



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 755-2009

**INSPECTION OF LARGE DIAMETER INTERCEPTOR SEWERS BY MULTI-SENSOR
METHODS**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 INSPECTION OF LARGE DIAMETER INTERCEPTOR SEWERS BY MULTI-SENSOR METHODS

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, October 23, 2009.

B3. SITE INVESTIGATION

B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site from 9:00 a.m. to 12:00 Noon on October 20, 2009 to provide Bidders access to the Site. All Bidders are requested to confirm their attendance at the Site, via e-mail to the Contract Administrator (armand.delaurier@aecom.com), no later than 4:30 p.m., October 19, 2009.

B3.2 The Bidder is advised that while the Site is accessible for viewing at any time, they will only be permitted to access manholes for inspection during the pre-arranged site visit.

B3.3 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

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 promptly notify the Contract Administrator of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.

B4.3 If the Bidder is unsure of the meaning or intent of any provision therein, the Bidder should request clarification as to the meaning or intent prior to the Submission Deadline.

B4.4 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.

B4.5 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.

B4.6 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Contract Administrator in writing.

B5. ADDENDA

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

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

- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B5.2.2 The Bidder is responsible for ensuring that he 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.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 9 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.
- B6. SUBSTITUTES**
- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least four (4) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B14.

- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.5, deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B14.1(a).

B7. BID SUBMISSION

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B7.4 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.5 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 B14.1(a).
- B7.6 The Bid may be submitted by mail, courier or personal delivery, or by facsimile transmission.
- B7.7 If the Bid is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address, and shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1
- B7.7.1 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 Submission.
- B7.8 If the Bid is submitted by facsimile transmission, it shall be submitted to (204) 949-1178.
- B7.8.1 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time.
- B7.9 Bids submitted by internet electronic mail (e-mail) will not be accepted.

B8. BID

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

- (d) if the Bidder is carrying on business under a name other than his own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 11 of Form A: Bid shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
- (d) if the Bidder is carrying on business under a name other than his own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B9.1.1 Notwithstanding C11.1.1, prices on Form B: Prices shall not include the Goods and Services Tax (GST) or Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B9.4 Prices from Non-Resident Bidders are subject to a Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. QUALIFICATION

B10.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Bidder does not carry on business in Manitoba, in the jurisdiction where the Bidder does carry on business; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.

- B10.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>
- B10.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) have successfully carried out work similar in nature, scope and value to the Work; and
 - (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
 - (c) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba); and
 - (d) have successfully completed 150,000 m of multi-sensor inspection in 600mm and greater diameter pipe with over 30,000 m of experience being in diameter 1500 mm diameter or larger.
- B10.4 Further to B10.3(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 valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association or by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or
 - (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>)
- B10.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.
- B10.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. OPENING OF BIDS AND RELEASE OF INFORMATION

- B11.1 Bids will not be opened publicly.
- B11.2 Following the Submission Deadline, the names of the Bidders and their 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>
- B11.3 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>
- B11.4 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.

B12. IRREVOCABLE BID

- B12.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 10 of Form A: Bid.
- B12.2 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 10 of Form A: Bid.

B13. WITHDRAWAL OF BIDS

- B13.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B13.1.1 Notwithstanding C22.5, 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.
- B13.1.2 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 11 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B13.1.3 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 11 of Form A: Bid; and
 - (c) if the notice has been given by any one of the persons specified in B13.1.3(b), declare the Bid withdrawn.
- B13.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B12.2 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.

B14. EVALUATION OF BIDS

- B14.1 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 therefrom (pass/fail);
 - (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
 - (c) Total Bid Price ;
 - (d) economic analysis of any approved alternative pursuant to B6;
- B14.2 Further to B14.1(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.
- B14.3 Further to B14.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid or in other information required to be submitted, that he is responsible and qualified.
- B14.4 Further to B14.1(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.

B14.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

B14.4.2 Further to B14.1(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.

B15. AWARD OF CONTRACT

B15.1 The City will give notice of the award of the Contract, or will give notice that no award will be made.

B15.2 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.

B15.2.1 Without limiting the generality of B15.2, 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.

B15.3 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 B14.

B15.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his Bid upon written request to the Contract Administrator.

B15.4 Notwithstanding C4 and Paragraph 6 of Form A: Bid, the City will issue a purchase order to the successful Bidder in lieu of the execution of a Contract.

B15.5 The Contract Documents, as defined in C1.1(n) (ii), in their entirety shall be deemed to be incorporated in and to form a part of the purchase order notwithstanding that they are not necessarily attached to or accompany said purchase order.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Supply of Services* (Revision 2007 04 12) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Supply of Services* 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 Supply of Services*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the inspection of large diameter interceptor and secondary sewers by multi-sensor methods in the City of Winnipeg.

