



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 186-2015

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, May 8, 2015.

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

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

B3. SITE INVESTIGATION

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

B4. ENQUIRIES

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

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

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

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

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

B5. CONFIDENTIALITY

B5.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Bidder before receipt hereof; or
- (b) becomes publicly known other than through the Bidder; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B5.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

B6. ADDENDA

- B6.1 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.
- B6.2 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.
- B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B6.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.3 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.

B7. SUBSTITUTES

- B7.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B7.3 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.
- B7.4 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.
- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her 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.
- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.

- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her 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 B17.
- B7.9 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.
- B7.10 Notwithstanding B7.2 to B7.9, and in accordance with B8.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B17.1(a).

B8. BID COMPONENTS

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices;
 - (c) Bid Security
 - (i) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B8.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B8.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B8.5 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.
- B8.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B17.1(a).
- B8.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B8.8 Bids shall be submitted to:

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

B9. BID

B9.1 The Bidder shall complete Form A: Bid, making all required entries.

B9.2 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/her own name, his/her 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/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

B9.3 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.

B9.4 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/her 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/her 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.

B9.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B10. PRICES

B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B10.1.1 Notwithstanding C12.2.3(c), prices on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B10.2 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.

B10.3 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.

B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B11. DISCLOSURE

B11.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B11.2 The Persons are:

- (a) Andy Vincent (Chaneline International)

B12. QUALIFICATION

B12.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.

B12.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

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

B12.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
- (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);

B12.4 Further to B12.3(a) the Bidder and/or any proposed Subcontractor undertaking the GRP liner installation and grouting portion of the Work must be able to demonstrate the following qualifications in accordance with B12.6 (Form L: Contractor Experience):

- (a) A minimum of three examples of successful GRP liner installations greater than 1200 mm in diameter.
- (b) A minimum of one example of non-circular GRP liner installation, greater than 1200 mm in diameter.

B12.5 Further to B12.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
- (b) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; 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 Division website at <http://www.winnipeg.ca/matmgt/>).

B12.6 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B12.7 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.

B13. BID SECURITY

B13.1 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.

B13.1.1 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.

B13.1.2 All signatures on bid securities shall be original.

B13.1.3 The Bidder shall sign the Bid Bond.

B13.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B13.2 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.

B13.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B13.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B13.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B13.3 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.

B14. OPENING OF BIDS AND RELEASE OF INFORMATION

B14.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.

B14.1.1 Bidders or their representatives may attend.

B14.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/default.stm>

B14.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/default.stm>

B14.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B15. IRREVOCABLE BID

B15.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.

B15.2 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.

B16. WITHDRAWAL OF BIDS

B16.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B16.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B16.1.2 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.

B16.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Bid until after the Submission Deadline has elapsed;
- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B16.1.3(b), declare the Bid withdrawn.

B16.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B15.2 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.

B17. EVALUATION OF BIDS

B17.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

B17.2 Further to B17.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B17.3 Further to B17.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B17.4 Further to B17.1(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.

B17.4.1 Further to B17.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B18. AWARD OF CONTRACT

B18.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B18.2 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.

B18.2.1 Without limiting the generality of B18.2, 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.

B18.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B17.

B18.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of installation of non-circular GRP liners into trunk sewers on Selkirk Avenue and Archibald Street.

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

- (a) Flow control
- (b) Developing access to the trunk sewers at each site
- (c) Installation of GRP liners
- (d) Annulus grouting of GRP liners
- (e) Closing up trunk access points and backfilling
- (f) Site restoration

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "**CSA**" means Canadian Standards Association;
- (b) "**ASTM**" means American Society for Testing and Materials;
- (c) "**WIS**" means Water Industry Standard;
- (d) "**IGN**" means Information and Guidance Notes;
- (e) "**GRP**" means glass reinforced plastic;
- (f) "**Selkirk Avenue Trunk**" means the City of Winnipeg Trunk Sewer targeted for rehabilitation on Selkirk Ave and shown on the Drawings (Asset ID: S-MA00013786);
- (g) "**Mission Trunk**" means City of Winnipeg Trunk Sewers targeted for rehabilitation off Archibald Street and shown on the Drawings (Asset ID's: S-MA70019992 and S-MA70028463).

D4. CONTRACT ADMINISTRATOR

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

Adam Braun, P.Eng.
Municipal Engineer
99 Commerce Drive
Winnipeg, MB R3P 0Y7

Telephone No. 204 447-5381
Facsimile No. 204 284-2040

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

D4.3 Bids Submissions must be submitted to the address in B8.8.

D5. CONTRACTOR'S SUPERVISOR

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

D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D6.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;

- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
- (b) the Contract, all deliverables produced or developed; and
- (c) any statement of fact or opinion regarding any aspect of the Contract.

D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

D7. NOTICES

D7.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

D7.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D7.3, D7.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D4.1.

D7.3 Notwithstanding C21., all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg
Chief Financial Officer
Facsimile No.: 204 949-1174

D7.4 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 facsimile number:

The City of Winnipeg
Legal Services Department
Attn: Director of Legal Services
Facsimile No.: 204 947-9155

D7.5 **Bids Submissions** must be submitted to the address in B8.8

D8. FURNISHING OF DOCUMENTS

D8.1 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/her at cost.

SUBMISSIONS

D9. AUTHORITY TO CARRY ON BUSINESS

D9.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D10. SAFE WORK PLAN

D10.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D10.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Safety/default.stm>

D10.3 Notwithstanding B12.4 at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

D11. INSURANCE

D11.1 The Contractor shall provide and maintain the following insurance coverage:

- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
- (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.

D11.2 Deductibles shall be borne by the Contractor.

D11.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.

D11.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D12. PERFORMANCE SECURITY

D12.1 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.

D12.1.1 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.

D12.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13. SUBCONTRACTOR LIST

D13.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D14. EQUIPMENT LIST

D14.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D15. DETAILED WORK SCHEDULE

D15.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least twenty (20) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D15.2 The detailed work schedule shall consist of the following:

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

D15.3 Further to D15.2(a), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

D15.4 The intention is to complete this work during the 2015/2016 winter construction season.

SCHEDULE OF WORK

D16. COMMENCEMENT

D16.1 The Contractor shall not commence any Work until he/she is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D16.2 The Contractor shall not commence any Work on the Site until:

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

- (i) evidence of authority to carry on business specified in D9;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D10;
 - (iv) evidence of the insurance specified in D11;
 - (v) the performance security specified in D12;
 - (vi) the Subcontractor list specified in D13;
 - (vii) the equipment list specified in D14; and
 - (viii) the detailed work schedule specified in D15.
- (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.

