THE CITY OF WINNIPEG

TENDER

TENDER NO. 220-2024

CENTREPORT SOUTH REGIONAL WATER AND WASTEWATER SERVICING – PHASE 1A - CONTRACT 4A - FEEDER MAIN

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 CENTREPORT SOUTH REGIONAL WATER AND WASTEWATER SERVICING – PHASE 1A - CONTRACT 4A - FEEDER MAIN

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, May 22, 2024.

B2.2 The Contract Administrator or the Manager of Purchasing 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.

(a) The Contract Administrator or an authorized representative will be available at the Sturgeon Road Athletic Field gravel parking lot (1160 Sturgeon Road) at the following times:

(i) May 9, 2024 from 2:00 pm to 3:00 pm

(ii) May 14, 2024 from 2:00 pm to 3:00 pm

(b) During these times the Contract Administrator will be on Site to answer any questions that the Bidder may have. At a minimum, the Bidder's personnel viewing the Site shall ensure they are wearing high visibility vests to clearly identify themselves as Contractor personnel. Viewing of the Site is not mandatory and is intended to further supplement the Drawing and to provide Bidder's a better look at access constraints and existing conditions.

B3.2 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.

B3.3 The Bidder/Proponent is responsible for inspecting the Site, the nature of the Work to be done and all conditions that might affect their Bid/Proposal or their performance of the Work, and shall assume all risk for conditions existing or arising in the course of the Work which have been or could have been determined through such inspection.

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D8.1.

B4.2 If the Bidder finds errors, discrepancies or omissions in the Tender, 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 Tender 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 Tender 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.

B4.6 Any enquiries concerning submitting through MERX should be addressed to:

MERX Customer Support
Phone: 1-800-964-6379
Email: merx@merx.com

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 Tender 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 Tender, 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.

B6.3 Addenda will be available on the MERX website at www.merx.com.

B6.4 The Bidder is responsible for ensuring that they have received all addenda and is advised to check the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B6.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid/Proposal. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6.6 Notwithstanding B4, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D8.

B7. SUBSTITUTES

B7.1 The Work is based on the Plant, Materials and methods specified in the Tender.

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 their 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 they wish 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 their 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 B18.

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/Proposal;

(b) Form B: Prices;

(c) Form G1: Bid Bond and Agreement to Bond.

B8.2 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.

B8.3 The Bid shall be submitted electronically through MERX at www.merx.com.

B8.3.1 Bids will **only** be accepted electronically through MERX.

B8.4 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B18.1(a).

B9. BID

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

B9.2 Paragraph 2 of Form A: Bid/Proposal shall be completed in accordance with the following requirements:

(a) if the Bidder is a sole proprietor carrying on business in their own name, their 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 their 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/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B9.4 Paragraph 13 of Form A: Bid/Proposal shall be signed in accordance with the following requirements:

(a) if the Bidder is a sole proprietor carrying on business in their 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 their duly authorized officer or officers;

(d) if the Bidder is carrying on business under a name other than their 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/Proposal should be entered 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).

B10.5 The Bidder shall enter the Total Bid Price from Form B: Prices into the Total Bid Price field in MERX.

B10.5.1 Bidders are advised that the calculation indicated in B18.4 will prevail over the Total Bid Price entered in MERX.

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) J-CON Civil Ltd. – Utility Locating Program

(b) Total Trenchless Ltd. – CPKC Rail Crossing Methodology Review

(c) The Tunneling Company – CPKC Rail Crossing Methodology Review Using Down the Hole Hammer

(d) Geonex Inc. - CPKC Rail Crossing Methodology Using Down the Hole Hammer

(e) Victaulic – Chamber Piping Review

B12. CONFLICT OF INTEREST AND GOOD FAITH

B12.1 Further to C3.2, Bidders, by responding to this Tender, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B12.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:

(a) other commitments;

(b) relationships;

(c) financial interests; or

(d) involvement in ongoing litigation;

that could or would be seen to:

(i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or

(ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;

(e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of their participation in the Tender process or the Work; or

(f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

B12.3 In connection with their Bid, each entity identified in B12.2 shall:

(a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;

(b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and

(c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B12.4 Without limiting B12.3, the City may, in their sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and

conditions as the City, in their sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in their sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

B12.5 Without limiting B12.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in their sole discretion:

(a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of their employees proposed for the Work;

(b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in their sole discretion, determines cannot be avoided or mitigated;

(c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B12.4 to avoid or mitigate a Conflict of Interest; and

(d) disqualify a Bidder if the Bidder, or one of their employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

B12.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in their sole discretion.

B13. QUALIFICATION

B13.1 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.

B13.2 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, Purchasing Division website at https://www.winnipeg.ca/matmgt/Templates/files/debar.pdf

B13.3 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);

(d) have completed the Accessible Customer Service online training required by the Accessibility for Manitobans Act (AMA) (see B13.5 and D10)

B13.4 Further to B13.3(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) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) in the form of:

(i) 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

(ii) 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

(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, Purchasing Division website at http://www.winnipeg.ca/matmgt/.

B13.5 Further to B13.3(d), the Bidder acknowledges they and all Subcontractors have obtained training required by the Accessibility for Manitobans Act (AMA) available at http://www.accessibilitymb.ca/training.html for anyone that may have any interaction with the public on behalf of the City of Winnipeg.

B13.6 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B13.7 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B13.8 Prior to commencement, the Contractor shall submit the following qualifications for the operator(s) completing the Trenchless CPKC Railway Crossing Works, using either of the two approved installation methods.

(a) Down the hole hammer installation:

(i) The operator shall have down the hole hammer experience as an operator on at least three successful projects using the same equipment required for this project.

(ii) A detailed description of projects on which this system has been successfully used including the names, addresses and telephone numbers of owner's representatives for these projects as well as length, diameter, and pipe material used.

(b) Microtunnelling installation:

(i) The Contractor or Subcontractor completing the Work must be listed as a pre-qualified for microtunnelling within Tender 990-2023B.

B14. BID SECURITY

B14.1 The Bidder shall include in their Bid Submission bid security in the form of a digital 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 Form G1: Bid Bond and Agreement to Bond, available on The City of Winnipeg, Corporate Finance, Purchasing Division website at https://www.winnipeg.ca/MatMgt/templates/files/eBidsecurity.pdf.

B14.2 Bid security shall be submitted in a digital format meeting the following criteria:

(a) The version submitted by the Bidder must have valid digital signatures and seals;

(b) The version submitted by the Bidder must be verifiable by the City with respect to the totality and wholeness of the bond form, including: the content; all digital signatures and digital seals; with the surety company, or an approved verification service provider of the surety company.

(c) The version submitted must be viewable, printable and storable in standard electronic file formats compatible with the City, and in a single file. Allowable formats include pdf.

(d) The verification may be conducted by the City immediately or at any time during the life of the bond and at the discretion of the City with no requirement for passwords or fees.

(e) The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding B14.2(a).

B14.3 Bonds failing the verification process will not be considered to be valid and the bid shall be determined to be non-responsive in accordance with B18.1(a).

B14.4 Bonds passing the verification process will be treated as original and authentic.

B14.4.1 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.

B14.5 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 formed with the successful Bidder and the contract securities are furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B14.6 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 Tender.

B15. OPENING OF BIDS AND RELEASE OF INFORMATION

B15.1 Bids will not be opened publicly.

B15.2 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 MERX website at www.merx.com.

B15.3 After award of Contract, the name(s) of the successful Bidder(s) and their Contract amount(s) will be available on the MERX website at www.merx.com.

B15.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

B15.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

B16. IRREVOCABLE BID

B16.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B16.2 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 formed and the contract securities have been 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/Proposal.

B17. WITHDRAWAL OF BIDS

B17.1 A Bidder may withdraw their Bid without penalty at any time prior to the Submission Deadline.

B18. EVALUATION OF BIDS

B18.1 Award of the Contract shall be based on the following bid evaluation criteria:

(a) compliance by the Bidder with the requirements of the Tender, or acceptable deviation there from (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B13 (pass/fail);

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to B7.

B18.2 Further to B18.1(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.

B18.3 Further to B18.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in their Bid or in other information required to be submitted, that they are qualified.

B18.4 Further to B18.1(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.

B18.4.1 Bidders are advised that the calculation indicated in B18.4 will prevail over the Total Bid Price entered in MERX.

B18.4.2 Further to B18.1(a), in the event that a unit price is not provided on Form B: Prices, the City may determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B19. AWARD OF CONTRACT

B19.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B19.2 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 qualified, and the Bids are determined to be responsive.

B19.2.1 Without limiting the generality of B19.2, 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 their 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.

B19.3 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B18.

B19.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of their Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

C0.1 The *General Conditions for Construction* (Revision 2020-01-31) 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, Purchasing Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm

C0.2 A reference in the Tender 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.

(a) Further to C2.4:

(i) Specifications shall govern over the Geotechnical Baseline Report (GBR)

(ii) The GBR shall govern over the Geotechnical Data Report (GDR)

(b) Further to C3.1(a), revise clause (ii) with the following:

(i) The nature of the surface and subsurface conditions at the Site and reviewed the GBR and GDR appended to these Specifications.

D2. FORM OF CONTRACT DOCUMENTS

D2.1 Notwithstanding C4.1(c) and C4.4, the Contract Documents will be provided to the Contractor electronically and there will be no requirement for execution and return to the City by the Contractor. Accordingly, the provisions under C4.4(a) and C4.4(b) are no longer applicable.

D3. BACKGROUND AND PROJECT INFORMATION

D3.1 CentrePort Canada is North America's largest tri-modal port shared between the City of Winnipeg and the RM of Rosser. The goal of this project is to bring regional water and wastewater infrastructure to the southern portions of CentrePort Canada (CentrePort South) located within the City of Winnipeg. These lands, previously referred to as Airport Area West (AAW), will ultimately result in an additional 1,457 hectares of serviced lands planned for commercial and residential development.

D3.2 The first phase of the CentrePort South Program (referred to as Phase 1A) includes four (4) separate construction contracts. The current project (Contract 4A) is to install a 750 mm feeder main to bring potable water to the CentrePort South development area. The feeder main initiates at a new offtake structure (OS 2) connected to the Rouge Feeder Main and extends north into the central location of CentrePort South at a second new offtake structure (OS 3).

D3.3 An automatic flushing unit at Offtake Structure 3 is included in this contract in order to maintain water potability within CentrePort South Phase 1A during the early years of development when water demand is relatively low. As described in Section E38, this unit contains a chlorine analyzer which is programed to flush water out of the feeder main system when chlorine residuals drop below a set value. The unit also provides additional capabilities such as pressure monitoring.

(a) An additional component of this flushing system is the 350 mm sewer main shown on Drawings 13434 to 13436. The purpose of this sewer is to convey flushed water from the flushing unit to the downstream interceptor sewer. Furthermore, this sewer allows large volumes of water from the feeder main to be discharged into the downstream sewer system for the purpose of controlling detention times in the wastewater force main (to be constructed as part of Contract 2A).

(b) A new electrical service will be brought to the site of OS 3 as part of this project to service the flushing unit. KGS Group will submit a service application to Manitoba Hydro for this Work. The Contractor will be responsible to coordinate installation of the electrical service with Manitoba Hydro.

D3.4 The feeder main and sewer main piping are intended to be installed by open cut method (unless otherwise noted) to address the soil conditions that exist throughout the project area. Till and bedrock exist at variable elevations throughout the project area and will need to be removed as

part of the feeder main and sewer main Works. The Contractors should review the Drawings and the Geotechnical Reports to familiarize themselves with the anticipated soil conditions. Bedrock and boulder removal are defined within the Specifications and paid for within the unit rates on Form B. The Bidder shall be aware that no claims for delays will be considered when encountering till or bedrock as the time and effort shall be included within the unit prices.

D3.5 KGS Group has submitted a utility application to CPKC for the cased trenchless pipe crossing shown on Drawings 1-0798C-C0001-001 and 1-0798C-C0002-001. The application is not yet approved by CPKC. It is anticipated that the CPKC crossing application will be approved prior to commencement of the trenchless Work. Two valve chambers have been included in the Provisional Items at either end of the CPKC railway crossing to support the potential requirement from CPKC.

D3.6 A 1200 mm steel encasement pipe has been included at the Sturgeon Road crossing shown on Drawing 1-0798F-C0009-001 to protect the feeder main piping beneath the roadway, allow for future maintenance and replacement of the pipe without disturbing the roadway. The casing and carrier pipes shall be installed by open cut methods due to the shallow till and bedrock at this location.

D3.7 A commissioning plan will be required to support the cleaning and pressure testing of the feeder main due to the limited infrastructure that exists within CentrePort South. A sample plan has been provided to provide insight into the construction challenges, and can be found in Appendix E. The actual plan shall be prepared by the Contractor and submitted to the Contract Administrator as described in E41.

(a) The feeder main pipe will be cleaned by swabbing (pigging) and then pressure tested once clean. No water supply exists within CentrePort South. Thus, it is anticipated that water for cleaning and pressure testing be obtained from Offtake Structure 2.

(b) No sewers currently exist within CentrePort South for discharging water into. The Contractor will need to develop a strategy for collecting and discharging the water used for cleaning and pressure testing. Water cannot be discharged directly to the environment without dechlorination. See the requirements within E43.

D3.8 Subsequent tenders will be posted in 2024 for Contract 2A – Wastewater Force Main, and Contract 3 – Interceptor Sewer. Both of these tenders interact with this current project near MH-04 as shown on Drawings 13434 to 13436. Construction timelines for these other tenders are fluid. As a result, all potential bidders are to be aware that coordination with these future tenders will be required to ensure there are no schedule disruptions or delays. Depending on when MH-04 is installed by the interceptor sewer contractor, this project will either connect the 350 sewer main directly to MH-04 or install a temporary end cap, as described in Section E39. Provisional Pay Items have been included for both of these scenarios.

D3.9 A historic resource site (the St. James Burial Mound) exists approximately 100 m north of Murray Park Road and 200 m east of Sturgeon Road. The planned infrastructure has been intentionally redirected far outside of this area to avoid impacting these important lands. While no Work is planned in this location it shall be understood that this area must not be disturbed by any construction activity.

D3.10 The City is in the process of obtaining temporary construction access agreements on privately owned lands to facilitate pipe installation as shown on the Drawings. It is expected that the access agreements with the private land owners will be in place by the time the project is awarded.

D4. DESIGN INTENT

D4.1 The following provides additional background information on the project considerations and design intent. It is included as information only. The Contractor is responsible for the means and methods for completion of the Work in conformance with the Drawings and Specifications.

(a) Preparation Work

(i) Utility locations and elevations are to be confirmed prior to commencement of construction as required to allow for preventative or corrective actions if required.

(ii) Temporary modifications to existing ditches within working and laydown areas as required to deal with drainage throughout the duration of construction.

(b) Pipe Installation

(i) Feeder main and sewer main installation has been assumed to be by open cut methods except in areas where specifically noted otherwise on the Drawings and as noted in Sections E23 and E26.

(c) Traffic Management

(i) The Work will primarily take place along Sturgeon Road, which is classified as a Regional Street by the City of Winnipeg. Traffic plans must be developed to minimize the impacts along all roadways and the plan must be followed throughout the duration of the construction. Reference E7 and E10.

(ii) Any Work impacting traffic lanes or flow are to be planned and coordinated to minimize the duration of detours and interruptions.

D5. SCOPE OF WORK

D5.1 The Work to be done under the Contract shall consist of the installation of a new feeder main system including the installation of new offtake structures. The complete scope is described within the applicable Specifications and Drawings

D5.2 The major components of the Work are as follows:

(a) Construction of feeder main by open cut and trenchless installation methods;

(b) Construction of a feeder main railway crossing by down the hole hammer or microtunnelling;

(c) Construction of sewer main by open cut and trenchless installation methods;

(d) Construction of cast-in-place feeder main offtake structures;

(e) Connection to an existing feeder main;

(f) Installation of pre-cast valve chambers (If required, See D3.4);

(g) Installation of an automatic flushing unit;

(h) Electrical servicing;

(i) Cleaning and pressure testing the feeder main and sewer main; and

(j) Surface restoration and related Works.

D5.3 The following shall apply to the Work:

(a) Universal Design Policy

http://clkapps.winnipeg.ca/DMIS/DocExt/ViewDoc.asp?DocumentTypeId=2&DocId=3604

D6. SITE INVESTIGATION DUE DILIGENCE AND RISK

D6.1 Notwithstanding C3.1, the Contractor acknowledges that the site investigation reports and other site information included in this Tender have been provided to it and may be relied upon by the Contractor to the extent that the Contractor uses Good Industry Practice in interpreting such report(s) and site information and carries out the Work in accordance with Good Industry Practice based upon such report(s) and the information contained in them and such other site information. In the event that a newly discovered site condition related to:

(a) the location of any utility which can be determined from the records or other information available at the offices of any public authority or person, including a municipal corporation and any board or commission thereof, having jurisdiction or control over the utility;

(b) subsurface hazardous materials or other concealed physical conditions;

(c) the location, nature, quality or quantity of the materials to be removed or to be employed in the performance of the Work;

(d) the nature, quality or quantity of the Plant needed to perform the Work;

(e) all matters concerning access to the Site, power supplies, location of existing services, utilities or materials necessary for the completion of the Work; and

(f) all other matters which could in any way affect the performance of the Work;

that could not have been "properly inferable", "readily apparent" and readily discoverable" using Good Industry Practice by the Contractor, results in additional Work which is a direct result of this newly discovered site condition, such additional Work will be considered by the City under Changes in Work.

D7. DEFINITIONS

D7.1 When used in this Tender:

(a) **"Benchmark"** is a permanent reference Control Point established by the Contractor;

(b) **"Contact Grouting"** means grout injected into the theoretical space between the jacking pipe and the ground after the drive is completed.

(c) **"Controlled Low Strength Material" (CLSM)** is cement stabilized fill, per CW 2160
"Control Point" means a marker established as a referenced point for survey methods;

(d) **"CPKC"** means Canadian Pacific Kansas City Railway;

(e) **"CPM"** means Critical Path Method;

(f) **"Down the Hole Hammer" (DTH)** means a trenchless method used in the installation of a steel casing through predominantly granular material (i.e. sands with cobbles, boulders and rock. This done by placing a pneumatically driven percussive hammer at the front of the casing connected to an air compressor. The percussive force pulverizes the material at the face while simultaneously pushing the spoils back to the rear of the casing for removal via an auger system.

(g) **"Electronic Jacking Record"** means electronic data in native format, such as ASCII, TXT or HTML, or as imported into MS Excel, and as recorded by the data logger of the microtunnelling control system. In no case shall the term "Electronic Jacking Record" be construed to mean a scan or printout of machine operating parameters submitted in portable document format (PDF);

(h) **"Feeder Main"** means a pressurized large diameter pipe used to convey potable water from a pump station to a local water main distribution network. For this project, the term Feeder Main shall be considered equivalent to the term Water main, as used within the City of Winnipeg Standard Construction Specifications;

(i) **"GBR"** means Geotechnical Baseline Report;

(j) **"GDR"** means Geotechnical Data Report;

(k) **"HRIA"** means heritage resource impact assessment;

(l) **"Maintained Grass Area"** means any grassed area that is regularly mowed by maintenance crews. Specifically, this refers to the Sturgeon Road Athletic Field, ditches along Silver Avenue, as well as City boulevards and medians;

(m) "**Microtunnelling**" means a remotely controlled, guided, pipe jacking process that provides continuous support to the excavation face and uses a pressurized bentonite slurry spoil removal system. The microtunnelling process does not require routine personnel entry into the tunnel. A key element of microtunnelling is the ability to control the stability of the face by applying fluid and mechanical pressure to balance the earth and groundwater pressures;

(n) **"Microtunnelling Boring Machine (MTBM)"** means a remote-controlled, guided slurry shield that provides continuous support to the excavation face. The MTBM is operated from a control container located on the ground surface;

(o) **"Naturalized Grass Area"** means any grassed area that is not regularly mowed by maintenance crews. Specifically, this refers to ditches along Sturgeon Road, Sturgeon Access, Tonka Point and forested or formerly forested areas;

(p) **"PVC"** means Polyvinyl Chloride;

(q) **"Site"** means the lands and other places on, under, in or through which the Work is to be performed;

(r) "**SubSurface Monitoring Point"** (SSM) means a cased borehole settlement monitoring point located above the tunnel crown used for detecting settlement between the location of the Settlement Point and the tunnel excavation. This device serves as a simple borehole extensometer;

(s) **"Supply Chain Disruption"** means an inability by the Contractor to obtain goods or services from third parties necessary to perform the Work of the Contract within the schedule specified therein, despite the Contractor making all reasonable commercial efforts to procure same. Contractors are advised that increased costs do not, in and of themselves, amount to a Supply Chain Disruption;

(t) **"Surface Monitoring Point" (SMP)** means monitoring points established to measure elevation of the ground surface;

(u) **"Work" or "Works"** means the carrying out and the doing of all things, whether of a temporary or permanent nature, that are to be done pursuant to the Contract and, without limiting the generality of the foregoing, includes the furnishing of all Plant, Material, labour and services necessary for or incidental to the fulfilment of the requirements of the Contract, including all Changes in Work which may be ordered as herein provided.

D8. CONTRACT ADMINISTRATOR

D8.1 The Contract Administrator is KGS Group, represented by:

Tristan Eldridge C.E.T.
Municipal Engineering Technologist

Telephone No. 204 896-1209
Email Address teldridge@kgsgroup.com

D8.2 At the pre-construction meeting, Mr. Eldridge will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D9. CONTRACTOR'S SUPERVISOR

D9.1 At the pre-construction meeting, the Contractor shall identify their designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D10. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

D10.1 The Accessibility for Manitobans Act (AMA) imposes obligations on The City of Winnipeg to provide accessible customer service to all persons in accordance with the Customer Service Standard Regulation ("CSSR") to ensure inclusive access and participation for all people who live, work or visit Winnipeg regardless of their abilities.

D10.1.1 The Contractor agrees to comply with the accessible customer service obligations under the CSSR and further agrees that when providing the Goods or Services or otherwise acting on the City of Winnipeg's behalf, shall comply with all obligations under the AMA applicable to public sector bodies.

D10.1.2 The accessible customer service obligations include, but are not limited to:

(a) providing barrier-free access to goods and services;

(b) providing reasonable accommodations;

(c) reasonably accommodating assistive devices, support persons, and support animals;

(d) providing accessibility features e.g. ramps, wide aisles, accessible washrooms, power doors and elevators;

(e) inform the public when accessibility features are not available;

(f) providing a mechanism or process for receiving and responding to public feedback on the accessibility of all goods and services; and

(g) providing adequate training of staff and documentation of same.

D11. UNFAIR LABOUR PRACTICES

D11.1 Further to C3.2, the Contractor declares that in bidding for the Work and in entering into this Contract, the Contractor and any proposed Subcontractor(s) conduct their respective business in accordance with established international codes embodied in United Nations Universal Declaration of Human Rights (UDHR) https://www.un.org/en/about-us/universal-declaration-of-human-rights International Labour Organization (ILO) https://www.ilo.org/global/lang--en/index.htm conventions as ratified by Canada.

D11.2 The City of Winnipeg is committed and requires its Contractors and their Subcontractors, to be committed to upholding and promoting international human and labour rights, including fundamental principles and rights at work covered by ILO eight (8) fundamental conventions and the United Nations Universal Declaration of Human Rights which includes child and forced labour.

D11.3 Upon request from the Contract Administrator, the Contractor shall provide disclosure of the sources (by company and country) of the raw materials used in the Work and a description of the manufacturing environment or processes (labour unions, minimum wages, safety, etc.).

D11.4 Failure to provide the evidence required under D11.3, may be determined to be an event of default in accordance with C18.

D11.5 In the event that the City, in its sole discretion, determines the Contractor to have violated the requirements of this section, it will be considered a fundamental breach of the Contract and the Contractor shall pay to the City a sum specified by the Contract Administrator in writing ("Unfair Labour Practice Penalty"). Such a violation shall also be considered an Event of Default, and shall entitle the City to pursue all other remedies it is entitled to in connection with same pursuant to the Contract.

D11.5.1 The Unfair Labour Practice Penalty shall be such a sum as determined appropriate by the City, having due regard to the gravity of the Contractor's violation of the above requirements, any cost of obtaining replacement goods/ services or rectification of the breach, and the impact upon the City's reputation in the eyes of the public as a result of same.

D11.5.2 The Contractor shall pay the Unfair Labour Practice Penalty to the City within thirty (30) Calendar Days of receiving a demand for same in accordance with D11.5. The City may also hold back the amount of the Unfair Labour Practice Penalty from payment for any amount it owes the Contractor.

D11.5.3 The obligations and rights conveyed by this clause survive the expiry or termination of this Contract, and may be exercised by the City following the performance of the Work, should the City determine, that a violation by the Contractor of the above clauses has occurred following same. In no instance shall the Unfair Labour Practice Penalty exceed the total of twice the Contract value.

D12. FURNISHING OF DOCUMENTS

D12.1 Upon award of the Contract, the Contractor will be provided with 'issued for construction' Contract Documents electronically, including Drawings in PDF formal only.

SUBMISSIONS

D13. AUTHORITY TO CARRY ON BUSINESS

D13.1 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.

D14. SAFE WORK PLAN

D14.1 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 Documents, if applicable.

D14.2 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, Purchasing Division website at http://www.winnipeg.ca/matmgt/Safety/default.stm

D14.3 Notwithstanding B13.4 at any time during the term of the Contract, the City may, at their 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.

D15. INSURANCE

D15.1 The City shall provide and maintain the following owner controlled insurance coverage to remain in place at all times during the performance of the Work:

(a) wrap up liability insurance, in the amount of at least ten million dollars ($10,000,000.00) inclusive. The insured parties shall include the City, Contractor and all subcontractor whether named or unnamed in the policy and all others having an insurable interest in the Work. Manitoba, its ministers, officers, employees and agents and Canadian Pacific Railway Company to be listed as additional insureds. Wrap up liability insurance to include but not limited to:

(i) products and completed operations
(ii) blanket contractual liability
(iii) unlicensed motor vehicle liability,
(iv) sudden and accidental pollution liability with a minimum sublimit of $1,000,000
(v) City and Contractors protective coverage
(vi) blasting, tunneling or the removal or weakening of support of any land, whether such support be natural or otherwise,
(vii) no XCU exclusion,
(viii) cross liability clauses
(ix) non-owned automobile liability

(b) Wrap up liability insurance shall be maintained from the date of the commencement of the Work until the date of Total Performance of the Work and shall include an additional

twenty-four months completed operations coverage that will take affect after Total Performance.

