



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 59-2006**

**2005 OUTFALL MAINTENANCE PROGRAM AND RIVERBANK STABILITY  
IMPROVEMENTS FOR THE EASTWOOD OUTFALL**

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## **PART B - BIDDING PROCEDURES**

### **B1. PROJECT TITLE**

- B1.1 2005 OUTFALL MAINTENANCE PROGRAM AND RIVERBANK STABILITY IMPROVEMENTS FOR THE EASTWOOD OUTFALL

### **B2. SUBMISSION DEADLINE**

- B2.1 The Submission Deadline is 12:00 noon Winnipeg time, February 9, 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, safety railing installation and surface restoration and riverbank stability improvements.
- D2.2 The major components of the Work are as follows:
- (a) Remove existing trees as specified by the Contract Administrator
  - (b) Remove 15 m of existing 525 mm diameter CSP pipe and replace with 19 m of 2 mm - 525mm diameter CSP.
  - (c) Supply and install 525 mm debris grate.
  - (d) Complete four 1-meter CIPP joint repairs as specified on the drawings.
  - (e) Cut back the bank at to create a smooth surface and sub cut above the UWRL as shown on the drawings. Remove the soil from Site.
  - (f) Place geotextile and riprap at 1.5H : 1V along the bank and in the sub cut above the UWRL.
  - (g) Place riprap above grade, beyond the URWL, as shown on the drawings.
  - (h) Plant trees and re-sod according to the Contract Administrator
- 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. EQUIPMENT LIST**

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

#### **D12. SECURITY CLEARANCE**

D12.1 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.

D12.2 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.

D12.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person, will not be permitted to perform any Work within City facilities or on private property.

D12.4 Any Criminal Record Search Certificate obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.

D12.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a



repeated criminal records search will not be permitted to continue to perform Work under the Contract within City facilities or on private property.

**D13. DETAILED WORK SCHEDULE**

D13.1 The Contractor shall provide the Contract Administrator with a detailed Work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the GC:4.1 for the return of the executed Contract

**D14. EMERGENCY CONTACT LIST**

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**

**D15. COMMENCEMENT**

D15.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

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

- (a) the Contract Administrator has confirmed receipt and approval of:
  - (i) evidence 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 equipment list specified in D11;
  - (viii) the security clearances specified in D12;
  - (ix) the detailed Work schedule specified in D13; and
  - (x) the emergency contact list specified in D14.
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D15.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

**D16. SUBSTANTIAL PERFORMANCE**

D16.1 The Contractor shall achieve Substantial Performance by March 31, 2006.

D16.2 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.

- D16.3 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.

**D17. TOTAL PERFORMANCE**

- D17.1 The Contractor shall achieve Total Performance by June 15, 2006.
- D17.2 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.
- D17.3 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.

**D18. LIQUIDATED DAMAGES**

- D18.1 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 Substantial Performance during which such failure continues.
- D18.2 The amount specified for liquidated damages in D18.1 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.
- D18.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

**D19. SCHEDULED MAINTENANCE**

- D19.1 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.
- D19.2 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**

**D20. JOB MEETINGS**

- D20.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor

respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

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

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

D21.1 Further to GC:6.26, 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**

**D22. WARRANTY**

D22.1 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. 59-2006

2005 OUTFALL MAINTENANCE PROGRAM AND RIVERBANK STABILITY IMPROVEMENTS FOR THE EASTWOOD OUTFALL

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)



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

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

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

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

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

This credit is subject to the Uniform Customs and Practice for Documentary Credit (1993 Revision), International Chamber of Commerce Publication Number 500.

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

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

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





**FORM K: EQUIPMENT**  
(See D11)

2005 OUTFALL MAINTENANCE PROGRAM AND RIVERBANK STABILITY IMPROVEMENTS FOR THE  
EASTWOOD OUTFALL

<p>1. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>2. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>3. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

**FORM K: EQUIPMENT**  
(See D11)

2005 OUTFALL MAINTENANCE PROGRAM AND RIVERBANK STABILITY IMPROVEMENTS FOR THE  
EASTWOOD OUTFALL

<p>4. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>5. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>6. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

## 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-3267	Shoreline Protection Plan - Existing Site Conditions (November 2005)
LD-3268	Shoreline Protection Plan - Detailed Site Plan
LD-3269	Shoreline Protection Plan - Section A
LD-3270	Eastwood Drive Outfall (RR-108)
LD-3271	Debris Grate Details
LD-3272	Silt Fence and Miscellaneous Details

#### E2. GEOTECHNICAL INFORMATION

- E2.1 Further to GC:3.1, of the General Conditions, a geotechnical test holes have been done in the vicinity of the proposed Works to determine the character of the subsurface soil to facilitate the design of the Work. The information is considered accurate at the locations indicated and at the time of the investigation. However, considerable variations in the soil conditions may exist between test holes and fluctuations in ground water levels can be expected seasonally. Test hole logs are included.
- E2.2 Bidders are responsible for any interpretation they place on the supplied information and are expected to make such additional investigation of the soil as they feel necessary to satisfy themselves.
- E2.3 Any test borings made by the bidder shall be done in accordance with the requirements of the appropriate authority of the City of Winnipeg. Bidders shall notify the Contract Administrator prior to starting any soil boring operation.

#### E3. DANGEROUS WORK CONDITIONS

- E3.1 Further to clause GC 6.26 of the General Conditions, the Contractor shall be aware that underground chambers, manholes, and sewers are considered a confined space and shall follow the "Guidelines for confined Entry Work" as published by the Manitoba Workplace Safety and Health Division.

- E3.2 The Contractor shall be aware of the potential hazards that can be encountered in gate chambers, manholes and sewers such as explosive gases, toxic gases and oxygen deficiency.
- E3.3 The air in a confined space must be tested before entry and continuously during the time that personnel are inside the space. Equipment for continuous monitoring of gases must be explosion-proof and equipped with a visible and audible alarm. The principal tests are for oxygen deficiency, explosion range and toxic gases. Testing equipment must be calibrated in accordance with manufacturer's specifications.
- E3.4 The Contractor shall ventilate all confined spaces including underground chambers, tunnels, pipes and shafts as required and approved by the Manitoba Workplace Safety and Health Act (the "Act"). If no ventilation is supplied, a Worker must wear a respirator or supplied air to enter the confined space.
- E3.5 Workers must wear a respirator or supplied air at all times when entering a chamber, manhole or sewer where live sewage is present.
- E3.6 The Contractor shall provide a photoionization detector (PID) on Site at all times to monitor potential hydrocarbon vapours in the confined spaces. The gas detector and safety equipment conforming to the Act shall be made available to the Contract Administrator for his use during inspections. In addition, the Contract Administrator shall collect discrete air samples for laboratory analysis.
- E3.7 The Contract Administrator may issue a stop Work order to the Contractor if the above guidelines are not being followed. The Contractor shall not resume his operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to the stop Work order for not following these safety guidelines.

#### **E4. WATERWAY BY-LAW**

- E4.1 The Contractor shall note that portions of the Works fall within 107 metres (350 feet) of the regulated summer water level of the Red River and are therefore within the jurisdiction of the Waterway By-law. The Contract Administrator will apply and pay for the required City of Winnipeg Waterway Permits for the permanent Work. The Contractor shall adhere to restrictions imposed by the permit.
- E4.2 The Contractor shall be responsible to apply and pay for a Waterway Permit for all temporary Works including construction access ramps as outlined in E11.
- E4.3 Under no circumstances will stockpiling of any material be permitted within 107 metres of the regulated summer water level of the Red River.

#### **E5. PROTECTION OF EXISTING TREES**

- E5.1 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 minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E5.2 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.

E5.3 No separate measurement or payment will be made for the protection of trees.

E5.4 Elm trees cannot be trimmed between April 1 and July 31, inclusive.

## **E6. FLOW CONTROL**

E6.1 During winter months land drainage and storm relief sewers can receive flow of an undetermined amount from groundwater infiltration, watermain breaks, snow melt and other unforeseen sources.

E6.2 Provide flow control measures to contend with and maintain flow in the land drainage and storm relief sewers that are directed to the location where gate chambers are being constructed. Flow control measures shall include but not be limited to diversions, flumes and by-pass pumping.

E6.3 Discharge hoses for by-pass pumping shall not be laid across vehicle or pedestrian traffic areas and must be protected from freezing during winter months. Pumping equipment if used, shall be set-up in a location and in such a way to not be a noise problem for nearby residences

E6.4 Provide a flow control plan for each gate chamber location to the Contract Administrator for review before removing any existing sewer pipe.

E6.5 Costs for flow control are considered incidental to the Work.

E6.6 If in the opinion of the Contract Administrator suspension of Work activities that require temporary by-pass pumping and temporary shutdown of the Site may cause a delay in completion of the Work through no fault of the Contractor, the completion date of the Work will be adjusted accordingly.