D16.3 The City intends to award this Contract by June 19, 2015.

D16.3.1 If the actual date of award is later than the intended date, the dates specified for Commencement, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D17. WORKING DAYS

D17.1 Further to C1.1(jj), the Contract Administrator's determination of whether or not atmospheric and Site conditions are such that a Working Day is deemed to have elapsed may be based at one time on one type of work while at another time a Working Day may be based on another type of work. When more than one type of major work is involved, the quantity of equipment that must be able to work in order to meet the requirements of a Working Day may vary considerably from that specified in the General Conditions.

D17.2 In the event that incidental work is behind schedule which, in the opinion of the Contract Administrator, should have been or could have been carried out by the Contractor in conjunction with or immediately following work of a major type, the City hereby reserves the right to charge Working Days on the incidental work until such time as it is up to schedule.

D17.3 When the major type of work involves restoration of the site to the condition it was prior to rainfall, Working Days shall not be charged.

D17.4 The Contract Administrator will furnish the Contractor with a daily record for each major type of work showing various information concerning the equipment, the time it worked, could have worked and Working Days charged. This report is to be signed each day by an authorized representative of the Contractor.

D17.5 Time spent on site completing Pre-Design inspections shall not be considered as Working Days.

D18. SUBSTANTIAL PERFORMANCE

D18.1 The Contractor shall achieve Substantial Performance within thirty-five (35) consecutive Working Days of the commencement of the Work as specified in D16.

D18.2 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.

D18.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D18.4 Notwithstanding the limitations placed on the number of consecutive Working Days located herein, the Contractor shall achieve Substantial Performance by March 4, 2016.

D19. TOTAL PERFORMANCE

D19.1 The Contractor shall achieve Total Performance within sixty-five (65) consecutive Working Days of the commencement of the Work as specified in D17.

D19.2 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.

D19.3 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.

D20. LIQUIDATED DAMAGES

D20.1 If the Contractor fails to achieve Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

- (a) Substantial Performance – two thousand dollars (\$2,000.00);
- (b) Total Performance – five hundred dollars (\$500.00).

D20.2 The amounts specified for liquidated damages in D19.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.

D20.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

D21. JOB MEETINGS

D21.1 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.

D21.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D22. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D22.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

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

D23.1 Further to B12.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B12.4.

MEASUREMENT AND PAYMENT

D24. PAYMENT

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

WARRANTY

D25. WARRANTY

D25.1 Warranty is as stated in C13.

FORM H1: PERFORMANCE BOND
(See D12)

KNOW ALL MEN BY THESE PRESENTS THAT

_____ ,
(hereinafter called the "Principal"), and

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

_____ dollars (\$_____)

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

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

BID OPPORTUNITY NO. 186-2015

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

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

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

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

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

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

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

_____ day of _____, 20____.

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)**
(See D12)

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 186-2015
NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

Pursuant to the request of and for the account of our customer,

(Name of Contractor)

(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

_____ Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

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

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

(Date)

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

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

This credit is subject to the Uniform Customs and Practice for Documentary Credit (2007 Revision), International Chamber of Commerce Publication Number 600.

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM K: EQUIPMENT
(See D14)

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

<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 D14)

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

<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>

FORM L: CONTRACTOR EXPERIENCE

(See B12)

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

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

1. Project References:

Project Client/Contact: _____
(Name)

(Address)

_____ (phone) _____ (email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

2. Project References:

Project Client/Contact: _____
(Name)

(Address)

_____ (phone) _____ (email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM L: CONTRACTOR EXPERIENCE

(See B12)

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

3. Project References:

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

4. Project References:

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM L: CONTRACTOR EXPERIENCE

(See B12)

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

5. Project References:

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

6. Project References:

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

<u>Year</u>	<u>Description of Project, including type of pipe</u>	<u>Value</u>
-------------	---	--------------

_____	_____	_____
_____	_____	_____
_____	_____	_____

FORM L: CONTRACTOR EXPERIENCE

(See B12)

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

7. Project Personnel:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>

8. Project Personnel:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>

9. Project Personnel:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>

FORM L: CONTRACTOR EXPERIENCE

(See B12)

NON-CIRCULAR TRUNK SEWER REHABILITATION BY GRP LINING

10. Project Personnel:

Name and Title: _____
(Name)

Qualifications: (attach resume and fill out information below)

<u>Year</u>	<u>Description of Past Project</u>	<u>For Whom Work Was Performed</u>	<u>Value</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

- E1.1 These Specifications shall apply to the Work.
- E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm> .
- E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 The following are applicable to the Work:

<u>Appendix No.</u>	<u>Appendix Title</u>
A	Record Drawings
B	Site Photos

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
10984	Cover Sheet
10985	Mission Trunk – Plan & Profile
10986	Selkirk Avenue Trunk – Plan & Profile
10987	Mission Trunk – Weir Chamber Details
10988	Miscellaneous Sections and Details

GENERAL REQUIREMENTS

E2. SHOP DRAWINGS

- E2.1 Description
- This Specification shall revise, amend, and supplement the requirements of CW 1100 of the City of Winnipeg's Standard Construction Specifications.
 - The term "Shop Drawings: means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, which are to be provided by the Contractor to illustrate details of a portion of the Work.
- E2.2 Submit all Shop Drawings in accordance with CW 1100 except as modified herein.
- E2.3 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 shown on all submissions for Engineering review.
- E2.4 Submit Shop Drawing submissions within seven (7) Calendar days of a request as indicated in E2 or receipt of Notice of Award in accordance with B18, whichever is earlier.
- E2.5 Allow for a seven (7) Calendar day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
- E2.6 Shop drawing submissions will be limited to 2 reviews per shop drawing. This shall include a review of the initial submission and a review of the revised submission. Costs associated with subsequent reviews will be charged to the Contractor.

E2.7 Measurement and Payment

- (a) The provision of Shop Drawings shall be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E3. CONFINED SPACE ENTRY

E3.1 The Contractor shall be aware that Hydrogen Sulphide Gas is present in all underground structures connected to the City's sewer systems and has been known to accumulate in concentrations sufficient to cause serious harm or death to personnel who are not using adequate Personal Protective Equipment.

E3.2 The Contractor's attention is drawn to the Province of Manitoba Workplace Safety and Health Act ("the Act"), and the Regulations and Guidelines there-under pertaining to Confined Space Entry Work and in particular the requirements for conducting hazard/risk assessments and providing personal protective equipment (PPE).

E4. PROTECTION OF EXISTING TREES

E4.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard 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 metres 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 trunk. 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.

E4.2 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his/her designate.

E4.3 Except as required in Clause E3.1(c) and E3.1(e), Elm trees shall not be pruned at any time between April 1 and July 31.