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

- (a) Mobilization to the Site;
- (b) Preparation of manholes to accommodate insertion of multi-sensor sewer inspection equipment;
- (c) Multi-sensor sewer inspections;
- (d) Manhole and surface restoration, and site clean-up;
- (e) Demobilization.

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "WRc" means "Water Research Centre" which is the accepted standard for sewer condition coding and assessment.

D4. CONTRACT ADMINISTRATOR

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

Armand Delaurier, C.E.T.
Senior Municipal Technologist
99 Commerce Drive, Winnipeg, MB R3P 0Y7

Telephone No. (204) 477-5381 Cell No. (204) 792-0161

Facsimile No. (204) 284-2040

D4.2 Before commencement of Work, Mr. Delaurier will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D5. CONTRACTOR'S SUPERVISOR

D5.1 Further to C6.19, the Contractor shall employ and keep on the Work, at all times during the performance of the Work, a competent supervisor and assistants, if necessary, acceptable to the Contract Administrator. The supervisor shall represent the Contractor on the Site. The supervisor shall not be replaced without the prior consent of the Contract Administrator unless the supervisor proves to be unsatisfactory to the Contractor and ceases to be in his employ.

D5.2 Before commencement of Work, the Contractor shall identify his designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5.2.1 Further to C5.5 Contract Administrator may give instructions or orders to the Contractor's supervisor and such instructions or orders shall be deemed to have been given to the Contractor.

D6. NOTICES

- D6.1 Notwithstanding C22.3, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following address or facsimile number:

The City of Winnipeg
Chief Financial Officer
Administration Building, 3rd Floor
510 Main Street
Winnipeg MB R3B 1B9
Facsimile No.: (204) 949-1174

SUBMISSIONS

D7. AUTHORITY TO CARRY ON BUSINESS

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

D8. SAFE WORK PLAN

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

D9. INSURANCE

- D9.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg and AECOM Canada Ltd. added as an additional insured; such liability policy to also contain a cross-liability clause, non-owned automobile liability and products and completed operations cover, to remain in place at all times during the performance of the Work;
 - (b) if required, automobile liability insurance for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00), to remain in place at all times during the performance of the Work;
- D9.2 Deductibles shall be borne by the Contractor.
- D9.3 The Contractor shall provide the Contract Administrator 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 on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D9.4 The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D10. PERFORMANCE SECURITY

- D10.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form Hs1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
 - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D10.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D10.2 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 and prior to the commencement of any Work on the Site.

D11. SUBCONTRACTOR LIST

- D11.1 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.

D12. EQUIPMENT LIST

- D12.1 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.

D13. DETAILED WORK SCHEDULE

- D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site.
- D13.2 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;
 - (c) a Traffic Control Plan that identifies locations and approximate timing of proposed lane closures and parking restrictions, and
 - (d) a detailed deployment schedule for the Work at each site
- all acceptable to the Contract Administrator.
- D13.3 Further to D13.2(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.
- D13.4 Further to D13.2(d), the daily manpower schedule shall list the list a detailed deployment schedule for each deployment location detailing the required time line for.
- (a) Lane closures,

- (b) Multi-sensor deployment time,
- (c) CCTV inspection schedule,
- (d) Laser profiling schedule,
- (e) Multi-sensor tool retrieval schedule, and
- (f) Lane re-opening time(s).

D14. SECURITY CLEARANCE

D14.1 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;

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

D14.1.1 The original Criminal Record Search Certificate (Form P-253) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner. The applicant shall:

- (a) Provide the original Criminal Record Search Certificate (Form P-253) to the Contract Administrator.

D14.2 Prior to the commencement of any Work specified in D14.1, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform such Work.

D14.3 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 D14.1.

D14.4 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.

D14.5 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 D14.1.

D15. ADDITIONAL SUBMITTAL REQUIREMENTS

D15.1.1 References:

- (a) With consideration of the specific type of work required by this project, it is requested that the Contractor provide at least three references where the Contractor or the Subcontractor has performed similar type of work using the equipment that is proposed for use on this project. The references must include a brief summary of the scope of work, in addition to the name, position, email, and phone number of the project contact.

