



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 666-2016

WATER MAIN REHABILITATION BY CIPP LINING

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 WATER MAIN REHABILITATION BY CIPP LINING

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, August 4, 2016.

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.

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.
- B10.2 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) Aegion Corporation
- (b) Fer-Pal Infrastructure
- (c) RS Technik

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, the Bidder and/or any proposed Subcontractor undertaking the installation of water main liners, shall within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator to demonstrate the following qualifications and as indicated on (Form L: Contractor Qualifications and Experience):

- (a) A minimum of three successful water main lining projects completed in the last 5 years utilizing the proposed water main lining system submitted for this project, utilizing the means, methods and products proposed for this Work.
- (b) A minimum of three successful water main lining projects in the last 5 years demonstrating satisfactory water main cleaning in accordance to E5.
- (c) A minimum of three successful water main lining projects in the last 5 years for the project Superintendent proposed for this Work utilizing the proposed water main lining system submitted for this project by the utilizing the means, methods and products proposed for this Work.

B12.5 Further to B12.3, the Bidder and/or any proposed Subcontractor undertaking the design of water main liners, shall within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator to demonstrate the following qualifications and as indicated on (Form L: Contractor Qualifications and Experience):

- (a) Design of a minimum of three successful water main lining projects in the last 5 years utilizing the proposed water main lining system submitted for this project, utilizing methods proposed for this work.

- B12.6 .Further to B12.3, the Bidder and/or any proposed Subcontractor undertaking the supply of water main liners, shall within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator to demonstrate the proposed liner system conforms to the submittal requirements in accordance with E5.4.6
- B12.7 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/>).
- B12.8 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.
- B12.9 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.

FORM L: CONTRACTOR QUALIFICATIONS AND EXPERIENCE

(See B12)

WATER MAIN REHABILITATION BY CIPP LINING – INSTALLATION CONTRACTOR

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: Installation Contractor or Subcontractor

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

<u>Year</u>	<u>Description of Project, including size and type of CIPP pipe</u>	<u>Value</u>

2. Project References: Installation Contractor or Subcontractor

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

<u>Year</u>	<u>Description of Project, including size and type of CIPP pipe</u>	<u>Value</u>

FORM L: CONTRACTOR QUALIFICATIONS AND EXPERIENCE

(See B12)

WATER MAIN REHABILITATION BY CIPP LINING – INSTALLATION CONTRACTOR

3. Project References: Installation Contractor or Subcontractor

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

<u>Year</u>	<u>Description of Project, including size and type of CIPP pipe</u>	<u>Value</u>
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_____	_____	_____
_____	_____	_____
_____	_____	_____

4. Project References: Cleaning Contractor or Subcontractor

Project Client/Contact: _____

(Name)

(Address)

(phone)

(email)

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

FORM L: CONTRACTOR QUALIFICATIONS AND EXPERIENCE

(See B12)

WATER MAIN REHABILITATION BY CIPP LINING – INSTALLATION CONTRACTOR

5. Project References: Cleaning Contractor or Subcontractor

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: Cleaning Contractor or Subcontractor

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 QUALIFICATIONS AND EXPERIENCE

(See B12)

WATER MAIN REHABILITATION BY CIPP LINING – INSTALLATION CONTRACTOR

7. Project Personnel CIPP Superintendent:

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: Cleaning Superintendent

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: CIPP Design Professional

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 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 rehabilitation of water mains by cured in place pipe (CIPP).

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

- (a) Design, supply and installation of approximately 90 metres of 150 mm nominal water main lining, including valves and appurtenances.
- (b) Design, supply and installation of approximately 1100 metres of 200 mm nominal water main lining, including valves and appurtenances.
- (c) Design, supply and installation of approximately 260 metres of 250 mm nominal water main lining, including valves and appurtenances.
- (d) Water main disinfection and testing.
- (e) Restoration of asphaltic concrete pathways.
- (f) Restoration of portland cement concrete sidewalk.
- (g) Boulevard restoration by sodding.

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "ASTM" means American Society for Testing Materials ;
- (b) "AWWA" means American Waterworks Association ;
- (c) "CIPP" means Cured In Place Pipe as defined by ASTM F1216;

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is AECOM represented by:

Mr. Greg Karman, C.E.T.
Project Manager

Telephone No. 204 477-5381

Email Address greg.karman@aecom.com

Alternate Contact during Bid Period:

Mr. Marvin McDonald, C.E.T.

Telephone No. 204 477-5381

Email Address marvin.mcdonald@aecom.com

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

D5. CONTRACTOR'S SUPERVISOR

D5.1 At the pre-construction meeting, the Contractor shall identify his/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 not be submitted to the above facsimile numbers. Bids must be submitted in accordance with B8.

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/matmgmt/Safety/default.stm>
- D10.3 Notwithstanding B12.7 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 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.
- D15.2 The detailed work schedule shall consist of the following:
- (a) a critical path method (C.P.M.) schedule for the Work;
 - (b) a Gantt chart for the Work based on the C.P.M. schedule;
- all acceptable to the Contract Administrator.
- D15.3 Further to D15.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:
- D15.4 Further to D15.2(b), 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.

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 Contractor shall commence the Work on the Site no later than May 1, 2017.

D16.4 The City intends to award this Contract by September 2, 2016.

D16.4.1 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.

D18. SUBSTANTIAL PERFORMANCE

D18.1 The Contractor shall achieve Substantial Performance within twenty (20) 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.