(c) The City reserves the right to add, delete, revise and redefine insurance requirements and deductibles at any time, at its sole discretion, or as necessitated by the placement, extensions/renewals of the insurance policy, during the term of the Project.

D15.2 Deductibles under the policy not to exceed $50,000 maximum of any one loss and shall be borne by the Contractor;

D15.3 The Contractor shall provide and maintain the following insurance coverage at all times during the performance of the Work and throughout the warranty period:

(a) commercial general liability insurance, in the minimum amount of five million dollars ($5,000,000) inclusive per occurrence and five million dollars ($5,000,000) general aggregate. The said insurance shall include coverage for products and completed operations, blanket contractual, Contractors protective, sudden and accidental pollution, non-owned automobile, unlicensed motor vehicle liability, a cross liability clause and shall not contain any XCU exclusions or limitations and will add the City, Manitoba its ministers, officers, employees and agents and Canadian Pacific Railway Company to be listed as additional insureds.

(b) 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 $5,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident.

(c) an all-risks Installation Floater carrying adequate limits to cover all supplies and/or materials intended to enter into and form part of any installation.

(d) All risks property insurance for all equipment, machinery, portable offices, portable toilets including any tunnelling and trenchless sewer installation equipment, and tools used on the Project that may be owned, rented, leased or borrowed.

D15.4 Deductibles shall be borne by the Contractor.

D15.5 All policies shall be taken out with insurers licensed in the Province of Manitoba.

D15.6 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 Documents, as applicable.

D15.7 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.

D15.8 The Contractor will be required to cooperate with the City and provide their project experience and project claims history and any other information necessary to obtain the owner-controlled project insurance as outlined in D15.1(a) and (b) within five (5) business days after request.

D16. CONTRACT SECURITY

D16.1 The Contractor shall provide and maintain the performance bond and the labour and material payment bond 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; and

(b) a labour and material payment bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H2: Labour and Material Payment Bond), in an amount equal to fifty percent (50%) of the Contract Price.

D16.1.1 Where the contract security is a performance bond, it may be submitted in hard copy or digital format. If submitted in digital format the contract security must meet the following criteria:

(a) the version submitted by the Contractor must have valid digital signatures and seals;

(b) the version submitted by the Contractor must be verifiable by the City with respect to the totality and wholeness of the bond form, including: the content; all digital signatures and digital seals; with the surety company, or an approved verification service provider of the surety company.

(c) the version submitted must be viewable, printable and storable in standard electronic file formats compatible with the City, and in a single file. Allowable formats include pdf.

(d) the verification may be conducted by the City immediately or at any time during the life of the bond and at the discretion of the City with no requirement for passwords or fees.

(e) the results of the verification must provide a clear, immediate and printable indication of pass or fail regarding D16.1(b).

D16.1.2 Digital bonds failing the verification process will not be considered to be valid and may be determined to be an event of default in accordance with C18.1. If a digital bond fails the verification process, the Contractor may provide a replacement bond (in hard copy or digital format) within seven (7) Calendar Days of the City's request or within such greater period of time as the City in their discretion, exercised reasonably, allows.

D16.1.3 Digital bonds passing the verification process will be treated as original and authentic.

D16.2 The Contractor shall provide the Contract Administrator identified in D8 with the required performance and labour and material payment bonds within seven (7) Calendar Days of notification of the award of the Contract by way of an award letter 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 Documents, if applicable.

D16.3 The Contractor shall, as soon as practicable after entering into a contract with a Subcontractor:

(a) give the Subcontractor written notice of the existence of the labour and material payment bond in D16.1(b); and

(b) post a notice of the bond and/or a copy of that bond in a conspicuous location at the Site of the Work.

D17. SUBCONTRACTOR LIST

D17.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract Documents, if applicable.

D18. REQUIREMENTS FOR SITE ACCESSIBILITY PLAN

D18.1 The Contractor shall provide the Contract Administrator with an Accessibility 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 Documents, if applicable.

D18.2 The Accessibility Plan shall demonstrate how the Contractor will accommodate the safe passage of pedestrians and cyclists in accordance with the Manual of Temporary Traffic Control, the Contract Drawings, Staging Plans, and Streets By-Law No. 1481/77 at all times for the duration of the Construction. Unless noted in the Contract, the Accessibility Plan must include a written plan for the following:

(a) How the Contractor will maintain at least one crossing in each direction for each intersection (one north/south crosswalk and one east/west crosswalk).

(b) How the Contractor will maintain access to bus stops within the site.

(c) How the Contractor will maintain access to pedestrian corridors and half signals.

(d) How the Contractor will maintain cycling facilities.

(e) How the Contractor will maintain access to residents and businesses unless otherwise noted in the Contract.

(f) Any required detour signage at adjacent crossings to facilitate sidewalk or active transportation pathway closures.

D18.3 The Accessibility Plan may also include figures, sketches, or drawings to demonstrate the proposed plan.

D18.4 The Accessibility Plan shall include written details on how the Contractor intends to review, maintain, and document all items related to the Accessibility Plan on-site during Construction, including, but not limited to:

(a) Signage

(b) Temporary Ramping

(c) Transit Stops

(d) Detour Signage

D18.5 At minimum, the Contractor shall review the site conditions on a daily basis to ensure that all features related to the Accessibility Plan are in place. The site review is intended to correct deficiencies as a result of unforeseen events such as wind, traffic, or the general public. Deficiencies that are direct result of the Contractors actions must be corrected immediately.

D18.6 Any changes to the Accessibility Plan must be approved by the Contract Administrator.

D18.7 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the site has been maintained.

D18.8 Deficiencies as a direct result of actions by the Contractor that are not immediately corrected and/or failure to produce records that demonstrate that the site was maintained in compliance with the Accessibility Plan may result in a pay adjustment via the monthly Progress Payment. The rate of pay adjustment will be as per the following schedule:

(a) First Offence – A warning will be issued and documented in the weekly or bi-weekly site meeting.

(b) Second Offence – A field instruction to immediately correct the site will be issued by the Contract Administrator.

D18.9 Third and subsequent Offences – A pay reduction will be issued in the amount of $250.00 per instance and per day.

D19. DEWATERING AND DRAINAGE PLAN

D19.1 In addition to C6, the Contractor is solely responsible for planning, implementing, maintaining and monitoring an effective dewatering and drainage system for the Site during performance of the Work.

D19.2 The Contractor is responsible for the control, diversion, storage and pumping of all water including without limitation rain, snow melt, groundwater, leaking infrastructure and water in pipes throughout all stages of the Work.

D19.3 The Contractor shall submit a Dewatering and Drainage Plan to the Contract Administrator at least five (5) Calendar Days prior to commencement of Work at the Site. The Contractor must

obtain approval of the Dewatering and Drainage Plan prior to implementation. If changes are made to the dewatering plan during construction, the Contractor shall submit these changes to the Contract Administrator for approval in advance of implementation of the changes. The Dewatering and Drainage Plan submittal shall include the following at a minimum:

(a) a sketch or sketches of the Site clearly showing the drainage scheme and flow paths including temporary features such as ditches/swales or piping, pump locations, storage elements and connections or outlets to the existing land drainage system;

(b) information for all pipe used including material, diameter, length, fittings, connections, restraints, blocking, protection features;

(c) dimensions for all swales and ditches to be used;

(d) description of all erosion protection measures and material used;

(e) monitoring and maintenance plan including Contractor's designated contact person responsible for dewatering and drainage, inspection intervals and means for supervising and monitoring pumping activity;

(f) Pump sizes and power source (as required), and noise attenuation features (to be mitigated to 55 dBa from 7 am – 7 pm, and 50dBa outside these hours) and

(g) any other related information reasonably requested by the Contract Administrator.

D19.4 Do not pump or drain any water containing excessive suspended materials or harmful substances into waterways, sewers or other drainage systems. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing authority's limitations and requirements.

D19.5 The Contractor shall be responsible for all damages within or outside the Site directly resultant from Contractor's actions, omissions or neglect which may be caused by or which may result from water backing up, flowing through, overflowing or excessive surcharge of drainage systems.

D19.6 The Contractor shall organize and bear all costs related to the effective dewatering of excavations and all other pumping and drainage necessary for the proper execution of the Work, including keeping the pipes, structures, shafts, excavations and trenches free of undesirable accumulations of groundwater, seepage, surface water, melt water or rainwater.

D19.7 All dewatering equipment and discharge hoses shall be protected from freezing and shall remain fully operational in freezing weather.

D19.8 Dispose of all water drained or pumped as above by discharging it to sewers, drainage ditches or natural water course as reviewed by the Contract Administrator, and in compliance with all local, Municipal, Provincial and Federal environmental regulations, ordinances, bylaws, etc., and provide documentation indicating that authority has been granted to discharge effluent water into any drainage ditch, brook, creek or river. Contractor shall develop and implement at their own cost any filtration, settlement or other acceptable treatment methods required prior to disposal.

D19.9 Keep all drainage channels, gutters, swales, ditches, sewers, culverts and disposal areas free of silt, sand, debris and gravel and remove such deposits as required.

D19.10 Dewatering and drainage during construction will be considered incidental to Site Development and Restoration.

SCHEDULE OF WORK

D20. DETAILED WORK SCHEDULE

D20.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least ten (10) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.

D20.2 The detailed work schedule shall consist of the following:

(a) A critical path method (CPM) schedule for the work; and

(b) A Gantt chart for the Work based on the CPM schedule, as acceptable by the Contract Administrator.

D20.3 Further to D20.2(a), the CPM schedule shall identify the start and completion dates of the following Work items:

(a) Commencement date

(b) Utility locates

(c) Site preparation and access

(d) Supply and installation of feeder main pipe, completed with all required fittings, valve chambers and appurtenances

(i) Specific dates for completion of Works within the Sturgeon Road Athletic Field and Quail Ridge Apartments.

(e) Installation of new offtake structures, valve chambers and automatic flushing unit

(f) Feeder main connections to existing Rouge Road Feeder Main

(g) Supply and installation of sewer main pipe, completed with all required fittings, valves chambers and appurtenances

(h) Pigging and pressure testing of feeder main pipe

(i) Flushing and pressure testing of sewer main pipe

(j) Site restoration

(k) Critical Stages, Substantial Performance and Total Performance

D20.4 Timelines and staging for pedestrian and traffic management identified in E10 as required to complete the Work should be included in the schedule.

D20.5 The Contractor shall update the schedule and provide it to the Contract Administrator prior to each weekly construction site meeting for review and discussion at the meetings.

D21. COMMENCEMENT

D21.1 The Contractor shall not commence any Work until they are in receipt of an award letter from the Award Authority authorizing the commencement of the Work.

D21.2 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 D13;

(ii) evidence of the workers compensation coverage specified in C6.15;

(iii) the Safe Work Plan specified in D14;

(iv) evidence of the insurance specified in D15;

(v) the contract security specified in D16;

(vi) the Subcontractor list specified in D17;

(vii) the Requirements for Site Accessibility Plan specified in D18;

(viii) the Dewatering and Drainage Plan specified in D19;

(ix) the detailed Work Schedule specified in D20; and

(x) the direct deposit application form specified in D38.

(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.

D21.3 The Contractor shall commence the Work on the Site within thirty (30) Working Days of receipt of the award letter.

D21.3 The City intends to award this Contract by July 15, 2024.

D21.3.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D22. WORK BY OTHERS

D22.1 Further to C6.25, the Contractor's attention is directed to the fact that other Contractors, the personnel of Utilities and the staff of the City may be working within the project limit, approach roadway, adjacent roadways or right-of-way. The activities of these agencies may coincide with the Contractors execution of Work and it will be the Contractor's responsibility to cooperate to the fullest extent with other personnel working in the area, and such cooperation is an obligation of the Contractor under the terms of Contract.

D22.2 As referenced in Section D3, Work by others on or near the Site will include but not necessarily be limited to:

(a) Successful bidder of – CentrePort South Regional Water & Wastewater Servicing Contract 2A – Force Main. Refer to Drawings 13434 to 13436.

(b) Successful bidder of Tender 990-2023B – Construction of ~1,045 m of 1200 mm Interceptor Sewer – CentrePort South Regional Water and Wastewater Servicing Phase 1A (Contract 3). Refer to Drawing 13434.

(c) KGS has submitted an application to Manitoba Hydro to relocate the existing underground primary cables shown on Drawing 1-0798F-C0008-001. Application No. CSPI-240223-55 is in progress. The Contractor shall be responsible to coordinate with Manitoba Hydro to have this relocation work completed and ensure there is no conflict with the nearby feeder main installation Works. Refer to Section E19.

(d) Park Maintenance – Regular maintenance to the Sports fields by City Park Staff is anticipated throughout the spring and summer months.

(e) Revegetation of Naturalized Areas – City crews will be responsible for the final seeding of the naturalized areas shown on the Drawings. The Contractor is responsible to coordinate the topsoil removal, and topsoil re-placement with City staff in accordance with the Specifications.

D22.3 Further to D22.1 the Contractor shall cooperate and coordinate all activities with all parties performing required Work by Others identified in D22.1 and accommodate the necessary area on Site required for the Work by Others to complete the Work.

D23. CRITICAL STAGES

D23.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) **Critical Stage 1:** To ensure no conflict between this contract and Contract 2A (Force Main), construction of the 350 mm PVC sewer main on the west side of Sturgeon Road, as shown on Drawings 13434 to 13436 must be completed by December 1, 2024.

(b) **Critical Stage 2:** The Rouge Road Feeder Main must be restored to service within three days of isolation and turn over to the Contractor. Only a single shutdown will be permitted to complete the feeder main connection.

D24. SUBSTANTIAL PERFORMANCE

D24.1 The Contractor shall achieve Substantial Performance by July 31, 2025.

D24.2 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.

D24.3 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.

D24.4 Substantial Performance will require that the System if ready for use and can be used for the purpose intended. This will include but not be limited to all piping being installed, cleaned, and pressure tested.

D25. TOTAL PERFORMANCE

D25.1 The Contractor shall achieve Total Performance by August 31, 2025.

or within 30 days of substantial performance if seasonal inclement weather does not allow p ermanent restorations to commence immediately after Substantial Performance, whichever comes first. The Contract Administrator will advise the Contractor when seasonal conditions will allow permanent restorations to begin. The Contractor will start final restorations no later than 14 (fourteen) Calendar Days after formal notification by the Contract Administrator.

D25.2 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.

D25.3 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.

D26. LIQUIDATED DAMAGES

D26.1 If the Contractor fails to achieve Critical Stages, 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 unless otherwise noted, following the days fixed herein for same during which such failure continues:

(a) Critical Stage 1 - Two Thousand Five Hundred dollars ($2,500.00);

(b) Critical Stage 2 - Five Thousand dollars ($5,000.00)

  (i) The Contractor shall pay the City the above amount per each and every Calendar Day beyond the number of days listed for Critical Stage 2;

(c) Substantial Performance - Two Thousand Five Hundred dollars ($2,500.00); and

(d) Total Performance - One Thousand Five Hundred dollars ($1,500.00).

D26.2 The amounts specified for liquidated damages in D26.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve, Critical Stages, Substantial Performance or Total Performance by the days fixed herein for same.

D26.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D27. SUPPLY CHAIN DISRUPTION SCHEDULE DELAYS

D27.1 The City acknowledges that the schedule for this Contract may be impacted by the Supply Chain Disruption. Commencement and progress of the Work shall be performed by the Contractor with due consideration to the delivery requirements and schedule identified in the Contract in close consultation with the Contract Administrator.

D27.2 If the Contractor is delayed in the performance of the Work by reason of the Supply Chain Disruption, the Work schedule may be adjusted by a period of time equal to the time lost due to such delay and costs related to such delay will be determined as identified herein.

D27.3 A minimum of seven (7) Calendar Days prior to the commencement of Work, the Contractor shall declare whether a Supply Chain Disruption will affect the start date. The Contractor shall provide sufficient evidence that the delay is directly related to a Supply Chain Disruption, including but not limited to ordering of Material or Goods, production and/or manufacturing schedules or availability of staff as appropriate.

D27.4 For any delay related to Supply Chain Disruption and identified after Work has commenced, the Contractor shall within seven (7) Calendar Days of becoming aware of the anticipated delay declare the additional delay and shall provide sufficient evidence as indicated in D27.3. Failure to provide this notice will result in no additional time delays being considered by the City.

D27.5 The Work schedule, including the durations identified in D23 and D25 where applicable, will be adjusted to reflect delays accepted by the Contract Administrator. No additional payment will be made for adjustment of schedules except where seasonal work, not previously identified in the Contract, is carried over to the following construction season.

D27.6 Where Work not previously identified is being carried over solely as a result of delays related to Supply Chain Disruption, as confirmed by the Contract Administrator, the cost of temporary works to maintain the Work in a safe manner until Work recommences, will be considered by the Contract Administrator. Where the Work is carried over only partially due to Supply Chain Disruption, a partial consideration of the cost of temporary works will be considered by the Contract Administrator.

D27.7 Any time or cost implications as a result of Supply Chain Disruption and in accordance with the above, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

D28. SCHEDULED MAINTENANCE

D28.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) Sodding as specified in CW 3510 and E45.4;

(b) Watering and maintenance of all new vegetation until established.

D28.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D29. JOB MEETINGS

D29.1 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.

D29.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever they deem it necessary.

D30. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D30.1 Further to C6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

D31. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

D31.1 Further to B13.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at their sole discretion and acting reasonably, require updated proof of compliance, as set out in B13.4.

D32. TRAFFIC CONTROL

D32.1 Further to Clause 3.7 of City of Winnipeg Standard Specification CW 1130:

(a) The Contractor shall make arrangements to place temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary traffic control devices required to complete the Work.

(b) The Contractor shall not interfere with traffic signals. Any modification of traffic signals shall be done by City of Winnipeg Traffic Signals.

(i) Advance notice is required to facilitate traffic signal modifications.

(c) The Contractor shall make arrangements with Winnipeg Transit for Work that impacts Transit routes or stops.

(d) The City of Winnipeg Manual of Temporary Traffic Control on City Streets is available online at:

(i) http://winnipeg.ca/publicworks/trafficControl/manualTempTrafficControl.stm

D32.2 Additional traffic management requirements are outlined in E9 and E10.

D33. PEDESTRIAN SAFETY

D33.1 Further to clause 3.6 of CW 1130:

(a) The Contractor shall maintain a closed Site around all Work elements to restrict pedestrian and vehicular access. Temporary fencing or an alternative as approved by the Contract Administrator shall be installed at all open excavations, trench cages, cans and shafts for the project duration in accordance with Provincial requirements.

(b) The Contractor shall be responsible for maintaining fencing in a proper working condition at all times. Pedestrian Safety requirements shall be incidental to Site Development and Restoration.

D34. WORK UNDERNEATH AND IN THE VICINITY OF HYDRO POWER INFRASTRUCTURE

D34.1 The Contractor is responsible for notifying Manitoba Hydro in advance of Work in the vicinity and underneath Hydro infrastructure (e.g. overhead transmission lines). The Contractor shall follow all Manitoba Hydro requirements for safe working distances and clearances from Hydro infrastructure including but not limited to overhead electrical lines.

D34.2 Manitoba Hydro requires a minimum vertical clearance from their overhead electrical lines as follows:

(a) Minimum 10 feet from overhead distribution lines,

(b) Minimum 15 feet from overhead transmission lines; and

(c) Minimum 20 feet from high voltage transmission lines.

D35. WORK IN PROXIMITY TO LARGE NATURAL GAS MAINS

D35.1 The Contractor should be familiar with and comply with the requirements of the latest revision of Manitoba Hydro's "Safe Excavation & Safety Watch Guidelines". This document is available at: http://www.hydro.mb.ca/customer_services/permits_and_inspections/excavation_guidelines.pdf

D35.2 Work precautions and procedures required for working near gas mains will be incidental to the Contract.

D36. CONFINED SPACE ENTRY

D36.1 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 assessment and providing personal protective equipment (PPE).

D36.2 The Contractor shall assist and provide Supplied Air Breathing Apparatus conforming to the requirements of the Act, Regulations and Guidelines for the use of the Contract Administrator where confined entry is required to allow for inspection of the Work.

D37. GEOTECHNICAL BASELINE REPORT (GBR) AND GEOTECHNICAL DATA REPORT (GDR)

D37.1 The primary purpose of the GBR is to establish a contractual understanding of the geotechnical conditions anticipated to be encountered during the trenchless construction elements of the project. The GBR sets baselines for geotechnical conditions and material behavior anticipated to be encountered during construction in order to provide a basis for bidding and assist in resolution of disputes that may arise over subsurface conditions. Secondarily, the GBR:

(a) Presents the geotechnical conditions that formed the basis of design.

(b) Identifies important considerations, key project constraints, and select requirements that must be addressed by the Contractor during bid preparation and construction

(c) Provides information to assist the Contractor in evaluating requirements for excavating and supporting the ground.

(d) Provides guidance to the Contract Administrator in administering the contract and monitoring Contractor performance.

D37.2 The GBR provides the basis for identifying geotechnical and geologic conditions that qualify as a "substantial difference in the nature of the surface or subsurface conditions", as defined in D41. The geotechnical baseline conditions (baseline) contained within the GBR are not necessarily geotechnical fact. The baseline was developed using judgment to interpolate between borings and extrapolate beyond the boring logs and laboratory test data. The judgment applied in the interpolations and extrapolations reflects the view of the author of the report in describing the baseline. Bidders should use the baseline subsurface conditions and the surface conditions which can be observed during a site visit as the basis for bids. It should be noted that

the project design was based on assumed construction methods and levels of workmanship. The behavior of the geologic materials present in the surface and subsurface excavations will be influenced by the Contractor's selected equipment, means, and methods.

D37.3 The GDR provides a summary of results for the geotechnical and geophysical explorations, field testing, and laboratory testing undertaken within the CentrePort project area and along the pipe alignment.

D37.4 Bidders should have a geotechnical engineer and/or engineering geologist review and explain the information presented in the GBR and GDR to assure a complete understanding of the reported information as a basis for submitting a Bid. Additional documents used to develop the GBR are listed in the References section of the GBR.

(a) The GBR was developed in part from the GDR. The technical data contained within the GDR upon which Contractor may rely are: the boring method, the locations and logs of the borings, the levels of subsurface water (if any), laboratory test methods and results, geophysical survey data, and similar factual data. The Contractor is not entitled to rely upon other technical data.

(b) Bore hole information represents subsurface characteristics to the extent indicated, only for the point location of the bore hole and, with regard to the level of subsurface water (if any), only at the time the boring was made and when subsurface water level readings were collected.

D37.5 Geophysical seismic refraction surveys were conducted to estimate the depth to bedrock along portions of the pipe alignment and the results are based on interpretation of the data. The depths to subsurface boundaries derived from seismic refraction surveys are generally accepted as accurate to within ten percent of the true depths to the boundaries, below 10 meters. Above 10 meters, the accuracy of the seismic refraction data is approximately +/- 1.0 meters. Structural discontinuities in the bedrock occurring on a scale less than the geophone spacing would go undetected in the interpretation of the data.

D37.6 Risks associated with subsurface conditions consistent with, or less adverse than the baseline conditions are allocated to the Contractor. Those risks associated with subsurface conditions more adverse than the baseline condition are accepted by the City. The provision of a baseline condition in the Contract is not a warranty that the baseline condition will be encountered. The baseline condition is the contractual standard that the City and the Contractor will agree to use when interpreting D41.

D37.7 The City accepts the risks for subsurface conditions that are more adverse than the stated baseline conditions. The City will negotiate with the Contractor for additional reasonable compensation to the Contractor if these three conditions exist:

(a) The actual subsurface conditions encountered are more adverse than the baseline conditions.

(b) The Contractor can document that the subsurface conditions are more adverse than those described in the baseline and that the conditions materially and significantly increased the cost and/or time required to complete the work.

(c) The Contractor has made diligent efforts to complete the work described in the Contract Documents, including any changes to methods, equipment, labor, and materials made necessary by the adverse conditions using the most cost effective means.

D37.8 If all of the foregoing conditions are satisfactorily met, additional compensation and schedule will be negotiated, based on the provisions described in D41 and E16

MEASUREMENT AND PAYMENT

D38. PAYMENT

D38.1 Further to C12, the City shall make payments to the Contractor by direct deposit to the Contractor's banking institution, and by no other means. Payments will not be made until the Contractor has made satisfactory direct deposit arrangements with the City. Direct deposit application forms are at https://winnipeg.ca/finance/files/Direct_Deposit_Form.pdf.

D39. WATER USE

D39.1 The Contractor is responsible for obtaining City permits and paying for any charges associated with temporary water meters and water use.

D40. FUEL PRICE ADJUSTMENT

D40.1 The Contract is subject to a fuel price adjustment which will be calculated monthly based on eligible Work completed utilizing the following mathematical formulas;

(a) where the price of fuel has increased - ((CFI/BFI)-1.15) x Q x FF; and

(b) where the price of fuel has decreased - ((CFI/BFI)-0.85) x Q x FF; where

(i) BFI = base fuel index

(ii) CFI = current fuel index

(iii) FF = fuel factor

(iv) Q = monetary value of Work applied in the calculation.

D40.1.1 Eligible Work will be determined in accordance with D40.5.

D40.1.2 The base fuel index (BFI) will be the retail price of fuel identified on the Submission Deadline based on latest published "Monthly average retail prices for gasoline and fuel by geography" for Winnipeg, published by Statistics Canada, Table 18-10-0001-01. The BFI is a blended rate based on 15% regular unleaded gasoline at self-service filling stations and 85% diesel fuel at self-service filling stations.

D40.1.3 The current fuel index (CFI) based on the above blended rate will be determined for each monthly progress estimate and applied on the following progress estimate as a change order once rates are published by Statistics Canada.

D40.1.4 A Fuel Factor (FF) rate of the monetary value of all eligible Work completed that month based on the Contract unit prices will be used to calculate the assumed apportioned cost of fuel.

D40.2 Fuel cost adjustments may result in additional payment to the Contractor or credit to the City within the Contract by way of a monthly change order.

D40.3 The fuel escalation or de-escalation adjustment will not be applied if the CFI is within ±15% of the BFI.

D40.4 Fuel escalation adjustments will not be considered beyond the Substantial Performance/Critical Stages except where those dates/Working Days are adjusted by change order. Fuel de-escalation adjustments will apply for Work that extends beyond the dates/Working Days specified for Substantial Performance/Critical Stages.