- D15.1.2 Sample Documentation:
- (a) Provide a sample report of each type of inspection (eg. SONAR, LASER, CCTV, and Gas) with your submission, including digital MPEG DVD-R video recording and corresponding magnetic data file of an actual sewer performed by each camera that will be used at least 2 weeks before beginning the inspection work.
- D15.1.3 CCTV Operator Certifications
- (a) Submit copies of valid operator training certificates for NAAPI Level of Qualification of WRc Operators, or acceptable alternate training program, for each operator at least 10 working days before starting the inspection work.
- D15.1.4 In-pipe Inspection Emergency Plan
- (a) The Contractor shall submit an Emergency Plan that outlines proposed methods for recovering in-line inspection equipment that has become lodged, lost or uncontrollable within the sewer. For information, the Contractor's attention is called to Clauses 3.2.1 and 4.7 of CW 2145.

SCHEDULE OF WORK

D16. COMMENCEMENT

- D16.1 The Contractor shall not commence any Work until he is in receipt of a notice of award from the City 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 D7;
 - (ii) evidence of the workers compensation coverage specified in C6.14;
 - (iii) the safe work plan specified in D8;
 - (iv) evidence of the insurance specified in D9;
 - (v) the performance security specified in D10;
 - (vi) the Subcontractor list specified in D11;
 - (vii) the equipment list specified in D12;
 - (viii) the detailed work schedule specified in D13; and
 - (ix) the security clearances specified in D14.
 - (x) All submittal requirements detailed in D15.
 - (b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.
- D16.3 The Contractor shall commence the Work on the on the Contract within seven (7) days of receipt of a notice of award from the City authorizing the commencement of the Work.

D17. WORKING DAYS

- D17.1 Further to C1.1(gg), 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 thirty (30) 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 forty (40) 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 in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City two thousand dollars (\$2,000) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.
- D20.2 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City one thousand dollars (\$1,000) per Working Day for each and every Working Day following the day fixed herein for Total Performance during which such failure continues.
- D20.3 The amounts specified for liquidated damages in D20.1 and D20.2 are based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance and/or Total Performance by the days fixed herein for same.
- D20.4 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

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

D21.1 Further to C6.23, 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).

D22. SAFETY

D22.1 The Contractor shall be solely responsible for safety at the Site and for compliance with all laws, rules, regulations and practices required by the applicable safety legislation.

D22.2 The Contractor shall be solely responsible for securing the Site, and any existing facility thereon, and for the proper care and protection of the Work already performed.

D22.3 The Contractor shall do whatever is necessary to ensure that:

- (a) no person, property, right, easement or privilege is injured, damaged or infringed by reason of the Contractor's activities in performing the Work;
- (b) the health and safety of all persons employed in the performance of the Work or otherwise is not endangered by the method or means of its performance;
- (c) adequate medical services are available to all persons employed on the Work and at all times during the performance of the Work;
- (d) adequate sanitation measures are taken and facilities provided with respect to the Work;
- (e) pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the performance or existence of the Work or Plant;

D23. SITE CLEANING

D23.1 The Contractor shall maintain the Site and the Work in a tidy condition and free from the accumulation of waste and debris, other than that caused by the City or by other contractors.

D23.1.1 As the Work progresses, the Contractor shall remove any Plant and Material not required for the performance of the remaining Work. He shall also remove waste and debris other than that caused by the City or other contractors, and leave the Site and the Work clean and suitable for occupancy by the City unless otherwise specified.

D23.1.2 Total Performance shall not be considered to have been achieved until the Contractor has cleaned up the Site and has removed all Plant, surplus Material, waste and debris, other than that left by the City or other contractors.

D24. INSPECTION

D24.1 Before beginning or resuming operations upon any portion of the Work, the Contractor shall notify the Contract Administrator so as to enable him to arrange for inspection. If the Contractor fails to notify the Contract Administrator, the Contractor shall, if and when required by the Contract Administrator, forthwith take down or expose and redo that portion of the Work required to facilitate inspection. The cost of such taking down or exposure, and redoing, if any, shall be borne by the Contractor.

D24.2 If and when required by the Contract Administrator, the Contractor shall take down or expose forthwith any portion of the Work where the Contract Administrator determines that the Work is not in accordance with the Contract. The cost of such taking down or exposure, and redoing, if any, shall fall upon the City if the taking down or exposure indicates that the portion exposed was properly performed, but if otherwise the cost shall be borne by the Contractor.

D25. DEFICIENCIES

D25.1 Further to C10.5, the Contract Administrator may order the Contractor to alter or improve his methods, to increase or improve his Plant, to furnish additional or more suitable Material, or to employ additional or more qualified labour if, at any time, the Contract Administrator determines that:

- (a) the Work is not being, or will likely not be, performed satisfactorily; or
- (b) progress is not being, or will likely not be, maintained in accordance with the work schedule.

