTM Specification A 569 or SAE 1010.
- (b) Plates shall be accurately curved to suit the tunnel cross section and shall be of uniform fabrication to allow plates of similar curvature to be Interchanged.
- (c) All plates shall be punched for bolting on both longitudinal and circumferential seams and shall be so fabricated as to permit complete erection from the inside of the tunnel. The longitudinal seam shall be of the lap type, with an offset equal to the gage of the metal for the full width of the plate to allow the cross section of the plate to be continuous through the seam.
- (d) Grout holes shall be two inches (2") in diameter and shall be provided as shown on the plans to permit grouting as the assembly of the liner plate proceeds. All grout holes shall be plain,



tapped or welded with coupling. Tapped holes shall be provided with a pipe plug screwed in place.

E16.2.2 Galvanizing and Coating

- (a) Material shall be hot-dipped galvanized in accordance with the requirements of CSA G164.
- (b) Bolts and nuts supplied with galvanized liner plates shall be galvanized to CSA G1 64, Class 5.

E16.2.3 Bolts and Nuts

- (a) Bolts and nuts shall be of a diameter and length as recommended by the manufacturer. Bolts and nuts shall conform to ASTM A307 for 3.0 mm and 4.0 mm plates and ASTM A449 for 5.0 mm and 6.0 mm plates.
- (b) Galvanized nuts and bolts are required with galvanized liner plate.

E16.2.4 Saddle plates

Prefabricated saddle plates shall be used to attach existing connections to the liner plates.

E16.2.5 Liner Plate Products

Acceptable Liner Plate Product  
3mm Tunnel liner plates  
Trade name: **Armtec**  
Manufacturer: Armtec Ltd.

The Contractor may elect to use an alternative product upon review and approval by the Contract Administrator. The Contractor shall request the Manufacturer to directly submit written information on the preparation, materials, design, performance, references, and use of proposed products.

E16.3 Construction Methods

E16.3.1 Liner plate shall be assembled in accordance with the manufacturer's instructions.

E16.3.2 Longitudinal seams shall be staggered between rings. Voids occurring between liner plate and existing structure or ground shall be pressure grouted until completely filled. Grout material and method of grouting shall refer to E18 Grouting

E16.3.3 Saddle plates shall be installed in accordance with the manufacturer's instruction and as indicated on the Contract drawings.

E16.4 Method of Measurement and Payment

E16.4.1 Liner Plates

- (a) Measurement of Installation of liner plates

Supply and installation of liner plates shall be measured on a linear measure basis. The length to be paid for shall be the total number of linear metres acceptably supplied and installed complete with welded joints, grouting, construction of transitions and necessary hardware, measured horizontally, at grade, above the centre line of the pipe, as computed by measurement made by the Contract Administrator.

- (b) Basis of Payment for Installation of Liner Plates

Supply and Installation of liner plates will be paid for at the Contract Unit Price per linear metre for "Supply and Installation of liner plates", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all

operations herein described and as shown on the drawings and details and all other items incidental to the Work included in this Specification.

#### E16.4.2 Prefabricated Saddle Plates

Supply and Installation of new saddle plates for connecting new liner plates to new or existing manholes, catch basins and sewer services will be measured for payment on a unit basis for each size and type of saddle plate and paid for at the Contract Unit Price for the Items of Work listed below. Number of units to be paid for will be the total number of saddle plates supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator. Connection of the saddle plate to the actual manhole, catch basin and sewer service shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

Items of Work:

Supply and installation of Saddle Plate for CSP MH Riser  
Supply and installation of Saddle Plate for existing Conc LDS  
Supply and installation of Saddle Plate for existing CSP Service

### E17. HIGH DENSITY POLYETHYLENE PIPE

#### E17.1 Description

This Specification shall cover the requirements for the supply and installation of HDPE pipe.