D19. TOTAL PERFORMANCE

D19.1 The Contractor shall achieve Total Performance within thirty (30) consecutive Working Days of the commencement of the Work as specified in D16.

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 – one thousand five hundred dollars (\$1,500);
- (b) Total Performance – five hundred dollars (\$500).

D20.2 The amounts specified for liquidated damages in D20.1 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 B12.7, 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 B12.7.

D24. TRAFFIC MANAGEMENT

D24.1 Traffic control shall be carried out in accordance with Clause 3.7 of CW 1130.

D24.2 Further to D24.1, should the Public Works Department require that Work on Regional Streets be carried out at night, on Sundays, on Public Holidays, or that work be restricted or suspended during peak traffic hours, the Contractor shall comply without additional compensation being considered to meet that requirements. Notwithstanding the above, construction activities on Selkirk Avenue will be permitted weekdays, during normal construction hours provided traffic is maintained as specified in D24.4(a).

D24.3 Regional Streets on this project are:

- (a) Roblin Boulevard
- (b) Corydon Avenue
- (c) University Crescent

D24.4 Further to D24.1 and D24.2 on Regional Streets construction activities shall be restricted as follows:

- (a) Roblin Boulevard and Corydon Avenue
 - (i) Maintain all westbound lanes and one east bound lane at all times.
- (b) University Crescent
 - (i) Maintain one north bound lane and all south bound lanes at all times.
- (c) Maintain access to private approaches at all times.

D24.5 Further to Section 3.6 of CW 1130 of the General Requirements, the Contractor shall maintain safe pedestrian crossing at intersections at all times.

D24.6 The Contractor shall not park company or private vehicles inside the barricaded work zone in a manner that will block sightlines for vehicles and pedestrians approaching and crossing intersections.

MEASUREMENT AND PAYMENT

D1. WATER USED ON CITY OF WINNIPEG CONSTRUCTION PROJECTS

D1.1 Further to Section 3.7 of CW 1120, charges incurred for the permit and water meters shall be paid for by the Contractor when taken out. The Contractor shall forward the invoice to the Contract Administrator for reimbursement. The billing for water usage sent to the Contractor shall be forwarded to the Contract Administrator for payment. The Bid Opportunity number shall be noted on each permit.

D2. PAYMENT

D2.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D3. WARRANTY

D3.1 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. 666-2016

WATER MAIN REHABILITATION BY CIPP 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. 666-2016
WATER MAIN REHABILITATION BY CIPP 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)

WATER MAIN REHABILITATION BY CIPP 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)

WATER MAIN REHABILITATION BY CIPP 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>

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>Drawing No.</u>	<u>Drawing Name/Title</u>
D-14382	Cover Sheet
D-14383	Index Page - Drawing Index, Design Notes, Legend & Abbreviations
D-14384	University Crescent - Thatcher Dr to Markham Rd
D-14385	Roblin Boulevard – 818.2m West of Shaftesbury Blvd to 494.7m West of Shaftesbury Blvd
D-14386	Roblin Boulevard - 494.7m West of Shaftesbury Blvd to 134.7m West of Shaftesbury Blvd
D-14387	Roblin Boulevard/Corydon Avenue - 134.7m West of Shaftesbury Blvd to 44m East of Bower Blvd
D-14388	Corydon Avenue - 44m East of Bower Blvd to Boreham Blvd

GENERAL REQUIREMENTS

E2. PROVISIONAL ITEMS

- E2.1 The Provisional Items listed in the Schedule of Prices are a part of the Contract.
- E2.2 The Contractor shall not perform Work included in the Provisional Items without prior authorization from the Contract Administrator. All Work included in the Provisional Items will be carried out within the construction areas shown on the drawings.
- E2.3 Notwithstanding C.7, the City reserves the right to diminish all or any portion of the items of Work listed in the Provisional Items and no claim shall be made for damages on grounds of loss of anticipated profit or for any other reason.

E3. PROTECTION OF EXISTING TREES

- E3.1 The Contractor shall take the following precautionary steps to avoid damage from his construction activities to existing boulevard trees within and adjacent to the limits of construction:
- The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of any tree.
 - Mature tree trunks shall be strapped with 25 x 150 x 2400 (1" x 6" x 8") wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.

- (i) Excavations shall be carried out in such a manner so as to minimize damage to existing root systems. Roots over 50 mm in diameter that must be cut to facilitate an excavation shall be neatly pruned with a saw prior to excavation and coated with an appropriate wound dressing to prevent infection.
 - (ii) 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.
 - (iii) Work on site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch.
- (c) American elm trees are not to be pruned between April 1st and August 1st and Siberian elm trees between April 1st and July 1st of any year under provisions of The Dutch Elm Disease Act.

E3.2 All damages to existing trees caused by the Contractor's construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Public Works Department, Urban Forestry Branch.

E3.3 No separate measurement or payment will be made for protection of trees. It shall be considered incidental to the Contract Work.

E4. WATER MAIN TESTING

E4.1 Further to CW 2125 Clause 3.4.3, samples must be submitted to the laboratory no later than 20 hours following sampling.

E5. CLOSE-FIT LINERS FOR THE REHABILITATION OF WATER MAINS

E5.1 Description

E5.1.1 This specification covers the supply and installation of close-fit liners for the rehabilitation of water mains or other pressure pipelines.