E4.4 Measurement and Payment

E4.4.1 Protection of existing trees shall be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E5. TRAFFIC MANAGEMENT

- E5.1 All temporary traffic control shall be undertaken in accordance with the City of Winnipeg's Manual of Temporary Traffic Control in Work Areas on City Streets.
- E5.2 Further to Clause 3.7 of CW 1130:
- E5.2.1 Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.
- E5.3 The Contractor shall strive maintain a minimum of one lane of traffic on Selkirk Avenue during construction. The Contractor shall provide notice of complete street shutdowns (if required) complete with dates and duration a minimum of five (5) working days prior to street closures.

E6. FLOW CONTROL

- E6.1 Description
- (a) This Specification shall cover flow control measures required for rehabilitation of the trunk sewers identified on the Drawings.
- E6.2 Submittals
- (a) Submit a flow control plan for each site in accordance with E2 a minimum of twenty (20) Business Days prior to undertaking the work. The flow diversion plan shall include the following:
- (i) A description and sketch detailing the arrangement of the proposed flow control measures.
 - (ii) A list of the key components required for the flow control measures, including but not limited to the following:
 - (i) Cofferdams
 - (ii) Piping or hoses (as required)
 - (iii) Pumps (as required)
 - (iii) A detailed procedure for installation and removal of the flow control measures.
 - (iv) Monitoring plan (if required). Plan shall include a 24 hr contact person.
 - (v) Means and methods for dealing with excessive flows or wet weather events.
- E6.3 Existing Conditions
- E6.3.1 The following peak dry weather flows shall be used for development of the flow control procedures:
- (a) Selkirk Avenue Trunk: 78 L/s
 - (b) Mission Trunk: 145 L/s
- E6.4 Methods
- (a) Carry out works only during such time periods when prevailing and anticipated weather conditions do not contribute wet weather flow or snowmelt to the host pipe. The intent is to complete lining work during the 2015/2016 winter construction season. Investigate any instance of dry weather flow and provide adequate means to address same to preclude backups during the liner installation.
 - (b) Provide necessary flow control measures for the main line sewer and sewer services required to perform the Work.
 - (c) Diversion of wastewater flow directly or indirectly to the environment, Land Drainage Sewers, or Storm Relief sewers will not be allowed.

- (d) Maintain existing sewer flows from upstream sewers during construction around the sewers being lined.
- (e) Provide adequate temporary bypass pumping for live sewer services connected to the sewer being lined from when the service is blocked off until it is reinstated.
- (f) Provide security personnel for locations where by-pass pumping requires normally secure or locked doors and access areas to be left open or unlocked.

E6.4.1 Weather

- (a) Review the Environment Canada weather forecast with the Contract Administrator before each day of liner installation.
- (b) Delay installation of liners and/or secure Works when the anticipated weather conditions are such that anticipated sewer flow will exceed the flow control measures provided.
- (c) The Contractor shall advise immediately of any weather-related delays.
- (d) The Contractor to schedule Work according to the weather; the City is not responsible for delays due to weather.

E6.5 Measurement and Payment

- (a) "Flow Control" shall be measured and paid on a Lump Sum basis for each site as listed in the Form B: Prices.
- (b) Payment for "Flow Control" shall include the supply of all materials and equipment required to complete the Work and shall be made upon completion of the lining works.
- (c) Only one unit of flow control will be paid for each site and will include all occurrences of mainline and sewer service flow control requirements.
- (d) Where no flow control measures are undertaken, no payment will be made for this item of work.

E7. GRP LINING

E7.1 Description

- (a) This Specification shall cover the following:
 - (i) Sewer cleaning,
 - (ii) Sewer inspection,
 - (iii) Sewer preparation for liner installation,
 - (iv) GRP liner installation, and
 - (v) GRP liner grouting.

E7.2 References:

- (a) WRc Sewerage Rehabilitation Manual, 4th Edition
- (b) IGN 4-34-02 – Specification for Glassfibre Reinforced Plastics (GRP) Sewer Linings
- (c) ASTM F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Inversion and Curing of a Resin-Impregnated Tube
- (d) ACI 229 – Report on Controlled Low-Strength Materials

E7.3 Submittals

- E7.3.1 Provide the GRP liner design submittals to the Contract Administrator in accordance with E2, a minimum of ten (10) Business Days prior to manufacture of GRP liner.
- E7.3.2 Provide all other required submittals to the Contract Administrator in accordance with E2, a minimum of twenty (20) Business Days before starting the lining work.

- E7.3.3 Submit the GRP design Shop Drawings sealed and signed by a Professional Engineer licensed to practice in the Province of Manitoba. Shop Drawings shall include the following information:
- (a) GRP thickness computations including all specified design checks. Identify design assumptions based on a review of the inspection videos that differ from the information provided in the Specifications for the existing sewer design conditions.
 - (b) Calculations showing the hydraulic capacity of the GRP lined sewer versus the existing sewer.
 - (c) Details of the GRP composite proposed and verification of all short and long term material properties.
 - (d) Design mix and relevant constituent properties for the grout mixture.
 - (e) Details of the service reinstatement method.
 - (f) Other information that may reasonably be required by the Contract Administrator to confirm the GRP liner design proposed conforms to the specified requirements and design intent.
- E7.3.4 Submit a construction protocol that provides information on the following.
- (a) Confined entry and safety protocols.
 - (b) Proposed main line and sewer service flow control arrangements in accordance with E5.
 - (c) Details of template establishment and inspection protocol to confirm the size of annulus, liner and length of lining sections.
 - (d) Pipe assembly details including joint assembly requirements, temporary support of segmental panels to facilitate construction and grouting operations.
 - (e) Detailed grouting protocol including minimum and maximum grouting pressures, maximum allowable liner deflection/deformation, and quality assurance and quality control program to verify grout physical characteristics and annulus filling verification.
 - (f) Detailed implementation schedule for panel assembly, annulus grouting, service reinstatement, and terminations.
- E7.4 GRP Liner Design
- E7.4.1 General
- (a) Design full or partial segment GRP Segmental lining as either a Type I or Type II lining system in accordance with Section 4 or 5, respectively, of Volume II – Sewer Renovation, WRc Sewerage Rehabilitation Manual, 4th Edition and these specifications. Notwithstanding the above, where a Type II design is contemplated it shall be designed to accommodate full overburden load as noted herein.
 - (b) Size GRP Segments in accordance with the design objectives to minimize annulus size and to maximise hydraulic capacity; with due consideration to meet reasonable constructability considerations.
- E7.4.2 Design Objectives.
- (a) Maximizing the structural enhancement of the sewer by installing a structural section of sufficient quality and sufficient strength to address all relevant loading conditions and preclude further sewer deterioration.
 - (b) Minimizing the hydraulic capacity impact of rehabilitation by maximizing the bore of the rehabilitated sewer.
 - (c) Reducing infiltration and exfiltration that may compromise long term structural stability of the pipe.
 - (d) Preventing root intrusion.