MEASUREMENT AND PAYMENT

D26. PAYMENT

D26.1 Further to C11, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D27. WARRANTY

D27.1 Warranty is as stated in C12.

FORM H1: PERFORMANCE BOND
(See D10)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$ _____ ._____)

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

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

BID OPPORTUNITY NO. 755-2009

INSPECTION OF LARGE DIAMETER INTERCEPTOR SEWERS BY MULTI-SENSOR METHODS

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 D10)

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 755-2009

INSPECTION OF LARGE DIAMETER INTERCEPTOR SEWERS BY MULTI-SENSOR METHODS

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

(Name of Contractor)

(Address of Contractor)

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

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

(Address)

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

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

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

(Date)

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

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

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

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM K: EQUIPMENT
(See D12)

INSPECTION OF LARGE DIAMETER INTERCEPTOR SEWERS BY MULTI-SENSOR METHODS

<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 D12)

INSPECTION OF LARGE DIAMETER INTERCEPTOR SEWERS BY MULTI-SENSOR METHODS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
Figure 1	Main Interceptor and Sutherland Secondary
Figure 2	Main Interceptor – NEWPCC to Newton
Figure 3	Main Interceptor – Newton to Hartford
Figure 4	Main Interceptor – Hartford to Matheson
Figure 5	Main Interceptor – Matheson to Church
Figure 6	Main Interceptor – Church to Alfred
Figure 7	Main Interceptor – Alfred to Jarvis
Figure 8	Main Interceptor – Jarvis to Alexander
Figure 9	Sutherland Secondary – Main to Annabella
Figure 10	Sutherland Secondary – Annabella to Higgins

- E1.4 In addition to the Contract Drawings, several historic drawings are provided for information.
- E1.5 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B6.

E2. CONFINED SPACE ENTRY

- E2.1 The Contractor shall be aware that Hydrogen Sulphide Gas is present in all underground structures connected to the City's sewer systems and has been known to accumulate in concentrations sufficient to cause serious harm or death to personnel who are not using adequate Personal Protective Equipment.
- E2.2 The Contractor's attention is drawn to the Province of Manitoba Workplace Safety and Health Act ("the Act"), and the Regulations and Guidelines there-under pertaining to Confined Entry Work and in particular the requirements for conducting hazard/risk assessments and providing personal protective equipment (PPE).
- E2.2.1 Further to E2.2, the Contractor shall use an approved and properly maintained Supplied Air Breathing Apparatus when entering and working in sewers, manholes and catch basins.
- E2.3 The Contractor shall also be aware that while all manholes have been fitted with ladder rungs and/or stirrups to facilitate access and egress, these fixtures should not be relied upon for the safe access or egress of manholes.

E3. SEWER INSPECTION

E3.1 Description

- E3.1.1 The City of Winnipeg Specification CW 2145 shall govern the Work, except as modified herein, required to complete the multi-sensor inspection of Main Street Interceptor and Sutherland Avenue Secondary sewers in the City of Winnipeg, as identified on the drawings, and as listed in Form B: Prices.
- E3.1.2 For tendering purposes, the Work has been divided into eleven separate Work Sites based sewer features, and on location and spacing of the modified deployment manholes noted on the Contract drawings.
- E3.1.3 As noted in Form B: Prices, two Work Sites have been designated as Provisional Work, any or all of which may be added to the Contract pending budgetary constraints.

E3.2 Multi-Sensor Sewer Inspection

- (a) The general sequence of Work activities is as follows:
- (i) Mobilize to the inspection site;
 - (ii) Erect temporary traffic control devices;
 - (iii) Open and prepare manhole(s) for insertion of in-line inspection equipment;
 - (iv) Perform the in-line sewer inspection;
 - (v) Recover the inspection equipment and close the manhole(s);
 - (vi) Remove temporary traffic control devices;
 - (vii) Demobilize, or move to the next inspection site;
 - (viii) Process the inspection data and submit an inspection report.
- (b) The Contractor shall remove all equipment from the interceptor and secondary sewers at the end of each shift.