E5.2 Definitions

E5.2.1 Close-fit liners are liners that fit integrally with the host pipe and when installed correctly are devoid of any annulus from a practical perspective that would facilitate the migration of water between the host pipe and the liner.

E5.2.2 Cured-in-place-pipe (CIPP) systems are resin-felt composite structures, with either fibers or membranes which when installed and cured will form a continuous-close fit liner within an existing water main.

E5.2.3 Acceptance Test – A test or a series of tests conducted under actual or simulated field conditions to determine whether a material system or component conforms to specified requirements in a construction or procurement document.

E5.2.4 Type Tests – Tests carried out under controlled laboratory conditions to demonstrate representative short or long term structural properties of a product or one of its components

E5.2.5 Demonstration Test – A Type or Acceptance Test carried out to demonstrate cause and effect by specified methods; used to establish the relationship between a specific set of procedures to prepare and apply a product and a desired outcome in terms of achieving target mechanical or other properties. For example, building a test panel to illustrate what combination of surface preparation and application technique/procedures are required to achieve target adhesion values.

- E5.2.6 Material Resistance Adjustment Factor – Factors that define the expected end use condition in terms of the values obtained in Type Testing either due to the difference between controlled laboratory and actual or simulated field conditions or due to long term applied load effects where direct testing is not available
- E5.2.7 Maximum Allowable Pressure (MAP) – The maximum combination of internal pressures that a pipe or lining system is anticipated to be exposed to including sustained, occasional surge and/or test pressure
- E5.2.8 Maximum Allowable Operating Pressure (MAOP) – The maximum anticipated sustained internal operating pressure that a pipe system or liner is anticipated to be exposed to
- E5.2.9 Occasional Surge (emergency or transient) Pressure – Short-term internal pressure events usually caused by emergency operations of the pipe network system (e.g. a rapid valve closure) or malfunction (e.g. power failure, component failure, etc.)
- E5.2.10 Recurring (cyclic) Surge Pressure – Internal surge pressures that occur frequently and are inherent to the design and operation of the pipe network system (such as normal pump start-up or shutdown and normal valve opening or closure). Recurring surge pressure may occur millions of times in a piping system's lifetime.
- E5.2.11 External Load – External loads due to earth pressure, static or fluctuating groundwater levels, or other non-dynamic loading sources
- E5.2.12 Live Load – Dynamic loads due to vehicles, railways or airplanes
- E5.2.13 Loads Due to Thermal Effects – Load induced shear effects due to thermal expansion and contraction of the pipe lining system or bonded liner materials
- E5.3 Reference Standards
- E5.3.1 The following reference standards may be applicable to this specification:
- (a) AWWA Manual of Water Supply Practice M28 – Rehabilitation of Water Mains
 - (b) ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
 - (c) ASTM D5813 - Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems
 - (d) ASTM F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
 - (e) ASTM F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)
 - (f) ASTM D638 - Standard Test Methods for Tensile Properties of Plastics
 - (g) ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
 - (h) ASTM D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings
 - (i) ASTM F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place thermosetting Resin Pipe (CIPP)
 - (j) ASTM D2290 - Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe
 - (k) ASTM D2837 Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
 - (l) ASTM D2990 - 09 -Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

- (m) ASTM D2992 - Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings
- (n) ASTM D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- (o) NSF/ANSI Standard 61: Drinking Water System Components – Health Effects
- (p) ACI 440.2R-08: Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures – Chapter 7 – Inspection, evaluation, and acceptance

E5.3.2 All reference standards shall be inferred to be the latest revision of the specific reference standard, unless a specific year is specified.

E5.4 Material, Installer and Design Requirements

E5.4.1 Liner Rehabilitation Systems

- (a) Liner rehabilitation systems shall be designated as a Class IV Lining system as specified in Appendix A of AWWA M28 and the supplemental requirements noted herein.
- (b) Acceptable lining systems shall be qualified CIPP systems that meet the technical requirements identified herein. Spray-on lining systems will not be considered as acceptable lining systems for Class IV liners in this specification.
- (c) The following lining systems can be designed as Class IV lining systems under many loading situations and host pipe defect patterns; and are approved for use subject to meeting project specific requirements and required installer experience as noted herein:
 - (i) Aqua-Pipe ® / Sanexen – CIPP based system
 - (ii) InsituMain TM / Insituform – CIPP based system
 - (iii) NordiPipe TM / Norditube Sekisui – CIPP based system
 - (iv) RS BlueLine TM / RS Technik – CIPP based system

Notwithstanding general approval for use of these products as Class IV liners, the proposed lining system shall be required to meet all project specific requirements to be considered for use in the City of Winnipeg.

- (d) Liner rehabilitation system shall be certified to NSF 61.Drinking Water System Components – Health Effects as Pipe liner- Immediate Return to Service for the pipe sizes and conditions specified herein.

E5.4.2 Temporary Pressurized Water Supply Pipe

- (a) As per CW 2110.

E5.4.3 Close-Fit Liner Design Objectives

- (a) Class IV liners shall:
 - (i) Provide an internal corrosion barrier for the host pipe
 - (ii) Have the ability to span holes, gaps, and defects in the host pipe.
 - (iii) Have inherent ring stiffness such they do not collapse or appreciably change shape when dewatered.
 - (iv) Have a long term independent pressure rating greater than the specified MAOP for the system.
 - (v) Be able to survive a burst failure of the host pipe.
 - (vi) Maximize the structural enhancement of the composite liner-host pipe by providing a close-fit with the host pipe.