- (e) Providing sufficient chemical resistance to prevent sewer pipe degradation related to the conveyance of storm water or sewage.
- (f) Minimizing sewer service disruption to the combined sewer function during the rehabilitation process.
- (g) Minimizing the time required to complete the sewer rehabilitation.
- (h) Minimizing disturbance to pavements and boulevards.
- (i) Minimizing disruption to vehicular and pedestrian traffic.
- (j) Minimizing the impact of construction on commercial, industrial, and institutional facilities.

E7.4.3 Hydraulic Requirements

- (a) Perform a design check to confirm the full flow hydraulic capacity of the GRP liner is equal to or greater than the existing sewer. Use the "Colebrook-White" formula with assumed "ks" value of 0.03 mm for the GRP. The "ks" value for the existing sewer may be estimated based on observed condition of the pipeline using Tables C.1 (a) and (b) of Volume I, Appendix C – Sewer Renovation, WRc Sewerage Rehabilitation Manual, 4th Edition. The following ks values may be assumed for the existing sewers:
 - (i) Selkirk Ave Trunk – 20 mm
 - (ii) Mission Trunk – 6 mm

E7.4.4 Type 1 Design

- (a) Type I Design shall be in accordance with Section 4 of Volume II – Sewer Renovation, WRc Sewerage Rehabilitation Manual, 4th Edition and the following minimum design checks.
 - (i) Short term buckling/strength/deformation checks against external pressure due to grouting operations. Short term checks to address both external pressure and flotation.
 - (ii) Long term tensile capacity check due to earth and superimposed loading as noted below.
 - (iii) Long term buckling/deformation checks due to hydrostatic pressure.
- (b) Use the following minimum design assumptions.
 - (i) Rigid composite section, bond with host pipe required.
 - (ii) Existing trunk sewers have a wall thickness equal to 200 mm or greater.
 - (iii) External pressures due to grouting based on installers proposed construction protocol/method statement.
 - (iv) Groundwater table is 2.0 m below the existing ground surface.
 - (v) Third party verified values for short term flexural modulus, long term flexural modulus, long term permissible flexural strain (measured in the hoop direction), long term tensile strength, and shear bond strength all measured in accordance with Section 8 of IGN 4-34-02
 - (vi) Calculate dead load based on soil density of 1920 kg/m³ and applied dead and live load formula from, Clause X.1.2.2 of Appendix X1 of ASTM F1216. Include an allowance for an AASHTO HS20 concentrated live load in the total external pressure on the pipe.
 - (vii) Minimum factor of safety (N) of 2 against failure in determination of maximum permissible external pressure.

E7.4.5 Type 2 Design

- (a) As an alternate to a Type I design, design as a Type II liner in accordance with Section 5 of Volume II – Sewer Renovation, WRc Sewerage Rehabilitation Manual, 4th Edition, with the provision that the applied loads consider full overburden loads as defined for Type I design loads above and the following minimum design checks.

- (i) Short term buckling/deformation checks against external pressure due to grouting operations. Short term checks to address both external pressure and flotation.
 - (ii) Long term check buckling/deformation checks due to hydrostatic pressure;
 - (iii) Provide allowance for full earth and superimposed loading as noted below.
- (b) Use the following minimum design assumptions.
- (i) Flexible liner, no bond with host pipe.
 - (ii) Groundwater table is 2.0 m below the existing ground surface.
 - (iii) Third party verified values for short term flexural modulus, long term flexural modulus, long term permissible flexural strain (measured in the hoop direction), and long term tensile strength all measured in accordance with Section 8 of IGN 4-34-02
 - (iv) Calculate dead load based on soil density of 1920 kg/m³ and applied dead and live load using formula from, Clause X.1.2.2 of Appendix X1 of ASTM F1216-09. Include an allowance for an AASHTO HS20 concentrated live load in the total external pressure on the pipe.
 - (v) Minimum factor of safety (N) of 2 against failure in determination of maximum permissible external pressure.

E7.5 Existing Sewer Design 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 2014. Images from these inspections are included in Appendix B. Copies of these video inspections are available to the Contractor in digital format upon request.
- (b) The Contractor shall be responsible to determine the actual amount of sediment and debris in the sewers included in this Work.

E7.6 Materials

E7.6.1 GRP Liner

- (a) Constituent materials and manufacturing of GRP segments shall conform to IGN 4-34-02.
- (b) Joints shall be capable of withstanding internal and external hydrostatic pressures. Assume both internal and external water levels at ground surface.
- (c) Appearance Criteria
 - (i) Each GRP panel shall be reviewed relative to Table 3 of Appendix G of IGN 4-34-02 for confirmation that all external and internal surfaces are within final allowable defect limits.
- (d) Approved Manufactures:
 - (i) Channeline International,
 - (ii) Hobas Pipe, or
 - (iii) approved equal in accordance with B7.

E7.6.2 Test Plate Samples

- (a) In addition to the normal QA/QC associated with GRP production, the Contract Administrator will select at least one panel from each production run to secure test plate samples for thickness measurements and the determination of relevant short term flexural modulus and flexural strength values.
- (b) The Contractor Administrator will coordinate test plate sample testing to confirm the flexural strength, flexural modulus and thickness in accordance with the requirements of ASTM D790. The testing lab shall be a mutually agreeable laboratory with

adequate experience in testing of GRP liners. The cost of the testing will be borne by the Contractor.

E7.6.3 Annular grout shall conform to the requirements of ACI 229.

E7.6.4 Transitions

- (a) Transitions shall be completed using a polymer concrete grout compatible with the liner and grouting materials.
- (b) Approved products:
 - (i) Sikatop 123 as manufactured by Sika Canada Inc., or
 - (ii) approved equal in accordance with B7.

E7.7 Quality Control Records

E7.7.1 Maintain the following Quality Control records of the work and provide to the Contract Administrator after completion of the work.

- (a) Summary of the GRP Segment manufacturing records, including:
 - (i) All QA/QC testing carried out in accordance with IGN 4-34-02.
 - (ii) A certificate of compliance in accordance with Appendix H of IGN 4-34-02 for each GRP liner design.
- (b) A grouting summary.

E7.8 Sewer Cleaning

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

E7.9 Sewer Inspections

E7.9.1 Perform the following sewer inspections in accordance with CW 2145 except as modified herein. All inspection work shall be undertaken in the presence of the Contract Administrator.