## **E7. SHOP DRAWINGS**

E7.1 Description

E7.1.1 This Specification shall revise, amend and supplement the requirements of CW 1100.

- (a) The term 'shop drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, including Site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the Work.
- (b) The Contractor shall submit specified shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be show on all submissions for Engineering review.

- (i) 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.

#### E7.1.2 Shop Drawings

- (a) Original drawings are to be prepared by Contractor, SubContractor, Supplier, Distributor, or Manufacturer, which illustrate appropriate portion of Work; showing fabrication, layout, setting or erection details as specified in appropriate sections.
- (b) Shop drawings for the following structural components shall bear the seal of a registered Engineer of Manitoba.
  - (i) Shoring.
  - (ii) Reinforcing steel.
  - (iii) Metal Fabrications.

#### E7.1.3 Contractor's Responsibilities

- (a) Review shop drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.
- (b) Verify:
  - (i) Field Measurements
  - (ii) Field Construction Criteria
  - (iii) Catalogue numbers and similar data
- (c) Coordinate each submission with requirements of Work and Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.
- (d) Notify Contract Administrator, in writing at time of submission, of deviations from requirements of Contract Documents.
- (e) Responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review of submission, unless Contract Administrator gives written acceptance of specified deviations.
- (f) Responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
- (g) The Contractor shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of shop drawings. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Contract Administrator on previous submission.
- (h) After Contract Administrator's review and return of copies, distribute copies to subtrades as appropriate.
- (i) Maintain one (1) complete set of reviewed shop drawings, filed by Specification Section Number, at the Site of the Work for use and reference of the Contract Administrator and SubContractors.

#### E7.1.4 Submission Requirements

- (a) Schedule submissions at least 14 Calendar Days before dates reviewed submissions will be needed, and allow for a 14 Calendar Day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
- (b) Submit five (5) paper prints of shop drawings. The Contractor is advised that the Contract Administrator will retain three (3) copies of all submittals and return two (2) copies to the Contractor.

- (c) Accompany submissions with transmittal letter, containing:
  - (i) Date
  - (ii) Project title and Bid Opportunity number
  - (iii) Contractor's name and address
  - (iv) Number of each shop drawing, product data and sample submitted
  - (v) Specification Section, Title, Number and Clause
  - (vi) Drawing Number and Detail/Section Number
  - (vii) Other pertinent data
- (d) Submissions shall include:
  - (i) Date and revision dates.
  - (ii) Project title and Bid Opportunity number.
  - (iii) Name of:
    - Contractor
    - SubContractor
    - Supplier
    - Manufacturer
    - Separate detailer when pertinent
  - (iv) Identification of product of material.
  - (v) Relation to adjacent structure or materials.
  - (vi) Field dimensions, clearly identified as such.
  - (vii) Specification section name, number and clause number or drawing number and detail/section number.
  - (viii) Applicable standards, such as CSA or CGSB numbers.
  - (ix) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents.

#### E7.1.5 Other Considerations

- (a) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
- (b) Material and equipment delivered to the Site of the Works will not be paid for at least until pertinent shop drawings have been submitted and reviewed.
- (c) Incomplete shop drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.
- (d) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions and review of shop drawings.

### **E8. AUTHORIZED WORK ON PRIVATE PROPERTY**

E8.1 Portions of the permanent Work must be performed on private property. The Contract Administrator will obtain permission for any permanent Work that must be performed at 34 Eastwood Drive and 50 Eastwood Drive.

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 other than specified in this specification the Contract Administrator will authorize such Work in writing after the Contractor has provided in writing to the Contract Administrator the permission of the affected property owner.

## **E9. OFFICE FACILITIES**

- E9.1 The Contractor shall supply office facilities, located at the Eastwood Drive Outfall, meeting the following requirements:
- (a) The field office shall be for the exclusive use of the Contract Administrator.
  - (b) The building shall be conveniently located near the Site of the Work.
  - (c) The building shall have a minimum floor area of 20 square meters, a height of 2.4 m with 2 windows for cross ventilation and a door entrance with a suitable lock.
  - (d) The building shall be suitable for all weather use. It shall be equipped with an electric heater so that the room temperature can be maintained between 24/25° C.
  - (e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.
  - (f) The building shall be furnished with one desk, one office chair, one drafting table, one table 3 m x 1.2 m, one stool, and a minimum of 8 chairs. The building shall have telephone line and fax line. The Contractor is responsible for providing the telephone and fax machine, both in good working order.
  - (g) A portable toilet shall be located near the field office building. The toilet shall have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.
  - (h) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each Site meeting. The Contract Administrator may request additional cleaning when he deems it necessary.
- E9.2 The Contractor shall be responsible for all costs related to office facilities including but not limited to installation, operation, maintenance and removal.

## **GENERAL REQUIREMENTS**

### **E10. MOBILIZATION AND DEMOBILIZATION**

#### **E10.1 Description**

Mobilization and demobilization will include but not be limited to start-up costs, equipment setup and removal, field office and storage facilities set-up and removal and Site cleanup.

#### **E10.2 Materials**

##### **E10.2.1 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.

#### **E10.4 Methods of Measurement and Payment**

E10.4.1 Mobilization and demobilization will be measured on a unit basis and paid for at the Contract Unit Price for "Mobilization and Demobilization" in accordance with this specification, accepted and measured by the Contract Administrator.

E10.4.2 50% of the Mobilization and Demobilization unit price will be paid on the first progress payment.

The remaining 50% of the Mobilization and Demobilization unit price will be paid subsequent to the completion of the Work and restoration and clean up of all Sites.



## **E11. SITE DEVELOPMENT AND RESTORATION**

### **E11.1 Description**

This Specification shall cover all aspects of the Site Development and restoration Work, including, erection and maintenance and removal of safety fencing, field office and storage facilities set-up and removal, sediment control works, snow clearing, general access development, access maintenance and removal, Contract Administrator's Site trailer, and Site restoration.

### **E11.2 Materials**

#### **E11.2.1 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.

### **E11.3 Construction Methods**

#### **E11.3.1 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, etc. necessary to restore any Site and construction access areas to their pre-existing condition.

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 Contractor is responsible for obtaining and paying for all required permits and permissions that are necessary for Site access, including a Waterways Permit, if required by the City of Winnipeg. Contact Don Kingerski, P.Eng., Riverbank Management Engineer at 986-5159 for information regarding Waterways Permits.

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.

#### **E11.3.2 Frozen Waterways Permit**

The Contractor is responsible for obtaining the required Frozen Waterways Permits for permission to Work on the river ice. Contact the City of Winnipeg Police Service.

#### **E11.3.3 Vegetation Removal**

Some vegetation (small trees and sod) removal will be permitted in order to facilitate Site access. Existing vegetation shall not be removed 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.

#### **E11.3.4 Snow and Ice Removal**

Snow cover shall be cleared from the riverbank and hauled off Site prior to placement of the geotextile and 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.

#### E11.3.5 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. Areas of shaft drilling and 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.

#### E11.3.6 Environmental Regulations

- (a) The Contractor shall adhere to all relevant Federal and Provincial environmental regulations.
- (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 D14.

#### E11.3.7 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 not be limited to the Contractor's lay down area, the removal of the Contract Administrator Site trailer, landscaping and grading repairs and removal of all temporary fencing.

#### E11.4 Methods of Measurement and Payment

##### Site Development and Restoration

- (a) The Site development and restoration will be measured and paid for at the Contract Lump Sum Price for "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.

### E12. **OUTFALL SEWER REPAIRS**

#### E12.1 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.

## E12.2 Materials

### E12.2.1 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.

### E12.2.2 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.

### E12.2.3 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 600g/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 hotdip galvanized.

### E12.2.4 Galvanized Primer

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

### E12.2.5 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.

### E12.2.6 CSP Outfall Pipe

Shall be the wall thickness as shown on the construction drawings, CSP as per Clause 5.3 of CW 3610.

### E12.2.7 CSP Couplers , CSP Saddles and Concrete Transition Collars

- (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.

### E12.2.8 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.

#### E12.2.9 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.

### E12.3 Construction Methods

#### E12.3.1 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.

#### E12.3.2 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.

#### E12.3.3 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.

#### E12.3.4 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.

#### E12.3.5 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.

#### E12.3.6 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.

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.

#### E12.3.7 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.

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.

#### E12.3.8 Installation of Debris Grate

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

#### E12.3.9 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.

### E12.4 Method of Measurement and Payment

#### E12.4.1 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, measured from the tie-in point

to the tip of the manufactured bevelled end section, horizontally above the center 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.

**E12.4.2 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.

**E12.4.3 Supply and Installation of Debris Grate**

The supply and installation of the Debris Grate shall be measured on a unit basis. The units to be paid for shall be the total number of Debris Grate 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 Grate will be paid for at the Contract Unit Price for "Supply and Installation of Debris Grate", 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.