The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

#### E17.1.1 Submittal

- (a) The Contractor shall submit at least one (1) week prior to the Commencement of Work, the installation procedure for the HDPE liner pipe including joining, extrusion weld, anticipated pushing force and pushing apparatus, lubrication, set-up locations, and end treatments.
- (b) The Contractor shall submit at least one (1) week prior to the Commencement of Work, a proposed material and /or product which is to be used as the casing spacers.
- (c) The Contractor shall submit at least one (1) week prior to the Commencement of Work, a proposed method for the installation of the casing spacers.
- (d) The fusing of the pipe liner must be performed by qualified personnel with a minimum of three (3) years of experience in HDPE pipe fusing. The Contractor shall submit proof of experience, in writing, within 3 days of request by the Contract Administrator. The Contractor shall submit the installation procedure at least one (1) week prior to the Commencement of the Work.

#### E17.1.2 Equipment

- (a) All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time as approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

#### E17.2 Materials

#### E17.2.1 Liner Pipe Raw Material Requirements

- (a) The liner pipe shall be manufactured from a high density polyethylene material which meets or exceeds the minimum cell classification 345444C when classified in accordance with ASTM D3350.
- (b) The raw material used to produce the liner pipe shall be a polyethylene compound qualified as Type II, Category 5, Class C, Grade P34 in accordance with ASTM D1248.
- (c) The polyethylene raw material shall contain a minimum of 2%, well dispersed finely divided carbon black for UV stabilization. Additives, which can be conclusively proven not to be detrimental to the liner pipe, may also be used provided that the pipe produced meets or exceeds all of the requirements of this specification.
- (d) The liner pipe shall contain no recycled compound except that generated in the
- (e) Manufacturer's own plant from resin of the same specification and from the same raw material supplier.

#### E17.2.2 HDPE Liner Pipe Products

Acceptable Lining Pipe Product.  
DR 32.5, High Density Polyethylene (HDPE) Pipe  
Trade name: **KWH Sclairpipe**  
Manufacturer: KWH Pipe (Canada) Ltd.

The Contractor may elect to use an alternative product upon review and approval by the Contract Administrator. The Contractor shall request the manufacturer to directly submit written information on the preparation, materials, design, performance, references, and use of proposed products.

#### E17.2.3 Lubricant

- (a) Lubricant shall be non-toxic, vegetable based lubricating gel.

#### E17.2.4 Casing Spacer Products

- (a) Acceptable casing spacer materials include wood, styrofoam, HDPE casing spacers, or an approved equivalent.

### E17.3 Construction Methods

#### E17.3.1 Installation of Casing Spacers

- (a) The casing spacers may either be installed on the liner pipe or installed on the host pipe to ensure that the liner pipe is aligned within the host pipe as shown in the drawings.

#### E17.3.2 Installation of the Liner Pipe

- (a) The Contractor must ensure that all obstructions and joint offsets are removed or corrected as required to facilitate the installation of the HDPE liner pipe. The

Contractor will be responsible for the cleaning of all pipes as required prior to the installation of the liner pipe. The cost for cleaning shall be incidental to the cost of the installation of the HDPE pipe. The Contractor must confirm, with the HDPE pipe manufacturer, the allowable bending tolerances of the HDPE liner pipe prior to installation to ensure that pipe deflections in the existing pipe do not interfere with or prevent the installation of the liner pipe. (also refer to Guide-1/95; Guideline document from "The Society of the Plastics Inc.)

- (b) A variety of pushing techniques can be used to insert the liner pipe into the existing conduit.
- (c) The maximum push force for the installation of the HDPE pipe liner shall not exceed the force recommended by the manufacturer. The Contractor shall submit a proposed pushing apparatus and anticipated force. All pulling apparatus shall have a means of monitoring the pull force exerted on the pipe.
- (d) Application of the lubricant shall be as approved by the Contract Administrator. The Contractor shall adhere to the requirements of the hazard assessment and safe Work plan as identified in D7.

#### E17.3.3 Fusing of Liner Pipe

- (a) Wherever possible, the HDPE pipe should be joined by the method of thermal butt fusion, as outlined in ASTM D 2657, Heat Joining Polyolefin Pipe and fittings. Butt fusion joining of the pipe and fittings shall be performed in accordance with the procedures recommended by the manufacturer. The temperature of the heater plate shall not exceed 425 degrees Fahrenheit (+/- 25 degrees Fahrenheit). The joining interfacial pressure should not exceed 25 pounds per square inch of projected end area for European design fusion machines or 75 pounds per square inch of projected end area for American design fusion machines.