- (a) Pre-Design Inspection, as required to determine size and shape of host pipe and liner in accordance with E6.8.2. Undertake Pre-Design inspection prior to manufacture of liner. No coding submission will be required.
- (b) Pre-Lining Inspection after sewer cleaning and preparation. No coding of the submission will be required.
- (c) Post-Lining Inspection subsequent to installing the GRP and sewer service reinstatement. Full coding required. Perform post-lining inspection immediately after sewer service reinstatement while flow control measures are in place.
- (d) Warranty Inspection before expiration of the warranty period and acceptance. Full coding required.

E7.9.2 The following amends and supplements specification CW 2145:

- (a) Replace Section 3.4 with:
 - (i) Ensure each operator is fully trained in all aspects of sewer inspection and capable of making accurate observations and recording all conditions that may be encountered in the sewers.
 - (ii) Perform condition coding using operators who can demonstrate proficiency coding in accordance with the requirements of the WRc "Manual of Sewer Condition Classification 3RD Edition".
- (b) Replace Section 3.5 with:
 - (i) Perform sewer condition coding in accordance with the requirements of the WRc Manual of Sewer Condition Classification 3RD Edition.
 - (ii) Record place names in accordance with Clause 3.9.4 of the CW 2145.

- (c) Further to Section 3.13, a paper or “hard copy” of the inspection reports is not required and the digital format should be submitted on a CD-R.
 - (i) The Contractor shall maintain backup copies of all digital video and inspection data submissions for the duration of the Warranty Period as stated in C13.
 - (ii) The Contractor shall supply inspection data for review by the Contract Administrator on a DVD.
- (d) Replace Clause 3.8.1 with:
 - (i) Provide a minimum of 400 lines of resolution around the periphery of the picture for digital MPEG video playback.
- (e) Replace Clause 3.11.1 with:
 - (i) Capture the inspections in digital format in colour from the live video source on archival grade digital versatile discs, DVD-R format to the following minimum requirements. Adjust requirements as required to achieve 400 lines of resolution specified in Clause E8.1.6 of this Specification.
 - ◆ XDVD MPEG-2 or MPEG-4 format (MPEG-4 preferred).
 - ◆ Picture Size: NTSC 720 x 480 @ 29.97 frames per second.
 - ◆ Data/Bit Rate: 6.0 M-bits/sec.
- (f) Replace Clause 3.17.7.6, with:
 - (i) Record the distance from the centre of the manhole to the cable calibration location at the start of the inspection and adjust the distance reading so that zero is at the centre of the start manhole. This distance is known as the cable calibration distance. The cable calibration location is the intersection point between the camera’s widest horizontal viewing angle and the pipe’s side periphery (03 or 09 o’clock) when the camera is level and looking forward.

E7.9.3

Sewer Inspection Equipment

- (a) Minimum requirements of the in-line inspection platform include:
 - (i) Independently controlled drive tracks that enable the platform to manoeuvre around bends and climb over debris up to 300mm in height.
 - (ii) Operable under partially or fully submerged flow conditions, for distances up to 500m upstream or downstream from a single access point.
 - (iii) Operable in sewers of various cross-sections and constructed of standard pipe materials including brick, concrete, PVC, HDPE, and steel.
 - (iv) Tethered to facilitate extraction of the platform from the sewer, without causing damage to the sewer infrastructure, in the event the equipment fails or otherwise becomes uncontrollable within the sewer.
 - (v) Equipped with sufficient high intensity lighting to illuminate the sewer for visual inspection.
- (b) The following amends and supplements specification CW 2145:
 - (i) Equipment shall be capable of continuously capturing digital video from first generation recordings with no frame loss, regardless of the progression of the inspection.
 - (ii) Equipment shall be used to acquire continuous digital video images of the sewer for the entire length being inspected.
 - ◆ Perform sewer condition coding in accordance with the requirements of the WRc Manual of Sewer Condition Classification 3RD Edition.
 - ◆ Perform condition coding using operators who can demonstrate proficiency coding in accordance with the requirements of the WRc “Manual of Sewer Condition Classification 3RD Edition”.
 - ◆ Ensure each operator is fully trained in all aspects of sewer inspection and capable of making accurate observations and recording all conditions that may be encountered in the sewers.

- ◆ Operators failing to meet the accuracy requirements on two occasions will not be permitted to code on the remainder of the contract until they can demonstrate to the Contract Administrator that they can code in accordance with the requirements of the WRC Manual of Sewer Condition Classification 3Rd Edition.
- ◆ Incorporate a suitable distance-reading device to measure the location of the equipment in the pipe, to an accuracy of $\pm 0.5\%$ of the length of the inspection.

E7.9.4 Verification of Existing Sewer Dimensions

- (a) Verify dimensional requirements of sewer to be rehabilitated prior to manufacture of the GRP segments (during Pre-Design inspection) to determine liner dimensional requirements. Acceptable methods would include:
- (i) Passing a template of sufficient size, rigidity, length, and cross section through the host pipe pre- and post-lining
 - (ii) Utilizing sufficiently accurate laser profiling technology that is specifically designed to quantify dimensional requirements for this application.

E7.9.5 Review the Pre-Design inspection video with the Contract Administrator before starting preparatory work to confirm the extent and precise location of all pre-work required.

E7.9.6 Review the Pre-Lining Inspection videotape with the Contract Administrator at least 24 hours before commencing installation and obtain approval to install liner. The Pre-Lining Inspection shall confirm:

- (a) Necessary cleaning and pipe preparation work, including internal and external sewer repairs, have been satisfactorily completed.
- (b) 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 GRP liner prior to commencing lining.
- (c) Location, condition and operational status of all sewer services.
- (d) The limit and precise location of any internal point repairs.

E7.9.7 Review Sewer Service Reports while reviewing the Pre-Lining Inspection.

E7.9.8 Post-Lining Inspection is to confirm the adequacy of sewer service reinstatements and the fit and finish of the liner.

E7.9.9 Warranty Inspection to confirm the fit and finish of the liner, 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.

E7.9.10 Provide the Contract Administrator with the following sewer inspection reports. Reports shall be prepared in accordance with CW 2145.

- (a) Submit pre-design inspection prior to manufacture of liner.
- (b) Submit pre-sewer repair inspection and pre and post-lining inspection and reports prior to completion of construction.
- (c) Submit a Warranty Inspection report prior to Final Acceptance of Work.

E7.9.11 Sewer Connection Report

- (a) Confirm exact location of all catch basin drain and sewer connections that are connected to the sewer being lined.
- (b) Submit a written Sewer Connection Report to the Contract Administrator providing the following information for each sewer service including CB leads and utility manhole drains.
 - (i) Location of connection (chainage from upstream manhole and clock reference).
 - (ii) Diameter of sewer connection lateral.