**E12.4.4 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.

**E13. GEOTEXTILE**

**E13.1 Description**

**E13.1.1** This Specification shall cover the supply and placement of the geotextile fabric below the rockfill riprap.

**E13.2 Materials**

**E13.2.1** Each geotextile roll to be used shall be tagged to provide product identification for inventory and quality control purposes.

**E13.2.2** Geotextile rolls shall be furnished with suitable wrapping for protection against moisture and extended exposure from the sun, and contamination from dirt, dust, and any other deleterious materials. The geotextile shall remain wrapped in a protective covering until it is used.

**E13.2.3** Non-woven geotextile fabric shall meet or exceed the following requirements:

Parameter	Test Method	Minimum Criteria
Grab Tensile Strength	ASTM D4632	900 N

Mullen Burst	ASTM D3786	2600 kPa
Puncture	ASTM D4833	550 N
Trapezoidal Tear	ASTM D4533	350 N
Apparent Opening Size	ASTM D4751	1.2 mm
Permittivity	ASTM D4491	1.2 sec <sup>-1</sup>
Flow Rate	ASTM D4491	60 L/sec/m <sup>2</sup>

E13.2.4 Suitable products shall be Amoco 4553, Layfield LP 8, Emco R080, Geotex 801, Terrafix 600R, Armtec 250, Mirafi 180 N, Trevira 011/250, or approved equivalent.

### E13.3 Construction Methods

E13.3.1 Geotextiles shall consist of non-woven fabric.

E13.3.2 All Work related to the geotextile storage, handling, and installation shall comply with the procedures and recommendations of the manufacturers, and as accepted by the Contract Administrator.

E13.3.3 Snow and Ice shall be cleared from the riverbank in accordance with E11.3.4 prior to placement of geotextile

E13.3.4 The fabric shall be loosely laid in order to allow conformity to the bedding surface. Folds and wrinkles in the fabric shall be avoided. Pins, nails or weights shall be installed to hold the fabric in place such that placement of fill material will not excessively stretch or tear the fabric and seam overlaps will be maintained.

E13.3.5 The fabric shall be overlapped in a downstream direction (upstream panel overtop of downstream panel) at all joints a minimum of 600 mm. The overlap shall be pinned or secured as approved by the Contract Administrator.

E13.3.6 A minimum of 300 mm of material shall be placed over the fabric prior to equipment passage.

E13.3.7 Riprap shall be placed on the geotextile in such a manner that the geotextile is not damaged, torn, excessively stretched, or punctured.

E13.3.8 Any damaged geotextile, as identified by the Contract Administrator, shall be repaired immediately at the Contractors own cost. 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 that shall be large enough to be sewn or overlapped a minimum of 600 mm onto the undamaged geotextile.

### E13.4 Measurement and Payment

E13.4.1 The supply and placement of geotextile, and related Work specified herein will be measured on an area basis and paid for at the Contract Unit Price for "Geotextile". The area to be paid for shall be the total number of square metres of ground covered by geotextile, placed in accordance with this Specification, accepted and measured by the Contract Administrator.

E13.4.2 Overlap at all joints shall be considered a single layer of geotextile for measure and payment purposes.

E13.4.3 Geotextile used for repairs will be excluded from the quantity paid.

**E14. ROCKFILL RIPRAP**

E14.1 Description

E14.1.1 This Specification shall cover the supply and placement of rockfill riprap.

E14.2 Materials

E14.2.1 The rockfill material for use as riprap shall consist of a clean free draining, sound, dense, durable, crushed rock. The material shall be 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.

E14.2.2 Individual particles shall be shaped such that no dimension is greater than two times the smallest dimension. Flat, elongated, or platy particle shapes will not be accepted.

E14.2.3 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.

E14.2.4 The rockfill material shall meet the following requirements:

Parameter	Test Method	Specified Limit
Bulk Specific Gravity	ASTM C127	2.6 minimum
Absorption	ASTM C127	2.5 % maximum
LA Abrasion Loss	ASTM C131	32% maximum
Soundness	ASTM C88	13% maximum
Gradation	ASTM D5519	See below

E14.2.5 Rockfill riprap shall be well graded having a full range and even distribution of sizes and shall conform to the following gradation:

<u>Canadian Metric Sieve Size (millimeters)</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%

E14.2.6 Submittals

- (a) The Contractor shall submit the proposed supplier(s) and location of quarry Sites for supply of riprap.
- (b) Representative samples of the rockfill riprap submitted for material testing purposes shall be completed as specified herein.

E14.2.7 Quarry Sites

Contractors supplying rockfill riprap shall be responsible for demonstrating that the material is of adequate quality and volume to meet the material specifications contained herein.

E14.2.8 Testing and Approval



- (a) All materials set forth in 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 for any materials taken by the Contract Administrator for testing purposes.
- (b) The Contract Administrator will visit proposed quarry Sites for inspection of the proposed rockfill material and quarry faces a minimum of fourteen (14) days prior to supply and placement of riprap.
- (c) No supply and placement of riprap will be permitted prior to the Contract Administrator reviewing the source.
- (d) The procedures for preparation of all rockfill samples for use in material inspection and testing shall be subject to review and acceptance by the Contract Administrator for individual tests. The samples may be obtained from crushed and processed material at the sizing necessary for specific tests if the material is deemed to be representative of the riprap that will be used, subject to the acceptance of the Contract Administrator.
- (e) The testing frequency necessary to confirm the material quality will be specified at the discretion of the Contract Administrator.

#### E14.3 Construction Methods

##### E14.3.1 Subcutting of the Existing Subgrade

Where shown on the drawings Subcutting of the existing subgrade shall be performed in accordance with E19.

##### E14.3.2 Placing Geotextile

Place geotextile as shown on the drawings and in accordance with E13.

E14.3.3 Rockfill shall be pushed or rolled into place in such a manner that the larger rocks are uniformly distributed and the smaller rocks serve to fill the places between the larger rocks such that excessive segregation of the various particle sizes does not occur.

E14.3.4 Sufficient levelling shall be done to produce a neat and uniform surface, conforming to the shape and dimensions shown on the drawings.

E14.3.5 The allowable fill tolerances shall be within  $\pm 50$  mm of the grades and thickness shown on the drawings, provided positive downslope grading is achieved.

E14.3.6 Provide a smooth uniform surface from the existing grade and new riprap when placing outside edges or transitions, as accepted by the Contract Administrator.

E14.3.7 Temporary stockpiling of riprap along the riverbank shall not be permitted. Material shall be placed to the required lines and grade shown the drawing immediately upon delivery to the Site.

#### E14.4 Measurement and Payment

E14.4.1 The supply and placement of rockfill shall be measured on a weight basis and paid for at the Contract Unit Price for "Rockfill Riprap". The weight to be paid for shall be the total number of metric tonnes of rockfill supplied and placed in accordance with this Specification, as measured by a certified weigh scale and accepted by the Contract Administrator.

E14.4.2 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 which are not supplied at the time of delivery, or which are lost.

**E15. 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.

**E16. TOPSOIL AND SODDING**

The riverbank area within the limits of the Eastwood outfall Right of Ways shall be re-vegetated with topsoil and sod as shown on the drawings. Work shall be in accordance with, and shall be measured and paid in accordance with CW 3510.

Area beyond the R.O.W. disturbed by the Contractor shall be resodded at the cost fo the Contractor.

**E17. SILT FENCE**

E17.1 Description

E17.1.1 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.

E17.1.2 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.

E17.2 Materials

E17.2.1 Fences Posts

Fence posts shall be 100 mm diameter untreated wood posts or 50 mm diameter steel.

E17.2.2 Filter Fabric

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 435	5 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.

E17.2.3 Wire Mesh

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

E17.2.4 Fencing Material Fasteners

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

E17.3 Construction Methods

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

E17.3.1 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 Subclause 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).

E17.3.2 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 Subclause 3.2 of this specification. If silt fence is found to be loose or torn, repair or replace as necessary to comply with Subclause 3.2 of this specification.
- (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.

E17.3.3 Silt Fence Removal

- (a) The silt fence shall remain in place until new vegetation growth has established on the bank, as determined by the Contract Administrator.
- (b) Upon authorization of the Contract Administrator, remove all fence posts, wire mesh, fabric, and fasteners from Site.
- (c) Restore areas disturbed E11, without releasing any deleterious substances to the adjacent watercourse.

E17.4 Measurement and Payment

- E17.4.1 The supply, placement, and removal of silt fence shall be measured on a length basis and paid for at the Contract Unit Price per lineal metre for "Silt Fence". The length to be paid for shall be the total number of metres supplied and placed in accordance with this

Specification, accepted and measured by the Contract Administrator. Payment of silt fence shall be in accordance with the following payment schedule:

- (a) Sixty percent (60%) of the Contract Unit Price per lined metre for "Silt Fence" shall be paid following supply and installation.
- (b) Forty percent (40%) of the Contract Unit Price per lined metre for "Silt Fence" shall be paid following final removal.