E3.3 Existing Conditions

- (a) Main Street Interceptor Sewer:
- (i) This Interceptor is a monolithic concrete sewer constructed in approximately 1936;
 - (ii) It is the primary conveyance of sewage to the North End Water Pollution Control Centre, which treats approximately 65% of the City's wastewater;
 - (iii) Within the contract limits, the interceptor is typically located in the southbound lanes of Main Street, while north of Margaret Ave the interceptor is located in the median, and south of the Henry Ave the interceptor is located in the northbound lanes of Main Street.
 - (iv) Main Street is a Regional Street that carries between 30,000 and 50,000 vehicles per day within the contract area.
 - (v) When visually inspected at manholes in 1994, this sewer was reported to be in generally good condition, with deteriorated concrete (exposed aggregate) being observed between Sutherland Ave and Church Ave, and near Hartford Ave.
 - (vi) Hydraulic analysis indicates that multi-sensor in-line inspection is feasible under dry weather flow conditions.
- (b) Sutherland Secondary Sewer
- (i) This sewer is a monolithic concrete sewer constructed in approximately 1936;
 - (ii) It conveys sewage from the Mission and Roland sewer districts on the east side of the Red River, and the Boyle-Syndicate sewer district on the west side of the river, to the Main Street Interceptor.
 - (iii) This sewer is roughly located in the westbound curb lane of Sutherland Avenue, a local commercial/industrial collector route that carries approximately 7900 vehicles per day;
 - (iv) When the manhole east of Austin Street was visually inspected in 1994, the concrete was reported to be deteriorated (exposed aggregate);

- (v) Records indicate that crossing sewers and watermain at Annabella St, McFarlane St, and Syndicate Street pass directly through the Secondary sewer, and may obstruct the passage of in-line inspection tools.
- (vi) Hydraulic analysis has not been undertaken for this secondary sewer, but it is expected that in-line multi-sensor inspection is feasible under dry weather flow conditions;
- (c) Access Manholes
 - (i) Standard manhole openings are 521mm in diameter;
 - (ii) Modified deployment manhole openings are approximately 688mm;
 - (iii) Manhole riser and barrel sizes are as shown on the historical drawings.

E3.4 Measurement and Payment

- (a) Mobilization and Demobilization
 - (i) Mobilization and demobilization will be measured as a single unit and paid for at the Contract Lump Sum Price for "Mobilization and Demobilization" to the City of Winnipeg.
- (b) Multi-Sensor Sewer Inspections
 - (i) Sewer inspections will be measured and paid for in accordance with CW 2145.
- (c) Inspection Reports
 - (i) Inspection reports will not be measured for separate payment and will be included with Multi-Sensor Inspection.
- (d) Basis of Payment
 - (i) Payment will be made at the Contract Unit Price for the "Items of Work" listed on Form B: Prices, measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.
 - (ii) For each of the Inspection Sites, seventy-five percent (75%) of the unit price bid for this Work will be paid upon reaching Total Performance. 25 percent (25%) of the bid price will be held back until the Final Inspection Report has been reviewed acceptance inspection is completed. The holdback for receipt of the Final Inspection Report will not affect the determination or issuance of Total Performance for the Contract.

E3.5 This specification amends and supplements specification CW 2145.

E3.5.1 Further to section 3.13, a paper or "hard copy" of the inspection reports is not required and the digital format should be submitted on a CD-R.

- (a) The Contractor shall maintain backup copies of all digital video and inspection data submissions for the duration of the warranty period as stated in C13.
- (b) The Contractor shall supply a portable hard disk drive (HDD), complete with all operating software, power adaptors and USB cable, containing all video inspections and coding data to the City upon completion of the project. The HDD shall be minimum 500 GB in size, 7200 RPM, and connectable via USB 2.0.

E3.5.2 The Contract drawings are based on information contained in the City's GIS database. If the Contractor has trouble interpreting the drawings, or if they believe them to be wrong, the Contract Administrator shall be approached for assistance/clarification.

- (a) The Contractor shall assist the Contract Administrator in making any required measurements for the correction of errors found on the drawings.

E4. SEWER INSPECTION EQUIPMENT

E4.1 In-Line Sewer Inspection Equipment

E4.1.1 In-Line Sewer inspection equipment shall be comprised of a self-propelled track-mounted platform bearing multiple inspection sensors / technologies that can undertake simultaneous remote multi-sensor inspection of sewers ranging in size from 900mm through 2300mm.

E4.2 In-Line Inspection Platform

E4.2.1 Minimum requirements of the in-line inspection platform include:

- (a) Independently controlled drive tracks that enable the platform to manoeuvre around bends and climb over debris up to 300mm in height.
- (b) Operable under partially or fully submerged flow conditions, for distances up to 2000m upstream and downstream of a single access point.
- (c) Operable in sewers of various cross-section, and constructed of standard pipe materials including brick, clay, concrete, PVC, HDPE, and steel.
- (d) Tethered to facilitate extraction of the platform from the sewer, without causing damage to the sewer infrastructure, in the event the equipment fails or otherwise becomes uncontrollable within the sewer.
- (e) Equipped with sufficient high intensity lighting to illuminate the sewer for visual inspection.
- (f) Capability for simultaneous data collection from multiple inspection sensors/technologies including, but not limited to:
 - (i) CCTV video inspection
 - (ii) Spherical view video inspection
 - (iii) Three dimensional (3D) LASER scanning
 - (iv) SONAR scanning
 - (v) Gyroscopic position tracking
 - (vi) H₂S gas sensing
 - (vii) Thermal sensing
 - (viii) Penetrometer testing