#### E17.3.4 Grouting of Annular Space

Refer to E18 Grouting.

#### E17.3.5 Sealing the Cut Ends of the Liner Pipe

- (a) All cut ends and "cut-out" sections of the HDPE pipe shall be sealed by a method to be determined by the pipe supplier and approved by the Contract Administrator.

#### E17.3.6 Inspection

- (a) The Contractor shall perform an inspection of the existing conduit with the Contract Administrator prior to attempting to install the liner pipe. The purpose of this inspection is to ensure that there are no locations within the pipe, which are so badly misaligned or deflected that the liner pipe cannot be pulled or pushed past.

### E17.4 Method of Measurement and Payment

#### E17.4.1 Measurement of Installation of HDPE Pipe

- (a) Supply and installation of HDPE Pipe shall be measured on a linear measure basis. The length to be paid for shall be the total number of linear metres acceptably supplied and installed complete with welded joints, grouting, construction of transitions and necessary hardware, measured horizontally, at grade, above the centre line of the pipe, as computed by measurement made by the Contract Administrator.

#### E17.4.2 Basis of Payment for Installation of HDPE Pipe

- (a) Supply and Installation of HDPE Pipe will be paid for at the Contract Unit Price per linear metre for "Supply and Installation of HDPE Pipe", measured as specified herein, which price shall be payment in full for supplying all materials and for performing all

operations herein described and as shown on the drawings and details and all other items incidental to the Work included in this Specification.

## **E18. GROUTING**

### **E18.1 Description**

This Specification shall cover the requirements for the cementitious grouting. The items specified herein include the injection grouting of conventional or cellular foam cementitious grout and general repair grout.

This section also covers the requirements for furnishing, handling, transporting, storing, mixing and injecting the grouting materials, waste water and waste grout disposal; clean-up of Work areas upon completion of the Work and all such other operations as are incidental to the grouting.

The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

#### **E18.1.1 General Requirements**

- (a) All grouts shall be installed in accordance with the supplier's instruction and as indicated on the contract drawings.
- (b) Grout shall be prepared according to the grout manufacturer's written instructions for placement of grout by pumping or tremie placement.
- (c) The Contractor shall supply workers with appropriate safety equipment for performing pressure grout, and associated tasks. Supply safety devices, confined space entry equipment, drop sheets and other items to protect the Site, other contents and other personnel from contact with the Contractor's materials or equipment.

#### **E18.1.2 Quality Assurance**

- (a) The applicator shall have a minimum of 3 years of experience performing similar Work and be authorized by the suppliers for performing injection of the nature specified, using the product specified or approved.
- (b) The specialized batching, mixing, and placing equipment shall be automated with bulk handling equipment approved by the manufacturer. Transit mixes are not acceptable for this application
- (c) During all phases of grouting, the Contractor must supply and maintain a backup system, repair parts, or reserve equipment to maintain grouting operations in the event of an equipment failure, or during a time of critical operation.

#### **E18.1.3 Submittals**

- (a) The Bidder shall submit a statement of qualifications of the applicator of the grout within 3 business days of request by the Contract Administrator. The statement must identify the years of experience of the individuals responsible for the mix design, grout preparation and installation. Proof must be given that the applicator has experience with Work of similar nature and scope.
- (b) The Contractor shall submit a grout mix design a minimum of one (1) week prior to proceeding with the Work. The mix design shall meet the specifications herein, and shall detail all components of the grout mixture. The submission shall include all written recommendations of product manufacturer for each product to be used in the mix. The submission shall also include the anticipated 28 day compressive strength.
- (c) The Contractor must submit a detailed procedure for grouting a minimum of one (1) week prior to proceeding with the Work. It shall include the names of supervisory staff, equipment lists, and a list of material expected to be used during the grouting. If requested by the Contract Administrator, the Contractor shall also list the date, start, and completion times of the grouting procedure. The detailed procedure must also include the following:
  - (i) Grout port types and dimensions, configuration along the axis of the liner pipe, and longitudinal spacing.
  - (ii) Grouting application rates and anticipated hydrostatic pressure on the liner pipe.
  - (iii) Method for repairing grout ports.
  - (iv) Type, material specification, configuration and location of bulkheads.