- (iii) Material type of sewer connection.
- (iv) Observed condition of connection.
- (v) Status of connection (active, inactive or unable to determine).
- (vi) Property serviced including the address (if known).

E7.10 Sewer Preparation and Repairs Prior to Lining

- (a) Perform sewer preparation and repairs as required for installation of the GRP liner and as indicated in the Specification and Construction Drawings.
- (b) Remove intruding sewer services and solid debris in accordance with the CW 2140.
- (c) Sewer Service Grouting
 - (i) Fill voids around sewer services with a non-shrink, watertight cement grout, an appropriate polyurethane grout compound, or other approved grouting product to form a smooth watertight connection.
- (d) Sewer Invert Restoration
 - (i) The Contractor shall restore the sewer invert of the existing sewers as required for installation of the GRP liner. Any voids found shall be filled a non-shrink, watertight cement grout, an appropriate polyurethane grout compound, or other approved grouting product prior to liner installation.

E7.11 Installation of GRP Liners

E7.11.1 GRP Panel Installation.

- (a) Assemble GRP panels in accordance with approved installation protocol submission.
- (b) Profile of alignment shall be offset to invert of pipe to as great a degree as possible leaving largest annulus at crown.
- (c) Securely fasten panels in-place to facilitate construction and sufficiently to assure that panels are not displaced during grouting operations. Ensure that temporary support system minimizes point loads and other features that may cause damage to GRP liner during grouting operations.

E7.11.2 Annulus Grouting

- (a) Carry out annulus grouting in accordance with approved grouting protocol submission. Monitor liner during grouting operations to ensure short-term deflections do not exceed maximum allowable and that liner is not displaced during grouting operations. Confirm that annulus is fully grouted.
- (b) Grout holes to be pre-drilled. Temporary wooden plugs may be used during grouting. On completion, the holes should be repaired after grouting with appropriate preparation and filler materials.
- (c) General rules that apply to grouting include:
 - (i) Estimate the volume of grout required (include overfill allowance based on grout properties, sewer geometry and condition, and previous experience with grout mixture);
 - (ii) By-pass or pump through any sewer flows that occur during grouting operations;
 - (iii) Minimize infiltration (or its effects);
 - (iv) Inject from the downstream end of the renovated section;
 - (v) Inject from the invert towards the crown;
 - (vi) Provide air vents at the high points;
 - (vii) Monitor and record the injection pressures;
 - (viii) Inspect the lining for signs of distortion or flotation;
 - (ix) Monitor and record the volume of grout injected and compare with the estimate (with due consideration of overfill allowance);

- (x) Regularly monitor for grout leaks in sections of sewer upstream and downstream, drain connections (via inspection chambers), particularly if the volume of grout injected exceeds the estimated grout take.
- (d) The volume to be grouted at any one time can be varied to suit the various constraints such as the workability of the grout, design of the lining (including flotation), capacity of the mixing and pumping equipment, rate of installation of the lining, and the necessity for over pumping.
- (e) Sections should be grouted during the shift immediately following their installation provided that the stop ends and any lateral connections have attained sufficient strength.
- (f) Grout should either be injected through a minimum of three preformed holes (nominally 50 mm diameter) located in the haunches and crown of the lining or through pipes cast into the crown and invert of the stop ends. The former method is preferable because, in the event of a blockage, grouting can recommence at the adjacent panel. The grout should be injected from the lowest vent hole and successive holes plugged as air free grout is seen to issue from them. If the major dimension of the lining exceeds 1000 mm consideration should be given to the provision of more grout holes.

E7.11.3 Transitions at Liner Termination

- (a) At transition terminations, the interface between the exterior surface of the liner and the host pipe shall be made watertight. The transition shall extend from the termination of the liner 1.00 m into the host pipe (unless otherwise shown on the Drawings) and provide a gradual transition from the host pipe to the lined section. Grouted transition shall match the GRP liner internal diameter and taper to a thickness of no more than 13 mm where meeting the host pipe.
- (b) Preparation of the host pipe and installation of polymer concrete grout shall follow the manufactures recommendations.

E7.11.4 Reinstatement of Sewer Connections

- (a) Reinstatement sewer connections in a watertight manner that precludes leakage of the potential leakage of the connection to the annulus area between the host pipe and the liner.
- (b) Reinstatement live sewer connections to 100% of the original cross sectional area.
- (c) Cut out openings for sewer connections from inside the lined sewer by manual means or with a television camera and a remote controlled cutting device.
- (d) Remove sharp edges from opening cut outs and provide a smooth rounded lip.
- (e) Sewer Service Grouting
 - (i) Fill voids between the liner and the host pipe at sewer service openings with a non-shrink, watertight cement grout or an appropriate polyurethane grout compatible with the liner system, or other approved grouting product to form a smooth watertight connection.

E7.12 Post Construction Design Review for Total Performance

- (a) The Contract Administrator will perform a post-construction design review to confirm that the completed liner meets the design objectives relative to structural requirements prior to Total Performance. The design review will utilize the measured values for flexural strength, flexural modulus for the GRP liner.
- (b) The Contract Administrator will advise of any discrepancies between the constructed GRP and the design requirements.
- (c) Perform necessary remedial measures to confirm that any GRP liners deemed as structurally deficient will comply with the design life objectives such as determination of a more representative groundwater elevation locally through monitoring, and supplemental strength testing and thickness measurements.

- (d) Repair sections of GRP removed for supplemental testing by placing an approved internal point repair of the same thickness and strength as the full segment liner.
- (e) Review remedial action with the Contract Administrator prior to implementation.
- (f) Perform further testing, monitoring and calculations and install structural enhancements at own cost.

E7.13 Measurement and Payment

E7.13.1 Mobilization and Demobilization

- (a) Mobilization and demobilization will be measured on a lump sum basis and paid for at the Contract Lump Sum Price for "Mobilization and Demobilization". Payment for Mobilization and demobilization shall include all costs associated with mobilization and demobilization, site set up, and cleanup.
- (b) 50% of the Mobilization and Demobilization lump sum price will be paid once lining crews arrive on site to commence lining installation.
- (c) The remaining 50% of the Mobilization and Demobilization lump sum price will be paid subsequent to the completion of the GRP installation and site cleanup.

E7.13.2 Sewer Cleaning

- (a) Sewer cleaning will be measured and paid for in accordance with CW 2140, except as modified herein.
- (b) Only one item of payment will be made for pre-lining cleaning.