D40.5 The Fuel Factor (FF) rates will be set as follows:

(a) The Fuel Factor rate shall be set at 1.2% of the monetary value of all Work based on unit prices.

D41. CHANGES IN WORK

D41.1 Amend C7.2.1 (a) to include the following additional clauses:

(a) Contractor shall notify the Contract Administrator promptly in writing of any changes in geotechnical, geologic or material behaviour conditions that the Contractor considers more adverse than the GBR baseline conditions upon discovery and before they are disturbed, in any event no later than five (5) calendar days after discovery.

(b) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after Total Performance under the Contract Documents.

(c) No claim by the Contractor related to the trenchless CPKC Railway Crossing Works shall be allowed under the Changes of Work provisions unless the Contractor investigates and demonstrates that such alleged conditions are materially different from those conditions identified in the Geotechnical Baseline Report and results in an increase in the Contractor's cost of and/or time required for the performance of the Work. The contractor shall within 30 calendar days after notification to the City that Contractor believes a material difference exists, provide the documentation, backup, justification, and compensation for the alleged impact to the Contractor's cost of and/or time required for the performance of the Work. Any and all costs incurred by the Contractor for demonstrating that a material difference exists shall be borne by the Contractor unless the City agrees that the material difference does have a cost and/or time impact.

(d) If City agrees that there is a material difference that impacts the Contractor's cost and/or time, payment for geologic investigation(s) and testing of the material difference will be paid for by the City. Payment will be made by the City for reasonable and customary prices for geologic investigation(s) and testing. The contractor is encouraged to review geologic investigations and/or testing planned to demonstrate a material difference with the Contract Administrator prior to execution of the same. The City will be sole judge of what is reasonable and customary.

(e) The Contractor expressly agrees to maintain detailed daily labor, material, production, and equipment logs defining hours and costs for all periods of Contractor performance representing claimed differing site conditions. These logs shall fully separate bid Contract Work from claimed differing site condition work, and the Contractor shall provide these documents to the Contract Administrator for review. These daily logs shall constitute documentation of performance and must be signed on a daily basis both by the Contractor and Contract Administrator. Said signatures do not mean acceptance of the claim or value of adjustment of Contract Price and/or Time but will serve to document the Contractor's use of labor, material, and equipment. If Contract Administrator and City agree that there is a material difference that impacts the Contractor's cost and/or time, payment for the material difference in labour, material, production and equipment will be paid for by the City based on reasonable and customary prices, using the methods defined in C7.4. Equipment rates will be established in accordance with the Daily Equipment Rate listed on Form B and as defined in E16. The failure of the Contractor to maintain said logs or to obtain signatures on the logs shall render the Contract Administrator daily records definitive.

WARRANTY

D42. WARRANTY

D42.1 Warranty is as stated in C13.

DISPUTE RESOLUTION

D43. DISPUTE RESOLUTION

D43.1 If the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator, the Contractor shall act in accordance with the Contract Administrator's opinion,

determination, or decision unless and until same is modified by the process followed by the parties pursuant to D43.

D43.2 The entire text of C21.4 is deleted, and amended to read: “Intentionally Deleted”

D43.3 The entire text of C21.5 is deleted, and amended to read:

(a) If Legal Services has determined that the Disputed Matter may proceed in the Appeal Process, the Contractor must, within ten (10) Business Days of the date of the Legal Services Response Letter, submit their written Appeal Form, in the manner and format set out on the City’s Purchasing Website, to the Chief Administrative Officer, and to the Contract Administrator. The Contractor may not raise any other disputes other than the Disputed Matter in their Appeal Form.

D43.4 Further to C21, prior to the Contract Administrator’s issuance of a Final Determination, the following informal dispute resolution process shall be followed where the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator (“Dispute”):

(a) In the event of a Dispute, attempts shall be made by the Contract Administrator and the Contractor’s equivalent representative to resolve Disputes within the normal course of project dealings between the Contract Administrator and the Contractor’s equivalent representative.

(b) Disputes which in the reasonable opinion of the Contract Administrator or the Contractor’s equivalent representative cannot be resolved within the normal course of project dealings as described above shall be referred to a without prejudice escalating negotiation process consisting of, at a minimum, the position levels as shown below and the equivalent Contractor representative levels:

(i) The Contract Administrator;

(ii) Supervisory level between the Contract Administrator and applicable Department Head;

(iii) Department Head.

D43.4.1 Names and positions of Contractor representatives equivalent to the above City position levels shall be determined by the Contractor and communicated to the City at the pre-commencement or kick off meeting.

D43.4.2 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.

D43.4.3 Both the City and the Contractor agree to make all reasonable efforts to conduct the above escalating negotiation process within twenty (20) Business Days, unless both parties agree, in writing, to extend that period of time.

D43.4.4 If the Dispute is not resolved to the City and Contractor’s mutual satisfaction after discussions have occurred at the final escalated level as described above, or the time period set out in D43.4.3, as extended if applicable, has elapsed, the Contract Administrator will issue a Final Determination as defined in C1.1(v), at which point the parties will be governed by the Dispute Resolution process set out in C21.

INDEMNITY

D44. INDEMNITY

D44.1 Indemnity shall be as stated in C17.

D44.2 Notwithstanding C17.1, the Contractor shall save harmless and indemnify the City in the amount of twice the Contract Price or five million dollars ($5,000,000), whichever is greater, against all costs, damages or expenses arising from actions, claims, demands and proceedings, by whomsoever brought, made or taken as a result of negligent acts or negligent omissions of

the Contractor, their Subcontractors, employees or agents in the performance or purported performance of the Work, and more particularly from:

(a) accidental injury to or death of any person whether retained by or in the employ of the contractor or not, arising directly or indirectly by reason of the performance of the Work, or by reason of any trespass on or damage to property;

(b) damage to any property owned in whole or in part by the City, or which the City by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain;

(c) damage to, or trespass or encroachment upon, property owned by persons other than the City;

(d) any claim for lien or trust claim served upon the City pursuant to The Builders' Liens Act;

(e) failure to pay a Workers Compensation assessment, or Federal or Provincial taxes;

(f) unauthorized use of any design, device, material or process covered by letters patent, copyright, trademark or trade name in connection with the Work;

(g) inaccuracies in any information provided to the City by the Contractor.

D44.3 Further to C17, The City shall save harmless and indemnify the Contractor in the amount of twice the Contract Price or five million dollars ($5,000,000), whichever is greater, against all costs, damages or expenses arising from actions, claims, demands and proceedings, by whomsoever brought, made or taken as a result of negligent acts or negligent omissions of the City, their employees or agents in the performance of its obligation under the Contract.

THIRD PARTY AGREEMENTS

D45. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

D45.1 Funding for the Work of the Contract is being provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada and accordingly, as required by the applicable funding agreements, the following terms and conditions shall apply.

D45.2 For the purposes of D45:

(a) **"Government of Canada"** includes the authorized officials, auditors, and representatives of the Government of Canada; and

(b) **"Government of Manitoba"** includes the authorized officials, auditors, and representatives of the Government of Manitoba.

D45.3 Indemnification By Contractor

D45.3.1 In addition to the indemnity obligations outlined in C17 of the General Conditions for Construction, the Contractor agrees to indemnify and save harmless the Government of Canada and the Government of Manitoba and each of their respective Ministers, officers, servants, employees, and agents from and against all claims and demands, losses, costs, damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from this Contract or the Work, or from the goods or services provided or required to be provided by the Contractor, except those resulting from the negligence of any of the Government of Canada's or the Government of Manitoba's Ministers, officers, servants, employees, or agents, as the case may be.

D45.3.2 The Contractor agrees that in no event will Canada or Manitoba, their respective officers, servants, employees or agents be held liable for any damages in contract, tort (including negligence) or otherwise, for:

(a) any injury to any person, including, but not limited to, death, economic loss or infringement of rights;

(b) any damage to or loss or destruction of property of any person; or

(c) any obligation of any person, including, but not limited to, any obligation arising from a loan, capital lease or other long term obligation;

in relation to this Contract or the Work.

D45.4 Records Retention and Audits

D45.4.1 The Contractor shall maintain and preserve accurate and complete records in respect of this Contract and the Work, including all accounting records, financial documents, copies of contracts with other parties and other records relating to this Contract and the Work during the term of the Contract and for at least six (6) years after Total Performance. Those records bearing original signatures or professional seals or stamps must be preserved in paper form; other records may be retained in electronic form.

D45.4.2 In addition to the record keeping and inspection obligations outlined in C6 of the General Conditions for Construction, the Contractor shall keep available for inspection and audit at all reasonable times while this Contract is in effect and until at least six (6) years after Total Performance, all records, documents, and contracts referred to in D45.4.1 for inspection, copying and audit by the City of Winnipeg, the Government of Manitoba and/or the Government of Canada and their respective representatives and auditors, and to produce them on demand; to provide reasonable facilities for such inspections, copying and audits, to provide copies of and extracts from such records, documents, or contracts upon request by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada and their respective representatives and auditors, and to promptly provide such other information and explanations as may be reasonably requested by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada from time-to-time.

D45.5 Other Obligations

D45.5.1 The Contractor consents to the City providing a copy of the Contract Documents to the Government of Manitoba and/or the Government of Canada upon request from either entity.

D45.5.2 If the Lobbyists Registration Act (Manitoba) applies to the Contractor, the Contractor represents and warrants that it has filed a return and is registered and in full compliance with the obligations of that Act, and covenants that it will continue to comply for the duration of this Contract.

D45.5.3 The Contractor shall comply with all applicable legislation and standards, whether federal, provincial, or municipal, including (without limitation) labour, environmental, and human rights laws, in the course of providing the Work.

D45.5.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.

D45.5.5 The Contractor represents and warrants that no current or former public servant or public office holder, to whom the Value and Ethics Code for the Public Sector, the Policy on Conflict of Interest and Post Employment, or the Conflict of Interest Act applies, shall derive direct benefit from this Contract, including any employment, payments, or gifts, unless the provision or receipt of such benefits is in compliance with such codes and the legislation.

D45.5.6 The Contractor represents and warrants that no member of the House of Commons or of the Senate of Canada or of the Legislative Assembly of Manitoba is a shareholder, director or officer of the Contractor or of a Subcontractor, and that no such member is entitled to any benefits arising from this Contract or from a contract with the Contractor or a Subcontractor concerning the Work.

FORM H1: PERFORMANCE BOND
(See D16)

KNOW EVERYONE 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

TENDER NO. 220-2024

CENTREPORT SOUTH REGIONAL WATER AND WASTEWATER SERVICING – PHASE 1A - CONTRACT 4A - FEEDER MAIN

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: LABOUR AND MATERIAL PAYMENT BOND
(See D16)

KNOW EVERYONE BY THESE PRESENTS THAT

_____
his/its heirs, executors, administrators, successors or assigns (hereinafter called the "Principal"), and

_____ ,
his/its heirs, executors, administrators, successors or assigns (hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), for the use and benefit of claimants as herein below defined, in the amount of

_____

_____ dollars ($_____.____)

of lawful money of Canada, for the payment whereof we, the Principal and the Surety jointly and severally bind ourselves firmly by these presents.

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

TENDER NO. 220-2024

CENTREPORT SOUTH REGIONAL WATER AND WASTEWATER SERVICING – PHASE 1A - CONTRACT 4A - FEEDER MAIN

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 promptly make payment to all claimants as hereinafter defined, for all labour, service and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void, otherwise it shall remain in full force and effect subject, however, to the following conditions:

(a) A claimant is defined as one having a direct contract with the Principal for labour, service and material, or any of them, used or reasonably required for use in the performance of the contract, labour, service and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment (but excluding rent of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract;

(b) The above-named Principal and Surety hereby jointly and severally agree with the Obligee that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant’s work, labour or service was done or performed, or materials were furnished by such claimant, may sue on this bond, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon;

(c) No suit or action shall be commenced hereunder by any claimant

(ii) unless claimant shall have given written notice to the Principal and the Surety above-named, within one hundred and twenty (120) days after such claimant did or performed the last of the work, labour or service, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work, labour or service was done or performed. Such notice shall be served by mailing the same by registered mail to the Principal, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the Province of Manitoba;

(iii) after the expiration of one (1) year following the date on which Principal ceased work on said Contract; including work performed under the guarantees provided in the Contract;

(iv) other than in a court of competent jurisdiction in the Province of Manitoba.

(d) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

(e) The Surety shall not be liable for a greater sum than the specified penalty of this bond.

The Principal and Surety hereby agree that The Guarantors' Liability Act (Manitoba) shall apply to this Bond.

IN TESTIMONY WHEREOF, the Principal has hereunto set its hand affixed its seal, and the Surety has caused these presents to be sealed and with its corporate seal duly attested by the authorized signature of its signing authority this

_____ 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 J: SUBCONTRACTOR LIST
(See D17)

CENTREPORT SOUTH REGIONAL WATER AND WASTEWATER SERVICING – PHASE 1A - CONTRACT 4A - FEEDER MAIN

Name	Address

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 their 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, Purchasing 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 Tender shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B7. In every instance where a brand name or design specification is used, the City will also consider approved equals and/or approved alternatives in accordance with B7.

E1.4 The following are applicable to the Work:

Drawing No.	Drawing Name/Title
1-0798F-D0001-001	COVER SHEET
1-0798F-D0002-001	INDEX PAGE
1-0798F-D0003-001	KEY PLAN
1-0798F-C0005-001	STURGEON ROAD ATHLETIC FIELD – STA 1+000 TO STA 1+255
1-0798F-C0006-001	STURGEON ROAD ATHLETIC FIELD – STA 1+255 TO STA 1+510
1-0798F-C0007-001	STURGEON ROAD ATHLETIC FIELD – STA 1+510 TO STA 1+750
1-0798F-C0008-001	STURGEON ROAD ATHLETIC FIELD – STA 1+750 TO STA 2+000
1-0798F-C0009-001	SASKATCHEWAN AVENUE – STA 1+950 TO STA 2+190
1-0798F-C0010-001	STURGEON ROAD SOUTH – STA 2+005 TO STA 2+260
1-0798F-C0011-001	STURGEON ROAD SOUTH – STA 2+260 TO STA 2+525
1-0798F-C0012-001	TONKA POINT – STA 2+510 TO STA 2+765
1-0798F-C0013-001	TONKA POINT – STA 2+765 TO STA 3+020
1-0798F-C0014-001	TONKA POINT – STA 3+020 TO STA 3+275
1-0798F-C0015-001	TONKA POINT – STA 3+275 TO STA 3+400
13434	STURGEON ROAD NORTH – STA 2+990 TO STA 3+255
13435	STURGEON ROAD NORTH – STA 3+255 TO STA 3+510
13436	STURGEON ROAD NORTH – STA 3+510 TO STA 3+740
1-0798C-C0001-001	STURGEON ROAD SOUTH – CPKC RAILWAY MILE 3.28 GLENBORO SUBDIVISION CROSSING
1-0798C-C0002-001	STURGEON ROAD SOUTH – CPKC RAILWAY MILE 3.28 GLENBORO SUBDIVISION CROSSING - SETTLEMENT MONITORING
1-0798F-D0004-001	STURGEON ROAD ATHLETIC FIELD – CONSTRUCTION LIMITS
1-0798F-B0001-001	GRASS RESTORATION TYPES
1-0798F-C0016-001	OFFTAKE STRUCTURE SITE DETAILS
1-0798F-C0017-001	VALVE CHAMBER SITE DETAILS
1-0798F-C0018-001	OFFTAKE STRUCTURE 2 DETAILS
1-0798F-C0019-001	OFFTAKE STRUCTURE 3 DETAILS
1-0798F-C0020-001	OFFTAKE STRUCTURE 3 – SECTION VIEWS
1-0798B-C0008-001	VALVE AND AR CHAMBER DETAILS
1-0798F-C0021-001	MISCELLANEOUS PIPE DETAILS

1-0798F-S0001-001	OFFTAKE STRUCTURES – GENERAL NOTES
1-0798F-S0002-001	STRUCTURAL SECTION – OFFTAKE STRUCTURE 2
1-0798F-S0003-001	STRUCTURAL SECTION – OFFTAKE STRUCTURE 3
1-0798F-S0004-001	STRUCTURAL DETAILS – OFFTAKE STRUCTURES 2 & 3
1-0798F-E0001-001	ELECTRICAL SITE PLAN, SINGLE LINE DIAGRAM AND DETAIL
1-0798F-E0002-001	ELECTRICAL SPECIFICATION

E2. GEOTECHNICAL INVESTIGATION REPORT

E2.1 Geotechnical Data Report (GDR)

(a) The GDR summarizes the testing and geotechnical conditions observed along the alignments of the proposed pipeline infrastructure within the project area and provides technical support for the GBR. This report includes geotechnical data collected at the project site and summary of encountered subsurface conditions along the alignments. A copy of the GDR is included in Appendix A.

E2.2 Geotechnical Baseline Report (GBR)

(a) The GBR presents an interpretation of geotechnical data collected during the project geotechnical exploration (KGS Group, 2024) and provides construction considerations for use by Bidders for Bid preparation and administration of the Contract. Further information is provided in D37 and a copy of the GBR is included in Appendix B.

GENERAL REQUIREMENTS

E3. OFFICE FACILITIES

E3.1 The Contractor shall supply a separate Site trailer for exclusive use by the Contract Administrator.

E3.2 The Site trailer will serve as the Contract Administrators' office facility and shall meet the following requirements:

(a) The field office shall be for the exclusive use of the Contract Administrator and City staff and will be used for site meetings.

(b) The field office shall be located near the Site of Work at a location acceptable to the Contract Administrator.

(c) The building shall have a minimum floor area of 25 square metres, minimum of two windows and a door entrance with suitable lock.

(d) The building shall be suitable for all-weather use. It shall be equipped with an electric heater and air conditioner capable of maintaining a temperature range between 16 °C and 25 °C.

(e) The building shall be supplied with adequate lighting and have a minimum of three wall outlets with 120 Volt power supply at all times.

(f) The building shall be furnished with two desks, two meeting tables, one drafting table, one filing cabinet and a minimum of 12 chairs.

(g) A portable toilet shall be located near the field office building. The toilet shall have a locking door.

(h) The field office shall be cleaned on a weekly basis, prior to the Site Meetings, to the satisfaction of the Contract Administrator.

E3.3 The office facilities will be provided from the date of the commencement of the Work to the date of Substantial Performance.

E3.4 Measurement and Payment

(a) The Contractor shall be responsible for all installation, transportation and removal costs, all operating costs, provision of furnishings and equipment, cleaning and the general maintenance of the office facilities.

(b) Payment for the office facility is included in Site Development and Restoration.

E4. HERITAGE RESOURCES PROTECTION AND MONITORING PROGRAM

E4.1 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the Heritage Resources Act (1986), Section 12, which outlines the protections against the disturbance of heritage resources.

E4.2 Description

E4.2.1 The Historic Resources Branch (HRB) in their assessment of the heritage potential for this project (AAS File # AAS-23-20756), issued conditional approval for all areas of the project except for the following:

(a) Sturgeon Road South from station 2+150 to station 2+600.See Drawings 1-0798F-C0010-001 to 1-0798F-C0012-001. Within this area, the Contractor must retain the services of a qualified archeologist to supervisor all construction activities as described within the Heritage Resource Protection Plan (HRPP) in Appendix C.

(b) The Contractor shall not commence or proceed with any ground disturbance activities within the area described in the provisions above without a qualified archaeologist present to monitor said activities.

E4.2.2 The HRPP also includes measures and requirements that the Contractor must follow if artifacts are encountered while completing the Works, regardless of location.

E4.2.3 Equipment-free zones designated within the HRPP must be adhered to.

E4.3 Construction Methods

E4.3.1 The Contractor shall be responsible for the implementation of the HRPP that details the procedures to be followed in the event that heritage resources are accidentally encountered during construction activities. The plan shall be reviewed and discussed with the Contract Administrator prior to mobilization.

E4.3.2 Prior to completing any Works within the monitoring area designated above, the Contractor shall contract an archaeologist qualified to conduct an HRIA in the Province of Manitoba.

E4.3.3 The Archaeologist shall secure a Heritage Permit to Search for or Excavate a Heritage Object from HRB for the project.

E4.3.4 The Archaeologist shall monitor all ground disturbance activities and inspect all shafts, trenches and their removed sediments for heritage resources. The Archaeologist shall maintain written field notes and a photographic record.

E4.3.5 The Archaeologist shall document any heritage features and identify and collect any heritage resources exposed during the construction activities. All heritage objects will be treated according to HRB management standards.

E4.3.6 Upon conclusion of the fieldwork, the Archaeologist shall prepare a report meeting the requirements of the HRPP.

E4.3.7 Heritage objects recovered during the course of the monitoring are owned by the Crown with the custody residing in the HRB. All archaeological materials will be processed, packaged, and submitted to the HRB by the date specified on the relevant Heritage Permit and in accordance to Archaeological Artifact Submission Standards (2009).

E4.3.8 Should heritage resources be found at any point during construction outside of the monitoring area designated above, the Contractor the meet all requirements of Items E4.3.3 to E4.3.7.

E4.4 Basis of Payment

E4.4.1 Costs incurred by the Contractor related to heritage resource monitoring and reporting shall be paid for under the allowance for “Heritage Resources Mitigation Measures”. Payment will be based on actual invoiced costs for HRIA activities with allowable mark-ups in accordance with the General Conditions.

E5. SHOP DRAWINGS

E5.1 Description

E5.1.1 This Specification shall revise, amend and supplement the requirements of CW 1110.

(a) The term ‘Shop Drawings’ means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, including Site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the Work.

(b) The Contractor shall submit specified Shop Drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be shown on all submissions for Engineering review.

E5.1.2 Shop Drawings

(a) Original drawings are to be prepared by the Contractor, Subcontractor, Supplier, Distributor, or Manufacturer, which illustrate an appropriate portion of Work; showing fabrication, layout, setting or erection details as specified in appropriate sections.

(b) Shop drawings for the following structural components shall bear the seal of a Registered Professional Engineer in the Province of Manitoba.

(i) Shoring and Shaft Layout

(ii) Reinforcing Steel

(iii) Pre-Cast Concrete Structures

(iv) Steel Casing Pipe

- The Contractor must provide pipes that can be installed with their intended means and methods. The pipe class listed on the drawings is intended only to meet the final burial depth of the pipe in accordance with ASTM A252 standards. The Contractor must provide a submission that demonstrates that the proposed pipe can support the anticipated loading applied to the pipe.

(v) Thrust Blocks

- A thrust block shop drawing is required for any trenchless technology that requires applying thrust as part of its process. The interaction of the thrust with respect to shoring, existing soil conditions, existing utilities or other site-specific issues must be addressed by the thrust block design.

(c) Additional submittal requirements for each component of Work may be listed within the relevant specification section.

(d) Construction of any Work item requiring a shop drawing may not commence until the specific shop drawing Submittal has been approved.

(i) Note that no shaft construction may proceed without approved shop drawings that include engineered stamped drawings demonstrating that the shoring design(s):

(ii) Meet all provincial regulations.

(iii) Is able to support soil and active loading.

(iv) Permits the effective installation of the planned Works.

(v) Where shafts are used for boring that the shoring also supports the planned boring works as well as interaction with the thrust block design.

E5.1.3 Contractor’s Responsibility

(a) Review Shop Drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.

(b) Verify the following metrics against what's indicated in the Shop Drawings:
   (i) Field Measurements
   (ii) Field Construction Criteria
   (iii) Catalogue numbers of material delivered to the Site and similar data

(c) Coordinate each submission with requirements of Work and Contract Documents. Individual Shop Drawings will not be reviewed until all related drawings are available.

(d) Notify Contract Administrator, in writing at the time of submission, of deviations from the requirements of Contract Documents.

(e) Responsibility for deviations from requirements of Contract Documents in the submission is not relieved by the Contract Administrator's review of the submission unless Contract Administrator gives written acceptance of specified deviations.

(f) Responsibility for errors and omissions in submission is not relieved by the Contract Administrator's review of submittals.

(g) The Contractor shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of Shop Drawings. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Contract Administrator on the previous submission.

(h) After the Contract Administrator's review and return of copies, distribute copies to subtrades as appropriate.

(i) Maintain one (1) complete set of reviewed Shop Drawings, filed by Specification Section Number, at the Site of the Work for use and reference of the Contract Administrator and Subcontractors.

E5.1.4 Submission Requirements

(a) Schedule submissions at least ten (10) Calendar Days before the dates on which reviewed submissions will be needed, and allow for a 10 Calendar Day period for review by the Contract Administrator of each submission and re-submission unless noted otherwise in the Contract Documents.

(b) Submit one (1) digital copy (PDF) of the shop drawings.

(c) Accompany submissions with a transmittal letter, containing:
   (i) Date
   (ii) Project title and Tender number
   (iii) Contractor's name and address
   (iv) Number of each Shop Drawing, product data and sample submitted
   (v) Specification Section, Title, Number and Clause
   (vi) Drawing Number and Detail/Section Number
   (vii) Other pertinent data

(d) Submissions shall include:
   (i) Date and revision dates
   (ii) Project title and Tender number
   (iii) Name of:
      - Contractor
      - Subcontractor
      - Supplier
      - Manufacturer
      - Separate detailer when pertinent

(iv) Identification of product of material

(v) Relation to adjacent structure or materials

(vi) Verification that field dimensions are identified as such

(vii) Specification section name, number and clause number or drawing number and detail/section number

(viii) Applicable standards, such as CSA or CGSB

(ix) Contractor's stamp, initialled or signed, certifying review of the submission, verification of field measurements and compliance with Contract Documents.

E5.1.5 Other Considerations

(a) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.

(b) Material and equipment delivered to the Site of the Works will not be paid for at least until pertinent Shop Drawings have been submitted and reviewed.

(c) Incomplete Shop Drawing information will be considered as stipulated deductions for progress payment certificates.

(d) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions and review of Shop Drawings.

(e) Where a Contractor is providing a shop drawing for an element that contains other elements that require shop drawings, the Contractor is responsible for ensuring that the shop drawings are coordinated with each other (example shoring systems supporting construction activities and structures, or a concrete structure supporting internal piping and other ancillary elements).

E5.2 Measurements and Payment

E5.2.1 Notwithstanding E6, preparation and submittal of Shop Drawings shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

E6. EXPEDITED SHOP DRAWINGS

E6.1 In order to expedite Shop Drawings with critical timelines, the Lowest Responsive Bidder will be permitted, after receiving written approval from the Contract Administrator, to arrange for the preparation of Shop Drawings for the following items with critical timelines:

(a) Shaft Shoring

(b) Pre-Cast Concrete Structures

(c) PVC and Ductile Iron Pipe

(d) Custom Bends

(e) Valves

(f) Automatic Flushing Unit

E6.2 If Award is made to the Lowest Responsive Bidder, then no specific payment for the preparation of Shop Drawings will be made.