- (vii) Eliminate leakage in the host pipe by providing a liner with adequate hydrostatic integrity and a liner system design that prevents migration of water between the liner and the host pipe emanating from reinstated service connections.
- (viii) Have a means of long term restraint in the axial direction to preclude differential movement between the host pipe and the liner.
- (ix) Maximize hydraulic efficiency by providing a smooth flow channel and minimal reduction of bore in the rehabilitated system.
- (x) Minimize construction footprint to as great a degree as possible to minimize disturbance to pavements and boulevards as well as disruption to vehicular and pedestrian traffic.
- (xi) Select a Class IV liner product and plan approach to rehabilitation toward maximizing the achievement of these design objectives.

E5.4.4 Close-Fit Liner Design – General

- (a) A Class IV Lining is a fully structural or structurally independent liner as defined in AWWA Manual M 28. As such the liner should possess the following characteristics:
 - (i) A long term (50 year) burst strength, when tested independently from the host pipe, equal to or greater than the MAOP stated herein of the pipe to be rehabilitated.
 - (ii) The ability to survive any dynamic loading or other short term effects associated with sudden failure of the host pipe due to internal pressure loads.
- (b) A Class IV lining design shall also consider additional design considerations where specified herein, including buckling, transient and vacuum loads.
- (c) If the structural design is premised on adhesion or attaining a bond to the host pipe, the following limit states should be checked in design:
 - (i) Ultimate strength under internal pressure
 - (ii) Ultimate strength considering combined internal pressure and bending due to earth and live loads
 - (iii) Buckling shall be considered under;
 - ◆ external pressure (Live load, dead load and groundwater) with pipeline empty and;
 - ◆ external pressure (Dead Load and groundwater) with transient induced vacuum pressure (where applicable)
 - (iv) Longitudinal checks shall be carried out for Poisson's effect, differential temperature effects, and thrust effects.
- (d) If the structural design is not premised on adhesion or attaining a bond with the host pipe, the design can be based on a fully deteriorated pressure pipe as defined in Clause X1.3.2 of Appendix X1 of ASTM F1216 as modified in accordance with design conditions noted herein.

E5.4.5 Close-Fit Liner Design – Project Specific Requirements

- (a) Where design is based on a fully deteriorated pressure pipe as defined in Clause X1.3.2 of Appendix X1 of ASTM F1216, the following minimum design assumptions shall apply:
 - (i) Earth Loads
 - ◆ Include an allowance for an AASHTO HSS25 concentrated live load in the total external pressure on the pipe. Calculate minimum live load surcharge based on Cooper E80 distributed load for portions of CIPP installed under railway lines.
 - ◆ Calculate dead load based on soil density of 1920 kg/m³.
 - ◆ Groundwater table is 2.0 m below the existing ground surface.

- ◆ Minimum value for ovality of the host pipe will be 2% unless a greater value is indicated on the Construction Drawings or as determined from observation of the CCTV inspection.
- ◆ Long-term value for flexural modulus of elasticity will be considered to be the projected value at 50 years of a continuous application of the design load based on the specific resin and felt composite as established by ASTM D2990.
- ◆ Modulus of soil reaction (E's) will be assumed to be 6900 kPa unless a higher or lower value is indicated on the Construction Drawings.
- ◆ Minimum factor of safety (N) of 2.

(ii) Pressure Loads

- ◆ Maximum sustained operating pressure – 690 kPa (100 psi)
- ◆ Transient short term overpressure – 40% of maximum sustained operating pressure
- ◆ Vacuum pressure allowance – -50 kPa (-7 psi)
- ◆ Maximum allowable operating pressure (MAOP) for design – 1034 kPa (150 psi)
- ◆ Test pressure - – 862kPa (125 psi).
- ◆ Long term values for hoop stress shall be the time adjusted values projected at 50 years of continuous load.

E5.4.6 Submittals Prior to Design

- (a) Prior to Design provide proof that the liner product proposed for use can be considered a Class IV liner. Proof of being a Class IV liner can consist of Type testing including:
- (i) Short term tests
 - ◆ ASTM D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings
 - (ii) Long term tests (if available)
 - ◆ ASTM D2990 - 09 -Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics, or;
 - ◆ ASTM D2992 - Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" ;(Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings, or
 - (iii) Where no long term basis for material properties as noted above is available provide rationale for the use of Material Adjustment Factors to convert short term testing results to conservative long term values in a manner satisfactory to the Contract Administrator. Under no circumstances will short term tests as per ASTM D1599 be de-rated by less than a factor of 4 where no long term testing results are available.

E5.4.7 Submittals Before Starting Work

- (a) Provide the required submittals to the Contract Administrator a minimum of 10 days before starting pre-work at each site.
- (b) Submit the close fit liner thickness design as Shop Drawings in accordance with the specified requirements herein and sealed and signed by a Professional Engineer licensed to practice in the Province of Manitoba. Include the following information.
- (i) Wall thickness computations including all specified design checks.
 - (ii) For CIPP systems provide:
 - ◆ Name and manufacturer of each unique resin and tube proposed for use.
 - ◆ CIPP curing schedule provided by the resin supplier indicating the temperature, staging, duration and pressure required to achieve a proper cure of the resin and fabric tube composite.