E7.13.3 Sewer Inspections

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

E7.13.4 Sewer Inspection Reports

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

E7.13.5 Supply and Installation of GRP Liner

- (a) Liner installation will be measured on a length basis for each size and paid for at the Contract Unit Price for "Supply and Install GRP Liner". Length to be paid for will be the total number of liner meters of GRP liner supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- (b) Measurement for the supply and installation of GRP liners will be made horizontally at grade, above the centreline of the pipe from centre to centre of manholes.
- (c) Eighty (80) percent of the payment will be made upon satisfactory completion of the GRP installation work. The remaining twenty (20) percent of the payment will be made upon confirmation of the GRP strength and delivery and acceptance of all required submissions, Shop Drawings, and reports.
- (d) Payment for the supply and installation of GRP liners shall include but is not limited to the following:
 - (i) Verification of existing sewer dimensions
 - (ii) Submittals, including: GRP designs, material samples, material testing, operations protocol, and construction protocol
 - (iii) All required sewer preparation work
 - (iv) Supply and installation of GRP liner
 - (v) Grouting of GRP liner
 - (vi) Reinstatement of sewer services
 - (vii) Transitions at liner termination
 - (viii) Test samples
 - (ix) Quality control testing and records

E8. PIPELINE ACCESS MODIFICATIONS

E8.1 Description

- (a) This Specification shall cover the installation of access shafts and modifications to the trunk sewers required to gain access for the purposes of installing the GRP liner.

E8.2 Construction Methods

E8.2.1 Access Shafts

- (a) The Contractor shall install access shafts as shown on the Drawings to permit access to the top of the existing trunk sewers.
- (b) Access shafts shall be sized to permit removal of the top of the sewer, installation of the GRP liner, and construction of the trunk sewer closures.

E8.3 Demolition

E8.3.1 Demolish existing concrete structures as shown on the Drawings and as follows.

- (a) Carefully remove the tops of existing trunk sewers. The use of pneumatic breakers is prohibited. Tops of sewers may be saw cut or removed using small hand held jack hammers. Final openings in the existing trunk sewer shall be neatly cut square to the existing pipe prior to construction of the trunk sewer closure.
- (b) Carefully remove the existing weir in the Mission Trunk Sewer as shown on the Drawings. The use of pneumatic breakers is prohibited. Weir was cast into the invert of the existing sewer and care shall be taken not to damage the underlying pipe.
- (c) Support struts shall be installed within the brick, Selkirk Avenue Trunk sewer during excavation and installation of shoring. The struts shall be designed to carry the load of the sewer's roof (estimated at 2000 kg/m). The support struts shall extend a minimum of 1.5 m past the edges of the excavation in both directions. A support beam shall be installed between the sewers obvert and struts.

E8.3.2 Trunk Sewer Closures

- (a) Construct trunk sewer closures as shown on the drawings after completion of the liner installation.
- (b) Complete cast-in-place concrete and reinforcing steel work as shown on the Drawings and in accordance with E9 and E10.

E8.3.3 Weir Chamber Modifications

- (a) Reconstruct the weir in the Mission Trunk Sewer as shown on the Drawings.
- (b) Complete cast-in-place concrete and reinforcing steel work as shown on the Drawings and in accordance with E9 and E10.

E8.4 Measurement and Payment

- (a) "Pipeline Access Modifications" shall be measured and paid on a Lump Sum basis as listed in the Form B: Prices.
- (b) Payment for "Pipeline Access Modifications" shall include the supply of all materials and equipment required to complete the Work, including: excavation, shoring, demolition, cast-in-place concrete, reinforcing steel, and backfilling as specified herein.

E9. EXCAVATION, SHORING, AND BACKFILL

E9.1 Description

- (a) This Specification covers the requirements for excavations, demolition and backfilling of trenches and structures.

E9.2 Submittals

- (a) Shop Drawings for all excavation shoring (where required) shall be prepared and submitted in accordance with E2 a minimum of five (5) Business Days prior to undertaking the excavation and shoring installation. Where required by Workplace Safety and Health Regulation, shoring Shop Drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in the design of excavation shoring systems.

E9.3 Shoring Design

- (a) Shoring shall be provided for excavations in accordance with CW 2030.
- (b) Excavation shoring shall be designed to accommodate the installation of the GRP liners and the existing trunk sewers.
- (c) All shoring systems shall comply with Manitoba Workplace Safety and Health requirements.

E9.4 Excavation

- (a) Materials shall not be stockpiled over pipelines.
- (b) Carefully excavate to expose existing pipelines.
- (c) Only smooth edged buckets may be utilized for excavations within 1.5 m of the existing trunk sewer.
- (d) The existing trunk sewer shall be located prior to proceeding with excavations within 1.0 m of the pipe. Final excavation (within 300 mm of the pipe wall) shall be completed using soft dig or hand excavation methods to prevent damage to the pipe.
- (e) Excess excavation materials shall be disposed of off-site.

E9.5 Shoring Installation

- (a) Piles (if used) shall be pre-bored to a depth below the invert of the sewer. Pre-bored holes shall be filled after installation of piles to prevent movement of existing soils around the pipe.
- (b) Excavation and shoring installation shall not initiate movement or otherwise destabilize soils surrounding the existing trunk sewers.

E9.6 Backfill

- (a) Backfill within 1 m of existing and proposed pavements shall be completed to CW 2030, Class 1 standards. Granular Class 2 backfill shall extend to the underside of the stabilized fill, as shown on the Drawings.
- (b) Backfill within 1 m of existing gravel driveways shall be completed to CW 2030, Class 2 standards.
- (c) All other areas shall be backfilled with a Class 4 backfill unless otherwise noted on the Drawings.
- (d) Backfilling with frozen materials will not be permitted.

E9.7 Measurement and Payment

- (a) Excavation, shoring, and backfilling shall be considered incidental to "Pipeline Access Modifications" and will not be measured for payment. No separate payment will be made.

E10. CAST-IN-PLACE CONCRETE

E10.1 Description

- (a) This Specification shall cover the construction of cast-in-place concrete for the weir chamber modifications and trunk sewer closures.
- (b) All cast-in-place concrete shall be carried out in accordance with CW 2160 and CSA A23.1, except as amended or supplemented herein

E10.2 Submissions

E10.2.1 Construction Method Submission

- (a) No Work shall commence on construction of valve chamber until after the Contract Administrator's review of the Contractor's Construction Method submission.
- (b) The Contractor shall prepare for the Contract Administrator's review a Construction Method submission detailing:
 - (i) Construction sequence to be followed including all methods to be employed to ensure no damage occurs to existing structures or adjacent properties within or adjacent to excavation.
 - (ii) Proposed method of construction.
 - (iii) Specialized equipment to be used.
 - (iv) Any design revisions proposed to accommodate the Contractor's proposed construction method.
 - (v) Flow control considerations including details on the Contractor's proposed method of flow control.
 - (vi) The Contractor shall respond to any concerns that may be raised by the Contract Administrator after review of the Construction Method submission.