E4.3 In-Line Inspection Sensors / Technologies

E4.3.1 Minimum requirements of the inspection sensors / technologies include:

- (a) CCTV Video Inspection
 - (i) Equipment shall conform to CW 2145, except as modified herein.
 - (ii) Equipment shall be capable of continuously capturing digital video from first generation recordings with no frame loss, regardless of the progression of the inspection.
 - (iii) Equipment shall be used to acquire continuous digital video images of the sewer for the entire length being inspected.
 - ◆ Perform sewer condition coding in accordance with the requirements of the WRc Manual of Sewer Condition Classification 3RD Edition.
 - ◆ Perform condition coding using operators who can demonstrate proficiency coding in accordance with the requirements of the WRc "Manual of Sewer Condition Classification 3RD Edition".
 - ◆ Ensure each operator is fully trained in all aspects of sewer inspection and capable of making accurate observations and recording all conditions that may be encountered in the sewers.
 - ◆ Operators failing to meet the accuracy requirements on two occasions will not be permitted to code on the remainder of the contract until they can demonstrate to the Contract Administrator that they can code in accordance with the requirements of the WRc Manual of Sewer Condition Classification 3RD Edition.
 - ◆ Incorporate a suitable distance-reading device to measure the location of the equipment in the pipe, to an accuracy of $\pm 0.5\%$ of the length of the inspection.

- (b) Spherical View Video Inspection
- (i) "Spherical Video" provides a minimum 180 degree field of view and is recorded as a movie clip, allowing for PTZ off-line at any time after the inspection.
 - (ii) Spherical view video inspection equipment shall acquire continuous digital video images of the arc of sewer pipe above the fluid level, for the entire length of sewer being inspected.
 - (iii) Minimum equipment requirements are:
 - ◆ Capable of continuously capturing digital video from first generation recordings with no frame loss, regardless of the progression of the inspection.
 - ◆ Incorporate a suitable distance-reading device to measure the location of the equipment in the pipe, to an accuracy of $\pm 0.5\%$ of the length of the inspection.
 - ◆ Provide off-line viewing capabilities that can be imported into an inspection standard compliant pipe annotation tool.
- (c) Three Dimensional (3D) LASER Scanning Inspection
- (i) "Three Dimensional (3D) Laser Scanning" is a technique to determine the surface profile of mainline pipes greater than or equal to 1200mm using a three dimensional (3D) spinning laser which does not need to be attached to the CCTV inspection equipment.
 - (ii) Three Dimensional (3D) LASER scanning equipment shall provide an accurate determination of pipe geometry (features and defects) above the fluid level.
 - (iii) Minimum equipment requirements are:
 - ◆ The provision of laser scanning Internal Diameter and Deflection graphs will be used to quantify internal pipe wall material loss/gain or deformation (ovality and deflection) at a given payout location. Pipe cross-sections obtained from high resolution scans will be used to provide quantitative information regarding internal pipe diameter, including ovality. Precision Scans are produced with multi-colour indication depicting deviations from as built conditions as well as localized material gain and/or loss.
 - ◆ The laser shall support 75 Hz scan rates or higher and be Class 1; eye-safe for operator safety.
 - ◆ Surface Corrosion measurements accurate to 5mm at 3 metres in 1220mm (48 inch) pipes and larger.
 - ◆ Precision Ovality / deflection detailed range laser measurement scans accurate to $\pm 1\%$
 - ◆ Laser scanning shall be conducted continuously and simultaneously with other inspection technology for the entire length of the pipeline as identified in the detailed Scope of Work. Laser equipment shall be moved through the pipeline on a transport vehicle capable of supporting the laser inspection equipment above the water level. At a speed of 10m/minute, the maximum usable scan density is one scan per 1.0m. Increased density scans may be conducted per customer request where unusual or "of concern" conditions are evident by collecting data at lower speeds.
- (d) SONAR Scanning Inspection
- (i) SONAR scanning equipment shall accurately measure the depth to sediment or pipe surface below the fluid level at regular intervals throughout the inspection.
 - (ii) Minimum equipment requirements are:
 - ◆ SONAR equipment must be programmable multi-frequency profiling sonar specifically adapted to using sound waves to locate and map

subaqueous sewer irregularities by creating continuous SONAR images recorded in "real time" mode.