E17.4.2 Removal of accumulated sediment from the silt fence is considered incidental to the Work and no separate measurement or payment will be made.

## **E18. TREE REMOVAL**

### **E18.1 Description**

E18.1.1 This specification shall cover the removal of existing trees.

E18.1.2 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 and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

### **E18.2 Materials**

#### **E18.2.1 Existing Trees to be Removed**

The existing trees to be removed include, but not limited to ash, elm, cottonwood, oak, pine, maple, spruce, etc., all of which may be cut with standard chain saw equipment. The existing trees range from 50 mm to 1,000 mm diameter.

### **E18.3 Construction Methods**

E18.3.1 Prior to commencement of the Work the Contract Administrator shall identify all trees for removal. The Contractor shall cut down only trees designated to be removed, and grub out all stumps and roots greater than 100 mm diameter. In general, the Contractor shall start at the top of the tree and remove branches or trunks not longer than 2 m. Trees are to be felled so as to land within the limits of the Works. The Contractor shall load and haul all trees, stumps, roots, logs, brush, rubbish and all other surface litter from the Site and dispose of these materials at an approved disposal Site, acceptable to the Contract Administrator.

E18.3.2 The Contractor shall take all precautions to prevent damage to structures, adjacent property and to trees and shrubs. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.

E18.3.3 Any trees damaged during construction activities shall be examined by a bonded tree care professional and pruned as required. Damaged trees which are not viable shall be replaced by the Contractor at his own cost.

### **E18.4 Measurement and Payment**

E18.4.1 The removal of existing trees shall be measured on a per tree basis and paid for at the Contract Unit Price per unit for "Tree Removal", "50 mm to 250 mm diameter", "greater than 250 mm to 500 mm diameter", "greater than 500 mm diameter". The amount to be paid shall be the total number of trees removed in accordance with this specification, accepted and measured by the Contract Administrator.

E18.4.2 The removal of trees and brush less than 50 mm diameter is considered incidental to the Work and no separate measurement or payment will be made.

## **E19. RIVERBANK REGRADING**

### **E19.1 Description**

E19.1.1 This Specification shall cover excavation and regrading of the riverbank.

E19.1.2 The Work to be done under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

E19.1.3 This Specification shall supplement and amend standard City of Winnipeg Specification CW3170-R3.

### **E19.2 Materials**

#### **E19.2.1 Excavation**

The materials covered in this Specification consist of the in-situ overburden soils and may include but not necessarily limited to organic topsoil, clay, silt, sand, gravel, fill, rubble, trees, tree roots, shrubs, etc., all of which may be excavated with standard hydraulic excavation equipment.

#### **E19.2.2 Clay Fill**

The clay backfill for the slope regrading shall consist of a high plasticity material with a liquid limit in excess of 50%. The clay shall be free of deleterious material such as roots, organics, ice, snow or other unsuitable materials, and may be salvaged from the rockfill column excavation as approved by the Contract Administrator. Placement of frozen material will not be acceptable.

### **E19.3 Construction Methods**

#### **E19.3.1 Stripping and Topsoil Excavation**

All existing vegetation and topsoil within the limits of the riverbank regrading shall be stripped in accordance with clauses 9.2(a) and (b) of CW3170-R3 and disposed of off Site.

#### **E19.3.2 Common Excavation**

All material encountered within the limits of the riverbank regrading following stripping shall be excavated to the lines and grades shown on the drawings. All excavation shall proceed from the top of slope down to minimize the potential for slope instability. All materials shall be removed off Site immediately upon excavation. The allowable excavation tolerances shall be with 50 mm of the grade shown on the drawings, provided positive drainage is achieved.

#### **E19.3.3 Clay Fill**

Clay fill shall be placed along the bank to the lines, grades, and elevations shown on the drawings. The clay shall be spread and placed in layers not exceeding 150 mm thick and compacted to 95% SPMDD.

### **E19.4 Measurement and Payment**

#### **E19.4.1 Stripping, Topsoil and Common Excavation**

(a) Stripping, Topsoil and Common Excavation shall be measured on a volume basis and paid for at the Contract Unit Price for "Riverbank Regrading". The volume to be paid for shall be the total number of cubic metres of material excavated in accordance with this Specification, as measured by the Contract Administrator. Excavated volumes will be computed by the average end area method.

- (b) Excavation required for outfall pipe repairs or any other structures is not part of this Specification. These items are to be completed in accordance with Specification E12.

#### E19.4.2 Clay Fill

Placement of clay fill is considered incidental to the regrading Work and no separate measurement or payment will be made.

### **E20. STRAW MULCH**

#### E20.1 Description

- E20.1.1 This Specification shall cover the supply and placement of straw mulch on all areas of the riverbank to provide temporary erosion protection where existing vegetation has been removed.

#### E20.2 Materials

- E20.2.1 The material shall consist of wheat or barley straw, or other plants approved by the Contract Administrator. The straw mulch shall be air dried, reasonably light in colour, and shall not be musty, mouldy, caked or otherwise of low quality. The mulch shall be free of coarse (chaff) material and free of noxious weeds and/or seeds to prevent the introduction of weeds into previously seeded and planted areas. Dry mulching material that breaks down and does not bend will not be acceptable. The power mulching process shall produce a minimum of 75% of the straw being between 150 mm and 200 mm in length.

#### E20.3 Construction Methods

##### E20.3.1 General

- (a) The Contractor shall supply and place straw mulch material immediately after final grading is completed and prior to March 31 of any year.
- (b) Straw mulch shall be placed ensuring that there is a minimum of 90% ground coverage by area, as measured and accepted by the Contract Administrator.
- (c) Mulched areas shall be inspected periodically and after runoff producing storm events. Damaged areas shall be repaired immediately as determined by the Contract Administrator. Areas requiring remulching as directed by the Contract Administrator will be re-measured and additionally paid for at the Contract Unit Price for the Work item.

##### E20.3.2 Spreading of Straw Mulch Material

- (a) The straw mulch material shall be spread at a rate of 0.45 kg/m<sup>2</sup>, to a layer 25 to 50 mm in thickness. Mulch that remains clumped or bunched after application shall be separated and respread.

##### E20.3.3 Removal of Straw Mulch

- (a) Immediately prior to placement of topsoil and sod and/or topsoil and seed all straw mulch shall be removed and disposed of off Site.

#### E20.4 Measurement and Payment

- E20.4.1 Supply placement and removal of straw mulch will be measured on an area basis and paid for at the Contract Unit Price for "Straw Mulch". The area to be paid for shall be the total number of square metres of ground covered by straw mulch, supplied and placed in accordance with this specification, accepted and measured by the Contract Administrator.

## E21. TREE AND SHRUB PLANTING

### E21.1 Description

E21.1.1 This Specification shall cover the supply and planting of new trees and shrubs.

E21.1.2 The Contractor shall supply all labour, material, equipment and services necessary to complete the Work specified herein.

### E21.2 Materials

E21.2.1 The Contractor shall supply and install the size and species as shown below.

#### TREES

	<u>SIZE</u>
Green Ash	75 mm calliper
Manitoba Maple	75 mm calliper
Cottonwood (male)	75 mm calliper

#### SHRUBS

	<u>SIZE</u>
Dogwood	1 gallon pot

E21.2.2 Trees shall be measured when the branches are in their normal position. Height dimensions specified are to refer to the main body of the tree and not from branch tip to root base. Where trees have been specified by calliper or diameter, reference is to be made to the diameter of the trunk measure 15 cm above the ground as the tree stands in the nursery prior to lifting.

E21.2.3 Water is to be potable and free of minerals which may be detrimental to plant growth.

E21.2.4 Planting soil shall consist of black topsoil, a fertile friable natural loam containing by volume not less than 4% and no more than 25% of organic matter for clay loams, and not less than 2% and no more than 25% for sandy loams, with an acidity value ranging from pH 6.0 to 7.5 capable of sustaining vigorous plant growth.

E21.2.5 Root ball burlap shall be 150 g Hessian burlap, biodegradable.

E21.2.6 Anti-desiccant shall be a wax-like emulsion to provide film over tree leaf surfaces reducing evaporation but permeable enough to permit transpiration.

E21.2.7 Wound dress shall be a horticulturally accepted non-toxic, non-hardening emulsion.

E21.2.8 Wire baskets shall be a horticulturally accepted product designed to carry the weight and burlap-covered root ball. Minimum diameter basket size to conform to the same maximum diameter of the tree root ball for the respective minimum tree calliper.

E21.2.9 Mulch shall be a clean bark or wood chip mulch with chips not less than 15 mm nor larger than 75 mm in size and not more than 20 mm thick. Mulch is to be free of leaves, branches, and other extraneous matter.

E21.2.10 Fertilizer shall be a slow release formulation of low nitrogen and high phosphorous e.g. 10-50-12. Apply quantities at rates stated by the product manufacturer.