E6.3 If no contract is awarded, then the City of Winnipeg will pay the requested Bidder five hundred dollars ($500.00) per item listed above. Delivery of the Shop Drawings to the City and payment of the above amounts will constitute full and final consideration of each party to the other, and neither party will have any further liability to the other with respect to this Tender.

E7. ENVIRONMENTAL PROTECTION PLAN

E7.1 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the environmental protection measures as herein specified.

E7.2 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

(a) Federal
  (i) Canadian Environmental Protection Act (CEPA) c.16
  (ii) Canadian Environmental Assessment Act (CEAA) c.37
  (iii) Transportation of Dangerous Goods Act and Regulations c.34

(b) Provincial
  (i) The Dangerous Goods Handling and Transportation Act D12
  (ii) The Endangered Species Act E111
  (iii) The Environment Act c.E125
  (iv) The Fire Prevention Act F80
  (v) The Manitoba Heritage Resources Act H39.1
  (vi) The Maitoba Noxious Weeds Act N110
  (vii) The Manitoba Nuisance Act N120
  (viii) The Public Health Act c.P210
  (ix) The Workplace Safety and Health Act W120
  (x) Other current applicable associated regulations.

(c) Municipal
  (i) The City of Winnipeg By-law no. 1/2008
  (ii) Other applicable Acts, Regulations and By-laws.

E7.3 The Contractor is advised that the following environmental protection measures apply to the Work.

(a) Materials Handling and Storage
  (i) Construction materials and debris shall be prevented from entering drainage pipes or channels.
  (ii) Construction materials and debris shall also be prevented from accumulating on local roadways and sidewalks when tracked out of the Site by trucks hauling excavated materials.
  (iii) The Contractor shall provide on-Site measures to mitigate the tracking of sediment off-Site and therefore reduce the amount of street cleaning required. These measures may take the form of a truck wheel wash (automated or manually operated) or other measures as approved by the Contract Administrator.

(b) Fuel Handling and Storage
  (i) The Contractor shall obtain all necessary permits from Manitoba Conservation for the handling and storage of fuel products and shall provide copies to the Contract Administrator.
  (ii) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.
  (iii) Fuels, lubricants, and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.
  (iv) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.

(v) Products transferred from the fuel storage area(s) to specific Work Sites shall not exceed the daily usage requirement.

(vi) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheet of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill.

(vii) Refuelling of mobile equipment and vehicles shall take place at least 100 metres from a watercourse.

(viii) The area around storage Sites and fuel lines shall be distinctly marked and kept clear of snow and debris to allow for routine inspection and leak detection.

(ix) A sufficient supply of materials, such as absorbent material and plastic oil booms to clean up minor spills shall be stores nearby on-site. The Contractor shall ensure that additional material can be made available on short notice.

(c) Waste Handling and Disposal

(i) The construction area shall be kept clean and orderly at all times during and at completion of construction.

(ii) At no time during construction shall personal or construction waste be permitted to accumulate for more than one day at any location on the construction Site, other than at a dedicated storage area as may be approved by the Contract Administrator.

(iii) All resulting debris shall be deposited at a Waste Disposal Ground operating under the authority of Manitoba Regulation #150/91. Exceptions are liquid industrial and hazardous wastes which may require special disposal methods (see SC:21.4 D).

(iv) Indiscriminate dumping, littering, or abandonment shall not take place.

(v) No on-site burning of waste is permitted.

(vi) Waste storage areas shall not be located so as to block natural drainage.

(vii) Run-off from a waste storage area shall not be allowed to cause siltation of a watercourse.

(viii) Waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.

(ix) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.

(d) Dangerous Goods/Hazardous Waste Handling and Disposal

(i) Dangerous goods/hazardous wastes are identified by, and shall be handled according to, The Dangerous Goods Handling and Transportation Act and Regulations.

(ii) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations.

(iii) The Contractor shall have on-site staff that is trained and certified in the handling of the dangerous/hazardous goods, when said dangerous/hazardous goods are being utilized on-site for the performance of the Work.

(iv) Different waste streams shall not be mixed.

(v) Disposal of dangerous goods/hazardous wastes shall be at approved hazardous waste facilities.

(vi) Liquid hydrocarbons shall not be stored or disposed of in earthen pits on-site.

(vii) Used oils shall be stored in appropriate drums, or tankage, until shipment to waste oil recycling centres, incinerators, or secure disposal facilities approved for such wastes.

(viii) Used oil filters shall be drained, placed in suitable storage containers, and buried or incinerated at approved hazardous waste treatment and disposal facilities.

(ix) Dangerous goods/hazardous waste storage areas shall be located at least 100 metres away from the high water line and be dyked.

(x) Dangerous goods/hazardous waste storage areas shall not be located so as to block natural drainage.

(xi) Run-off from a dangerous goods/hazardous waste storage area shall not be allowed to cause siltation of a watercourse.

(xii) Dangerous goods/hazardous waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.

(e) Emergency Response

(i) The Contractor shall ensure that due care and caution is taken to prevent spills.

(ii) The Contractor shall report all major spills of petroleum products or other hazardous substances with significant impact on the environment and threat to human health and safety (as defined in Table 1 below) to Manitoba Conservation, immediately after occurrence of the environmental accident, by calling the 24-hour emergency phone number (204) 945-4888. The Contract Administrator shall also be notified.

(iii) The Contractor shall designate a qualified supervisor as the on-site emergency response co-ordinator for the project. The emergency response co-ordinator shall have the authority to redirect manpower in order to respond in the event of a spill.

(iv) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-site emergency response co-ordinator:

- Notify emergency-response co-ordinator of the accident:
  - identify exact location and time of accident
  - indicate injuries, if any
  - request assistance as required by magnitude of accident (Manitoba Conservation 24-hour Spill Response Line (204) 945-4888, Police, Fire Department, Ambulance, company backup)
- Attend to public safety:
  - stop traffic, roadblock/cordon off the immediate danger area
  - eliminate ignition sources
  - initiate evacuation procedures if necessary
- Assess situation and gather information on the status of the situation, noting:
  - personnel on-site
  - cause and effect of spill
  - estimated extent of damage
  - amount and type of material involved
  - proximity to waterways, sewers, and manholes
- If safe to do so, try to stop the dispersion or flow of spill material:
  - approach from upwind
  - stop or reduce leak if safe to do so
  - dike spill material with dry, inert sorbet material or dry clay soil or sand
  - prevent spill material from entering waterways and utilities by diking
  - prevent spill material from entering manholes and other openings by covering with rubber spill mats or diking. Resume any effective action to contain, clean up, or stop the flow of the spilled product.

(v) The emergency response co-ordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to Manitoba Conservation according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.

(vi) When dangerous goods are used on-site, materials for containment and cleanup of spill material (e.g. absorbent materials, plastic oil booms, and oversized recovery drums) shall be available on-site.

(vii) Minor spills of such substances that may be contained on land with no significant impact on the environment may be responded to with in-house resources without formal notification to Manitoba Environment.

(viii) City emergency response, 9-1-1, shall be used if other means are not available.

(f) Vegetation

(i) Vegetation shall not be disturbed without written permission of the Contract Administrator. The Contractor shall protect plants which may be at risk of accidental

damage. Such measures may include protective fencing or signage and shall be approved in advance by the Contractor Administrator.

(ii) Herbicides and pesticides shall not be used adjacent to any surface watercourses.

(iii) All landowners adjacent to the area of application of herbicides or pesticides shall be notified prior to the Work.

(iv) Trees and shrubs shall not be felled into watercourses.

(v) Areas where vegetation is removed during clearing, construction, and decommissioning activities, shall be revegetated as soon as possible in accordance with the landscaping plans forming part of the contract, or as directed by the Contract Administrator.

E7.4 Method of Measurement and Payment

(a) Adherence to the laws that govern the requirements for Environmental Protection are incidental to the Contract.

E8. SITE DEVELOPMENT AND RESTORATION

E8.1 Description

(a) This Specification shall cover all aspects of the Site Development and Restoration Work, including but not limited to mobilization and demobilization, Site access, Site security (fencing and gates), utility clearances, traffic control and signage, snow clearing, Site runoff and drainage, protection, cleanup, and Site restoration.

(b) The Tender quantities listed on Form B: Prices include an expected quantity of Sodding based on the proposed Works. All Sodding beyond the quantities listed on Form B: Prices will be considered incidental to Site Development and Restoration, and no additional payment will be made for the additional quantities as described in Section E46.

(c) The Tender quantities listed on Form B: Prices include an expected quantity of Placement of Topsoil for Seeding based on the proposed Works. All Placement of Topsoil for Seeding beyond the quantities listed on Form B: Prices will be considered incidental to Site Development and Restoration, and no additional payment will be made for the additional quantities as described in Section E45.

(d) The Tender quantities listed on Form B: Prices include an expected quantity of Sturgeon Road South Road Reconstruction based on the proposed Works. All Sturgeon Road South Reconstruction quantities beyond those listed on Form B: Prices will be considered incidental to Site Development and Restoration, and no additional payment will be made for the additional quantities as described in Section E47.

E8.2 Submittals

(a) Access and Layout Plans for review and approval by the Contract Administrator, in accordance with CW 1110 and E10, for the following items:

(i) Sturgeon Road Athletic Field temporary working areas.

(ii) Traffic management plans.

(iii) Launch and receiving shafts for trenchless construction.

E8.3 Equipment

(a) All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator.

(b) The Contractor shall keep all equipment in good Working order and have sufficient standby equipment available at all times.

E8.4 Construction Methods

(a) Temporary Workspace and Site Access

(i) The Contractor shall be responsible to develop suitable Site access. This includes but is not limited to, removal of curbing, temporary ramping, temporary approach

construction, construction signage, temporary bridging over structures, removal and replacement of bollards, temporary safety fencing, protection of trees, any landscaping, grading and pavement repairs, removal and restoration of vegetation necessary to restore any Site and construction access areas to their pre-existing condition.

(ii) The Contractor is responsible for obtaining and paying for all required permits that are necessary for Site access.

(iii) Potential Contractor laydown areas have been identified on Drawing 1-0798F-D0004-001. Laydown areas other than those identified must be approved by the Contract Administrator.

(iv) The City is in the process of obtaining a Temporary Construction Easement on the property of Quail Ridge Apartments for the Contractor to access the work area shown on Drawing 1-0798F-C0008-001.

(i) The Contractor shall provide minimum 10 days notice to the Contract Administrator prior to entering Quail Ridge property.

(b) Vegetation Removal and Protection

(i) Vegetation (living trees smaller than 50 mm and sod) removal may be permitted to facilitate Site access and temporary lay-down areas. Existing vegetation shall not be removed without prior approval from the Contract Administrator.

(c) General Site Cleanup and Restoration

(i) All areas of the construction Site shall be restored to a condition the same or better than the original condition prior to initiation of Work.

(d) Topsoil and Sod

(i) Topsoil and Sodding Work shall include all maintained grass areas as shown on Drawing 1-0798F-B0001-001 that are disturbed by the Contractor during construction. The Contractor shall restore all areas disturbed during construction to the condition prior to the initiation of the Work or better, using topsoil and sod as described in Section E46.

(e) Topsoil Placement for Seeding

(i) Topsoil Placement for Seeding Work shall include all naturalized grass areas as shown on Drawing 1-0798F-B0001-001 that are disturbed by the Contractor during construction. The Contractor shall restore all areas disturbed during construction using topsoil as described in Section E45.

(f) Removal and Replacement of Wooden Bollards

(i) Removal and replacement of wooden bollards will be required to facilitate the Work, as described in Section E49.

(g) Traffic Control and Signage

(i) Coordinate, install and maintain traffic control and signage in accordance with E9 and E10.

(h) Snow Clearing

(i) The Contractor will be required to perform snow clearing and sanding operations on City streets and sidewalks within the Site where access to City snow clearing and sanding crews is blocked due to construction activities or where construction activities have created unsafe, icy conditions.

(ii) Snow build-up on sidewalks and roadways shall be maintained to the condition of the surrounding sidewalks and roadways.

(i) Construction Fencing

(i) The erection of temporary construction panel fencing is required around all active construction Work, including haul roads, for all Work south of Saskatchewan Avenue, as shown on Drawing 1-0798F-D0004-001.

(j) Surface Restoration

(i) Prior to construction, the Contractor shall inspect the grassed, pavement, and gravel surfaces within the site. After construction and site cleanup are complete, the Contractor shall re-inspect the conditions with the Contract Administrator.

(ii) The Contractor shall restore the condition and appearance of the site to pre-construction conditions or better in accordance with the following:

(i) Maintained grass areas damaged by construction activities will be restored in accordance with Section E46.

(ii) Naturalized grass areas damaged by construction activities will be restored in accordance with Section E45.

(iii) Road reconstruction will be paid for in accordance with Section E47.

(iv) Any other pavement damaged by construction activities will be restored in accordance with CW 3230 – Full-Depth Patching of Existing Slabs and Joints, and CW 3410 – Asphaltic Concrete Pavement Works.

(v) Any other concrete damaged by construction activities will be restored in accordance with CW 3310 – Portland Cement Concrete Pavement Works, and CW 3325 – Portland Cement Concrete Sidewalk.

(vi) Gravel surfacing damaged by construction activities will be restored in accordance with CW 3150 – Gravel Surfacing.

(vii) Items outside of the City specifications shall be restored to a condition equal to or better than the preconstruction condition.

(viii) Re-installation and if necessary, replacement of existing wooden bollards in accordance with Section E49.

E8.5 Method of Measurement and Payment

(a) Site Development and Restoration will not be measured and will be paid for at the Contract Lump Sum Price for “Site Development and Restoration”, which price shall be paid in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.

(b) 20% of the Site Development and Restoration unit price will be paid on the first Progress Payment following the commencement of the Work.

(c) 40% of the Site Development and Restoration unit price will be paid on the Progress Payment on subsequent progress payments on a proportional basis based on the extent of progress up to Substantial Performance, as determined by the Contract Administrator.

(d) 40% of the Site Development and Restoration unit price will be paid on the Progress Payment following Total Completion.

E9. TRAFFIC CONTROL

E9.1 In accordance with the Manual of Temporary Traffic Control on City Streets (MTTC), the Contract Administrator shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place, maintain, and remove all regulatory signs and traffic control devices authorized and/or required by the Traffic Management Branch in the following situations:

(a) Parking restrictions,

(b) Stopping restrictions,

(c) Turn restrictions,

(d) Diamond lane removal,

(e) Full or directional closures on a Regional Street,

(f) Traffic routed across a median,

(g) Full or directional closure of a non-regional street where there is a requirement for regulatory signs (turn restrictions, bus stop relocations, etc.) to implement the closure.

(h) Approved Designated Construction Zones with a temporary posted speed limit reduction. Traffic Services will be responsible for placing all of the advance signs and 'Construction

Ends' (TC-4) signs. The Contractor is still responsible for all other temporary traffic control including but not limited to barricades, barrels and tall cones.

E9.2 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the Site has been maintained.

E9.3 Further to E9.1(c) and E9.1(d) the Contractor shall make arrangements with the Traffic Services Branch of the City of Winnipeg to reinstall the permanent regulatory signs after the Contract Work is complete. At this time the Contractor shall make arrangements to drop off the stockpiled materials to Traffic Services at 495 Archibald Street.

E9.4 Any changes to the approved traffic management plan must be submitted to the Contract Administrator a minimum of (five) 5 Working Days prior to the required change for approval.

E9.5 If the Contract Administrator determines that the Contractor is not performing Traffic Control in accordance with this specification, Traffic Services Branch may be engaged to perform the Traffic Control. In this event the Contractor shall bear the costs associated charged to the project by the Traffic Services Branch of the City of Winnipeg in connection with the required Works undertaken by the Contractor.

E9.5.1 The City of Winnipeg Manual of Temporary Traffic Control on City Streets is available online at:

(a) http://winnipeg.ca/publicworks/trafficControl/manualTempTrafficControl.stm

E10. TRAFFIC MANAGEMENT AND PEDESTRIAN SAFETY

E10.1 Description

(a) This specification covers activities related to managing traffic throughout the work site. Items listed here are to be followed in addition all standard requirements.

E10.2 Materials and Equipment

E10.2.1 Further to Clause 3.7 of CW 1130:

(a) The Contractor shall be responsible for all signage and barricades as identified in the City of Winnipeg Manual of Temporary Traffic Control on City Streets. The Contractor shall provide the Contract Administrator a suitable Traffic Accommodation Strategy covering all the details for traffic management (cones and signage etc.) for each Work element at least five (5) working days prior to commencement of any lane closures related to the Work.

E10.3 General Requirements

E10.3.1 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 or create any other safety concern.

E10.3.2 The Contractor shall minimize the duration of road closures as much as possible such that only areas with active construction are closed off.

(a) The Contractor shall be responsible for preparing and submitting a traffic management plan to the Contract Administrator and the City of Winnipeg's Traffic Services Department for any proposed lane closures.

(b) The traffic management plan shall be submitted a minimum 15 working days prior to the date of the anticipated road closure.

E10.3.3 Emergency vehicle access must be maintained at all times.

E10.3.4 Intersecting streets, private approach and lane access shall be maintained at all times (unless approved within the Specifications or by the Contract Administrator).

(a) Should the Contractor be unable to maintain an existing access to a residence or business, he/she shall review the planned disruption with the business or residence and

the Contract Administrator and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contractor Administrator, prior to disruption of access.

E10.3.5 Winnipeg Transit service shall be maintained at all times.

(a) Should the Contractor be unable to maintain bus stops or routes it shall be reviewed with the Contract Administrator at least 48 hours in advance to see if modifications can be made.

E10.3.6 The Contractor shall provide at least five (5) days notification to the Contract Administrator prior to beginning a new phase of traffic control.

E10.4 Regional Street Requirements

E10.4.1 Local Streets impacted by the Work will include:

(a) Saskatchewan Avenue (West of Sturgeon Road)
  (i) No lane closures permitted.

(b) Silver Avenue
  (i) Maintain minimum one lane for vehicular access in either direction for the duration of the project.

(c) Sturgeon Access
  (i) No lane closures permitted.

(d) Sturgeon Road (South of Sturgeon Access)
  (i) Lane at a time closure is permitted. The contractor shall prepare and submit a traffic management plan for any required closures.

E10.5 Local/Non-Regional Street Requirements

E10.5.1 Local Streets impacted by the Work will include:

(a) Carriage Road
  (i) Maintain minimum one lane for vehicular access in either direction for the duration of the project.

(b) Saskatchewan Avenue (East of Sturgeon Road)
  (i) Maintain minimum one lane for vehicular access in either direction for the duration of the project. The Contractor shall prepare and submit a traffic management plan for any required closures.

(c) Sturgeon Road (North of Sturgeon Access)
  (i) Maintain minimum one lane for vehicular access in either direction for the duration of the project.

(d) Tonka Point
  (i) Maintain minimum one lane for vehicular access in either direction for the duration of the project.

E10.5.2 For all local or non-regional streets, and where not shown otherwise in the Drawings, the Contractor shall:

(a) Maintain a minimum of one lane of traffic that can be used in either direction.

(b) Maintain access for garbage/recycling trucks.

(c) Ambulance/ emergency vehicle access must be maintained at all times.

(d) Where possible maintain safe pedestrian routes around shaft locations and all other Work areas.

E10.6 Parks Requirements

E10.6.1 Parks impacted by the Works include:

(a) Sturgeon Road Athletic Field

(i) Temporary panel fencing in conformance with Workplace Safety and Health regulations must be installed at all times while construction Works are taking placing within the Sturgeon Road Athletic Field, as shown on Drawing 1-0798F-D0004-001.

(b) Matt Jonsson Memorial Skatepark

(i) No disruptions to the Matt Jonsson Memorial Skatepark will be permitted.

E10.7 Measurement and Payment

E10.7.1 All Work associated with adhering to the Traffic Management and Pedestrian Safety requirements identified are incidental to Site Development and Restoration E8.

E11. PROTECTION OF EXISTING TREES

E11.1 Removal of trees adjacent to the Quail Ridge Apartments, as shown on Drawing 1-0798F-C0008-001 has previously been completed as part of Tender 109-2024. No additional tree removal is permitted for any area of this project unless approved by the Contract Administrator.

E11.2 The Contractor shall take the following precautionary steps to avoid damage from construction activities to any existing trees within the limits of the construction area.

E11.2.1 Do not stockpile materials and soil or park vehicles and equipment within 2 metres of trees.

E11.2.2 Safety fencing shall be installed around the tree dripline.

(a) Where piping is to be installed parallel to existing trees lines such as on Drawings 1-0798F-C0006-001 to 1-0798F-C0010-01, safety fencing shall be installed along the tree dripline for the entire length of the proposed Works.

E11.2.3 Excavations shall be carried out in a manner to minimize damage to existing root systems. Where roots must be cut to facilitate an excavation, they shall be neatly pruned at the face of the excavation and coated with an appropriate wound dressing to prevent infection.

E11.2.4 Work on Site shall be carried out in a manner to minimize damage to existing tree branches. Where damage to tree branches does occur, the branches shall be pruned by an approved arborist from the City of Winnipeg's Urban Forestry approved Contractors list.

E11.2.5 American elm trees shall not 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.

E11.3 All damage to existing trees due to construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Public Works Department, Forestry Branch at the Contractor's expense.

E11.4 Costs for protection of trees shall be considered incidental to Site Development and Restoration. No separate measurement or payment will be made.

E12. TREE REMOVAL

E12.1 Description

E12.1.1 In the event that a Contractor identifies a need for a tree to be removed, they are to notify the Contract Administrator and arrange for a discussion with the City of Winnipeg Forestry Branch. Provisional items for tree removal have been included in this Tender for the unlikely risk that a tree is required to be removed.

E12.1.2 This specification shall cover the removal of existing trees.

E12.1.3 The Work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all

things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E12.2 Materials

E12.2.1 Existing Trees to be Removed

The existing trees to be removed include, but not limited to ash, elm, cottonwood, basswood, oak, pine, maple, spruce, etc., all of which may be cut with standard chain saw equipment. The existing trees range from 50 mm to 499 mm diameter.

E12.3 Construction Methods

E12.3.1 Prior to commencement of the Work the Contract Administrator shall identify all trees for removal. The Contractor shall cut down only trees designated to be removed, and grub out all stumps and roots greater than 100 mm diameter. In general, the Contractor shall start at the top of the tree and remove branches or trunks not longer than 2 m. Trees are to be felled so as to land within the limits of the Works. The Contractor shall load and haul all trees, stumps, roots, logs, brush, rubbish and all other surface litter from the Site and dispose of these materials at an approved disposal Site, acceptable to the Contract Administrator.

E12.3.2 The Contractor shall take all precautions to prevent damage to structures, adjacent property and to trees and shrubs. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.

E12.3.3 Any trees damaged during construction activities shall be examined by a bonded tree care professional and pruned as required. Damaged trees which are not viable shall be replaced by the Contractor at his own cost.

E12.4 Measurement and Payment

E12.4.1 The removal of existing trees shall be measured on a per tree basis and paid for at the Contract Unit Price for each size of “Tree Removal”. The amount to be paid shall be the total number of trees removed in accordance with this specification, accepted and measured by the Contract Administrator.

E12.4.2 The removal of trees and brush less than 50 mm diameter is considered incidental to the Work and no separate measurement or payment will be made.

E13. TREE PLANTING

E13.1 Description

E13.1.1 Should any trees require removal as part of this project, replacement trees will be planted as determined and directed by the Contract Administrator. Plantings will consist of trees in various container sizes.

E13.1.2 The Work to be undertaken by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as shown on the Drawings and as herein specified.

E13.1.3 Work shall include, but not necessarily confined to, the relocation, supply and installation of trees and shrubs.

E13.1.4 Reference

(a) All plants shall be supplied and installed as per the Canadian Standards for Nursery Stock Current Edition, published by the Canadian Nursery Trades Association, except where specified otherwise.

E13.1.5 Source Quality Control

(a) All plant material shall be randomly inspected at the source upon request of the Contract Administrator.

(b) Trees are to be grown in nurseries under proper cultural practices as recommended by the Canadian Nursery Trades Association.

(c) Only those trees that have been grown for at least the four (4) previous years in local Manitoba nurseries located in an Agriculture Canada Plant Hardiness Zone designation of 2(a or b) or 3(a or b) and within a 250 km radius of Winnipeg, will be accepted. Trees that have grown in plant hardiness zones 1 and 4 or greater will be rejected.

E13.1.6 Maintenance

(a) The Contractor shall be responsible for the maintenance of the trees for a period of one (1) year from the date of Total Performance. Any areas planted after September 15th, the maintenance period will commence on May 15th of the following year or such date as mutually agreed upon by all parties.

(b) Water to ensure soil moisture conditions for optimum growth and health of plant material. Ensure watering techniques do not cause erosion.

(c) Reform damaged watering saucers.

(d) Remove weeds as per overall weed control strategy.

(e) Replace or re-spread damaged, missing or disturbed mulch.

(f) For non-mulched areas, cultivate monthly to keep top layer of soil friable.

(g) If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Contract Administrator prior to application.

(h) Apply fertilizer as directed by manufacturer's specifications.

(i) Remove dead, broken or hazardous branches from plant material.

(j) Keep trunk protection and tree supports in proper repair and adjustment.

(k) Remove trunk protection, tree supports and level watering saucers at end of warranty period.

(l) Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

(m) Submit weekly written reports to Contract Administrator identifying:

- Maintenance work carried out.
- Development and condition of plant material.
- Preventative or corrective measures required which are outside Contractor's responsibility.

E13.1.7 Warranty

(a) The Contractor shall, at his/her expense, warrant the Work against any and all defects or deficiencies resulting from insect infestation, disease and mechanical damage due to improper handling, installation or maintenance, for a period of one (1) year from the date of the Total Performance. Nursery stock damaged by vandalism or reasons beyond the control of the Contractor shall be replaced by the client.

(b) End-of-Warranty inspection will be conducted by the Contract Administrator.

(c) The Contract Administrator reserves the right to request material replacement or extend the Contractor's Maintenance responsibilities for an additional one (1) year if, at the end of the Warranty Period, leaf development and growth are not sufficient to ensure future survival of the plant material.