- ◆ SONAR equipment shall be digital, and support a range of frequencies from 600 kHz to 1.0 MHz.
 - ◆ The range resolution measurement error shall be no greater than 2.0mm from distances of 1 to 4m, and no greater than 10.2mm from distances of beyond 5m.
 - ◆ The minimum detectable range for the SONAR unit shall be 150mm.
 - ◆ Error tolerances for sediment volume quantification shall be a minimum 92% accuracy for pipelines between 900mm and 1350mm diameter inclusive, and a minimum of 95% accuracy for pipelines equal to or greater than 1800mm diameter.
 - ◆ Sediment/debris calculations accurate to minimum 95% for pipes over 1800 mm (72 inch) diameter.
 - ◆ Sonar range resolution measurement error no greater than 0.08 inches from a distance of 1 to 4m (3 to 12 feet) and no greater than 0.4 inches from distances of beyond 5m (15 feet)
- (e) Gyroscopic position tracking
- (i) Minimum equipment requirements are:
 - ◆ Real-time pitch and roll measurements with respect to gravity that are accurate to ± 1 degree
- (f) Hydrogen Sulphide (H₂S) Gas Inspection
- (i) H₂S inspection equipment shall be capable of continuous measurement and recording of H₂S gas concentrations in the sewer atmosphere above the fluid level for the duration of the inspection.
 - (ii) Minimum equipment requirements are:
 - ◆ Electrochemical hydrogen sulphide sensor functional within a temperature range of -10°C to +40°C at pressures that vary from atmospheric by $\pm 10\%$, and a non-condensing humidity range of 15% to 90%, with a 90% response time of less than sixty seconds
 - ◆ Dynamic range of the sensor shall be from 0 ppm to 200 ppm, with a maximum theoretical range from 0 ppm to 999.9 ppm.
 - ◆ Sensor measurement resolution of 0.1 ppm.
 - ◆ Sensor measurement accuracy of ± 1.0 ppm at standard temperature and pressure.
- (g) Thermal Inspection
- ◆ Thermal sensing equipment shall continuously measure and record the atmospheric temperature along the sewer pipe for the duration of the inspection.

E5. PROJECT DELIVERABLES

- E5.1 The Contractor shall submit a formal Multi-Sensor Inspection Report, in paper and digital (PDF) formats, that summarizes all inspection activities and includes all inspection data in their raw format, along with any software required to view or utilize the raw data.
- E5.2 The Multi-Sensor Inspection Report shall include the following information:
- E5.2.1 CCTV video inspection:
- (a) Digital inspection reports in a format that will allow direct downloading into to the "Thesis" Data Management System. The Contract Administrator will provide a data entry utility at no cost if required.
 - (b) Inspection video with standard video and audio overlays in XSVD MPEG-2 format.

- (c) Still images captured from the inspection video in JPEG or BMP format.

E5.2.2 SONAR Scanning inspection:

- (a) Graphical summaries of sediment thickness and cumulative sediment volumes in the trough of the pipe below the water line versus pipe location, and pipe capacity depicting actual versus original theoretical storage capacity,
- (b) Statistical average, minimum, and maximum values of sediment accumulation along the sewer, where appropriate, as determined by calculating the portion of the pipe obstructed by sediment and presented as a percentage of the pipe area.
- (c) Video file of SONAR data in AVI file format.

E5.2.3 LASER Scanning inspection:

- (a) Summaries of pipe corrosion and debris buildup, presented as unrolled colour-coded full-circumference graphical illustrations of pipe condition, over the length of the sewer inspected. Where the presence of fluids in the pipe necessitates interpolation to complete the full circumference view, the method and calculations used to support these assumptions shall be presented.
- (b) Cross-sectional scans, taken at regular intervals along the inspected sewer segment, showing measured pipe cross section superimposed over as-built pipe cross section, and colour highlighted to identify all areas of apparent cross-section loss and gain.
- (c) Summaries of pipe ovality and deflection, including:
 - (i) Vertical & horizontal diameter plots of individual diameter measurements versus pipe length, for each section of sewer inspected.
 - (ii) Ovality plots depicting percent deviation from as built records,
- (d) LASER data as VRML (Virtual Reality Modeling Language) 3D computer graphic representations, in WRL format, with software viewer that can be used to display and interpret the LASER data.

E5.2.4 Gyroscopic Inspection:

- (a) Plan and profile views depicting the spatial orientation of each section of sewer inspected.