E21.2.11 Quality and source of trees and shrubs shall comply with Guide Specification for Nursery Stock, 1985 Edition of Canadian Nursery Trades Association referring to size and development of the plant and root ball. Nomenclature of specified trees shall conform to the International Code for Nomenclature of Cultivated Plants.

- E21.2.12 All trees and plants shall be clearly labelled as to species, size, and nursery origin until such time as they have been set in place on Site, and approved by the Contract Administrator. After approval the Contractor shall remove all tags and labels.
- E21.2.13 Trees are to have been root pruned regularly, but not later than one growing season prior to arrival on Site. The Contractor may be required to provide the Contract Administrator with documentation outlining his root-pruning program.
- E21.2.14 Trees are to characteristically developed for their species and structurally sound, well branched, healthy and vigorous and densely foliated when in leaf. The tree is to have a healthy, well developed, fibrous root system which may be verified through a testing procedure that destructively samples one or more randomly selected root balls.
- E21.2.15 Trees are to have only one, sturdy, reasonably straight and vertical trunk, and a well balanced crown with fully developed leader.
- E21.2.16 Trees shall be free from disease, insect infestation, rodent damage, sun scald, frost cracks, abrasions, unhealed scars, scars exceeding 5 cm in diameter, major forks or crooks in the trunk, broken branches, or angled leaders.
- E21.2.17 Trees exhibiting suppressed, weakly developed branches due to competition from other closely spaced trees in the nursery will not be accepted. Trees exhibiting dead branches will not be accepted.
- E21.2.18 Balled and burlapped trees in excess of 3 m height must have been dug with large firm balls. Roots in balls must be comprised of 75% fibrous and feeder root systems.
- E21.2.19 Tree spade dug trees are to be dug with mechanized digging equipment with hydraulic spade. Root balls are to satisfy C.N.T.A. standards.
- E21.2.20 Use of collected and native trees is not permitted.
- E21.3 Construction Methods
- E21.3.1 Trees and shrubs shall be planted during unfrozen ground conditions and suitable weather conditions for plant growth. Trees are to be planted within forty-eight (48) hours of excavation from the nursery. The location of plantings will be staked out or painted on Site by the Contract Administrator.
- E21.3.2 Excavate planting pits as indicated by the stakes or paint marks. Excavated soil shall be removed off Site. Remove any water that enters excavations prior to planting. Loosen bottom of planting hole to depth of 100-150 mm, cover the bottom of each excavation with minimum 150 mm topsoil mixture and incorporate with the subgrade. Plant trees vertically and orient to give the best appearance in relation to structure, roads, and sidewalks. With balled and burlapped root balls and root balls in wire baskets, loosed burlap and cut away to top 1/3 without disturbing root ball. Do not pull burlap or rope form under root ball. Non-biodegradable wrapping must be removed.
- E21.3.3 Tamp planting soil around root system in layers of 150 mm eliminating air voids. When 2/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling. Each plant shall have an earth saucer at its base having a diameter as large as the excavation with a 10 cm lip formed at the perimeter of the saucer to retain water. When planting is completed, give surface of planting saucer dressing of fertilizer. Mix fertilizer thoroughly with top layer of planting soil and water in well.
- E21.3.4 Trees shall be individually staked within seven (7) calendar days following planting with two 2.4 m metal T-bars located on the northwest and southeast side of the tree, and connected to the trunk with rubber hose or an industry accepted substitute. Prune nursery stock after planting to compensate for loss of roots suffered during transplanting.



E21.3.5 Trees and shrubs shall be watered during the planting procedure and once a week thereafter, or more frequently if required, during the growing season.

E21.3.6 Maintenance

- (a) The Contractor shall provide a one year maintenance of trees and shrubs from the date of Total Performance. Maintenance Work shall include:
- (b) Fertilizing – Spread Fertilizer consisting of synthetic slow release with maximum 35% nitrogen evenly at a frequency, ratio and rates recommended by the Manufacturer.
- (c) Watering –Apply 40 litres of water per tree twice a month or more if drought conditions prevail.
- (d) Tree Supports and Tie Adjustments – Maintain tree supports and ties in proper repair. Remove supports as directed by Contract Administrator. Strengthen any tree which is leaning.
- (e) Replace trees and shrubs that die within the one-year maintenance period.

E21.4 Measurement and Payment

E21.4.1 The supply, planting and maintenance of trees and shrubs will be measured on a unit basis and paid for at the Contract Unit Price of “Tree and Shrub Planting”. The amount to be paid for will be the total number of trees and shrubs supplied, planted, and maintained in accordance with this specification, accepted and measured by the Contract Administrator.

**E22. ENVIRONMENTAL PROTECTION PLAN**

E22.1.1 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the Environmental Protection Plan as herein specified, Fisheries Authorization & CEAA Screening report.

E22.1.2 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work and are available for viewing at the office of the Contract Administrator.

- (a) Federal
  - (i) Canadian Environmental Assessment Act (CEAA) c.37
  - (ii) Transportation of Dangerous Goods Act and Regulations c.34
  - (iii) The Fisheries Act
  - (iv) Navigable Waters Protection Act
- (b) Provincial
  - (i) The Dangerous Goods Handling and Transportation Act D12
  - (ii) The Endangered Species Act E111
  - (iii) The Environment Act c.E125
  - (iv) The Fire Prevention Act F80
  - (v) The Manitoba Heritage Resources Act H39.1
  - (vi) The Manitoba Noxious Weeds Act N110
  - (vii) The Manitoba Nuisance Act N120
  - (viii) The Public Health Act c.P210
  - (ix) The Workplace Safety and Health Act W210
  - (x) And current applicable associated regulations.

*(Note: Provincial regulations updated as of September 1999)*

(c) Municipal

- (i) The City of Winnipeg By-law No. 2480/79 and all amendments up to and including 7969/2000
- (ii) The City of Winnipeg By-law No. 1573/77 and all amendments up to and including 7670/2000
- (iii) And any other applicable Acts, Regulations, and By-Laws.

E22.1.3 The Contractor is advised that the following environmental protection measures apply to the Work.

(a) Materials Handling and Storage

- (i) Construction materials shall not be deposited or stored on riverbanks or river shorelines unless written acceptance from the Contract Administrator is received in advance.
- (ii) Construction materials and debris shall be prevented from entering the Assiniboine River. In the event that materials and/or debris inadvertently enter the watercourse, the Contract shall be required to remove the material and restore the watercourse to its original condition.

(b) Fuel Handling and Storage

- (i) The Contractor shall obtain all necessary permits from Manitoba Conservation for the handling and storage of fuel products and shall provide copies to the Contract Administrator.
- (ii) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.
- (iii) Fuels, lubricants, and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.
- (iv) In accordance with Section 2.5 (Construction: General Guidelines) of the Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, (DFO and DNR, 1996), the Contractor shall ensure that any temporary fuel storage areas established for construction of the project are contained by an impermeable dike and are located a minimum distance of 100 metres away from the high water line of the Assiniboine River. Dikes shall be designed, constructed, and maintained to retain not less than 100% of the capacity of the total number of containers or 110% of the largest container, whichever is greatest. The dikes shall be constructed of clay or similar impervious material. If this type of material is not available, the dike shall be constructed of locally available material and lined with high density polyethylene (HDPE). Furthermore, the fuel storage area(s) shall be secured by a barrier such as a high fence and gate to prevent vandalism.
- (v) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
- (vi) Products transferred from the fuel storage area(s) to specific Work Sites shall not exceed the daily usage requirement.

- (vii) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheet of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill.
  - (viii) Refuelling of mobile equipment and vehicles shall take place at least 100 metres from a watercourse.
  - (ix) The area around storage Sites and fuel lines shall be distinctly marked and kept clear of snow and debris to allow for routine inspection and leak detection.
  - (x) A sufficient supply of materials, such as absorbent material and plastic oil booms, to clean up minor spills shall be stored nearby on-Site. The Contractor shall ensure that additional material can be made available on short notice.
- (c) Waste Handling and Disposal
- (i) The construction area shall be kept clean and orderly at all times during and at completion of construction.
  - (ii) At no time during construction shall personal or construction waste be permitted to accumulate for more than one day at any location on the construction Site, other than at a dedicated storage area as may be approved by the Contract Administrator.
  - (iii) All resulting debris shall be deposited at a Waste Disposal Ground operating under the authority of Manitoba Regulation #150/91. Exceptions are liquid industrial and hazardous wastes which may require special disposal methods (see SC:21.4 D).
  - (iv) Indiscriminate dumping, littering, or abandonment shall not take place.
  - (v) No on-Site burning of waste is permitted.
  - (vi) Waste storage areas shall not be located so as to block natural drainage.
  - (vii) Run-off from a waste storage area shall not be allowed to cause siltation of a watercourse.
  - (viii) Waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
  - (ix) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.
- (d) Dangerous Goods/Hazardous Waste Handling and Disposal
- (i) Dangerous goods/hazardous wastes are identified by, and shall be handled according to, The Dangerous Goods Handling and Transportation Act and Regulations.
  - (ii) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations.
  - (iii) The Contractor shall have on-Site staff that is trained and certified in the handling of the dangerous/hazardous goods, when said dangerous/hazardous goods are being utilized on-Site for the performance of the Work.
  - (iv) Different waste streams shall not be mixed.
  - (v) Disposal of dangerous goods/hazardous wastes shall be at approved hazardous waste facilities.
  - (vi) Liquid hydrocarbons shall not be stored or disposed of in earthen pits on-Site.