E13.1.8 Replacements

(a) During the Warranty Period, the Contractor shall remove from Site any plant material that has died or failed to grow satisfactorily as determined by the Contract Administrator

and replace as per Specifications within a maximum ten (10) day period from notification.

(b) Defective trees shall be replaced within three (3) days of notification to the Contractor, unless otherwise agreed to by the Contract Administrator.

(c) The Contractor shall extend Maintenance and Warranty on replacement tree for a period equal to the original Maintenance and Warranty Periods.

(d) The Contractor shall continue such replacement, Maintenance and Warranty until tree is acceptable.

E13.2 Materials

E13.2.1 Planting Soil and Mulch

(a) As per Planting Preparation.

(b) Imported soils shall be used to backfill tree and shrub plantings.

E13.2.2 Miscellaneous Materials

(a) Water shall be potable and free of minerals which may be detrimental to plant growth.

(b) Stakes shall be metal T-Bar, steel, 40x40x5x2440 mm.

(c) ARBORTILE® by Deep Root Canada Corp., or equivalent approved by the Contract Administrator.

(d) Guying Collar shall be plastic tube, 13mm diameter, nylon reinforced.

(e) Trunk Protection shall be plastic perforated spiralled strip.

(f) Fertilizer shall be a slow release formulation of low nitrogen and high phosphorus e.g. 10-50-12. Apply quantities at rates stated by product manufacturer.

(g) Root Ball Burlap shall be 150 g Hessian burlap, biodegradable.

(h) Wire Baskets shall be horticultural accepted product designed to carry the weight and to contain a burlap-covered root ball. Minimum diameter basket size is to conform to the same minimum diameter of the tree root ball for the respective minimum tree caliper sizes.

E13.2.3 Plant Material

(a) All nursery stock supplied shall be Canadian Prairie nursery grown, and of species and sizes indicated in the plant list on the Drawings. Its quality shall be in accordance with the "Guide Specification for Nursery Stock of the Canadian Nursery Trades Association".

(b) Any nursery stock dug from native stands, wood lots, orchards, or neglected nurseries and which have not received proper cultural maintenance as advocated by the Canadian Nursery Trades Association shall be designated as "collected plants". The use of "collected plants" will not be permitted unless specified below.

(c) Nomenclature of specified nursery stock shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the names accepted in the nursery trade.

(d) Plants larger than specified may be used if approved by the Contract Administrator. The use of such plants shall not increase the Contract price.

(e) Plants shall be free of disease, insect infestation, rodent damage, or environmental stress.

(f) Trees:

(i) To be characteristically developed for their species and structurally sound, well branched, healthy and vigorous and densely foliated when in leaf. The tree is to have a healthy, well developed, fibrous root system which may be verified

through a testing procedure that destructively samples one or more randomly selected root balls;

(ii) To have been root pruned regularly, but not later than one growing season prior to arrival on-site. The Contractor may be required to furnish documentation to the client on their root-pruning program. Trees in excess of 75 mm caliper are to have been half root pruned during each of two successive growing seasons, the latter at least, one growing season prior to arrival on-site;

(iii) To have all parts, especially lower branches, moist and show live, green cambium tissue when cut;

(iv) Single stem trees to have only one, sturdy, reasonably straight and vertical trunk, and a well-balanced crown with fully developed leader.

(v) To be free of disease, insect infestation, rodent damage, sun scald, frost cracks, abrasions, unhealed scars, scars exceeding 5cm in diameter, major forks or crooks in the trunk, broken branches, or angled leaders. Trees having the above defects will not be accepted by the Contract Administrator;

(vi) Trees having a leader which has developed at a sharp angle to the trunk as a result of pruning or trunk damage will not be accepted;

(vii) Trees exhibiting suppressed, weakly developed branches due to competition from other closely spaced trees in the nursery will not be accepted. Trees exhibiting dead branches will not be accepted.

(viii) Any tree that has come out of dormant stage and is too far advanced will not be accepted unless prior approval obtained. Approval is required for any tree which has been held in cold storage.

(ix) Balled and burlapped trees in excess of a 3 m height must have been dug with large firm ball. Roots in root balls must be comprised of 75% fibrous and feeder root systems. Secure root balls with burlap, heavy twine and rope. For trees 75 mm or more in caliper, wrap ball in double layer of burlap and drum lace with minimum 10 mm diameter rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.

(x) Tree spade dug trees are to be dug with mechanized digging equipment with hydraulic spade. Lift root ball from hole, place in wire basket designed for purpose and lined with burlap. Tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.

(xi) Use of collected or native trees is not permitted.

E13.2.4 Tree Quantity and Size

(a) Trees are to be planted at the quantities and caliper listed in Form B and broken down in detail below. Any variations to size, caliper or species of specified trees will require a request for approval from the Contract Administrator.

(i) Large trees shall be a minimum 75 mm caliper, 2.5 m in height, with a minimum of eight (8) major branches 2 m above grade, have balled and burlapped root balls, and be double stake. Tree species specific to the site shall consist of:

- American Elm
- Bur Oak

(b) Planting locations will be determined on-site by the Contract Administrator.

(c) Trees are to conform to the measurements specified in Form B, except that trees larger than specified may be used if approved by the Contract Administrator.

(d) Trees are to be measured when the branches are in their normal position. Height dimensions specified are to refer to the main body of the tree and not from branch tip to root base. Where trees have been measured by caliper or diameter, reference is to be made to the diameter of the trunk measured 15 cm above the ground as the tree stands in the nursery prior to lifting. Caliper of tree shall be appropriately designed on a permanently fixed tag on one of the branches.

E13.2.5 Shipment and Pre-Planting Care

(a) Coordinate shipping of trees and excavation of holes to ensure minimum time lapse between digging and planting.

(b) Tie branches of trees securely, and protect trees against abrasion, exposure and extreme temperature change during transit. Avoid binding of trees with rope or wire which would damage bark, break branches or destroy natural shape of tree. Give full support to root ball of trees during lifting.

(c) Cover tree foliage with tarpaulin, and protect bare roots by means of dampened straw, peat moss, saw dust or other acceptable material to prevent loss of moisture during transit and storage.

(d) Remove broken and damaged roots with sharp pruning shears. Make clean cuts, and cover cuts over 10 mm diameter with a tree wound dressing.

(e) Keep roots moist and protected from sun and wind. Heel-in trees which cannot be planted immediately in shaded areas and water well.

E13.3 Construction Methods

E13.3.1 Workmanship

(a) All areas and locations provided for planting will be staked out or painted on-Site by the Contract Administrator. Excavation shall not proceed until the layout has been inspected and approved by the Contract Administrator. Excavation shall not be undertaken until all underground utilities have been located and protected.

(b) Coordinate operations. Keep Site clean and planting holes drained. Immediately remove soil or debris spilled onto street pavement, grass or sidewalk.

(c) Work to be coordinated with installation of fencing and planting of shrub.

E13.3.2 Planting Time

(a) Plant trees as early as May 15, 2025 but no later than June 30, 2025 depending when topsoil is placed and prepared.

(b) Plant only under conditions that are conducive to health and physical conditions of trees.

(c) Provide planting schedule to Contract Administrator. Extending planting operations over long period using limited crew will not be accepted.

(d) The Contractor must obtain all above and below ground clearances from all the utilities as well as the appropriate District Operations Branch in a timely manner so as not to jeopardize the schedule of the complete tree planting Contract.

E13.3.3 Excavation

(a) Tree pit to be dug with back hoe.

(b) Excavate tree pits as indicated by stakes or paint marks.

(c) Protect bottom of excavations against freezing.

(d) Remove water which enters excavations prior to planting. Ensure source of water is not ground water and notify Contract Administrator.

(e) Upon excavation of the planting, the excavation shall be backfilled with a Topsoil mixture to a depth to permit adequate installation and stabilization of the plant material. Topsoil shall be placed in accordance with City of Winnipeg Standard Construction Specification CW 3540 to a 300 mm depth.

E13.3.4 Installation

(a) Plantings of trees shall be undertaken as approved by the Contract Administrator. Configuration of planting shall be subject to input and final approval by the Contract Administrator.

(b) Planting shall be done during periods of suitable weather conditions and in accordance with locally accepted practice.

(c) Trees are to be planted within forty-eight (48) hours of excavation from the nursery.

(d) No tree pit is to be left open at the end of the Contractor's Work Day. Planting program is to be planned to ensure that all approved trees delivered to the Site at designated planting locations are installed and thoroughly watered the same day as delivery.

(e) With balled and burlapped root balls and root balls in wire baskets, burlap shall be loosened and cut away from the top 1/3 without disturbing root ball. Wire shall be cut away and removed from the top 1/3 of the root ball. Burlap or rope shall not be pulled from under root ball. Non-biodegradable wrapping shall be removed.

(f) To avoid future root girdling, The Contractor shall ensure that roots are not coiled around the root ball. After removal from the container, if it is seen that roots are coiled around the root ball, roots must be loosened and spread out in a more natural form before planting in order to establish healthy root development and root direction after planting.

(g) After inserting the tree and tamping the root system with Topsoil in layer of 150mm, water shall be poured in until the pit is thoroughly soaked. Filling of the hole shall then be completed and the fill-in soil shall be packed firmly around the roots, leaving a concave surface for convenient watering. After filling, the planting shall be watered at frequent intervals.

(h) Each tree is to have an earth saucer at its base having a diameter as large as the excavation with a 10 cm lip formed at the perimeter of the saucer to retain water.

(i) All nursery stock shall be set plumb in the centre of pits and at levels as shown on the planting details after settlement has taken place.

(j) Nursery stock shall be faced to give the best appearance or relationship to adjacent structure and to the approval of the contract administrator. Trees shall be placed equal to depth they were originally growing in nursery.

(k) Tree pit depth shall be such that the top of the root ball is even with the existing grade, taking into account that proper planting depth requires the root flare to be at or slightly above the finished grade. It is important to determine how deep the root flare is in the ball before it is placed in the planting hole. Sometimes the top of the ball may need to be raised until the root flare is at the proper planting depth and/or soil must be removed from the top of the ball.

(l) Each tree must be planted such that the trunk flare is visible at the top of the root ball. Trees where the trunk flare is not visible shall be considered a deficiency and payment for the planting will not be received until the deficiency is addressed. Do not cover the top of the root ball with soil.

E13.3.5 Supply and Installation of Mulch

(a) Contractor to supply and install mulch in tree pit, planters and in areas as indicated in the Drawings. Mulch supplied shall cover entire planting area to a consistent depth of 100 mm.

(b) Mulch must not be placed within 8 cm (3 in) of tree trunks.

E13.3.6 Fertilizing

(a) When planting is completed, give surface of planting saucer dressing of fertilizer meeting the requirements of Specification. Mix fertilizer thoroughly with top layer of planting soil and water in well.

E13.3.7 Trunk / Beaver Protection

(a) Install trunk protection on trees.

(b) Install trunk protection prior to installation of tree supports when used.

E13.3.8 Pruning

(a) The Contractor shall provide a licensed Manitoba Certified Arborist for each Work crew or Work Site.

(b) Employ clean sharp tools and make cuts flush with branch collars. Remove dead and injured branches.

E13.3.9 Watering

(a) Trees are to be watered during the planting procedure as described previously, and once a week thereafter, or more frequently as required, during the growing season.

(b) Apply 40 litres of water per 25 mm caliper per application using deep root feeder or low/pressure nozzle and hose. The water stream must not gouge out a hole in the soil and mulch.

(c) A complete record is to be kept of each series of waterings for all planted trees noting: 1) location, and 2) date of watering. This record shall be sent bi-weekly to the Contract Administrator.

E13.4 Measurement and Payment

E13.4.1 Installation and maintenance of trees shall be measured on a per unit basis. The amount to be paid for shall be the total number of trees supplied and installed in accordance with this Specification, and as acceptable to the Contract Administrator.

E13.4.2 Payment for Installation and maintenance of trees shall be paid for at the Contract Unit Prices for “Tree Planting” This price shall be payment in full for supplying all labour, equipment and materials, and performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E14. ALLOWANCE FOR MATERIAL SAMPLING AND TESTING

E14.1 Description

(a) Further to CW 2110, CW 2160, CW 3110 and CW 3410 this specification shall cover additional inspection and testing requirements for all materials used in the Work associated with this Tender.

(b) The Contractor shall be responsible to schedule, coordinate and provide material testing, including test reports, for all construction materials as outlined in CW 2110, CW 2160, CW 3110, CW 3410, other relevant City specifications, and the additional specifications within this Bid Opportunity. The Contractor shall engage an independent material inspection and testing agency for the purpose of conducting these material tests and obtaining associated documentation when directed by the Contract Administrator.

E14.2 Construction Methods

(a) The Contractor shall be responsible for scheduling field tests with an independent material inspection and testing Agency. All material tests conducted on Site shall be attended by the Contract Administrator. It is the Contractor’s responsibility to coordinate each of the scheduled tests with the Contract Administrator.

(b) The contact information from the Contract Administrator and City staff shall be provided to the testing agencies and all test results from all laboratory and field tests shall be provided to the Contract Administrator for review and/or approval.

(c) Copies of invoices from the testing agencies shall be provided monthly to the Contract Administrator.

E14.3 Measurement and Payment

(a) The cost for material sampling and testing shall be paid for under the allowance for “Material Sampling and Testing”. Costs will be based on actual invoiced costs for inspections, equipment, and monitoring with allowable mark-ups in accordance with the General Conditions.

E15. PROVISIONAL ITEMS

E15.1 The Provisional Items listed on Form B: Prices are part of the Contract.

E15.2 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.

E15.3 Notwithstanding C:7.5, 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 the grounds of loss of anticipated profit or for any other reason.

E16. CHANGE IN CONTRACT CONDITIONS

E16.1 Description

(a) This specification covers changes identified to the scope of Work including changes in geotechnical and geological conditions that may impact the Trenchless CPKC Railway Crossing Works.

(b) The basis for the geotechnical and geologic conditions are described in the GBR and GDR as defined in D37.

(c) The method for reviewing, recording and accepting change to geotechnical and geologic conditions or obstructions is described in Section D41.

E16.2 Measurement and Payment

(a) Where a Contractor has made a claim in accordance with C7 or D41 which has been accepted by the Contract Administrator and City, the Contractor will be compensated in accordance with D41 from the allowance under the Contact unit price “Change in Contract Conditions Allowance”

(b) Daily costs for all equipment, including but not limited to the tunneling or boring equipment, other equipment, construction vehicles, Contractor trucks and their staff’s personal vehicles, temporary site/storage facilities, rental equipment, and all other ancillary equipment required to undertake the trenchless Work and Work belonging to the Contractor or their sub-contractors shall be paid for at the daily rate under the contract unit price of “Daily Equipment Rate”

(i) The Contractor shall submit a breakdown of the equipment costs included within the Daily Equipment Rate to be used in assessing delay claims from Change in Work. A breakdown of these costs must be submitted prior to Commencement and add up to the total Daily Equipment Rate entered on Form B used to evaluate the Bids.

E17. EXTRA WORK ALLOWANCE

E17.1 Additional Work may be necessitated due to unforeseen circumstances that may arise during the course of the project due to:

(a) Additions to the scope of Work by the Contract Administrator, beyond that defined herein.

E17.2 A cash allowance has been included on Form B: Prices.

E17.3 The City reserves the right to delete any or all of the Cash Allowance from the Contract if the Work intended to be covered by the Cash Allowance is not required, or if the Works intended are found to be more extensive than the provisional Cash Allowance.

E17.4 Cost of additional work shall be evaluated by the methods outlined in C7.4, and a Change Order prepared by the Contract Administrator. Cost of the Change Order will be paid on the Progress Estimate and deducted from the Cash Allowance. If the valuation of the authorized work exceeds the Value of the Cash Allowance, the Contract Value will be adjusted by the shortfall.

E17.5 Additional services and/or Work will not be initiated for:

(a) Reasons of lack of performance or errors in execution.

(b) Scheduling changes initiated by the City, where at least 24 hours notice is given prior to the Contractors schedule time to be on Site.

E17.6 Should it be determined that additional material or services are required, the Contract Administrator shall approve the Work, prior to commencement of the additional Work.

E17.7 Material Mark-Up Factors:

(a) Markups on additional Work shall be in accordance with allowable markups outlines in C7.4.2

UTILITY COORDINATION

E18. SUPPORT OR TEMPORARY RELOCATION OF EXISTING PIPES AND UTILITIES

E18.1 The size and locations of shafts to facilitate the Work are at the discretion of the Contractor. Infrastructure in conflict with the Contractors proposed construction shafts shall be addressed through this Specification.

E18.2 The Contractor shall provide support or temporary relocation of existing services and utilities (including but not limited to water mains, sewer mains, gas mains, and electrical or telecommunication conduit/ducts), when excavations/IS shafts expose or require the support of these services (due to proximity or other reasons). Support of the services shall be undertaken to the requirements of the utility owner. Services and utilities may only be interrupted with the permission of the Contract Administrator and the utility owner.

E18.2.1 Where these utilities include buried gas or electrical lines, the Contractor shall contact Manitoba Hydro and follow the Safe Excavation & Safety Watch Guidelines listed at https://www.hydro.mb.ca/safety/pdfs/safe_excavation_safety_watch_guidelines.pdf

E18.2.2 Water mains shall not be temporarily cut and capped unless permission is given by the Contract Administrator and the City.

E18.3 Measurement and Payment

E18.3.1 Relocation or support of existing pipes and utilities to facilitate the feeder main or sewer main installation and associated excavations not identified on the Form B will be considered incidental to the cost of the feeder main or sewer main installation.

E19. RELOCATION OF UNDERGROUND HYDRO PRIMARY

E19.1 Description

(a) Two underground hydro primary cables are located along the proposed feeder main alignment, as shown on Drawing 1-0798F-C0008-001. Both of these cables will need to be relocated to facilitate feeder main installation.

(b) KGS Group has initiated this relocation request with Manitoba Hydro. This work is being completed under Application No. CSPI-240223-55. Cable relocation is estimated to be completed during the Winter of 2024/2025.

E19.2 Construction

(a) The Contractor shall prepare their schedule in such a manner to accommodate Manitoba Hydro's proposed relocation schedule.

(b) The Contractor shall coordinate with Manitoba Hydro and the Contract Administrator to ensure cable relocation does not cause delays to the overall project.

E19.3 Measurement and Payment

(a) Coordination and scheduling around the hydro primary relocation shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

FEEDER MAIN AND SEWER MAIN CONSTRUCTION

E20. SUPPLY AND INSTALLATION OF TEMPORARY SHORING

E20.1 Description

(a) This Specification supplements CW 2030 and covers shoring requirements for the Works.

E20.2 Construction Methods

(a) Excavation

(i) Remove excavated material from the Site immediately. Excavated material shall not be stockpiled on-Site.

(ii) All Working areas below grade shall be kept adequately and securely supported during and after excavation until the shoring and bracing is in place to prevent loss of ground or injury to any person from falling material.

(b) Excavation Security Fence

(i) Further to Clause 3.1 of CW 1130, completely cover the excavation and provide a security fence to completely surround the excavation when unattended generally in accordance with the following:

- Security fence shall be chain link fence as per CW 3550 or approved equal in accordance with B7, a minimum 1.80 metres high with metal support posts embedded far enough into the ground and spaced close enough together so the fence will not sag or collapse.
- Attach fencing securely to posts.
- Secure the gate or end of the fencing to a post with chain and a padlock.

(c) Shoring

(i) The type, strength, and amount of shoring and bracing shall be provided consistent with the nature of the ground surface and subsurface conditions, taking into account property lines, existing slopes, utilities and roadways.

(ii) Shoring and bracing shall be so spaced and dimensioned as to prevent caving, loss of ground, surface settlement, or squeezing of the soil beyond the neat lines of excavation. It shall be free from defects that might impair its strength or suitability for the Work. Sheeting/shoring and bracing shall conform to the latest revisions of the “Construction Safety Act” of the Department of Labour of the Government of Manitoba and in accordance with Province of Manitoba “W210 The Workplace Safety and Health Act” and “Guidelines for Excavation Work”.

(iii) Submit supporting design calculations as required to facilitate review of the submission for conformance with the Contract Documents.

(iv) Submit AutoCAD Shop Drawings and design calculations for the shoring/excavation system designed and sealed by a Professional Engineer registered or licensed to practice in the Province of Manitoba and experienced in the structural design of shoring systems. The designer of the shoring system shall inspect the system during construction and certify, in writing to the Contract Administrator, that construction is in conformance with the approved design.

(v) Shoring and bracing shall be installed such that the structure size and wall thickness shown on the shop drawings can be effectively installed and or constructed subsequent to installation of the shoring system.

(vi) Shoring and bracing shall be designed and installed to prevent settlement and damage to existing structures. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.

(vii) Shoring and bracing shall remain in place until it is no longer required to complete the Work.

(d) Monitoring Movement of Shoring

(i) The Contractor shall submit to the Contract Administrator a plan for monitoring the movement of shoring during construction a minimum of two (2) Working Days prior to the installation of shoring. The monitoring plan shall be performed by approved survey methods for vertical or horizontal movement of the shoring, acceptable to the Contract Administrator. Costs for monitoring shall be incidental to the installation of the temporary shoring.

E20.3 Measurement and Payment

(a) Shoring required for shafts to complete the Work will be incidental to the components of the Work to which shoring is required. No additional payment will be made for supplying materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E21. EXCAVATION, BEDDING AND BACKFILL

E21.1 General

(a) This Specification supplements requirements for excavation, bedding and backfill identified in CW 2030.

E21.2 Related Specifications

(a) Environmental Protection Plan - Section E6

(b) Feeder Mains – Section E23

(c) Sewer Mains – Section E26

E21.3 Submittals

(a) Submit shoring designs to Contract Administrator, in accordance with E18.

E21.4 Existing Utilities

(a) Arrange and pay for any required safety watches around existing utilities as per CW 1120.

(b) The Contractor shall arrange and provide temporary or permanent relocation of existing utilities, and or temporary support of existing utilities required for the excavation of the shafts. Work on private utilities may not occur without submittal and approval of your utility plan to the Contract Administrator and approval from the utility owner.

E21.5 Excavation

E21.5.1 The following clauses amend CW 2030:

(a) For the purpose this Specification, with regards to open cut installation only, boulders are defined as boulders, rock, concrete rubble and foundations greater than 1.0 cubic metre in volume, measured as a discrete unit, that are to be removed from the excavation to support the installation of the pipe.

(b) Solid rock and concrete excavation is defined as bedrock and buried concrete pavements that require blasting, drilling, splitting or breaking with additional equipment before being removed from excavations using normal mechanical excavation equipment.

(c) Excavation and disposal of tree roots and stumps shall be incidental to trench excavation for pipe installation. Tree roots and stumps are to be disposed of as per Item E21.6.

(d) Boulders large than 300 mm in diameter shall be considered unsuitable for backfill and shall be disposed of as described in E21.6.

E21.6 Disposal of Unsuitable or Surplus Excavated Material

E21.6.1 The Contractor is responsible for arranging for a disposal site for all excavated material, and associated Works including transportation and payment of tipping fees.

(a) Disposal of organic materials such as tree roots, stumps, soils contaminated with noxious weeds shall be the responsibility of the Contractor.

(b) Disposal of boulders larger than 300 mm shall be the responsibility of the Contractor.

(c) If the Brady Landfill or the Summit Road Landfill are used by the Contractor for disposing any unsuitable or surplus material under this Contract, the Contractor will be responsible to pay all tipping fees.

(i) Alternatively, the Contractor may locate a legal disposal site of their choosing in accordance with CW 3170 Item 9.4.

E21.7 Foundation and Bedding and Initial Backfill

E21.7.1 Foundation and Bedding to be Class B, Type 2 Bedding for trenches and shafts with PVC pipe, in accordance with City of Winnipeg Standard Detail SD-001.

(a) Shafts for trenchless CPKC railway crossing

(i) Backfill shafts up to bottom of Class B pipe bedding with cement stabilized backfill material in accordance with Table CW 2160.1 and as shown on the Drawings.

(ii) Cement stabilized backfill material shall be used to backfill all voids resulting from shaft construction between the vertical 45° feeder main bends.

E21.8 Backfill

E21.8.1 Excavations under or within one (1) metre of paved areas on roadways shall be Class 3 as per SD-002 (Class 2 backfill would also be acceptable, but at no additional cost), unless otherwise noted below or on the Drawings.

(a) Sturgeon Road open cut feeder main crossing shall utilize Class 1 backfill as shown on the Drawings.

E21.8.2 Material excavated when frozen, or when air temperature is less than 0°C, shall not be used as fill or backfill until material completely thaws.

E21.8.3 Backfill over-excavations resulting from bedrock or boulder removal with Type 1 material as directed by the Contract Administrator.

E21.8.4 The Contractor shall have personnel available for immediate repairs of settlement at shaft locations from the start of construction until final restoration is complete.

E21.9 Measurement and Payment

E21.9.1 All costs associated with Excavation, Bedding and Backfill as described herein are incidental to the installation of the feeder main and sewer main piping covered in CW 2110 and 2130 except the supplemental items listed below:

(a) Boulder Removal

(i) Excavation and disposal of boulders will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre of “Boulder Excavation”. Volume to be paid for will be the total number of cubic metres of boulders that are excavated and disposed of in accordance with this specification, accepted and measured by the Contract Administrator.

(ii) Individual boulder volumes will be calculated from the average diameter of each boulder that is excavated, as measured by the Contract Administrator.

(iii) No delay claims will be entertained relating to boulder removal. Payment for boulder removal shall include any delays, additional equipment or other costs incurred by the Contractor associated with boulder removal.

(iv) Boulder removal for construction of shafts associated with Section E30 shall be considered incidental to the Work.

(b) Solid Rock and Concrete Excavation

(i) For payment of solid rock and concrete excavation to be considered, the Contractor must notify the Contract Administrator as soon as the material is encountered.

(ii) Solid rock and concrete excavation will be considered for payment by the Contract Administrator only if the Contract Administrator witnesses that little to no progress is made by the Contractor attempting to excavate through the material with normal excavation equipment.

(iii) Bedrock removal for construction of shafts associated with Section E30 shall be considered incidental to the Work.

(iv) No delay claims will be entertained relating to solid rock and concrete excavation. Payment for solid rock and concrete excavation shall include any delays, additional equipment or other costs incurred by the Contractor associated with solid rock and concrete excavation.

(c) Surplus Material

(i) There shall be no measurement of surplus soil material or tree root and stump material disposed of at any disposal site. No additional payment will be made for disposal of surplus or waste soil materials. It shall be considered incidental to the cost of the Work.