- ◆ Substantiation of material properties used in design based on previous installations and quality control tests.
- (iii) Other information that may reasonably be required by the Contract Administrator to confirm the close fit liner design proposed conforms to the specified requirements and design intent.
- (c) For CIPP systems:
 - (i) Arrange for the manufacturer of the resin to provide a Fourier transform infrared spectroscopy (FTIR) report such that blind testing can be carried out at the Owner's discretion and expense to confirm that the same resin is indeed being incorporated into the works.
- (d) Submit a site planning and operations protocol that provides information on the following.
 - (i) An excavation, staging, and sampling plan that details:
 - ◆ All required shaft locations, shaft sizes and shoring/excavation safety requirements
 - ◆ Temporary water system layout
 - ◆ Required storage and staging area
 - ◆ Sampling locations and Demonstration Test set ups to comply with Section E5.5.9 – Quality Assurance Requirements
 - ◆ Traffic management to accommodate the full construction footprint at each site
 - (ii) Details of the host pipe preparation requirements.
 - (iii) For CIPP systems, include a wet out plan, including:
 - ◆ Resin impregnation method.
 - ◆ Designated location of the wet out facility if wet out not carried out on site.
 - ◆ Documentation the resin to be used has not exceeded its shelf life as recommended by the manufacturer of the resin including on-site pot life for multi-component epoxy resins.
 - ◆ Volume and weight of resin to be impregnated into each liner and repair section including any excess allowance for polymerization and migration.
 - ◆ Methods used and required settings during the resin impregnation process to attain the required wall thickness
 - (iv) Details of the termination seals to facilitate the transition from the installed liner to existing water mains and system appurtenances such as fittings and new valve and hydrant installations.
 - ◆ Where AWWA C219 style sleeve couplings are utilized, the products shall be listed on the City of Winnipeg Approved Products list.
 - ◆ Where non-metallic flanges are proposed, bolting materials shall be 316 stainless steel
 - ◆ Electrical isolation of dissimilar metals used in terminations shall be considered in the design of termination seal recognizing that the native soil regime is extremely corrosive. Metallic components shall be designed to meet design life objectives in soil resistivity values of 600 ohm-cm.
- (e) Submit a construction protocol that provides information on the following.
 - (i) Minimum and maximum pressures to install the liner during the installation and curing process.

- (ii) Provide the maximum allowable axial and longitudinal tensile stress for the liner and the arrangement for monitoring pull-in forces during installation if liner insertion is to be by pull-in methods.
- (iii) Number and location of heat source monitor gauges.
- (iv) Minimum and maximum allowable temperature during each phase of the cure period and controlling monitoring points.
- (v) Number of stages and anticipated time for each stage of the curing period based on resin supplier's recommendations for CIPP systems.
- (vi) Estimated time line required to install and cure the liner, to reinstate the water services, to reinstate the water main, and carry out backfilling and final restoration.

E5.4.8 Record Submittals

- (a) Quality Control Records in accordance with E5.5.9
- (b) Manufacture recommended procedures for future service installation and maintenance
- (c) Manufacturer recommendation to installation of fitting and/or appurtenances within CIPP renewed section including termination methods and details

E5.5 Construction Methods

E5.5.1 Verification of Dimensional Requirements

- (a) Verify dimensional requirements of each water main to be rehabilitated prior to installation of the close fit liner as follows.
 - (i) Length of liner from access pit-to-access pit, with due consideration to closure details
 - (ii) Diameter and cross-section of the water main at each access shaft.
- (b) Use calibrated callipers or other suitable measuring device capable of measuring accurately to +/- 1 millimetre to confirm cross section geometry at clock positions of:
 - (i) 12:00 to 6:00,
 - (ii) 2:00 to 8:00,
 - (iii) 3:00 to 9:00 and
 - (iv) 4:00 to 10:00.
- (c) Estimate the remainder of the water main dimensional requirements based on recognized visual classification methods from the CCTV Inspections.

E5.5.2 Water Main Cleaning

- (a) Cleaning and surface preparation.
 - (i) The quality of pipe cleaning and surface preparation is critical to the successful application of CIPP liners requiring bond for either structural integrity or for sealing against the host pipe to facilitate hydrostatic integrity of the relined system.
 - (ii) The interior surfaces of the pipe to be lined shall be cleaned by methods to remove all sediment, corrosion products (rust and graphite), biology, chemicals or other deposits, loose and deteriorated remains of old coating materials, oil, grease, accumulations of water, debris and other foreign matter.
 - (iii) Disposal of effluent and solids shall be accomplished in accordance with any applicable regulatory disposal requirements.
 - (iv) Service connections and end seals are locations where particular attention must be paid when cleaning and preparing pipe sections to facilitate achieving hydrostatic integrity of the relined system. Care must be taken to clean and prepare the full circumference of services and end seals to ensure the liner bonds to a dry, corrosion-free pipe surface. These precautions are needed to prevent recurrence of corrosion and resist the shear loads induced by any

recurring and occasional surge pressures within the lined pipe. The cleaning method(s) chosen shall meet the performance requirements of this section. The selection of cleaning and preparation method(s) shall consider the potential for damage to service connections, appurtenances and the host pipe and take precautions to minimize potential damage before selection and deployment.