- (vii) Used oils shall be stored in appropriate drums, or tankage until shipment to waste oil recycling centres, incinerators, or secure disposal facilities approved for such wastes.
- (viii) Used oil filters shall be drained, placed in suitable storage containers, and buried or incinerated at approved hazardous waste treatment and disposal facilities.
- (ix) Dangerous goods/hazardous waste storage areas shall be located at least 100 metres away from the high water line and be dyked.
- (x) Dangerous goods/hazardous waste storage areas shall not be located so as to block natural drainage.
- (xi) Run-off from a dangerous goods/hazardous waste storage area shall not be allowed to cause siltation of a watercourse.
- (xii) Dangerous goods/hazardous waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.

(e) Emergency Response

- (i) The Contractor shall ensure that due care and caution is taken to prevent spills.
- (ii) The Contractor shall report all major spills of petroleum products or other hazardous substances with significant impact on the environment and threat to human health and safety (as defined in Table 1 below) to Manitoba Conservation, immediately after occurrence of the environmental accident, by calling the 24-hour emergency phone number (204) 945-4888. The Contract Administrator shall also be notified.
- (iii) The Contractor shall designate a qualified supervisor as the on-Site emergency response co-ordinator for the project. The emergency response co-ordinator shall have the authority to redirect manpower in order to respond in the event of a spill.
- (iv) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-Site emergency response co-ordinator:
  - A. Notify emergency-response co-ordinator of the accident:
    - Identify exact location and time of accident
    - indicate injuries, if any
    - request assistance as required by magnitude of accident (Manitoba Conservation 24-hour Spill Response Line (204) 945-4888, Police, Fire Department, Ambulance, company backup)
  - B. Attend to public safety:
    - stop traffic, roadblock/cordon off the immediate danger area
    - eliminate ignition sources
    - initiate evacuation procedures if necessary
  - C. Assess situation and gather information on the status of the situation, noting:

- personnel on-Site
  - cause and effect of spill
  - estimated extent of damage
  - amount and type of material involved
  - proximity to waterways, sewers, and manholes
- D. If safe to do so, try to stop the dispersion or flow of spill material:
- approach from upwind
  - stop or reduce leak if safe to do so
  - dike spill material with dry, inert sorbet material or dry clay soil or sand
  - prevent spill material from entering waterways and utilities by diking
  - prevent spill material from entering manholes and other openings by covering with rubber spill mats or diking
- E. Resume any effective action to contain, clean up, or stop the flow of the spilled product.
- (v) The emergency response co-ordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to Manitoba Conservation according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.
- (vi) When dangerous goods are used on-Site, materials for containment and cleanup of spill material (e.g. absorbent materials, plastic oil booms, and oversized recovery drums) shall be available on-Site.
- (vii) Minor spills of such substances that may be contained on land with no significant impact on the environment may be responded to with in-house resources without formal notification to Manitoba Environment.
- (viii) City emergency response, 9-1-1, shall be used if other means are not available.
- (ix) The on-Site emergency response coordinator shall contact The Canadian Coast Guard, Selkirk (204) 785-6030, if the spill material reaches and is on or in the Red or Assiniboine Rivers.

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**Table 1 Spills that must be reported to the Manitoba Conservation as Environmental Accidents**

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<u>Classification</u>	<u>Hazard</u>	<u>Reportable Quantity/Level</u>
1	Explosives	All
2.1	Compressed Gas (flammable)	100 L*
2.2	Compressed Gas	100 L*
2.3	Compressed Gas (toxic)	All
2.4	Compressed Gas (corrosive)	All
3	Flammable Liquids	100 L

4		Flammable Solids	1 kg
5.1	PG** I & II	Oxidizer	1 kg or 1 L
	PG III	Oxidizer	50 kg or 50 L
5.2		Organic Peroxide	1 kg or 1 L
6.1	PG I	Acute Toxic	1 kg or 1 L
	PG II & III	Acute Toxic	5 kg or 5 L
6.2		Infectious	All
7		Radioactive	Any discharge or radiation level exceeding 10 mSv/h at the package surface and 200 uSv/h at 1 m from the package surface
8		Corrosive	5 kg or 5 L
9.1		Miscellaneous	50 kg (except PCB mixtures)
9.1		PCB Mixtures	500 g
9.2		Aquatic Toxic	1 kg or 1 L
9.3		Wastes (Chronic Toxic)	5 kg or 5 L

\* Container capacity (refers to container water capacity)

\*\* PG = Packing Group(s)

(f) Vegetation

- (i) Vegetation shall not be distributed without written permission of the Contract Administrator. The Contractor shall protect plants or trees which may be at risk of accidental damage. Such measures may include protective fencing or signage and shall be approved in advance by the Contractor Administrator.
- (ii) Trees damaged during construction activities shall be examined by bonded tree care professionals; viable trees damaged during construction activities shall be pruned according to good practise by bonded tree care professionals. Damaged trees which are not viable shall be replaced at the expense of the Contractor.
- (iii) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400 millimetre wood planks, or suitably protected as approved by the Contract Administrator.
- (iv) Herbicides and pesticides shall not be used adjacent to any surface watercourses.
- (v) All landowners adjacent to the area of application of herbicides or pesticides shall be notified prior to the Work.
- (vi) Trees or shrubs shall not be felled into watercourses.
- (vii) Areas where vegetation is removed during clearing, construction, and decommissioning activities, shall be revegetated as soon as possible in accordance with the landscaping plans forming part of the contract, or as directed by the Contract Administrator.

(g) Landscaping

Restoration of boulevards requiring topsoil and sod.

(h) Red and Assiniboine Rivers Navigation Protection

Dangerous Goods/Hazardous Waste Handling and Disposal

- A. The Red and Assiniboine Rivers are open to navigation from approximately mid April to mid November, annually. During this period, it will be the responsibility of the Contractor to fully ensure the safety of river users.
- B. The Contractor shall provide, install, and maintain adequate warning signs and lighting on any structure beyond the water's edge to notify boats and other craft navigating on the Assiniboine River that construction is underway. These warnings shall meet the requirements of the Winnipeg Rivers and Streams Authority Number One and of the Canadian Coast Guard.
- C. Prior to commencing any applicable operations over the Red River, the Contractor shall provide to the Contract Administrator a copy of all necessary approvals received by the Contractor.

**E23. CURED-IN-PLACE-PIPE (CIPP) FOR JOINT REPAIRS**

E23.1.1 DESCRIPTION

Internal point repairs using cured-in-place pipe (CIPP).

E23.1.2 DEFINITIONS

- (a) Cured-in-place-pipe (CIPP) means trenchless sewer rehabilitation by installing a resin-felt composite structure which when cured will form a continuous-close fit liner within an existing sewer.
- (b) Approved CIPP Suppliers and Installers means suppliers and installers pre-approved under City of Winnipeg "Request for Qualifications for the Supply and Installation of Cured in Pipe (CIPP)". A list of pre-approved CIPP suppliers and installers for 2005 is included in the Specifications.
- (c) Full segment CIPP means CIPP extending from manhole to manhole or manhole to node (wye or tee connection to another sewer).
- (d) Partial full segment CIPP means CIPP extending from a manhole to an intermediate point within the sewer and shall generally be longer than ten metres in length.
- (e) Internal point repair CIPP means CIPP a short length or multiples of short length CIPP to repair localized defects anywhere within a sewer or sewer service. Internal point repairs are generally one to ten metres in length.

- (f) Minimum material requirements for CIPP shall conform to ASTM D5813-95 “Standard Specification for Cured-In-Place Thermosetting Resin Sewer Pipe” and the supplemental requirements noted herein.

**E23.2 MATERIALS**

**E23.2.1 Pre-Approved CIPP Suppliers and Installers and Materials**

- (a) The following is a list of sewer lining systems – suppliers and installers and materials that have been pre-approved under the City of Winnipeg “Request for Qualifications for the Supply and Installation of Cured in Pipe (CIPP) Bid Opportunity No. 168-2005” for 2005 City of Winnipeg sewer rehabilitation projects.