(ii) There shall be no separate measurement for boulder disposal. No additional payment will be made for disposal of boulders that are unsuitable for backfill. It shall be considered incidental to the cost of the boulder removal.

E22. COLD WEATHER REQUIREMENTS

E22.1 Description

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

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

E22.2 Construction Methods

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

(i) Before any concrete is placed, all ice, snow, and frost shall be completely removed from all formwork, and other surfaces against which concrete temperatures of such surfaces raised above 7°C for twenty-four (24) hours minimum prior to concreting. Where concrete Work is to come in contact with the earth, the surface of the earth shall be completely free of frost when concrete is placed thereon.

(ii) Concrete aggregates and water shall be heated to not over 80°C. Concrete shall be not less than 20°C or more than 30°C in temperature when deposited. Concrete when placed during freezing weather, or if freezing is anticipated during curing period, shall be fully enclosed and the temperature of same maintained at not less than 20°C for five (5) days nor less than 5°C for an additional five (5) days.

(iii) Heating enclosures shall be strong and wind-proof, well ventilated with heating units so located as to prevent local overheating or drying of the concrete or damage from combustion gases. Only indirect fired heaters will be accepted. Units must be vented outside the enclosure. No direct fired units will be accepted.

(iv) The Contractor shall inform the Contract Administrator well in advance as to the methods of enclosure and frost protection they propose to employ.

E22.3 Measurement and Payment

(a) Cold weather requirements shall be considered incidental to the construction of cast-in-place concrete and no measurement or payment will be made for this item.

E23. WATER MAINS

E23.1 Description

(a) This Specification describes the supply and installation of feeder mains and shall supplement the requirements of CW 2110.

(b) The term “feeder main” shall be considered equivalent to the term “water main”.

E23.2 General

E23.2.1 Feeder main pipe installation is intended to be by open cut methods except for the following trenchless locations:

(a) Silver Avenue – Drawing 1-0798F-C0005-001

(b) Saskatchewan Avenue – Drawing 1-0798F-C0010-001

(c) Sturgeon Crushing Facility Approach – Drawing 1-0798F-C0012-001

E23.2.2 Deviations from this methodology must be submitted to the Contract Administrator for approval prior to commencement of Construction.

E23.2.3 Payment for reconstruction of the Sturgeon Road South crossing (Drawing 1-0798F-C0009-001) will be made in accordance with Section E47. Any other road reconstruction required as a result of the Works will be considered incidental to E7 Site Development and Restoration.

E23.2.4 Submittals

(a) Laying Schedule

(i) Submit laying schedule for review by the Contract Administrator. Laying schedule shall show general pipe layout, location of fittings and specials, proposed direction of lay and connection points.

(ii) Minor adjustments to pipe design plans to suit standard pipe lengths may be permitted by the Contract Administrator.

(b) Fittings

(i) Submit details of all fabricated fittings and specials, including details of proposed connections to existing pipes.

(c) Affidavit of Compliance

(i) An affidavit of compliance signed by an officer of the pipe manufacturer shall be provided stating that the pipe and fittings comply with this Specification, in accordance with Section 6.3 of AWWA C900.

E23.3 Materials

E23.3.1 All feeder main piping and fittings to be Poly Vinyl Chloride (PVC) AWWA C900 pipe conforming to City Approved Water Product Standard CoW-WM-01 and CoW-WM-02.

(a) Dimension Ratio (DR) to be 18.

(b) Approved products: Ipex Centurion, Westlake AquaSpring C900 or approved equal in accordance with B7.

E23.3.2 150 mm and 400 mm metallic water main piping at Offtake Structure 3 shall be ductile iron as shown on the Drawings and described in E36.

E23.3.3 Couplers for connection to existing PCCP feeder main shall be thrust restrained and suitable for both PVC and PCCP pipe.

(a) GF Multi/Joint 3007 Plus or approved equal in accordance with B7.

(i) Ensure coupler compatibility with existing pipe as per Item E23.4(h).

E23.3.4 Thrust Restraints:

(a) Mechanical restraints are to be installed at all PVC joints on and in between vertical bends, as noted on the Drawings.

(i) Acceptable product is PVC Stargrip Series 4400 or approved equivalent in accordance with B7. Contractor shall submit product information and/or shop drawings for mechanical restraints to be used for review and approval.

E23.3.5 Steel Casing as per Section E30.

E23.3.6 Tracer Wire System as per Section E28.

E23.4 Construction Methods

(a) PVC Pipe Installation

(i) Pipe installation to AWWA C605 and CW 2110 for PVC pipe.

(ii) Clean pipes, fittings, valves, and appurtenances of accumulated debris and water before installation. Carefully inspect materials for defects to approval of Contract Administrator. Remove defective materials from site.

(iii) Bevel or taper ends of PVC pipe to match fittings.

(iv) Handle pipe by approved methods. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.

(v) Lay pipes on prepared bed, true to line and grade. Ensure barrel of each pipe is in contact with shaped bed throughout its full length. Remove and replace defective pipe. Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation.

(vi) Face socket ends of pipe in direction of laying. For mains on a grade of 2% or greater, face socket ends up-grade.

(vii) Do not exceed permissible deflection at joints as recommended by pipe manufacturer.

(viii) Keep jointing materials and installed pipe free of dirt and water and other foreign materials. Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

(ix) Position and join pipes with equipment and methods approved by Contract Administrator. Do not use excavating equipment to force pipe sections together.

(x) Cut pipes in an approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

(xi) Align pipes carefully before jointing.

(xii) Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.

(xiii) Avoid displacing gasket or contaminating with dirt or other foreign material. Gaskets so disturbed or contaminated shall be removed, cleaned, lubricated and replaced before jointing is attempted again.

(xiv) Complete each joint before laying next length of pipe.

(xv) Minimize deflection after joint has been made.

(xvi) Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.

(xvii) Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by Contract Administrator.

(xviii) When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.

(xix) Do not lay pipe on frozen bedding.

(xx) Areas to be backfilled are to be free from debris, snow, ice, water and frozen ground.

(xxi) Do not use backfill material, which is frozen or contains ice, snow or debris.

(xxii) Protect valves and appurtenances from freezing.

(xxiii) Upon completion of pipe laying and after Contract Administrator has inspected Work in place, surround and cover pipes between joints with approved granular material placed to dimensions indicated or directed by Contract Administrator.

(xxiv) Hand place pipe zone material in uniform layers not exceeding 150 mm thick to minimum 300 mm over top of pipe. Do not dump material directly on top of pipe.

(xxv) Place layers of pipe zone uniformly and simultaneously on each side of pipe to prevent lateral displacement of pipe

(xxvi) Compact each layer and remaining backfill to Section CW 2030 - Excavation Bedding and Backfill.

(b) Steel Casing for Sturgeon Road Crossing:

(i) Install via open cut methods in accordance with CW 2110.

(ii) Welding as per E31.

(c) Frost Conditions

(i) No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Contract Administrator shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation. Every precaution must be taken to prevent frost from penetrating the ground to depths below the foundations during construction. Any pipe which, in the opinion of the Contract Administrator has been injured through neglect of this provision of the Specifications, shall be removed and made good by the Contractor and at the Contractor's expense.

(ii) Heating of the pipe, sand and gaskets shall commence when the ambient temperature falls below -5 C. The pipe shall be heated throughout with a low heat immediately prior to installation (warm to the touch).

(d) Thrust Blocks

(i) Thrust blocks shall be installed at all tees, wyes, elbows, bends, plugs, reducers and crosses and at locations shown on the Drawings. Thrust blocks shall consist of concrete as specified in Specification CW 2160 and shall be installed as shown on the Drawings. The thrust block shall bear against undisturbed soil and the soil shall be cut smooth and at the proper angle to the pipe. No horizontal struts or braces required for trench bracing shall remain in the concrete thrust block. A bond breaker consisting of 0.20 millimetre (8 mil) polyethylene sheeting shall be installed between fittings, valves, or plugs and the concrete of the thrust block to allow future removal of the thrust block without disturbing the fitting, valve or plug. Before any concrete is placed, all thrust block formwork shall be inspected and approved by the Contract Administrator.

(ii) Thrust blocks for piping smaller than 450 mm diameter shall be sized as per CW SD-004 and SD-005.

(iii) Thrust blocks for piping larger than 450 mm diameter shall be sized as shown on the Drawings.

(e) Thrust Restraints

(i) Mechanical thrust restraints shall be installed in accordance with manufacturer's recommendations at all vertical bends, and all pipe joints between vertical bends.

(f) Connection to Existing Feeder Mains

(i) Connections to the existing Rouge Road Feeder Main shall be completed in accordance with CW 2110 and E40.

(g) Tracer Wire System

(i) Install tracer wire and access ports in accordance with Section E28.

(h) Verify Connections to Existing Pipes

(i) The Works include connecting to the existing 600 mm diameter Rouge Road Feeder Main at the south extent of the project site.

(ii) The Contractor shall expose the pipe at the proposed connection locations to verify the actual horizontal/vertical alignment of the existing pipe, location of the nearest existing joint to the proposed tie in location, and determine the configuration and requirements of the tie-in.

(iii) The Contractor is responsible to procure the appropriate transition coupling necessary to make the connection as outlined on the Drawings.

(iv) Contractor shall submit Shop Drawings to the Contract Administrator for review prior to ordering any couplings or restraints.

(v) Adequate procurement time shall be allowed for manufacture and delivery of any transition couplings and restraints so as not to delay the project.

(vi) Once the connection locations and required materials are confirmed, the Contractor shall reinstate and/or repair the examined joints to the satisfaction of the City, and backfill any excavations made to expose the pipe.

(vii) The Contractor is responsible to ensure that the site is safe and secure between the time that the connections are verified, and the time that construction commences on the connections.

(viii) No separate measurement or payment will be made for verifying connections to existing pipes, and it will be considered incidental to the Works of the project.

E23.5 Measurement and Payment

(a) Measurement and payment for Water Mains shall be in accordance with CW 2110 for the diameter, class, bedding and backfill requirements listed on the Form B: Prices with the supplemental items listed below:

(i) Excavation, Bedding and Backfill, as described in E21, are incidental to Water Mains.

(ii) Tracer Wire System, as described in E28, is incidental to Water Mains.

(iii) Rouge Road Feeder Main Shutdowns works are incidental to Water Mains.

(iv) Surface Restorations will be paid as described in E7.

(v) Payment for the temporary or permanent relocation of existing utilities, and or temporary support of existing utilities required for the placement of shafts shall be incidental to Water Mains as specified in E18.

(vi) Cost of shaft construction and associated shoring required for the installation of the works described herein, is incidental to Water Mains.

(vii) Metallic water main piping and fittings within offtake structures and valve chambers are incidental to offtake structures and valve chambers as described in E34 and E35. Metallic water main piping and fittings beyond the transition flange outside of offtake structures and valve chambers shall be paid in accordance with CW 2110 for the items listed on the Form B: Prices.

(viii) For designated trenchless installation locations, any costs associated with a failed installation attempt, including costs for subsequent open cut installation, backfill, restoration and maintaining minimum traffic requirements is incidental to Water Mains.

(ix) Correction of alignment and grade exceeding the allowable variance will be at the Contractor’s own expense.

E24. WORK PRACTICES ON ASBESTOS-CEMENT PIPE

E24.1 Further to C6.26(d), the Contractor’s attention is directed to the possible health dangers associated with working with asbestos cement pipe and all work associated wit the existing AC water mains shall conform to the following publications:

E24.1.1 “Work Practices for Asbestos-Cement Pipe”, AWWA No. M16, published by the American Water Works Association.

E24.1.2 “Recommended Work Practices for AC Pipe”, 1977, published by the AC Pipe Producers Association.

E25. FEEDER MAIN PROTECTION AND OPERATING CONSTRAINTS

E25.1 General

(a) The Work involves construction activity in close proximity to the active 600 mm diameter Rouge Road Feeder Main.

(i) Close proximity shall be deemed to be any construction activity within a 5 m horizontal offset from the centreline of a feeder main.

(b) The Rouge Road Feeder Main is a critical component of the City of Winnipeg water supply system, and work in close proximity to the pipeline shall be undertaken with an abundance of caution. Large diameter pressure pipe generally has limited ability to withstand increased earth and live loading.

(c) PCCP typically fails in a non-ductile mode and has the potential to cause extensive consequential damage to infrastructure if failure should occur. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters.

(d) Work around the feeder main shall be planned and implemented to minimize the time period that Work is carried out in close proximity to the pipe and to ensure that the pipeline is not subjected to excessive construction related loads, including excessive vibrations and/or concentrated or asymmetrical lateral loads during backfill placement.

E25.2 Submittals

(a) Submit proposed construction equipment specifications to the Contract Administrator for review a minimum of ten (10) Business Days prior to construction. The equipment submission shall include:

(i) equipment operating and payload weights;

(ii) equipment dimensions, including wheel or track base, track length or axle spacing, track widths or wheel configurations; and

(iii) load distributions in the intended operating configuration.

(b) Submit a construction method statement to the Contract Administrator a minimum of ten (10) business days prior to construction. The construction method statement shall contain the following minimum information:

(i) proposed construction plan including excavation locations, haul routes, excavation equipment locations, and loading positions;

(ii) excavation plans, including shoring designs, for excavations occurring in close proximity to feeder mains where the excavation/shoring system is to be extended below the top of the feeder mains embedment zone (150 mm above the pipe); and,

(iii) Any other pertinent information required to accurately describe the construction activities in close proximity to the feeder main and permit the Contract Administrator to review the proposed construction plans. No work shall commence in close proximity to feeder mains, chambers, and other critical infrastructure until the equipment specifications and construction method statement have been submitted and accepted, and feeder main locations have been clearly delineated in the field. Work over feeder mains shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications on the pipe.

E25.3 Pre-Work, Planning and General Execution

(a) The Drawings provide the location of the feeder mains, chambers, and critical pipelines through the construction site. Pipe locations noted on the Drawings are based on the original record drawings. Locate critical infrastructure and confirm their position horizontally and vertically (if required) prior to undertaking work in close proximity to said infrastructure. Visually delineate all critical infrastructure identified herein on Site by use of paint, staking/flagging, construction fencing, snow fencing, or other suitable methods.

(b) Only utilize construction practices and procedures that do not impart excessive vibratory loads on feeder mains and chambers or that would cause settlement of the subgrade below feeder mains and critical pipelines.

(c) Only equipment and construction practices stipulated in the accepted construction method statement and the supplemental requirements noted herein may be utilized in close proximity to feeder mains, chambers, and other critical infrastructure identified herein.

(d) Construction operations should be staged in such a manner as to limit multiple construction loads at one time, (e.g., offset crossings sufficiently from each other, rollers should remain a sufficient distance behind spreaders to limit loads. A reasonable offset distance is 3 m between loads).

(e) Granular material, construction material, soil, and/or other material shall not be stockpiled on the pipelines or within 5 m of any critical infrastructure identified herein.

(f) Use only smooth edged excavation buckets, soft excavation or hand excavation techniques here there is less than 1.5 m of cover over the pipe. Where there is less than 1.0 m of cover, provide full time supervision and complete the excavation utilizing hand excavation or soft excavation methods.

(g) Equipment should not be allowed to operate while positioned directly over a feeder main except where permitted herein, outlined in the reviewed and accepted construction method statement.

(h) Excavation within 3 m of the outside edge of a feeder main and which extend below the feeder main obvert shall utilize shoring methods that prevent the movement of native in-situ soils (i.e. a tight shoring system).

(i) The Contractor shall ensure that all crew members understand and observe the requirements of working near feeder mains, valve chambers, and critical infrastructure. Prior to commencement of on-Site work, the Contractor shall jointly conduct an orientation meeting with the Contract Administer, all superintendents, foreman, and heavy equipment operators to make all workers on the Site fully cognizant of the limitations of altered loading on, the ramifications of inadvertent damage to, and the constraints associated with work in close proximity to feeder mains and critical pipelines. New personnel introduced after commencement of the Project need to be formally orientated as outlined herein. It is recommended that restrictions associated with the crossing, consistent with the Contractor's submitted method statement be posted on Site and near the crossing.

(j) Work should be planned such that equipment crossings of the existing FM are minimized. Crossings to be limited to a designated crossing location.

E25.4 Measurement and Payment

(a) No separate measurement or payment will be made for feeder main protection. It will be considered incidental to the Works of the project.

E26. WASTEWATER SEWERS

E26.1 Description

(a) This Specification shall cover the installation of the 350 mm wastewater sewer main. This Specification shall amend, and supplement Standard Specifications CW 2110 and 2130.

E26.2 General

E26.2.1 The 350 mm wastewater sewer pipe is intended to be converted into a water main at some point in the future, and therefore the CW 2110 material specifications apply to this Specification Section.

E26.2.2 Wastewater sewer installation is intended to be by open cut methods except for the following trenchless location:

(a) Sturgeon Road North – Drawing 13436

E26.2.3 Deviations from this methodology must be submitted to the Contract Administrator for approval prior to commencement of construction.

E26.2.4 Any road reconstruction required as a result of the Works will be considered incidental to E7 Site Development and Restoration.

E26.2.5 Flushing and pressure testing of the wastewater sewer shall be completed in accordance with E42.

E26.3 Submittals

(a) Laying Schedule

(i) Submit laying schedule for review by the Contract Administrator. Laying schedule shall show general pipe layout, location of fittings and specials, proposed direction of lay and connection points.

(ii) Minor adjustments to pipe design plans to suit standard pipe lengths may be permitted by the Contract Administrator.

(b) Fittings

(i) Submit details of all fabricated fittings and specials.

(c) Affidavit of Compliance

(i) An affidavit of compliance signed by an officer of the pipe manufacturer shall be provided stating that the pipe and fittings comply with this Specification, in accordance with Section 6.3 of AWWA C900.

E26.4 Materials

E26.4.1 All wastewater sewer piping and fittings shall conform to CW 2110 and shall be Poly Vinyl Chloride (PVC) AWWA C900 pipe conforming to City Approved Product Standard CoW-WM-01.

(a) Dimension Ratio (DR) to be 18.

E26.4.2 Restrained joint PVC pipe shall be used for trenchless installations unless otherwise approved by the Contract Administrator.

(a) Approved product: IPEX Terrabrute, Westlake Certa-Lok RJIB or approved equal in accordance with B7.

E26.4.3 Equipment

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

E26.5 Construction Methods

E26.5.1 Installation

(a) Installation of sewer pipe shall be by open cut methods except where shown on the Drawings or otherwise approved by the Contract Administrator.

(i) Trenchless installation shall be in accordance with CW 2130.

(b) Install pipe to line and grade shown on the drawings and in accordance with CW 2130 Item 3.6.

E26.5.2 Trench Shoring and Excavation

(a) Work must be completed in accordance with CW 2030 unless otherwise indicated by the Contract Administrator.

(b) The Contractor shall take precautionary steps to prevent damage from construction activities to adjacent properties. All damage to adjacent properties caused by the Contractor’s activities shall be repaired to equal or better condition than prior to

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

(c) The Contractor shall provide heating and hoarding of backfill material when the temperature is at or below 5° C or if the temperature will fall below 5° C within 24 hours after placing the material.

E26.6 Measurement and Payment

(a) Measurement and payment for Wastewater Sewers shall be in accordance with CW 2130 for the diameter, class, bedding and backfill requirements listed on the Form B with the supplemental items listed below:

(a) Excavation, Bedding and Backfill, as described in E21, are incidental to Wastewater Sewer.

(b) Surface Restorations will be paid as described in E7.

(c) Payment for the temporary or permanent relocation of existing utilities, and or temporary support of existing utilities required for the placement of shafts shall be incidental to Wastewater Sewer as specified in E18.

(d) Cost of shaft construction and associated shoring required for the installation of the works described herein, is incidental to Wastewater Sewer.

(e) Correction of alignment and grade exceeding the allowable variance will be at the Contractor's own expense.

E27. WATER SERVICES

E27.1 50 mm service pipe associated with the automatic flushing unit shall be Type K copper supplied and installed in accordance with CW 2110.

E27.2 Pre-insulated service pipe shall meet the following requirements:

(a) 50 m thick U.I.P. factory applied rigid polyurethane foam insulation.

(b) Provide 1.27 mm thick black polyethylene outer protective jacket.

(c) Insulation joints to be field insulated with compatible insulation half-shells and heat shrink sleaves.

(a) Approved manufacturer: Urecon or approved equal in accordance with B7.

E27.3 Heat trace cable shall meet the following requirements:

(a) Heat trace cable shall be self-regulating consisting of a continuous core of conductive polymer extrude between two copper bus wires with a fluoropolymer outer jacket.

(b) 120V operating voltage and a minimum 8 watts/foot.

(a) Approved product: Raychem XL-TRACE 8XL1-CT or approved equal in accordance with B7.

E27.4 Measurement and Payment

(a) Measurement and payment for Water Services shall be in accordance with CW 2110 for the diameter, class, bedding and backfill requirements listed on the Form B. Factory applied insulation and heat trace shall be considered incidental to Water Services. Note: Un-insulated, heat traced service piping installed within chambers shall be considered incidental to Section E35.

E28. TRACER WIRE SYSTEM

E28.1 Description

(a) This Specification describes the supply and installation of tracer wire and access ports for the 750 mm feeder main piping.

E28.2 Materials

(a) Tracer Wire:

(i) #14 AWG solid copper conductor in accordance with UL 83.

(ii) HMWPE insulation in accordance with UL 83, coloured blue to indicate potable water.

(b) Access Port:

(i) Standard CoW two piece valve box. Cast iron upper casing to be marked “W” for water.

E28.3 Construction Methods:

(a) Tracer Wire:

(i) Installation of tracer wire shall always be on the same side of the pipe. Tracer wire to be installed on the east or south side of the feeder main.

(ii) Tape tracer wire to pipe minimum every 3.0 m.

(iii) Ensure placement of bedding does not damage or strain tracer wire.

(b) Access Ports:

(i) Access ports shall be installed above every horizontal bend on the 750 mm feeder main pipe.

(ii) Install access ports flush with existing ground.

(iii) Backfill access ports with sand once tracer wire is installed as shown on the Drawings. Do not over fill access port, ensure valve cover is able to fully close.

E28.4 Testing:

(a) Once fully installed, the Contractor shall test the tracer wire system with typical locating equipment, ensuring proper function of the system.

(b) The Contractor shall be responsible for locating and repairing any breaks in the tracer wire and any other defects in the locating system.

E28.5 Measurement and Payment

(a) Measurement and payment for Tracer Wire System shall be as per the following:

(i) Tracer Wire: No separate measurement or payment shall be made for installation of tracer wire and associated works. Tracer wire installation shall be considered incidental to feeder main installation described in Section E23.

(ii) Access Port: No separate measurement or payment shall be made for installation of access ports and associated works. Access port installation shall be considered incidental to supply and installation of feeder main fittings described in Section E23.

CPKC RAILWAY CROSSING

E29. CPKC RAILWAY RIGHT OF WAY CROSSING REQUIREMENTS

E29.1 Description

E29.1.1 This Specification covers the potential costs borne by the Contractor imposed by CPKC Railway in order to comply with the Crossing agreement. The crossing agreement must be adhered to for all Work shown on the Drawings within the CPKC right-of-way.

E29.1.2 Installation through the CPKC right-of-way is subject to the additional requirements of the railway. The following documents shall apply:

(a) Minimum Safety Requirements for Contractors Working on CPKC Property in Canada (CPKC)

(b) CPKC Geotechnical Protocol for Pipeline and Utility Crossing(s) under Railway Tracks (CPKC)

(c) CP – SP-TS-2.39 – Pipeline and Cable Installations within Railway Right of Way (CPKC)

(d) Standards Respecting Pipeline Crossings Under Railways – TC E-10 (Transport Canada)

E29.1.3 Crossing Agreement

(a) The installation of the pipeline through the CPKC right-of-way is dependent on the execution of a crossing agreement between the City of Winnipeg and CPKC. KGS Group submitted the crossing agreement on behalf of the City on March 28, 2024 consisting of Drawings 1-0798C-C0001-001, 1-0798C-C0002-001 and a geotechnical assessment report. The complete submittal package is included in Appendix D. These appendix documents are for information only and do not form part of the Contract. CPKC has not yet formally approved the crossing application nor has the crossing agreement been executed. It is anticipated that the agreement will be fully executed in advance of commencement of the trenchless Work.

(b) Railway Track Monitoring Plan

(i) Details of the monitoring plan as identified in Section E33.

E29.2 Submittals

E29.2.1 The Contractor shall submit an Emergency Response Plan outlining the steps to be followed if the event of excessive soil loss or settlement. The Emergency Response Plan shall include the location and contact information for the nearest cement or grout plant to address voids/sinkholes. The Contractor shall also determine with the CPKC Roadmaster the nearest source of ballast material should tamping/resurfacing of the railway track be required.

E29.3 Methods

E29.3.1 The Contractor is responsible for all coordination with CPKC and any fees required to meet the CPKC requirements before and during the Work.

E29.3.2 Flagging and Signals

(a) All charges for flagging and signals protection incurred to complete the work listed herein, in the geotechnical report, and shown on Drawings shall be paid by the Contractor.

(b) Prior to the start of construction, a minimum notice of fourteen working days must be given to CPKC to arrange flagging protection.

E29.3.3 Settlement and Construction Monitoring

(a) Refer to Section E33 and the Drawings for monitoring requirements for railway monitoring.

E29.3.4 Railway Safety

(a) Comply with CPKC Minimum Safety Requirements for Contractors working on Railway Property, including training, protective equipment and procedures.

E29.3.5 Emergency Response Plan

(a) If an urgent or near urgent defect is detected during monitoring, an on-site meeting shall be conducted to determine the cause of the defect and remedial action.

(b) The Contractor will be required to carry-out remedial action as directed by the Contract Administrator and agreed upon by CPKC.

E29.4 Measurement and Payment

(a) Costs incurred by the Contractor from CPKC associated with the Work shown on the Drawings and described within the Specifications within the CPKC right-of-way, will be paid from the allowance under the Contract Unit Price “CPKC Right-of-Way Crossing Requirements”.

(b) The costs paid shall be the actual invoiced costs and any allowable mark-ups as stated within the General Conditions.

E30. TRENCHLESS CPKC RAILWAY CROSSING

E30.1 Description

E30.1.1 This Specification supplements and amends CW 2110 and shall cover the installation of the feeder main pipe works beneath the CPKC railway as shown on the Drawings.