E10.3 Materials

(a) Structural Concrete Mix Design

- (i) Provide concrete mixed in accordance with requirements of CW 2160 and CSA-A23.2. Concrete shall conform to requirements of Type A concrete in accordance with Table CW 2160.1.
- (ii) Structural concrete design shall be in accordance with performance specification having the following properties:
 - ◆ Class of Exposure: S-1
 - ◆ Minimum Compressive Strength @ 28 days: 35 MPa

(b) Hydrophilic Waterstop

- (i) One-part polyurethane, extrudable swelling waterstop (bentonite-free). Sikaswell S-2 or approved equal in accordance with B7.

E10.4 Construction Methods

E10.4.1 Forming

- (a) The Contractor shall be responsible for the design and installation of all necessary shoring, bracing and formwork.
- (b) All shoring shall conform to CW 2160, CSA S269.3 and CSA C23.1.

E10.4.2 Cast-in-Place Concrete

- (a) All cast-in-place concrete shall conform to CW 2160, and CSA A23.1.

E10.5 Measurement and Payment

- (a) Supply and placement of cast-in-place concrete shall be considered incidental to "Pipeline Access Modifications" and will not be measured for payment. No separate payment will be made.

E11. REINFORCING STEEL

E11.1 Description

- (a) This Specification shall cover all reinforcing steel work, in accordance with Specification CW 2160, except as amended or supplemented herein.

E11.2 Submittals

- (a) The Contractor shall submit reinforcing steel Shop Drawings in accordance with E2 a minimum of ten (10) Business Days prior to the fabrication of any reinforcing steel.

E11.3 Materials

E11.3.1 Reinforcing Steel

- (a) Further to CW 2160 Sentence 2.6 Materials: Reinforcing Steel, all reinforcing steel shall conform to the requirements of CSA G30.18, Grade 400.

E11.3.2 Bar Accessories

- (a) Bar accessories shall be of type approved by the Contract Administrator. They shall be made from a non-corroding material, and they shall not stain, blemish, or spall the concrete surface for the life of the concrete. Bar chairs are to be PVC; galvanized bar chairs are not acceptable.
- (b) Bar accessories shall include bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices that may be approved by the Contract Administrator. Bar accessories are not shown on the Contract Drawings. The supply and installation of bar accessories shall be considered incidental to the supply and placing of reinforcing steel.

E11.4 Construction Methods

E11.4.1 Placing of Reinforcing Steel

- (a) Placement of reinforcing steel shall be completed in accordance with CW 2160, CSA A23.1, and CSA A23.3.
- (b) Lap splices in accordance with CSA A23.3
- (c) Reinforcing steel shall be placed accurately in the positions shown on the Contract Drawings. Carefully adjust the location of reinforcing steel adjacent to openings to frame those openings in accordance with good practice, and maintain the bar spacing intent.
- (d) Splices in reinforcing steel shall be made only where indicated on the Contract Drawings. Prior approval of the Contract Administrator shall be obtained where, in the opinion of the Contractor, other splices must be made. All splices shall have laps of at least 40 bar diameters. Welded splices shall not be used.
- (e) A minimum of twenty-four (24) hours notice shall be given to the Contract Administrator prior to the pouring of any concrete to allow for inspection of reinforcing steel.

E11.4.2 Quality Control

- (a) The Contractor shall provide, without charge, the samples of reinforcing steel required for quality control tests and provide such assistance and use of tools and construction equipment as is required.

E11.5 Measurement and Payment

- (a) Supply and placement of reinforcing steel shall be considered incidental to "Pipeline Access Modifications" and will not be measured for payment. No separate payment will be made.

E12. RESTORATION

E12.1 Description

- (a) This Specification shall cover the restoration of all work sites.

E12.2 Restoration Works

- (a) Reconstruct concrete pavements in accordance with CW3310 and SD-213A.
- (b) Reconstruct existing non reinforced concrete sidewalks with a 100 mm non-reinforced concrete conforming to CW3325 and SD-228A. The sidewalk shall be constructed with 100 mm (min) of compacted base material.
- (c) Reconstruct concrete barrier curbs in accordance with CW3240 and SD-206A.
- (d) Gravel Surfacing
 - (i) Repair gravel surfaced areas in accordance with CW3150 and as shown on the Drawings.
 - (ii) Gravel surfacing material shall be a crushed limestone base material conforming to Section 2.2 of CW 3110.
- (e) Sod all maintained grassed areas in accordance with CW3510.

E12.3 Measurement and Payment

E12.3.1 Concrete Slab Patches

- (a) Construction of "Concrete Slab Patches" slabs shall be measured on a square metre basis as listed in Form B. Measurement will be made for each square metre of concrete slab acceptably replaced. Payment for "Concrete Slab Patching" shall include all base and sub base preparation, and the supply and placement of concrete and asphalt pavements.

E12.3.2 Concrete Barrier Curb Replacement

- (a) "Concrete Barrier Curb Renewal" shall be measured on a linear metre basis for. Measurement will be made for each linear metre of concrete curb acceptably replaced. Payment for "Concrete Barrier Curb Renewal" shall include all base and sub base preparation, and the supply and placement of concrete curbing.

E12.3.3 Sidewalk Patches

- (a) Construction of "Sidewalk Patches" shall be measured on a square metre basis as listed in Form B. Measurement will be made for each square metre of sidewalk acceptably replaced. Payment for "Sidewalk Patches" shall include all base and sub base preparation, supply and placement of concrete and asphalt pavements.

E12.3.4 Gravel surfacing shall be measured and paid in accordance with CW3150.

E12.3.5 Supply and installation of sod using imported topsoil shall be measured and paid in accordance with CW 3510.

E12.3.6 Payment for restoration works will be limited to areas disturbed to facilitate construction. Surface restoration outside of the designated construction areas shall be at the Contractors expense.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

- F1.1 Each individual proposed to perform the following portions of the Work:
- (a) any Work on private property;
 - (b) communicating with residents and homeowners in person or by telephone;
- F1.1.1 Each Individual shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his/her place of residence. Or
- (a) BackCheck, forms to be completed can be found on the website at: <http://www.backcheck.net/> ; or
 - (b) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: <http://www.commissionaires.mb.ca/> .
- F1.2 Prior to the award of Contract, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform such Work.
- F1.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work specified in F1.1.
- F1.4 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.
- F1.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform any Work specified in F1.1.