**Table E2.3.1a): Pre-Approved CIPP Suppliers and Installers**

<b>Applicant</b>	<b>Insituform Technologies Limited</b>	<b>Capital Commercial Pipe Service</b>	<b>Nelson River Construction Inc.</b>	<b>Summit Pipeline Services Ltd.</b>
Contact	Ken Foster 780-413-0200	Brian Ratchford 905-522-0522	Gordon Lee 204-949-8700	Doug Anderson
Supplier	Insituform Technologies Limited	Capital Commercial Pipe Services	C.I.P.P. Corporation	JWM Environmental Inc.
Installer	Insituform Technologies Limited	Capital Commercial Pipe Services	Municipal Pipe Tool Inc.	Summit Pipeline Services Ltd.
Liner Name	Standard Insituform® CIPP	Capital Lining Systems	C.I.P.P. Corp. Liner	Premier Pipe USA

**E23.2.2 Existing Sewer Conditions**

- (a) The assessment of liner system design conditions and site-specific repairs required to accommodate lining were based on the conditions observed from sewer inspections that were performed in 2005 as part of the 2005 Outfall Program. The video inspection and report are available to the Contractor for viewing at the office of KGS Group.
- (b) The Contractor shall be aware the video inspections provided were completed immediately after sewer cleaning and the amount of sediment and debris present at the time of this Bid Opportunity may not be the same. The Contractor shall be responsible to determine the actual amount of sediment and debris in the sewers included in this Work.
- (c) The following specific design conditions and site specific repair requirements apply but are not limited to the Work.

Eastwood Drive Sewer ID: RR-108	MH @ Glenway Avenue – Outfall @ Red River
Size/Shape	525 mm
Material	RC
Total Length	77.21 m



<u>Distance from Manhole</u>	<u>Required Action</u>
2.1 m	Internal point repair @ Joint
4.0 m	Internal point repair @ Joint
26.4 m	Internal point repair @ Joint
57.7 m	Internal point repair @ Joint

### E23.2.3 Submittals Before Starting Work

- (a) Provide the required submittals to the Contract Administrator a minimum of 10 days before starting the lining.
- (b) Submit the CIPP design Shop Drawings in accordance with CW1110 and sealed and signed by a Professional Engineer licensed to practice in the Province of Manitoba. Include the following information.
  - (i) CIPP thickness computations including all specified design checks. Identify design assumptions based on a review of the Sewer Maintenance Inspection that differ from the information provided in the Specifications for the existing sewer design conditions.
  - (ii) Calculations showing the hydraulic capacity of the CIPP sewer will be equal to or greater than the existing sewer.
  - (iii) Name and manufacturer of the resin and tube proposed for each CIPP.
  - (iv) CIPP curing schedule provided by the resin supplier indicating the temperature, staging, duration and pressure required to achieve a proper cure of the resin and fabric tube composite.
  - (v) Other information that may reasonably be required by the Contract Administrator to confirm the CIPP design proposed conforms to the specified requirements and design intent.
- (c) Resin Samples
  - (i) Arrange for the manufacturer of the resin to forward a reference sample of each type of resin proposed for use on the works to a test laboratory designated by the Contract Administrator to be used as a comparative reference sample for infrared spectrum testing.
  - (ii) Deliver a representative sample from each resin batch to be used on the project before adding the catalyst from the wet-out facility to a test laboratory designated by the Contract Administrator.
  - (iii) The Contract Administrator will arrange and pay for an infrared analysis of the samples.
- (d) Submit an operations protocol that provides information on the following.
  - (i) Resin impregnation method.
  - (ii) Designated location of the wet out facility.
  - (iii) Documentation the resin to be used has not exceeded its shelf life as recommended by the manufacturer of the resin.
  - (iv) Volume of resin to be impregnated into each liner and repair section including the proposed excess allowance for polymerization and migration (typically 7%) into cracks and joints of the host pipe.
  - (v) Roller gap setting required to provide the final installed CIPP thickness based on the proposed volume of resin.
  - (vi) Details of the wet-out procedure for internal point repair CIPP.
- (e) Submit a construction protocol that provides information on the following.

- (i) Proposed main line and sewer service flow control arrangements.
  - (ii) Minimum pressure to hold the tube tight against the existing sewer and the maximum pressure to not damage the sewer or uncured liner.
  - (iii) Provide the maximum allowable axial and longitudinal tensile stress for the fabric tube and the arrangement for monitoring pull-in forces during installation if liner insertion is to be by pull-in methods.
  - (iv) Number and location of heat source monitor gauges.
  - (v) Minimum and maximum allowable temperature during each phase of the cure period as measured at the heat source return line.
  - (vi) Number of stages and anticipated time for each stage of the curing period based on resin supplier's recommendations.
  - (vii) Estimated length of time required to reinstate the main line sewer and sewer services.
- (f) Provide the following additional information for internal point repair CIPP.
- (i) Limiting capacity of the flow through by-pass piping.
  - (ii) Details of the internal point repair CIPP installation method.
  - (iii) Means of curing such as ambient, steam or hot water and quality assurance procedures in-place to determine curing requirements are achieved.
  - (iv) Estimated length of time for installation of the internal point repair and to reinstate service services.

### E23.3 CONSTRUCTION METHODS

#### E23.3.1 Verification of Existing Sewer Dimensions

- (a) Verify dimensional requirements of each sewer to be rehabilitated prior to manufacture of the CIPP tube as follows.
- (i) Length of sewer from manhole to manhole for full segment and partial full segment CIPP.
  - (ii) Diameter and cross-section of the sewer at the upstream and downstream manholes and at a minimum distance of 500 millimetres inside the sewer from each manhole.
  - (iii) Use calibrated callipers or other suitable measuring device capable of measuring accurately to +/- 1 millimetre to confirm cross section geometry at clock positions of:
    - ◆ 12:00 to 6:00,
    - ◆ 2:00 to 8:00,
    - ◆ 3:00 to 9:00 and
    - ◆ 4:00 to 10:00.
  - (iv) Estimate the remainder of the sewer dimensional requirements based on dimensional checks and the Sewer Maintenance Inspections.

#### E23.3.2 Sewer Cleaning

- (a) Remove loose and solid debris and intruding connections in accordance with CW 2140 to adequately prepare the sewer for lining.

#### E23.3.3 Sewer Inspections

- (a) Perform the following sewer inspections in accordance with CW 2145 in the presence of the Contract Administrator.
- (i) Pre-Sewer Repair Inspection, where required, before starting any excavation. No coding submission will be required.

- (ii) Pre-Design Inspection, where required, prior to preparing the CIPP design. No coding of the submission will be required.
  - (iii) Pre-Lining Inspection after sewer cleaning and preparation. No coding of the submission will be required.
  - (iv) Post-Lining Inspection subsequent to installing the CIPP and sewer service reinstatement. Full coding required.
  - (v) Warranty Inspection before expiration of the warranty period and acceptance. Full coding required.
  - (vi) Water level in pipe during inspections must be no more than 5% of pipe diameter or height.
- (b) Review the Pre-Sewer Repair Inspection video with the Contract Administrator before starting the repair Work to confirm the extent and precise location of external sewer repairs.
- (c) Review the Pre-Design Inspection video to confirm the height and width of sewers larger than 600 millimetres in diameter and non-circular sewers.
- (i) Provide a copy of the video to the Contract Administrator.
  - (ii) Advise the Contract Administrator of any condition that is contrary to the design conditions or assumptions made that may affect either long or short-term performance of the CIPP prior to liner design.
- (d) Review the Pre-Lining Inspection videotape with the Contract Administrator at least 24 hours before installing the CIPP and obtain approval to install the CIPP. The Pre-Lining Inspection shall confirm:
- (i) Necessary cleaning and pipe preparation Work, including internal and external sewer repairs, have been satisfactorily completed.
  - (ii) Condition of the sewer pipe is consistent with the design conditions and the Specifications. Advise the Contract Administrator of any condition that is contrary to the design conditions or assumptions made that may affect either long or short-term performance of the CIPP prior to commencing lining.
  - (iii) Location, condition and operational status of all sewer services.
  - (iv) The limit and precise location for each internal point repair.
  - (v) Review Sewer Service Reports while reviewing the Pre-Lining Inspection.
- (e) Post-Lining Inspection is to confirm the adequacy of sewer service reinstatements and the fit and finish of the CIPP including continuous or discontinuous (every 5 metres) measurement of the height and width of large diameter and non-circular sewers along the entire length of the sewer. The actual measurements and distance of the measurements from the upstream manhole are to be visible on the measuring tape or device and recorded on the Post Lining Inspection.
- (f) Warranty Inspection to confirm the fit and finish of the CIPP, need for any remedial Work and acceptance of any repair Work performed during the warranty period. Sewer cleaning in accordance with CW 2140 is required to obtain a satisfactory inspection.

#### E23.3.4 Sewer Service Report

- (a) Confirm exact location of all sewer services connected to the sewer being lined by dye testing methods.
- (b) Submit a written Sewer Service Report for each CIPP location to the Contract Administrator providing the following information for each sewer service.
  - (i) Operational status of each sewer service (live or out of service). For live services indicate the property address of structure serviced.