E30.2 Materials

E30.2.1 Casing pipe shall be steel, in conformance with the following:

(a) New, smooth wall, seamless or welded carbon steel pipe which conforms to ASTM A252/A252M GR2 or better. No hydrostatic testing will be performed.

(b) Steel pipe shall have a minimum yield strength of 241 MPa.

(c) Pipe casing diameter shall be 1200 mm IPS minimum as shown on the Drawings.

(d) Minimum pipe wall thickness shall be 19.1 mm as shown on the Drawings. The Contractor is responsible to independently assess the need to increase the wall thickness based on their estimated installation loads.

(e) Pipe segment lengths shall be determined by the Contractor.

(f) End finish: beveled to an angle of 30 +5°, -0°.

(g) Pipe joints: to be complete joint penetration (CJP) groove weld butt joints to CSA W59.

(h) Joints welded from one side without backing are not prequalified CJP groove welds under CSA W59 and require qualification in accordance with CSA W47.1.

E30.2.2 Carrier Pipe:

(a) 750 mm PVC AWWA C900 in accordance with E23.

(b) All pipe joints within the steel casing pipe shall be installed with mechanical restraints in accordance with Section E23.

(c) Restrained joints may include welded joints, fused joints, integrally restrained joints, and external mechanically restrained joints.

(d) The Contractor is responsible to ensure that external mechanical restraints will fit properly within the casing pipe and are compatible with the casing spacers.

E30.2.3 Casing Spacers:

(a) Shell/band: 14-gauge steel, 304 stainless or carbon with shop coat.

(b) Risers: 10-gauge steel, 304 stainless or carbon with shop coat, MIG welded to shell/band when runner height extension is required.

(c) Runners: glass reinforced polymer plastic.

(d) Fasteners: 304 stainless steel.

(e) Configuration:

(i) Centered if no backfill grout is specified on the Drawings.

(ii) Centered and restrained if backfill grout is specified on the Drawings.

(iii) The Contractor may elect to use self-restraining casing spacers where applicable.

(iv) The Contractor is responsible to ensure that casing spacers will fit properly within the casing pipe prior to ordering.

E30.2.4 End Seals:

(a) Manufactured end seals: synthetic rubber with 304 stainless steel banding straps.

E30.3 Construction Methods

E30.3.1 Installation of steeling casing pipe shall be by down the hole hammer (DTH) or microtunnelling in accordance with E31 and E32.

E30.4 Measurement and Payment

E30.4.1 Trenchless CPKC Railway Crossing shall be measured on a linear metre basis and paid at the contract unit price for "Trenchless CPKC Railway Crossing" for either of the approved methods described in E31 and E32. The price shall include all work described herein and includes but shall not be limited to the boring/tunnelling, casing and carrier pipe, end seals, pipe restraints, construction of shafts, bedrock and boulder excavation, supply and installation of excavation support, bedding, backfilling, surface reinstatement and all appurtenances and miscellaneous materials.

(a) Measurement for length of pipe will be made horizontally at grade above the centreline of pipe through shafts from drive face of drive shaft to receiving face at receiving shaft.

(b) Repair of damage to underground and surface structures due to surface subsidence and soil heaving caused by the installation will be at the Contractor's own expense.

(c) Bedding and backfill described in E21 will be incidental to "Trenchless CPKC Railway Crossing".

(d) Surface restorations described in E7 will be incidental to "Trenchless CPKC Railway Crossing".

(e) Shoring described in E20 will be incidental to "Trenchless CPKC Railway Crossing".

E31. TRENCHLESS CPKC RAILWAY CROSSING - DOWN THE HOLE HAMMER INSTALLATION

E31.1 Description

(a) This Section includes the minimum requirements for the installation of the steel encasement pipe by Down the Hole Hammer (DTH) for the Trenchless CPKC Railway Crossing.

E31.2 General

(a) Qualifications: The Contractor shall submit the qualifications of the equipment operator as required in B13.

(b) Down-the-hole (DTH) hammer work plan:

(i) Submit a detailed description of the down-the-hole (DTH) hammer casing installation procedure at least twenty (20) working days prior to the scheduled mobilization for the crossing. The equipment selected by the Contractor shall be compatible with the geologic conditions described within the geotechnical investigation. The Contractor is solely responsible for evaluating the ground conditions and ensuring the appropriate equipment and installations procedures are employed during the work. The work plan shall include:

(i) Detailed description of the DTH hammer casing installation methodology (method statement).

(ii) DTH hammer installation equipment specifications and capabilities.

(iii) Description of the excavation system including driver bit, casing shoe, and casing bit.

(iv) Site layout plan including locations and dimensions of all trenchless working pits.

(v) Working pit excavation Shop Drawings detailing support structures or alternative methods for stabilizing the walls. Support structure Shop Drawings and specifications are required to be authenticated by a professional engineer registered to practice in the Province of Manitoba, as required by Manitoba OH&S Legislation.

(vi) Groundwater management plan for working pit excavations.

(vii) Casing pipe jointing procedure, including welding procedure data sheets (WPDSs) and/or welding procedure specifications (WPS) to CSA W47.1.

(viii) Welder qualifications.

(ix) Carrier pipe insertion plan, including carrier pipe jointing procedures and mitigation strategies to limit carrier pipe joint damage and over-insertion/over-belling (where applicable).

(x) Contact grout mix design and grouting plan including injection port (locations, type, frequency/spacing, and closure details), and injection pressures.

(xi) Settlement monitoring plan.

(xii) Contingency procedures to address the following:

- Inadvertent utility strikes, including power, natural gas, water, sewer, or telecommunication lines.
- Obstruction, inability to advance, or damaged tooling/equipment.
- Unexpected ground conditions.
- Deviation from the design line and grade exceeding the specified tolerances.
- Ground movement exceeding the specified tolerances.

(xiii) Schedule of the work including sequence of working pit excavations, casing pipe installation, carrier pipe insertion, contact grouting (where applicable), backfill grouting (if specified), and working pit backfill.

(ii) Product Data:

(i) Submit mill test certificates/mill test reports for the casing pipe steel.

(ii) Submit manufacturer's instructions, printed product literature and data sheets for carrier pipes, casing spacers, casing end seals, joint restraint systems, and working pit backfill materials.

(c) Close Out Submittals

(i) Field Notes:

(i) A daily logbook must be kept for all installations and submitted upon crossing completion. The daily logbook shall include, at a minimum:

(ii) The position of the casing pipe in relation to the design line and grade.

(iii) The date, starting time, and finish time for each casing pipe segment installed.

(iv) Advance rates.

(v) Jacking forces or hammer strokes per minute.

(vi) Quantity and type of lubrication, if used.

(vii) Quantity of spoil excavated.

(viii) Quantity of contact grout, if used, per port, and locations of ports.

(ix) Settlement monitoring survey results.

E31.3 Materials

(a) Steel Casing Pipe

(i) Steel Casing Pipe as per Section E30

(b) Carrier Pipe

(i) Carrier pipe as per Section E30

(c) Casing Spacers

(i) Casing Spacers as per Section E30

(d) End Seals

(i) End Seals as per Section E30

(e) Contact and Backfill Grouts

(i) Compressive Strength: minimum 2 MPa at 28-days, unless specified elsewhere.
(ii) Portland cement: to CSA A3000, Type HS, low heat of hydration.
(iii) Water: to CSA A23.1.
(iv) Aggregates: to CSA A23.1, normal-density fine aggregates.
(v) Admixtures: subject to the approval of the Engineer.

(f) Casing Pipe Bedding and Surround Material
(i) Flowable cement-stabilized fill to CW 2160.

(g) Working Pit Backfill Material
(i) Flowable cement-stabilized fill to CW 2160.

(h) Crossing Warning Signs
(i) Warning signs to CSA Z662 or local requirements, whichever is more stringent.

E31.4 Construction Methods

(a) Pre-Commencement
(i) All subsurface utilities within 25 m of the proposed alignment must be identified and location marked on the surface. Owners of subsurface utilities within 25 m of the proposed alignment must be notified of the impending work through Click Before You Dig Manitoba or directly if not a member of the service.
(ii) Contractor to daylight and protect utility crossings in accordance with the relevant crossing agreements.

(b) Working Pit Excavations
(i) Do excavation Work in accordance with CW 2030 and all relevant Manitoba OH&S Legislation.
(ii) Working pit dimensions and means of wall support shall be determined by the Contractor based on the site conditions and constraints, anticipated ground and groundwater conditions, and the proposed trenchless installation equipment.
(iii) Working pit dimensions shall conform to constraints specified on the Drawings.
(iv) Support structures shall be designed and authenticated by a professional engineer registered to practice in the Province of Manitoba, as required by Manitoba OH&S Legislation and E20.
(v) The Contractor shall manage the inflow of groundwater and surface water as required to keep working pits free of water during the performance of the work.

(c) DTH Hammer Casing Installation
(i) The Engineer must be notified 48 hours in advance of starting work. Trenchless crossings shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer's approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract.
(ii) The Contractor is responsible to establish and use benchmarks to furnish and maintain all reference lines and grades for any guidance systems used and is fully responsible for the accuracy of the work and any corrections. Guidance systems shall be mounted independently from the thrust block and jacking frame.
(iii) Install casing pipe as required to satisfy the line and grade of the carrier pipe as shown on the Drawings, the tolerance for line shall be ± 100 mm horizontal deviation and the tolerance for grade shall be ± 100 mm vertical deviation.
(iv) The Contractor shall determine the appropriate radial overcut for the anticipated ground conditions, however in no case shall the radial overcut exceed 19 mm.
(v) If the casing pipe installation does not meet the specified tolerances for line and grade, the Contractor shall correct the installation including any necessary redesign of the pipeline or structures and acquisition of necessary easements. Corrective

work shall be completed at no additional cost to the Owner and is subject to approval by the Engineer.

(vi) Trenchless installations shall be executed such that settlement and/or heave is minimized, the in-place steel casing shall have full bearing against earth, and no voids are left in any portion of the Work.

(vii) The Contractor shall monitor spoil material, quantity, and consistency, and make suitable changes to the trenchless installation method to control ground movements and minimize over excavation as required.

(viii) Spoil material from the trenchless operations shall be disposed of off-site by the Contractor at an appropriate facility.

(ix) Spoil material demonstrating unexpected ground conditions must be stored on site for review by the Engineer.

(x) The Contractor shall monitor jacking or ramming forces and ensure that installation forces remain below the axial capacity of the casing pipe and welded pipe joints.

(xi) The Contractor is responsible for the inspection of all welds. Support the pipe segments in the working pit and tack weld as required to ensure a straight joint before full circumferential welding. Complete welding in accordance with the submitted WPS and/or WPDSs.

(xii) On completion of trenchless crossings, contact grout the annular space between the casing pipe and the ground and any voids outside the casing pipe.

(d) Carrier Pipe Insertion

(i) Handle and join carrier pipes in accordance with CW 2110 and E23.

(ii) Use approved blocking method to guide carrier pipe into casing in true alignment.

(iii) Place casing spacers within 0.3 m of carrier pipe joints or immediately outside of external mechanical joint restraints.

(iv) Spacers for the remaining pipe barrel shall not exceed a separation of 1.8 m, or less, as based on manufacturer's recommendations for carrier pipe support.

(v) Place casing spacers within 0.3 m of each end of the casing.

(vi) Clearance between casing spacer risers and the casing pipe shall be a maximum of 25 mm when carrier pipe is in position in a centered and restrained spacer configuration.

(vii) Join carrier pipes one length at a time outside of the casing. Push or pull the carrier pipe into position.

(i) Prevent over-insertion/over-belling of the carrier pipe joints if the pipe is pushed into position.

(ii) Prevent separation of the carrier pipe joints if the pipe is pulled into position.

(viii) Place end seals on each end of the casing.

(ix) Manufacturer's recommendations for installation shall be followed where applicable.

(e) Working Pit Backfill

(i) Backfill working pits with flowable cement-stabilized fill.

(ii) The Contractor shall implement measures to avoid flotation of the carrier pipe within the working pit; measures may include placement of unshrinkable fill in small lifts, ballasting/weighting of the carrier pipe, and/or anchoring/blocking of carrier pipe.

(f) Surface Restoration

(i) After backfilling working pits, restore the ground surface as indicated on the Drawings.

E31.5 Measurement and Payment

(a) There shall be no separate measurement or payment for the work associated with Down the Hole Hammer Installation. Payment for Down the Hole Hammer Installation and all associated works shall be included in the price for Trenchless CPKC Railway Crossing.

E32. TRENCHLESS CPKC RAILWAY CROSSING - MICROTUNNELLING INSTALLATION

E32.1 Description

(a) This section outlines the minimum requirements for the installation of jacking pipes using microtunnelling construction techniques. The Contractor is responsible for selecting the means and methods to complete construction of the feeder main encasement using a one-pass installation of jacking pipe between the shaft locations shown on the Drawings.

E32.2 Qualifications

(a) The Contractor shall meet the qualification requirements listed in B13.

E32.3 Design Criteria

(a) The microtunnelling equipment shall be compatible with the geologic conditions described in the GBR and anticipated by the Contractor. The Contractor is solely responsible for evaluating the ground conditions and ensuring appropriate equipment and installation procedures are employed during the work. The tooling shall be capable of excavating material with the properties as identified in the GBR.

(b) The MTBM shall be equipped for automatic, continuous, real-time, electronic data logging with automatic information backup system.

(c) The articulated joints between the segments of the MTBM shall be watertight. The tail of the MTBM shall be gasketed to prevent material from entering the machine and the first jacking pipe.

(d) The MTBM shall be steerable in both the vertical and horizontal directions to install the jacking pipe on the line and grade shown on the Drawings. Variations from the design line shall not exceed six (6) percent of the MTBM diameter or 50 mm, whichever is greater. Variations from the design grade shall not exceed three (3) percent of the MTBM diameter or 25 mm, whichever is greater. Under no circumstances shall the steering deviation exceed one half (1/2) of the allowable pipe joint deflection recommended by the jacking pipe manufacturer. Steering corrections shall be made in accordance with criteria provided in this Specification.

(e) A laser or theodolite guidance system shall be used to guide and continuously monitor line and grade. The guidance system shall be capable of functioning at the intended maximum drive length without loss of accuracy or reliability.

(f) The cutter wheel shall have a reversible drive system to allow rotation in either clockwise or counterclockwise directions to minimize rotation or roll of the MTBM. The cutter wheel of the MTBM shall be accessible to allow manned entry to access, inspect, and replace worn out tooling during a drive without the use of a rescue shaft. Cutter discs are to be rear mounted to allow removable from inside the excavation chamber.

(g) The Contractor shall determine the appropriate radial overcut for the anticipated ground conditions, however in no case shall the radial overcut exceed 20 mm. The Contractor shall ensure that their selected overcut does not cause pipe joint deflections that exceed the allowable values as recommended by the pipe manufacturer.

(h) The Contractor shall use a properly formulated drilling fluid engineered to the ground conditions outlined in the GBR.

(i) Lubrication/grout ports shall be provided at a minimum as frequently as every third pipe. A lubrication port shall also be provided in the shield of the MTBM. The Pipe manufacturer shall install these ports within the pipe segments at the time of pipe manufacture. The lubrication ports shall have a minimum diameter of 31.25 mm and be threaded to allow connection of the lubrication and grouting systems. All ports shall be fitted with a one-way valve.

(j) Lubrication shall be continuously injected during pipe jacking operations to reduce frictional resistance between the excavated bore and the outside of the jacking pipe. Lubrication shall include a mixture of bentonite and/or polymers (including anti-swelling additives) and water and shall be suitable for the ground conditions described in the GBR.

(k) Upon completion of the microtunnel drive, grout shall be injected into the annular space through all ports. Once grouting has been completed, each port shall be sealed as per the manufacturer's recommendations.

(l) The thrust block shall be designed to withstand the maximum jacking force that the jacking system can produce without excessive deflection or displacement set by the shaft designer, with a factor of safety of 1.5. Launch and reception seals shall be provided at the launch and reception shafts, respectively.

(m) The jacking system shall be capable of uniformly distributing the jacking force to the end of the jacking pipe. The maximum allowable jacking force applied to the pipe shall not exceed the pipe manufacturer's recommended allowable eccentrically applied jacking load.

(n) Intermediate jacking stations (IJSs) shall be designed using a continuous steel casing fabricated to the same outside diameter as the jacking pipe. The steel cylinder shall be protected from corrosion with an approved epoxy paint system. Special recessed interjack pipe shall be used to accommodate the IJS. Mechanical joint shall be used between the shell and the interjack pipe to provide a watertight pipe joint during operation and after IJS removal. The steel casing and closed IJSs shall have an equal level of protection to the regular jacking pipe joints. The Contractor shall determine the required spacing of IJSs based on the ground conditions outlined in the GBR, estimated jacking forces, and thrust capacities of the jacking pipe and jacking frame.

(o) The spoil conveyance and separation system shall be designed for the full range of ground conditions as described in the GBR. The separation system shall be compatible with the anticipated excavation rate, effective in removing the spoils from the slurry, compatible with the available staging area, and compatible with noise control requirements.

(p) The MTBM shall be equipped with a continuous flammable gas monitor (with alarms if gas concentrations exceed regulatory thresholds).

E32.4 Submittals

(a) Provide sufficient detail to allow the Engineer to review whether the proposed equipment, materials, and procedures meet the requirements of the Specifications. Review of the Contractor's submittals by the Engineer shall not be construed in any way as relieving the Contractor of their responsibilities under this Specification.

(b) Microtunnelling Work Plan: Submit a work plan complete with drawings, written descriptions, procedures, and manufacturer's information identifying the details of the proposed method of construction, equipment, materials, and the sequence of operations during construction. This work plan shall include:

(i) MTBM specifications from the manufacturer.

(ii) Description of the tooling that will be used to excavate the materials identified in the GBR. Submit confirmation that the proposed equipment and methods can complete the required drive lengths within the identified geotechnical materials for the project. Explain the suitability of the proposed equipment for the ground conditions identified in the GBR.

(iii) Provide procedures for tooling inspection and changes during a microtunnelling drive.

(iv) Description of the alignment control and guidance systems. Provide details of surveying methods that will be used to set guide rails, jacking system, and guidance system positions. Provide description of procedures to check and reset guidance system during microtunnelling. Provide details of guidance system confirming the required line and grade can be achieved within the specified tolerances for the required drive lengths and curved section. Provide manufacturer's literature, drawings, and certificate of the calibration for the laser or theodolite system.

(v) At least one of the tunnel drives is expected to transition from underlain bedrock to the overburden material. Explain how pipe grade will be maintained in the transition zones between the underlain bedrock and clay till overburden materials. Detail the controls that will be used to stabilise the face in the mixed face ground conditions.

(vi) Description and capacity of the jacking system including details of the thrust ring, thrust block, jacking controls, hydraulic pressure to jacking force conversions, and hydraulic jack calibration data.

(vii) Description and capacity of the IJSs including placement, number of hydraulic cylinders, hydraulic pressure to jacking force conversions, calibration data, interjack pipe and shell materials, proposed spacings, and method of operation. Submit details including dimensions, seals, measures for corrosion protection, and method of abandonment and final seal configuration.

(viii) Description of lubrication system including materials to be used, manufacturer's literature, safety data sheets (SDS) sheets, mix equipment, procedure for lubricating the jacking pipe, and volume requirements.

(ix) Description of the slurry separation system including details of course and fine shaker screens, hydrocyclones, centrifuge equipment, holding tank capacity, separation rates, slurry additives (including SDS sheets), noise abatement provisions, and procedures for handling contaminated media.

(c) Shop Drawings and Equipment Layout Drawings:

(i) Submit shaft layout drawings detailing dimensions and locations of all equipment within available staging areas at each shaft location required to support microtunnelling operations. Equipment shall include cranes, front-end loader, jacking pipe stockpiling, spoil transfer areas, spoil hauling equipment, pumps, generators, lubrication plant, control cabin, separation plant, tool trailers, containers, and any other required equipment.

(ii) Submit MTBM shop drawings including configuration of cutter wheel and overcut tolerances.

(d) Construction Schedule:

(i) Submit a detailed schedule showing all major construction activities and durations including mobilization, site preparation, shaft construction, working slab construction, base slab construction, jacking equipment setup, launch seal installation, microtunnelling, exit seal installation, MTBM retrieval, contact grouting, shaft backfilling, site restoration and cleanup, and demobilization. Schedule is to be maintained and updated by the Contractor every two (2) weeks. Copies of revised schedules shall be provided to the Consultant.

(e) Calculations: Submit the following supporting design calculations. The Contractor shall clearly state all assumptions and values used in their calculations.

(i) Theoretical jacking force calculations for each drive based on the jacking pipe size and material, geometry, IJS placement strategy, installation depth, ground and groundwater conditions outlined in the GBR and drive length.

(ii) Maximum allowable jacking force calculations with respect to the Contractor's means and methods and IJS placement strategy.

(iii) Maximum allowable lubrication pressure calculations based on the lubrication mix design, system operating parameters, installation depth, and ground and groundwater conditions outlined in the GBR with the intent of preventing inadvertent returns.

(iv) Maximum allowable grouting pressure calculations based on contact grout mix design, system operating parameters, installation, depth, and ground and groundwater conditions outlined in the GBR with the intent of preventing inadvertent returns.

(f) Jacking Pipe Details: Provide manufacturer recommendations for allowable jacking loads and ultimate jacking loads. Submit details of pipe restraint to prevent movement of jacking pipe backwards into the launch shaft during stoppages and main jack retractions.

(g) Safety Plan: Submit a detailed safety plan for all work activities. The plan shall include details of air monitoring equipment, frequency of calibrating instruments, and procedures for lighting, ventilation, and electrical safeguards. Provide the name and qualifications for the site safety representative responsible for implementing the plan during the work. Safety

plan shall be in accordance with Provincial Regulatory and City of Winnipeg safety guidelines.

(h) Daily Records: Daily records shall be submitted to the Engineer for review by noon on the day following the shift for which the data or records were taken. These records shall include date, time, operator, tunnel drive designation, jacking pipe number and installed length, time required to jack each pipe, , jacking force, rate of advance, cutter wheel speed and torque, , line and grade offsets, machine roll, IJS usage and force, lubrication type, volume injected, material properties, and pressures, slurry inflow and outflow rates and pressures, , use of high pressure jets, face pressure, spoil volume, geotechnical conditions encountered, guidance system adjustments, ground water inflow rates, tooling replacements, slurry additives and properties, and problems encountered. Manual machine recordings of these parameters shall be recorded at intervals of no less than three times per pipe. Computer recorded data of machine performance parameters should be referenced to time and distance and should be recorded at time intervals of one minute or less.

(i) Contingency Plans: Submit contingency plans for the following list or problems that may be encountered during microtunnelling operations.

(i) Inability to advance the MTBM.

(ii) Jacking forces exceeding the allowable limits for the jacking pipe, IJSs, main jacking system, or thrust block.

(iii) Wearing out of tooling prior to reaching the reception shaft.

(iv) Steering difficulties resulting in line and grade tolerances being exceeded.

(v) Excessive pipe separation at joints.

(vi) Pipe movement into launch shaft during stoppages and main jack retractions.

(vii) Guidance system misalignment or distortion by heat, humidity, or physical disturbance.

(viii) Damage or failure of jacking pipe.

(ix) Inadvertent returns to the surrounding formation (loss of drilling fluid) or to the ground surface (hydrofracture).

(x) Obstruction removal.

(xi) Over excavation.

(xii) Encountering unexpected ground / geotechnical conditions.

E32.5 Quality Assurance

(a) The Contractor’s surveyor responsible for line and grade control shall have a minimum of 5 years experience in tunnelling and precision surveying. The Contractor’s surveyor shall have a minimum of three tunnelling projects for which they were responsible for line and grade. All survey work shall be completed in SI units.

(b) The Contractor shall allow access to the Engineer and shall provide necessary assistance and cooperation to aid the Engineer in documenting observations, measurements, and sample collection prior to, during and following all pipe jacking operations. Access shall include, but is not limited to:

(i) Full access to the MTBM, and jacking system during all site activities to visually observe jacking forces, tooling wear, and steering corrections.

(ii) Full access to the operator control room prior to, during, and following all microtunnelling operations. This shall include providing visual access to real-time operator control screens, gauges, and indicators. The display language of digital readouts, gauges and indicators shall be translated to English and denoted on site in English if the output is not natively in English. The operating readings and parameters shall be displayed and recorded in SI units.

(iii) Full access to the launch and reception shafts and installed pipeline to visually inspect installed jacking pipes, shaft seals, and line and grade.

(iv) Full access to the slurry separation plant to collect samples a minimum of once per installed pipe section or every three (3) metres from the shaker screens. This shall include access to the shaker screens, hydrocyclones, conveyor belts, centrifuge equipment, and slurry and spoil holding tanks.

(v) Full access to the lubrication plant to visually inspect storage and mixing tank levels, lubrication pressures and pumping rates, amount and type of additives, and collection of samples to determine lubrication properties.

(c) The Contractor shall provide safe access to all equipment in accordance with all safety regulations.

E32.6 Materials

(a) Steel Casing Pipe
  (i) Steel Casing Pipe as per Section E30

(b) Carrier Pipe
  (i) Carrier pipe as per Section E30

(c) Casing Spacers
  (i) Casing Spacers as per Section E30

(d) End Seals
  (i) End Seals as per Section E30

(e) Contact and Backfill Grouts
  (i) Compressive Strength: minimum 2 MPa at 28-days, unless specified elsewhere.
  (ii) Portland cement: to CSA A3000, Type HS, low heat of hydration.
  (iii) Water: to CSA A23.1.
  (iv) Aggregates: to CSA A23.1, normal-density fine aggregates.
  (v) Admixtures: subject to the approval of the Engineer.

(f) Casing Pipe Bedding and Surround Material
  (i) Flowable cement-stabilized fill to CW 2160.

(g) Working Pit Backfill Material
  (i) Flowable cement-stabilized fill to CW 2160.

(h) Crossing Warning Signs
  (i) Warning signs to CSA Z662 or local requirements, whichever is more stringent.

E32.7 General Execution

(a) Contractor shall furnish all necessary equipment, materials, power, water, and utilities for all microtunnelling activities required to complete this work.