- (b) Drying the pipe interior.
 - (i) A CIPP liner will not bond to a wet pipe surface. The constructor shall ensure that residual water and debris are removed from the pipe prior to lining. Excess water and any remaining debris may be removed by pulling tight fitting rubber disk squeegees through the pipe; but, they are not sufficient for drying the pipe. Oversized foam swabs must then be driven through the cleaned and prepared main using filtered compressed air. The filters must be capable of removing 100% of the compressor oil from the air discharge and must be checked and cleaned regularly. The number of swab passes required depends on the condition of the main; swabbing must continue until the swabs emerge clean and dry. Cleaned and prepared pipes may also be air-dried using a suitable, oil-free blower or vacuum system approved by customer. The inability to remove all debris or water suggests inadequate cleaning or leaking valves. These faults should be investigated and remedied before the lining begins. It is important to note that the pipe must be inspected prior to lining to ensure it is free of visible moisture and free standing water along its length and in any pipe joints and recesses that are to be coated.

E5.5.3 CCTV Inspections

- (a) Perform the following CCTV Inspections.
 - (i) Pre-cleaning Inspection, to confirm intermediate dimensional requirements, cleaning requirements.
 - (ii) Pre-Lining Inspection after cleaning and preparation to confirm that the host pipe is ready for lining.
 - (iii) Post-Lining Inspection subsequent to installing the liner and all water service reconnections to assess the adequacy of the liner and reinstatements based on visual classification standards
- (b) Use equipment suitable for potable water pipes.
- (c) Provide a copy of all CCTV inspections to the Contract Administrator.
- (d) Review the Pre-Lining Inspection videotape with the Contract Administrator at least 24 hours before installing the liner and obtain approval to install. The Pre-Lining Inspection shall confirm:
 - (i) Necessary cleaning and pipe preparation work to meet visual standards for surface preparation to achieve objectives for adhesion in all areas where adhesion is required; and including any internal and external repairs/modifications have been satisfactorily completed.
 - (ii) Condition of the host 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 liner prior to commencing lining.
 - (iii) Location, condition and operational status of all water services.
- (e) Post-Lining Inspection is to confirm the adequacy of water service reinstatements and the fit and finish of the CIPP.

E5.5.4 Water Service Reinstatement Report

- (a) Confirm exact location of all water services connected to the water main being lined.
- (b) Submit a written Water Service Report for each liner location to the Contract Administrator providing the following information:

- (i) Location of connection (spatially referenced chainage to a visible surface feature and clock reference).
- (ii) Size of the service.
- (iii) Material type of water service.
- (iv) Method of reinstatement (e.g. remote, by excavation) and special features required for reinstatement
- (v) Status of connection (active, inactive or unable to determine).
- (vi) Property serviced including the address.

E5.5.5 Temporary Pressurized Water Supply

- (a) Provide and maintain a temporary pressurized water supply to residential, commercial and industrial customers as per CW 1120 and CW 2110, where existing water mains will be shut down for extended time periods during installation of liners.

E5.5.6 Installation of Close Fit Liners

- (a) Install CIPP liners by inversion methods in accordance with ASTM F1216 or by pull-in methods in accordance with ASTM F1743 or F2019 and the approved construction protocol submission for the site.
- (b) CIPP liners shall be cured by hot water, steam or ultra-violet light. Carry out workmanship in accordance with ASTM D5813.
- (c) Terminate ends of close fit liners in a manner that provides sufficient axial restraint to protect against differential axial movement between the host pipe and the liner and is sealed to be watertight.

E5.5.7 Reinstatement of Water Services

- (a) Reinstatement all active water services to as great a degree as possible utilizing remote reinstatement methods.
- (b) Abandon services no longer in use by excavating the corporation stop and closing the valve or by removing the corporation stop and installing an approved repair clamp to seal the host pipe. Services to be abandoned and the required method of abandonment are noted on the construction drawings.
- (c) Ensure that any debris created from water service reinstatement is contained within the new liner and flushed and removed from the liner prior to putting the main in service. Take reasonable precautions to confirm that no debris from water service reinstatements is discharged into the water service and confirm services are free of debris upon return to service.
- (d) Where reinstatement of Water Service connections is not possible, due to factors beyond the Contractors control, reconnect water services by excavating the existing service, and reconnecting the service to the rehabilitated main as specified in CW 2110. Where permitted by liner manufacturer, services up to 25 millimetres can be direct tapped, and shall engage the new liner. Services greater than 25 millimetres shall be completed by methods approved by liner manufacture, and ensure water tight integrity between the host pipe, liner and connection pipe.

E5.5.8 Cleaning and Disinfection

- (a) Cleaning and Flushing
 - (i) Clean and flush water mains in accordance with CW 2125
- (b) Disinfection
 - (i) Disinfect water mains in accordance to CW 2125

E5.5.9 Quality Assurance Requirements

- (a) The Contractor shall have in place a formal Quality Assurance Program. A program at least as rigorous as the Quality Assurance Requirements of Chapter 7 of ACI 440.2-R19 (Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures) is desired. As a minimum the Quality

Assurance Program shall be designed to verify that design intent is achieved in the construction process.

- (b) Maintain the following Quality Control records of the work and provide to the Contract Administrator after completion of the work (based on CIPP liners).
 - (i) Summary of the resin impregnation process including:
 - ◆ Volume of resin supplied.
 - ◆ Excess quantity of resin added during the wet out to account for polymerization and migration into the host pipe.
 - ◆ Settings used to control wall thickness.
 - ◆ Resin catalyst(s) used.
 - ◆ Time and location of the wet out.
 - ◆ Means taken to store and transport the resin impregnated CIPP from the wet out facility to the job site (for off-site wet outs).
 - (ii) Means of curing liners.
 - (iii) Continuous log of pressure maintained in the liner during the curing period.
 - (iv) Pulling force used to pull or winch CIPP into place in the host sewer and measured liner elongation.
 - (v) Continuous log of monitoring temperatures to confirm that the liner was cured as required.