E5.2.5 H2S Gas inspection:

- (a) Graphical summary of individual H2S gas concentration measurements versus pipe length, for each section of sewer inspected.
- (b) Tabulation of locations where the inspected sewer pipe contains average concentrations of H2S above the 2.0 ppm threshold necessary for the production of sulphuric acid (H2SO4).
- (c) Statistical average, minimum, and maximum gas concentration values in each section of sewer inspected.
- (d) Maximum and average sewer lengths having H2S concentration greater than 2 ppm.

E5.2.6 Thermal inspection:

- (a) Graphical summary of individual temperature measurements versus pipe length.
- (b) Statistical average, minimum, and maximum temperature values in each section of sewer inspected.

E5.3 All deliverables shall be submitted to the Contract Administrator no later than 30 days from completion of sewer inspection activities.

E6. TRAFFIC CONTROL AND MAINTENANCE OF ACCESS

E6.1 The Contractor's attention is drawn to Clause D13.2(c) of this specification, which requires the Contractor to submit a Traffic Control Plan that identifies locations and approximate timing of proposed lane closures and parking restrictions.

- E6.2 Further to section 3.7 of CW 1130 of the General Requirements the Contractor shall be responsible to redirect and maintain traffic with appropriate signing in accordance with The City of Winnipeg, "Manual of Temporary Traffic Control in Work Areas on City Streets" at all times. The "Manual of Temporary Traffic Control in Work Areas on City Streets" can be found online at: (<http://www.winnipeg.ca/publicworks/Transportation/manual-2008-03-27.pdf>).
- E6.3 Work shall be carried out between the hours of 17:30 hours and 07:00 hours, unless otherwise approved by the Contract Administrator.
- E6.4 When working on Main Street, a minimum of two lanes in each direction shall remain open to vehicle traffic. Due to the exact positioning of the sewer access manholes, parking restrictions may be required.
- E6.5 Further to section 3.8 of CW 1130 of the General Requirements parking restriction signing on Regional Streets will be done by The City of Winnipeg, Traffic Services Branch.
- E6.6 The Contractor will be responsible for parking restriction signing required to perform the Work on non-regional and local residential streets. "No Parking" signs will be provided for the Contractor's use.
- E6.7 The Contractor shall implement parking restrictions in the following manner:
- (a) Erect signs no sooner than 24 hours before the Work commences at a particular location.
 - (b) Record the license plate numbers of vehicles already parked within the limits where the parking restriction signs are placed and fax the information to Winnipeg Police Services, Traffic Branch at 986-6998.
 - (c) Promptly remove parking restriction signs once the Work at that location is completed. Signs shall not be left in place over a weekend if no Work will be done at that location.
 - (d) Return signs immediately upon completion of the Work.
- E6.8 Further to section 3.6 of CW 1130 of the General Requirements, maintain safe pedestrian crossing at intersections at all times. Only one pedestrian crossing at an intersection is to be blocked at any one time. If more than one pedestrian crossing is blocked at an intersection at the same time the Contractor shall provide flag persons to safely escort pedestrians across the intersection.
- E6.9 Do not park company or private vehicles inside the signed work zone in a manner that will block sightlines for vehicles and pedestrians approaching and crossing intersections.

E7. NOTICES TO RESIDENTS

- E7.1 Further to CW 2140 section 3.5 and CW 2145, the Contractor shall deliver notices provided by the Contract Administrator to residents on the affected sewer lines 48 hours prior to the use of flushing equipment for either sewer cleaning or sewer inspection.
- E7.2 All costs associated with delivering notices shall be included in the price bid for "Multi-Sensor Inspection" and no separate measurement or payment will be made.

E8. DAMAGE TO CITY AND PRIVATE PROPERTY

- E8.1 All damage to City and private property caused by inspection operations is the responsibility of the Contractor. The Contractor shall repair all damaged property to the satisfaction of the Contract Administrator. All costs associated with these repairs shall be at the Contractors own expense.
- E8.2 Notify the Contract Administrator immediately when damage to property occurs.
- E8.3 The Contractor shall provide written reports to the Contract Administrator for each property attended for investigation of damage. Reports shall include photographs of all damage, dates

and times, verbal or written agreements with property owner and all actions taken or proposed to rectify the damage. Reports shall be submitted to the Contract Administrator within 24 hours of attending the property.

- E8.4 Sewers may be located in easements through private property or City owned parklands and Right-of-Ways where no paved access may exist. It will be the Contractors responsibility to identify these sewers and arrange for access and to restore any surface damage to private and City owned property to the satisfaction of the Contract Administrator.