#### E18.1.4 Records

- (a) The Contractor will keep records of all grouting operations, such as the time of each change of grouting operation, pressure, rate of pumping, proportioning of grout constituents, amount of cement for each change in water/cement ratio, and other data as deemed by the Contract Administrator to be necessary. The Contractor shall furnish all necessary assistance and co-operation to this end. A copy of all records shall be submitted to the Contract Administrator at the end of each workday.

#### E18.1.5 Protection To Work And Cleanup

- (a) The Contractor will be required to furnish such pumps as may be necessary to care for wastewater and grout from his operations. The Contractor shall, upon completion of his operations, clean up all waste resulting from his operations that is unsightly or would interfere with the efficient operation of the project as anticipated by the original design.

#### E18.1.6 Supervision of Grouting Operations

- (a) All pressure grouting operations shall be performed in the presence of the Contract Administrator, and shall be in accordance with the following general procedures.

#### E18.1.7 Equipment

- (a) All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time as approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

## E18.2 Materials

All products shall be new, free of defects, and supplied in their original factory containers.

Written recommendations from the product supplier(s) for application and preparation shall be available for the Contract Administrator upon request.

All products shall be handled, stored, and prepared in accordance with the written recommendations of the product manufacturer.

### E18.2.1 Cementitious Grout Products

- (a) Grout for the annular space and void filling shall be a mix of compounds consisting of non-metallic aggregate, Portland cement, chemical concrete additives, which may include water reducing, plasticizing and aqueous foam agents. Pozzolans and other cementitious materials may not be used.
  - (i) Compressive strength: 5-10 MPa (745 ? 1450 psi) at 28 days.
  - (ii) Net expansion at 28 days: maximum 0.4%.
  - (iii) Net shrinkage at 28 days: shrinkage not permitted.

All cementitious grout materials shall be supplied in original manufacturer's packaging, clearly identifying the product and preparation instructions.

- (b) Grout for general repair, host pipe/liner pipe transition and other areas shall be multi-purpose Speciality Polymers Inc. (SPI) rapid repair grout, or approved equal.

### E18.2.2 Other Requirements

- (a) Sand
  - (i) Sand for grout shall be clean and consist of hard, tough, durable, uncoated particles. The shape of the particles shall be generally rounded or cubical. The sand shall be generally well graded from fine to coarse in accordance with ASTM C 136 with 100 percent passing the No. 8 sieve.
  - (ii) The percentage of surface moisture in terms of the saturated surface-dried sand will be determined in accordance with ASTM C 70, or other method giving comparable results.
  - (iii) Sand shall be stored in such a manner as to avoid the inclusion of any foreign materials in the grout. All sand shall remain in free draining storage for at least 72 hours prior to use.
- (b) Water shall be potable water, which shall be imported to the Site.
- (c) All materials shall be delivered to the Site in undamaged, unopened containers bearing the supplier's original labels.
- (d) WHMIS labels on all containers shall confirm with Canadian regulations, including English and French risk phrases, proper chemical name, shipping class, packing group and UN number.

- (e) MSDS for all materials shall conform with Canadian regulations.
- (f) No materials shall be used which are manufactured from or contain toluene diisocyanate (TDI), toluene, acetone or methyl ethyl ketone.
- (g) No materials shall be used which are flammable or which display shipping Class 3 red warning labels.
- (h) The Contractor shall keep all materials from freezing as per the Manufacturer's specifications.

#### E18.2.3 Execution

- (a) Contractor shall evaluate, select and submit for review and approval the injection grouting material, method, and pertinent data to the Contract Administrator for each condition and type of joint, or void identified and deemed by the Contractor as requiring treatment at least two (2) weeks prior to the commencement of injection grouting.
- (b) The Contractor shall arrange a meeting with the Contract Administrator no less than 48 hours prior to any grouting operations to review and discuss the grouting Work plan, schedule, materials and methodology for the Work to be performed.
- (c) All drilling and grouting equipment used shall be of a type, capacity and mechanical condition suitable for performing the Work, as approved by the Contract Administrator. The power and equipment and the layout thereof shall meet all applicable requirements of municipal, provincial, and federal regulations and codes for both safety and otherwise.