E5.5.10 Acceptance Testing

- (a) Carry out tests, secure samples and arrange for third party tests at the laboratory noted herein. The following Acceptance Testing is required:
 - (i) Carry out a pressure test on each liner installed as per Clause 8.3 of ASTM F1216. Minimum test pressure shall be 862kPa (125 psi). Equipment, recording and reporting requirements shall conform to CW 2125.
 - ◆ Leakage allowance is an “apparent” leakage allowance to account for entrapped air, etc. .Any visible or readily apparent leaks shall be repaired irrespective of leakage allowance.
 - ◆ The pipe shall be pressurized at test pressure for 3 hours prior to test to allow for stabilization of the liner.
 - ◆ Allowable apparent leakage shall be calculated as 0.077 litres per millimetre of pipe diameter per kilometer per hour
 - (ii) Confirm fit and finish meet the visual classification standards of ASTM D5813 and that the liner is free of excess wrinkling or other feature that reasonably may compromise its functional or structural performance design objectives.
 - (iii) Secure confined samples and arrange for testing to confirm the CIPP flexural strength, flexural modulus and thickness in accordance with the requirements of ASTM D5813, D790, and ASTM D3567 for each liner installed.
 - (iv) Secure confined samples and arrange for testing to confirm the CIPP tensile strength and modulus in accordance with the requirements of ASTM D638 for each liner installed.
 - (v) Secure confined samples and arrange for testing to confirm the CIPP hoop strength in accordance with the requirements of ASTM D2290 at each of the two sites.
 - (vi) Secure confined samples and arrange for testing to confirm adequate adhesion to the host pipe has been achieved to meet functional and/or structural objectives. Adhesion testing shall be in accordance with ASTM D4451 and one location per site shall be mutually designated to use Demonstration Methods to confirm that surface preparation visual standards and standard installation protocol is sufficient to meet design objectives.
- (b) All of the above testing shall be included in the price bid for liner installation. All testing, with the exception of hydrostatic testing noted above shall be performed by:

Paragon Systems; Attention: Tony Araujo

- 1641 Langstaff Rd, Bldg. B.
- Units 14-17,
- Concord, ON L4K 5X8
- Phone: 905-738-0447

- (c) If additional testing is required beyond the minimum testing noted above it shall be reviewed in the context as defective work testing or Owner requested additional testing. Owner requested additional testing shall be paid for by the Owner, while additional testing required as a direct result of deficient work shall be borne by the Contractor.

E5.5.11 Infrared Spectroscopy (IR)

- (a) Where the Owner desires IR testing, the Contract Administrator will arrange for testing at the Owner's expense to compare the infrared spectrum of the resin field samples supplied from the wet-out to the reference spectrum generated from the resin sample provided by the resin manufacturer to verify installed material acceptability.

E5.5.12 Post Construction Design Review for Total Performance

- (a) The Contract Administrator will perform a post-construction design review to ensure that the completed close fit liner meets the 50 year design life structural requirements prior to Completion of Construction Acceptance. The design review will utilize the measured values for tensile strength, flexural strength, flexural modulus, and liner thickness from the sample testing.
- (b) Close fit liner strength values will be further reduced to account for creep (tensile and/or flexural) based on the long term material property values used in design to confirm that the 50 year design life requirement has been met. The use of full enhancement factors in this analysis will be limited to liners that are confirmed by visual classification to be close-fit liners based on the post-lining sewer inspection.
- (c) The Contract Administrator will advise of any discrepancies between the constructed liner and the design requirements.
- (d) Perform necessary remedial measures to confirm that a close fit liner deemed as structurally deficient will comply with the 50 year design life requirement such as additional testing to quantify the extent and nature of apparent defects and whether they compromise design intent.
- (e) Repair sections of liner removed for supplemental testing in a manner approved by the Contract Administrator.
- (f) Review remedial action with the Contract Administrator prior to implementation.
- (g) Perform further testing, monitoring and calculations and install structural enhancements at own cost.

E5.6 Measurement and Payment

E5.6.1 Measurement and Payment will be made in accordance to CW2110, and as listed on Form B: Prices, except as amended below.

E5.6.2 Water main Liner Installation

- (a) Water main liners will be measured on a length basis for each diameter and paid for at the Contract Unit Price per metre for "Class IV Water main Liner". Length to be paid for will be the total number of linear metres supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- (b) Payment for water main liners will include all mobilization and demobilization, design, pre-inspection, isolation of the water main from the distribution system, pipe cleaning, supply and installation of Class IV liner including excavation and backfill of pits, post-

installation testing, disinfection, and post-installation inspection and close-out submittals.

- (c) Eighty (80) percent of the payment will be made upon satisfactory completion of the liner and returning the water main to service. The remaining twenty (20) percent of the payment will be made upon confirmation of the liner strength and delivery and acceptance of all required submissions, shop drawings, and reports.

E5.6.3 Connections to Existing Water Mains

- (a) Connections to existing water mains will be measured and paid for as indicated in CW 2110 and will include all work and materials required for liner termination.