- (ii) Distance from the upstream manhole in metres and clock reference of the connection position to the sewer.
- (iii) Diameter in millimetres.
- (iv) Material type.
- (v) Observed condition of the sewer service.

E23.3.5 Flow Control

Flow control measures shall adhere to specification E6

E23.3.6 Sewer Preparation

- (a) Perform sewer preparation and repairs as indicated in the specification and drawings.

E23.3.7 Weather

- (a) Review the Environment Canada weather forecast with the Contract Administrator before starting CIPP lining installation.
- (b) Delay installation of CIPP when the anticipated weather conditions are such that anticipated sewer flow will exceed the flow control measures provided.

E23.3.8 Installation of CIPP

- (a) Install liners by inversion methods in accordance with ASTM F1216 or by pull-in methods in accordance with ASTM F1743-96.
  - (i) Full segment and partial full segment CIPP shall be cured by hot water or steam.
  - (ii) Internal point repair CIPP shall be ambient, hot water or steam cured.
- (b) Carry out workmanship in accordance with ASTM D5813.
- (c) Trim ends of CIPP neatly to fit flush with interior vertical surface and manhole benching and seal to make watertight.
- (d) Fill annular spaces where the CIPP does not make an adequate seal with the host pipe at manholes, termination points and sewer services due to broken or misaligned pipe with a resin mixture compatible with the CIPP.
- (e) Extend limits for internal point repairs a minimum of 300 millimetres in each direction beyond the limits of the defect to be repaired. Extend internal point repairs that terminate at sewer service services a minimum distance of 300 millimetres beyond the limit of the service.
- (f) Ensure termination points of internal point repairs provide a smooth and uniform flow transition to the host pipe for the full circumference of the repair.

E23.3.9 Sewer Inspection Reports

- (a) Provide the Contract Administrator with the following sewer inspection reports prepared in accordance with CW 2145.
  - (i) Submit pre-sewer repair inspection and pre and post-lining inspection and reports before Total Performance of Work.
  - (ii) Submit a warranty inspection report before Final Acceptance of Work.

E23.3.10 Quality Control Records

- (a) Maintain the following Quality Control records of the Work and provide to the Contract Administrator after completion of the Work.
  - (i) Summary of the resin impregnation process including:
    - ◆ Volume of resin supplied.

- ◆ Excess quantity of resin added during the wet out to account for polymerization and migration into the host pipe.
  - ◆ Roller gap setting.
  - ◆ Resin catalyst(s) used.
  - ◆ Time and location of the wet out.
  - ◆ Means taken to store and transport the resin impregnated CIPP from the wet out facility to the job site.
  - ◆ Means of curing internal point repair liners.
- (ii) Continuous log of pressure maintained in the liner during the curing period.
  - (iii) Pulling force used to pull or winch CIPP into place in the host sewer and measured liner elongation.
  - (iv) Continuous log of temperature at boiler in and out and at all thermistors placed between the host pipe and the liner at all manholes during the initial cure, cure, and cool down periods.

#### E23.3.11 Confined Test Samples

- (a) Provide necessary forms of the same diameter as the host pipe and secure a minimum 200 millimetre long full diameter confined test sample from each CIPP and internal point repair.
- (b) Locate the test sample form in an intermediate manhole or at a termination point and invert through the form.
- (c) Cut the CIPP sample to coincide with multi-piece form if used for CIPP larger than 450 millimetres in diameter to facilitate removal from the manhole.
- (d) Identify the location where the liner sample is from on the form and provide to the Contract Administrator intact in the form.
- (e) The Contract Administrator will coordinate and pay for CIPP sample testing to confirm the CIPP flexural strength, flexural modulus and thickness in accordance with the requirements of ASTM D5813, D790, and ASTM D3567.
- (f) If it can be demonstrated that it is impractical to obtain confined test samples due to CIPP size and site specific conditions then results from test plate samples modified in accordance with Clause E23.3.12 of this specification will be used to confirm flexural strength and flexural modulus.

#### E23.3.12 Test Plate Samples

- (i) Obtain and provide the Contract Administrator with test plate samples of each CIPP.
- (ii) Prepare test plate samples on-site from the actual CIPP and cure in a clamped mould placed in the downtube or manhole.
- (iii) The Contract Administrator will coordinate and pay for test plate sample testing to confirm the flexural strength, flexural modulus and thickness in accordance with the requirements of ASTM D5813, D790, and D3567.
- (iv) Flexural strength and flexural modulus results obtained from test plates will be reduced by the maximum percentage difference of the confined pipe and test plate samples prepared from the same CIPP system for at least 3 previous CIPP linings on the same project.
- (v) Schedule installation of liners for which confined pipe samples are impractical to obtain after at least 3 other CIPP linings on the same project have been completed and confined pipe and test plate samples have been secured to provide collaborative testing.

- (vi) Obtain and provide the Contract Administrator with pre and post lining measurements taken in accordance with Clause E23.3.1 of this specification to confirm in-place liner thickness.
- (vii) The Contract Administrator will review liner thickness results taken from test plates or unconfined samples on a case-by-case basis.

#### E23.3.13 Infrared Spectroscopy

- (a) The Contract Administrator will arrange and pay for testing to compare the infrared spectrum of the resin field samples supplied from the wet-out to the reference spectrum generated from the resin sample provided by the resin manufacturer to verify installed material acceptability.

#### E23.3.14 Post Construction Design Review for Total Performance

- (a) The Contract Administrator will perform a post-construction design review to ensure that the completed CIPP meets the 50 year design life structural requirements prior to Total Performance. The design review will utilize the measured values for flexural strength, flexural modulus, and CIPP thickness from the confined pipe sample testing or the reduced strength/modulus values obtained from the test plate testing in circumstances where confined pipe samples are not able to be secured.
- (b) CIPP strength values will be further reduced to account for creep based on the creep reduction values recommended in the pre-qualification submissions to assess the suitability of the liner to meet the 50 year design life requirement. The use of full enhancement factors in this analysis will be limited to liners that are confirmed by visual classification to be close-fit liners based on the post-lining sewer inspection.
- (c) The Contract Administrator will advise of any discrepancies between the constructed CIPP and the design requirements.
- (d) Perform necessary remedial measures to confirm that a CIPP deemed as structurally deficient will comply with the 50 year design life requirement such as confirmation of actual ovality, determination of a more representative groundwater elevation locally through monitoring, and supplemental strength testing and thickness measurements.
- (e) Repair sections of CIPP removed for supplemental testing by placing a full circumference internal point repair of the same thickness as the full segment liner over and extending 300 millimetres beyond each side of the cut section.
- (f) Install a supplemental CIPP of the required thickness to structurally enhance the installed CIPP if supplemental testing fails to confirm the CIPP will meet the 50 year design life requirement.
- (g) Review remedial action with the Contract Administrator prior to implementation.
- (h) Perform further testing, monitoring and calculations and install structural enhancements at own cost.

### E23.4 MEASUREMENT AND PAYMENT

#### E23.4.1 Verification of Existing Sewer Dimensions

- (a) Verification of existing sewer dimensions including the pre-design inspection will not be measured for separate payment and will be included with CIPP installation.

#### E23.4.2 Submittals Before Starting Work

- (a) Submittals required before starting Work including CIPP design, resin samples, operations protocol and construction protocol will not be measured for separate payment and will be included with CIPP installation.

#### E23.4.3 Sewer Cleaning

- (a) Sewer cleaning will be measured and paid for in accordance with CW 2140.

E23.4.4 Sewer Inspections

- (a) Sewer inspections will be measured and paid for in accordance with CW 2145.

E23.4.5 Sewer Service Reports

- (a) Sewer service reports will not be measured for separate payment and will be included with CIPP installation.

E23.4.6 CIPP Installation

- (a) Liner installation will be measured on a length basis for each size and paid for at the Contract Unit Price for "Internal Point Repair CIPP". Length to be paid for will be the total length of CIPP supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- (b) Internal Point Repairs CIPP measurement will be made along the length of the internal point repair CIPP as measured by the post lining video inspection. Internal point repair CIPP installed beyond the limits identified by the Contract Administrator during review of the pre-lining video shall not be measured for payment.
- (c) Eighty (80) percent of the payment will be made upon satisfactory completion of the CIPP installation Work. The remaining twenty (20) percent of the payment will be made upon confirmation of the CIPP strength and delivery and acceptance of all required submissions, shop drawings, and reports.

E23.4.7 Sewer Inspection Reports

- (a) Sewer inspection reports measured and paid for in accordance with CW 2145.

E23.4.8 Quality Control Records

- (a) Quality control records will not be measured for separate payment and will be included with payment for CIPP installation.

E23.4.9 Test Samples

- (a) CIPP test samples will not be measured for separate payment and will be included with payment for CIPP installation.

E23.4.10 Manhole Repairs

- (a) Manhole frames, covers, rungs and risers removed and replaced to facilitate the CIPP installation will not be measured for separate payment and will be included with payment for CIPP installation.