#### E18.3 Construction Methods

##### E18.3.1 Cementitious Grout Injection Preparation and Installation

- (a) Grouting shall be performed in conjunction with SP:11 Cold Weather Requirements.
- (b) All joints and areas to be grouted shall be cleaned of any dirt, grease, marine growth, or other substances that could interfere with penetration of grout, or its bond. Potable water shall initially be used, and if deemed unsuccessful by the Contract Administrator, the Contractor shall propose other materials.
- (c) All cleaning, flushing, or other agents shall be approved by the Contract Administrator and shall be sufficiently flushed or neutralized to allow proper installation and application of grout. Flushing or neutralizing shall be performed in accordance with manufacturer's written recommendations.
- (d) Injection ports shall be installed in holes drilled through the liner. The Contract Administrator shall approve the spacing between ports. The Contractor shall submit a plan for the injection port distribution which shall include the configuration and distribution of injection ports, the port size, the number of ports per location, and the number of locations at least two (2) weeks prior to the commencement of injection grouting. All injection ports shall be flushed clean prior to grouting, and repaired to the satisfaction of the Contract Administrator once grouting operations are complete.
- (e) Grout shall be placed from the bottom of the cavity to the top of the cavity in a uniform and continuous procedure. During grouting, adjacent ungrouted ports shall be left open to permit the flow or escape of air, water, or flushed-out grout. When required,



cap or seal adjacent ports or vent holes once clean; consistent grout is observed flowing from vent or port. At all times, a minimum of one vent hole or port shall be maintained open and monitored for grout level. The Contractor shall submit the proposed grouting procedure at least two (2) weeks prior to the commencement of injection grouting.

- (f) A fine screen or filter shall be used to remove lumps and other foreign matter from the slurry prior to pumping or tremie placement of the grout. The Contractor must make every effort to maintain proper placement and flow of grout.
- (g) As grouting proceeds, cap and move grout injection hose from port to port following the flow of clean grout flowing from vents or ports. In general, grouting should move from port to port in a regular and steady manner.
- (h) Grouting pressures shall be monitored and adjusted by the Contractor to suit local conditions encountered to permit full and complete penetration of the grout, while preventing leakage of grout or displacement of structural elements. The Contractor shall review changes in grouting pressure or rate with the Contract Administrator as Work proceeds. Grout pressure shall not exceed 33.8 kPa (4.9 psi) without the written approval of the Contract Administrator.
- (i) If the Contractor elects to perform simultaneous grouting operations, the Contractor must maintain sufficient reserve equipment and labour to accommodate and complete grouting of one cavity in the event of difficulty or equipment failure during grouting of the another cavity.
- (j) The batching and preparation of grout shall be performed in accordance with the written recommendations of the grout supplier, and the supplier's technical representative.
- (k) No Work shall be done adjacent to grouted areas for twenty-four (24) hours after the completion of grouting.
- (l) All excess surface sealing material, grout, seepage, and ports shall be removed from the surface of the liner pipe upon the final curing or set of the grout. Any voids encountered during removal shall be repaired as directed by the Contract Administrator.
- (m) The preparation of grouting mixes and pumping pressures shall be monitored by the Contract Administrator during all operations, and adjustments may be required to suit local conditions.
- (n) Construct grouted transition between existing SPCSP and new HDPE Spiral Wound Pipe as shown on the drawings.
- (o) Upon completion of the Work, remove all injection-related materials from the Work area, and remove all debris from the Site.

#### E18.4 Method of Measurement and Payment

##### E18.4.1 Measurement

Grouting of annular space shall be considered incidental to the installation of the HDPE Pipe and liner plates.

##### E18.4.2 Payment

No payment shall be made for the Grouting of annular space as it is considered incidental to the installation of the HDPE Pipe and liner plates.