E5.6.4 Removal and Replacement of Existing Valves and Installation of Valves

- (a) Removal and replacement of existing valves and installation of new valves on relined water mains will be measured on a unit basis, for each size and paid for at the Contract Unit Price for the Items of Work listed below. The number of units to be paid for will be the total number of valves removed, replaced or installed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work

- (i) Removal of Existing Valves on Relined Water Mains
 - (ii) Replacement of Existing Valves on Relined Water Mains
 - (iii) Installation of New Valves on Relined Water Mains
- (b) Payment for Removal of Existing Valves on Relined Water Mains will include all work and materials required to cut out and remove the existing valve, excavation and backfill, liner terminations, and the supply and installation of couplings and pipe spool pieces.
 - (c) Payment for Replacement of Existing Valves on Relined Water Mains will include all work and materials required to cut out and remove the existing valve, excavation and backfill, liner terminations, and the supply and installation of a new valve and valve box, couplings and pipe spool pieces.
 - (d) Payment for Installation of New Valves on Relined Water Mains will include all work and materials required to cut out and remove existing piping, excavation and backfill, liner terminations, and the supply and installation of a new valve and valve box, couplings and pipe spool pieces.

E5.6.5 Hydrant Assembly Installation

- (a) Hydrant assembly installation will be measured and paid for as specified in CW 2110 and will include will include all work and materials required to cut out existing pipe, excavation and backfill, liner terminations, and the supply and installation of a new tee, pipe spool pieces, couplings, hydrant assembly and thrust restraint. No additional measurement will be made for hydrant leads longer than 3.0 metres.

E5.6.6 Replacement of Tees

- (a) Replacement of existing tees will be measured and paid for as specified in CW 2110 and will include will include all work and materials required to cut out existing tee, excavation and backfill, liner terminations, and the supply and installation of the new tee, couplings pipe spool pieces, and thrust restraint.

E5.6.7 Backfill Material and Compaction

- (a) Base price for backfill materials and compaction requirements shall include for Class 5 backfill as per CW 2030. No measurement or payment shall be made for Class 5 backfill operations.
- (b) Where excavations are within 1 metre of pavements, walks or structures, or where directed by the contract administrator, backfill shall be Class 3 backfill as per CW 2030. Payment for Class 3 backfill operations shall be made on a volume basis from measurements taken by the Contract Administrator of excavations acceptably backfilled to Class 3 requirements. Payment will be made at the Contract Unit Price

per cubic metre for "Class 3 Backfill Material" and will include the supply, installation and compaction of granular backfill and the offsite disposal of excess excavated material.

E5.6.8 Service Reinstatement By Remote Methods

- (a) Remote reinstatement of water service connections will be measured on a unit basis, for each size and paid for at the Contract Unit Price "Remote Reinstatement of Water Service Connections". The number of units to be paid for will be the total number of connections made in accordance with this specification, accepted and measured by the Contract Administrator.

E5.6.9 Reinstatement of Water Service Connections Requiring Trench Excavation

- (a) Reinstatement of water service connections requiring trench excavation will be measured on a unit basis, for each size and paid for at the Contract Unit Price "Reinstatement of Water Service Connections Requiring Trench Excavation ". The number of units to be paid for will be the total number of connections made in accordance with this specification, accepted and measured by the Contract Administrator.
- (b) Supply and installation of water service saddle, saddle, corporation stop, couplings, up to 1.0 metre of new copper water service pipe measured from the outside of the water main, continuity bonding wire, and all excavation and backfill will be included in the reinstatement.

E5.6.10 Liner Terminations

- (a) Liner terminations required to complete the work for which measurement and payment is not elsewhere specified shall be incidental to the installation of Class IV water main liners.

E5.6.11 Pavement Restoration

- (a) Renewal of existing concrete pavement slabs will be measured on a surface area basis per square metre in accordance with CW 3230. No separate measurement or payment will be made for Drilled Dowels or Tie Bars, the cost for which shall be included in the prices bid for renewal of concrete pavement slabs. .
- (b) Removal and replacement of existing miscellaneous concrete slabs, curbs and asphaltic pavement will be measured for payment in accordance with CW 3235, CW 3240 and CW 3410.

E5.6.12 Boulevard Restoration

- (a) Restoration of boulevards, ditches, and grassed areas disturbed due to construction activities will be included with water main work being done.
- (b) Restoration of boulevard and grassed areas beyond the limits of construction as directed by the Contract Administrator will be measured for payment in accordance with CW 3510 and CW 3520.

E6. HYDRANT ACCESS PADS

E6.1 Description

- (a) This Specification covers the construction of approaches to provide access across existing ditches to new hydrants.

E6.2 Construction Methods

- (a) Construct embankment from suitable common excavated material to the dimensions shown on the drawings in accordance with CW 3170.
- (b) Place and compact crushed limestone base course to the dimensions shown on the drawings in accordance with CW 3110.
- (c) Supply and Install CSP culverts in accordance with CW 3610 where indicated.

E6.3 Method of Measurement and Payment

- (a) Corrugated Steel Pipe will be measured and paid for as specified in CW 3610.
- (b) Construction of hydrant approaches will be measured for payment on a unit basis and paid for at the Contract Unit Price for "Construction of Hydrant Access Pads". Number of units to be paid for will be the total number of hydrant access pads acceptably constructed in accordance with this specification, accepted and measured by the Contract Administrator.

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) any Work within City facilities other than:
 - (i) an underground structure such as a manhole;
 - (ii) in areas and at times normally open to the public;
 - (c) 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: <https://www.commissionaires.ca/en/manitoba/home>.
- 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.