(b) Microtunnelling operations shall not begin until:
  (i) All required submittals have been completed and reviewed by the Engineer.
  (ii) Orientation and grade of the jacking frame and guide rails have been properly surveyed and verified. Guide rails shall be securely attached to the concrete working slab to prevent movement or shifting during pipe jacking operations.
  (iii) Required geotechnical instrumentation has been installed and baseline readings have been established.
  (iv) Start-up inspection of mechanical and hydraulic systems have been performed. Start-up inspection shall be completed in the presence of the Engineer. The Contractor shall correct the condition, and remove, clear, or otherwise make it possible for the microtunnelling equipment to advance past the object. No rescue shaft shall be constructed or attempted without the written authorization by the Contract Administrator. Upon written notification of the Contract Administrator, the Contractor shall immediately proceed with removal of the object or obstruction by

means of a rescue shaft or by other reviewed methods, as submitted by the Contractor.

(v) On completion of trenchless crossings, contact grout the annular space between the casing pipe and the ground and any voids outside the casing pipe.

(c) Carrier Pipe Insertion

(i) Handle and join carrier pipes in accordance with CW 2110 and E23.

(ii) Use approved blocking method to guide carrier pipe into casing in true alignment.

(iii) Place casing spacers within 0.3 m of carrier pipe joints or immediately outside of external mechanical joint restraints.

(iv) Spacers for the remaining pipe barrel shall not exceed a separation of 1.8 m, or less, as based on manufacturer's recommendations for carrier pipe support.

(v) Place casing spacers within 0.3 m of each end of the casing.

(vi) Clearance between casing spacer risers and the casing pipe shall be a maximum of 25 mm when carrier pipe is in position in a centered and restrained spacer configuration.

(vii) Join carrier pipes one length at a time outside of the casing. Push or pull the carrier pipe into position.

(i) Prevent over-insertion/over-belling of the carrier pipe joints if the pipe is pushed into position.

(ii) Prevent separation of the carrier pipe joints if the pipe is pulled into position.

(viii) Place end seals on each end of the casing.

(ix) Manufacturer's recommendations for installation shall be followed where applicable.

(d) Working Pit Backfill

(i) Backfill working pits with flowable cement-stabilized fill.

(ii) The Contractor shall implement measures to avoid flotation of the carrier pipe within the working pit; measures may include placement of unshrinkable fill in small lifts, ballasting/weighting of the carrier pipe, and/or anchoring/blocking of carrier pipe.

(e) Surface Restoration

(i) After backfilling working pits, restore the ground surface as indicated on the Drawings.

E32.8 Site Clean Up and Restoration

(a) The Contractor shall remove all construction debris, spoils, oil, grease, and other materials shall be removed from the launch shaft, reception shaft, jacking pipes, and staging areas upon completion of microtunnelling activities.

(b) The Contractor shall dispose of all excavated materials. Excavated materials shall be transported in lined trucks. Slurry shall be pumped into tanker trucks and disposed of at acceptable facilities in accordance with current provincial regulations for disposal of these materials. Only those disposal sites identified in the reviewed submittals shall be used.

(c) The Contractor shall restore and repair any damage resulting from their construction activities. Property damaged shall be restored to a condition equal to or better than existing prior to construction. Restoration shall be completed no later than 30 days after Microtunnelling activities are complete.

E32.9 Measurement and Payment

(a) There shall be no separate measurement or payment for the work associated with Microtunnelling Installation. Payment for Microtunnelling Installation and all associated works shall be included in the price for Trenchless CPKC Railway Crossing.

E33. RAILWAY TRACK INSTRUMENTATION AND MONITORING

E33.1 Description

(a) The Work specified in this Section includes furnishing and installing geotechnical instrumentation to monitor the railway tracks. The work includes, but is not limited to, installing: Surface Monitoring Points and Subsurface Monitoring Points. Also included are furnishing monitoring equipment before excavation and trenchless work. The locations of monitoring points should be clearly marked as to ensure that repeated surveys can be accurately compared. Monitoring locations within the railway right-of-way must be in agreement with the Canadian Pacific Kansas City (CPKC) Local Track Supervisor. Flagging or other requirements set forth by CPKC must be adhered to when undertaking installation and monitoring within the CPKC right-of-way.

(b) The Contract Administrator is responsible for surveying the elevations and locations of the instruments. Baseline readings and elevations shall be determined before shaft or trenchless construction begins to establish a baseline, and during and after operations to monitor any movements related to the trenchless and shaft construction. The Contractor shall coordinate access and flagging requirements on behalf of the Contract Administrator to facilitate the survey monitoring within the CPKC right-of-way.

(c) Minimum instrumentation requirements are shown on the drawings and specified herein.

E33.2 Materials

(a) Surface Monitoring Points: Surface Monitoring Points shall be established by driving a 700-mm length of steel rebar within the railway ballast surface and leaving a minimum of 100 mm stickup above the ballast. The Contractor Administrator will affix a survey target to the top of each Surface Monitoring Point. Each monitoring point shall have a tag or marking indicating the station and offset from centerline.

(b) Subsurface Monitoring Point: Install as indicated in the Drawings. The settlement rod shall be installed to 1 m above the obvert of the pipeline casing. The protective casing for the Sub-Surface Monitoring Point shall be installed with a minimum 0.3 m stickup above the ground surface. The Contract Administrator will affix a survey target to the top of each Sub-Surface Monitoring Point.

E33.3 Submittals

(a) Submittals shall be made in accordance with the requirements identified in E5 and as listed below.

(b) Submit the following, at least four (4) weeks before scheduled installation of instruments:

(i) Instrumentation Installation Schedule: Submit the proposed schedule for installing the instruments.

(ii) Description of methods and materials for installing and protecting instruments.

(iii) Confirmation that monitoring points will be installed at locations shown in the drawings and as specified herein.

(c) Reports and Records:

(i) Submit pre and post construction surveys including photographs, video, field notes, and sketches along the entire alignment. Surveys should concentrate on significant man made features along the alignment including buildings, gutters, sidewalks, driveways, and other structures or improvements.

E33.4 Quality Control

(a) Install all monitoring points and instrumentation at locations shown in the drawings or as directed by the Contract Administrator.

(b) Should actual field conditions prevent installation of instruments at the location shown on the Drawings or specified herein, obtain acceptance from the Contract Administrator for new instrument location and elevation.

(c) Surveying of instrumentation shall be referenced to the same Control Points and Benchmarks established for setting out the work. Control Points shall be tied to Benchmarks and other monuments outside of the zone of influence of the excavation.

(d) Installation of instrumentation shall, at all times, be performed in the presence of the Contract Administrator.

E33.5 Construction Methods

(a) Coordination with Railway

(i) Contractor shall comply with all standards, terms, conditions and safety requirements defined in E29.

(ii) The Contractor must review the frequency of monitoring and threshold of settlement with the CPKC Local Track Supervisor before commencement of trenchless construction.

(iii) Contractor shall obtain written approval from CPKC to proceed with instrumentation and monitoring of the railway within the required timelines, as required under the crossing agreement.

(b) General Requirements

(i) Instrumentation shall be installed at the locations shown in the Instrumentation Schedule on the Drawings, and as specified herein. Instruments shall be installed in accordance with the submitted and approved installation schedule.

(ii) The Contractor shall confirm locations of conduits and underground utilities in all areas where holes are to be drilled and instruments installed. Instrument locations shall be modified, as approved by the Contract Administrator, to avoid interference with the existing conduit and utilities. Repair damage to existing utilities resulting from instrument installations at no additional cost to the City.

(c) Installation of Instruments

(i) Coordinate with CPKC to obtain access to the tracks for instrument installations and daily monitoring. Obtain permits and provide flaggers, as required, and pay all fees associated with providing access to the Contract Administrator for establishing and performing settlement monitoring. Provide all required worker training to access CPKC right-of-way and tracks.

(ii) Following completion of the work all instrumentation shall be removed or abandoned according to applicable codes and standards unless otherwise noted.

(d) Instrument Protection, Maintenance, and Repair

(i) Protect the instruments and surface Control Points from damage. Damaged installations shall be replaced or repaired prior to continuing excavation, or trenchless construction, unless permitted otherwise in writing by the Contract Administrator.

(e) Monitoring during Construction

(i) The Contractor shall provide access and assistance to the Contract Administrator for obtaining baseline and daily monitoring surveys, including coordinating track protection with CPKC.

(ii) The Contractor shall install all surface and subsurface settlement monitoring devices and coordinate with the Contract Administrator to perform a baseline survey of all devices at least two (2) days prior to the commencement of shaft excavation.

(iii) Baseline survey monitoring shall occur twice per day for two (2) days prior to the start of trenchless construction.

(iv) Once trenchless construction commences, and as long as the leading edge of the trenchless construction is within the Zone of Potential Train Loading (ZPTL), survey monitoring shall occur at least twice daily or after each train passage, whichever provides the greatest number of readings.

(v) Upon completion of the trenchless construction, where the pipe is in the final location, survey monitoring shall occur twice daily for three (3) days.

(f) Values

(i) Instrument Response Values:

Feature	Threshold Value (Action Required)	Response Value	Shutdown Value
	mm	mm	mm
Surface Monitoring Point	10	19	>19
Surface/Sub-Surface Monitoring Point	10	19	>19

(ii) When the instruments indicate movement equal to the Threshold Value, the Contractor shall meet with City to discuss his construction means and methods to determine what changes, if any, shall be made to better control ground movement. Instrument readings shall be required prior to commencing further work and will only proceed if the magnitude of movement has stabilized from the previous readings. If further movement is observed, work will be discontinued until movement is stopped at which point the pipe installation will be authorized to proceed.

(iii) When the instruments indicate movement equal to the Response Value, the Contractor shall meet with the City and CPKC representatives to develop and activate a plan to actively control ground movements to prevent reaching the Shutdown Value. Instrument readings shall be required and work will only be authorized to proceed if there is no movement between at least two readings taken 12 hours apart. If further movement is recorded, survey monitoring will continue until movement has stopped and revised installation procedure has been submitted. If all cases, CPKC will have the right to carry out maintenance of the track upon completion of the works to restore the track at the expense of the Contractor to the same or better condition as was established in the baseline survey.

(iv) When the instruments indicate movement equal to the Shutdown Value, the Contractor shall stop all work immediately, and meet with the City and CPKC representatives to develop a plan of action before work can be resumed.

(g) Abandonment of Instruments

(i) Control Points: All surface Control Points on public property shall remain in place at the completion of the work. Remove all surface Control Points on private property during the cleanup and restoration work, or as required by the Contract Administrator.

(ii) Monitoring Instruments:

(i) Surface Monitoring Points shall remain in place unless directed by the Contract Administrator to remove and dispose of the points.

(ii) Properly abandon all subsurface and utility settlement monitoring point boreholes, by grouting drilled holes and casing with cement bentonite grout as directed by the Contract Administrator.

E33.6 Measurement and Payment

(a) Installation and Monitoring will be paid for each type at the contract unit prices described below:

(i) Surface Monitoring Points

(ii) Subsurface Monitoring Points

(b) The price shall include but not be limited to the installation and protection of the instruments, replacement of damaged utilities, scheduling and coordinating access to the CPKC to facilitate instrument installation and survey monitoring throughout construction and abandoning of the instruments.

(c) 50% of the price will be paid following the installation of each instrument; and the remaining 50% will be paid once the particular instrument no longer requires monitoring as described within the Specifications.

CHAMBERS AND APPURTENANCES

E34. PRE-CAST CONCRETE CHAMBERS

E34.1 Description

E34.1.1 This Specification applies to the following chambers as shown on the Drawings:

(a) Valve Chamber 1 & 2 (Drawing 1-0798F-C0010-001)

(i) As listed in Form B: Prices, Valve Chambers 1 & 2 are provisional. These valve chambers are shown on all project drawings except Drawing 1-0798C-C0017-001, (CPKC Railway Crossing). The CPKC Railway crossing application has not yet been approved. Should CPKC approve the crossing as currently shown, (without the valve chambers), then the chambers will be removed from project scope. If CPKC determines that these valves chambers are required, then the chambers shall be included in the project scope.

(b) AV Chamber 1 & 2 (Drawing 1-0798F-C0017-001)

(c) Air Gap Chamber (Drawing 1-0798F-C0020-001)

(d) Check Valve Chamber (Drawing 1-0798F-C0020-001)

E34.1.2 All valves shall close clockwise with black operating nuts.

E34.2 Submittals

E34.2.1 Submit shop drawings for each chamber listed on the Drawings in accordance with E5.

E34.3 Materials

(a) Pre-cast concrete manholes as per CW 2130 and the Drawings.

(i) 750 mm frame and cover as CW 2130.

(ii) 1200 mm frame and covers to be Titan TF-48 F&C or approved equal in accordance with B7.

(b) Internal piping and fittings as per Section E36.

(c) Valves as per Section E37.

(d) Insulation shall be polyurethane spray foam, minimum 50 mm thick.

E34.4 Construction Methods

(a) Chamber installation as per CW 2130 and the Drawings.

(b) Chamber piping and fitting installation as per E36.

(c) Valve installation as per E37.

(d) Spray applied polyurethane insulation may be factory or field applied, in accordance with manufacturer's recommendations.

E34.5 Measurement and Payment

(a) Supply and installation of Pre-Cast Valve Chambers will not be measured and will be paid for at the Lump Sum Price for each type of “Pre-Cast Valve Chambers” which shall be payment in full for all excavation, backfill, supply and installation of pre-cast concrete chambers, valves, piping, fittings, appurtenances, miscellaneous metals and performing all operations herein described, and all other items incidental to the Work. Note: Chamber piping shall be considered incidental to the cost of the chamber up to the transition flange outside the chamber wall.

E35. CAST-IN-PLACE CONCRETE STRUCTURES

E35.1 Description

(a) This Specification applies to Offtake Structures 2 & 3 as shown on the Drawings.

E35.2 Submittals

(a) Submit shop drawings for each chamber listed on the Drawings in accordance with E5.

E35.3 Materials

(a) Cast-in-place concrete and reinforcement in accordance with CW 2160 and the Drawings.

(b) Steel fabrications as per the Drawings.

(c) Precast concrete sections and adjusting rings, ladder rungs, joint gaskets and cast iron frames and covers shall be in accordance with CW 2130 and as shown on the Drawings.

(a) 750 mm frame and cover as CW 2130.

(b) 1200 mm frame and covers to be Titan TF-48 F&C or approved equal in accordance with B7.

(d) Chamber piping, fittings and appurtenances as per Section E36 and the Drawings.

(e) Valves as per Section E37.

E35.4 Construction Methods

(a) Prepare formwork, reinforcing, concrete pouring and finishing in accordance with CW 2160 and the Drawings.

(b) Chamber piping and fitting installation as per E36.

(c) Valve installation as per E37.

(i) Coordinate final location of valve stem extensions and valve boxes with mechanical and structural shop drawings.

E35.5 Measurement and Payment

(a) Construction of offtake structures will not be measured and will be paid for at the Lump Sum Price for each type of “Cast-in-Place Concrete Structures” which shall be payment in full for all excavation, backfill, cast-in-place concrete works, steel beams, pre-cast concrete panels, supply and installation of valves, valve boxes, piping, service piping, fittings, appurtenances, miscellaneous metals, thrust blocks and restraints, manhole risers, manhole frame and cover and performing all operations herein described, and all other items incidental to the Work. Note: Chamber piping shall be considered incidental to the cost of the chamber up to the transition flange outside the chamber wall.

E36. PIPING, FITTINGS AND MISCELLANEOUS METAL FABRICATIONS

E36.1 Description

(a) General

(i) This Specification shall cover the supply, fabrication, transportation, handling, delivery and placement of piping, fittings and metal fabrications for valve chambers and offtake structures.

(ii) All piping and fittings shall be designed for an operating pressure of 700 kilopascals and a test pressure of 1,000 kilopascals.

E36.2 Submittals

(a) Submit the qualifications of the fabricator and welders to the Contractor Administrator for acceptance.

(b) Submit shop drawings in accordance with E5.

E36.3 Materials

E36.3.1 All materials shall be of a type acceptable to the Contract Administrator and shall be subject to inspection and testing by the Contractor Administrator.

E36.3.2 Material intended for use in the various assemblies shall be new, straight, clean, with sharply defined profiles.

E36.3.3 Welding materials: to CSA W59 and ANSI D11.2-89.

E36.3.4 Hot dipped galvanized steel repair material: Galvalloy and Gal-Viz.

E36.3.5 Fasteners

(a) Bolts for all direct bury flange connections shall be ASTM A307 or ASTM F568M, Grade B.

(b) Nuts for all direct bury flange connections shall be ASTM A563 or ASTM A563M, Grade B.

(c) Bolts for all sleeve style couplings and/or restraints shall be ASTM F593 or ASTM F738M, Type 316 stainless steel.

(d) Nuts for all sleeve style couplings and/or restraints shall be ASTM F594 or ASTM F836M, Type 316 stainless steel.

(e) Anti-seize compound shall be used on all bolts.

(f) For flanged connections, bolt size, type and diameter shall be in accordance with AWWA C207. Bolt length shall be suitable for coupling AWWA C207 Class D flange.

E36.3.6 Chamber Piping:

(a) Ductile iron piping conforming to AWWA C151.

(b) Pipe to be minimum Thickness Class 54.

(c) All piping shall be new.

(d) Cement mortar lining in accordance with AWWA C104.

(e) All ductile iron pipe shall be epoxy coated in accordance with E36.3.20.

E36.3.7 Chamber Fittings

(a) Ductile iron fittings shall conform to AWWA C110.

(b) All fittings shall be new.

(c) Cement mortar lining in accordance with AWWA C104.

(d) All ductile iron fittings shall be epoxy coated in accordance with E36.3.20.

(e) Flanges shall be compatible with the specified valves, conforming in dimensions and drilling to ANSI B16.1, Class 125.

E36.3.8 Grooved Couplings, and Fittings

(a) Direct grooved ends for ductile iron pipe shall conform to AWWA C606.

(b) Grooved flange adapters shall be compatible with AWWA C606 grooved end joints. Flanges to conform to ASME/ANSI B16.1 Class 125 bolt pattern.

(c) Grooved couplings and fittings shall be ductile iron conforming to ASTM A536 grade 65-45-12.

(d) Bolting hardware for grooved end fittings shall be stainless steel conforming to E36.3.5.

(e) All materials in contact with potable water shall be certified to NSF 61.

(f) Coatings:

(i) Interior: cement mortar lined.

(ii) Exterior: Epoxy coated.

(g) Approved manufacturer: Victaulic or approved equal in accordance with B7.

E36.3.9 Flanges for Pipe and Fittings

(a) Threaded ductile iron flanges shall conform to AWWA C115 ASME/ANSI B16.1 Class 125.

(b) Steel flanges shall conform to AWWA C207, minimum Class D Flange.

(c) Stainless steel flanges shall conform to AWWA C228, minimum Class SD Flange.

(d) Ductile iron and steel flanges shall be epoxy coated in accordance with E36.3.20.

E36.3.10 Blind Flanges:

(a) Cast or ductile flanges shall be ASME/ANSI B16.1 Class 125.

(b) Steel blind flanges shall be AWWA C207 Class D.

(c) Ductile iron and steel blind flanges shall be epoxy coated in accordance with E36.3.20.

E36.3.11 Thread-O-Lets

(a) The minimum thickness for ductile iron pipe used in the fabrication of welded outlets shall be Class 53.

(b) Welded outlets shall be shop installed. All lining and coating damage shall be repaired prior to pipe installation.

(c) Piping systems with welded outlets shall be designed so that bending loads are not applied to the outlet.

(d) Welded outlets shall not be subjected to impact or bending stresses during handling, storage, shipment, installation or operation.

E36.3.12 Flange Gaskets

(a) 3 mm, full-faced, SBR rubber gaskets or neoprene in accordance with AWWA C207.

(b) Gaskets shall be one piece construction where possible.

(c) Segmented gaskets shall be constructed of a minimum number of segments and joints shall be of dovetailed construction, or other jointing methods approved by the Contract Administrator.

E36.3.13 Flange Isolation Kits

(a) Flange isolation kits shall be used where noted, where dissimilar metal piping or fittings are joined.

(b) Flange isolation kits shall be to City of Winnipeg Specification except as modified below.

(c) Each kit shall be a double flange isolation kit with insulating sleeves and washers for each flange of the bolted connection.

(d) Bolt sleeves shall be comprised of G10 or G11 epoxy glass.

E36.3.14 O-Rings, Gaskets and Seals

(a) O-rings, gaskets and seals shall be made from either styrene-butadiene-rubber (SBR), Buna N nitrile rubber (NBR) or EPDM rubber compound.

(b) The manufacturer shall provide complete descriptions of the materials utilized in accordance with the ASTM D2000 designation system.

(c) All gaskets, seals and O-rings which come in contact with potable water must meet the requirements of NSF/ANSI Standard 61 as a minimum.

E36.3.15 Valve Stem Extension:

(a) The City of Winnipeg standard valve stem extension per AP-003. The extension shall be ASTM A276 Type 304 stainless steel, with a 50x50 mm square operating nut.

E36.3.16 Valve Stem Extension Guide and Wall Brackets:

(a) The Stem extension guide and wall brackets shall conform to ASTM A276, Type 316 stainless steel suitable for keeping the stem extension plumb and centred in the valve box while not interfering with the operation of the valve stem.

(b) Approved manufacturer: “Trumbull” or approved equal in accordance with B7.

E36.3.17 Threaded Valves

(a) Small diameter threaded ball valves (75 mm diameter and smaller) shall be two-piece brass / bronze, full port, 600 psi (4000 kPa) cold working pressure. Direction of opening shall be counter-clockwise and shall be indicated on the handle. Valve shall be certified for potable water applications per NSF 61 and NSF 372.

(b) Acceptable manufacturer; Crane, Jenkins, Kennedy, Mueller, or approved equal in accordance with B7.

E36.3.18 Threaded Piping, Fittings and Flanges

(a) Small diameter brass threaded piping, fittings and flanges (75mm diameter and less) shall be cast red brass conforming to ASTM B43 or cast bronze conforming to ASTM B62. Flange dimension and drilling shall be in accordance with ANSI B16.24 – Class 150.

(b) Small Diameter steel threaded fittings and flanges (75mm diameter and less) shall accordance with ANSI B16.5 - Class 150.

(c) Small diameter steel pipe nipples shall be Schedule 80 steel.

E36.3.19 Galvanic Anodes

(a) Galvanic anodes for cathodic protection of buried ferrous pipes and fittings shall be 10.9 kg pre-packaged zinc anodes to meet CW 2110.

E36.3.20 Coatings

(a) Unless otherwise specified herein, coatings for all metal chamber piping and fittings shall be a liquid epoxy meeting all the requirements of E36.3.21. As an alternative to liquid epoxy, the Contractor shall have the option to use fusion bonded epoxy in accordance with E36.3.22.

(b) Field-applied pipe coatings for above ground piping shall be a liquid epoxy meeting the requirements of E36.3.21.

E36.3.21 Liquid Epoxy Coatings

(a) Liquid epoxy coatings shall conform to AWWA C210.

(b) Liquid epoxy coatings shall be NSF 61 certified for immersion service in feeder main and water main pipelines.

(c) All coatings shall be applied in a minimum of two (2) or more layers (5 mils dry film thickness for each coat) for a minimum final coating dry film thickness of greater than 16 mils or the thickness recommended by the manufacturer for immersion service.

(d) Interior pipe linings shall be 100% solids liquid epoxy product. Approved products:
   (i) International Enviroline 230,
   (ii) International Bar-Rust 234P,
   (iii) Specialty Polymer Coatings SP-7888,
   (iv) Or approved equal in accordance with B7.

(e) Exterior pipe linings for all exposed steel piping, valves, and actuators shall be Polyamide Epoxy. Approved products:
   (i) International Enviroline 230,
   (ii) International Bar-Rust 234P,
   (iii) Specialty Polymer Coatings SP-7888,
   (iv) Tnemec Series N140F Pota-Pox Plus,
   (v) PPG Amerlock 2,
   (vi) Or approved equal in accordance with B7.

(f) Submit product data for liquid epoxy coating products in accordance with E5.

E36.3.22 Fusion Bonded Epoxy Coatings

(a) Fusion bonded epoxy coatings shall conform to AWWA C213 for steel components and AWWA C116 for ductile iron fittings.

(b) Fusion bonded epoxies shall be NSF 61 certified for immersion service in feeder main and water main pipelines.

(c) The final minimum coating thickness shall be greater than 16 mils or the thickness recommended by the manufacturer for immersion service.

(d) Submit product data for fusion bonded epoxy products in accordance with E5.

E36.3.23 Chamber Wall Thrust Restraints

(a) Thrust restraints shall be installed within all offtake structure walls as shown on the Drawings.

(b) Thrust restraints shall be EBAA 1100SDB or approved equal in accordance with B7.

E36.4 Construction Methods

(a) Fabrication

(a) Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured. Assemble work in such a way that no disfigurements will show in the finished work or impair the strength.

(b) Confirm measurements for all fabrications before fabricating.

(c) Pieces shall be of the sizes indicated on the Drawings and shall not be built up from scrap pieces. Confirm sizes with field measurements.

(d) Where possible, fit work and shop assemble, ready for erection.

(e) Remove and grind smooth burrs, filings, sharp protrusions, and projections from metal fabrications to prevent possible injury. Correct any dangerous or potentially harmful installations as directed by Contract Administrator.

(f) All steel welding shall conform to CSA Standard W59. Fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with CSA Standard W.47.1. Welding shall be done by currently licensed welders only.

(g) Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

(h) Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1.

(i) Use self-tapping shake-proof flat-headed screws on items requiring assembly by screws.

(b) Erection

(a) Do steel welding work in accordance with CSA W59 and aluminum welding work in accordance with CSA W59.2

(b) Erect metalwork in accordance with reviewed shop drawings, square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

(c) Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles where not specifically indicated on the Drawings.

(d) Provide components for building in accordance with shop drawings and schedule.

(e) Make field connections with bolts to CAN/CSA-S16, or weld.

(f) Touch-up rivets, bolts and burnt or scratched surfaces that are to receive paint finish, with zinc primer after completion of erection.

(g) Install electrochemical isolation gaskets and sleeves to electrically isolate dissimilar metals in accordance with E36.3.13.

E36.4.1 Installation of Lead Wires, Continuity Bonding and Galvanic Anodes

(a) Anodes and continuity bonding shall be installed on new pipes and fittings where shown on the Drawings or as directed by the Contract Administrator.

(b) Thermite Welding Procedure:

(i) Prepare metallic surface to bare metal by grinding or filing. Remove all coatings, dirt, mill scale, oxide, grease, moisture, and other foreign matter from weld areas in the area required to complete the weld.

(ii) Before welding, remove wire insulation as required to fit the mould, avoiding damage to the exposed copper wire. If the wire is cut or nicked over halfway through its diameter, cut off and strip the new end. If the manufacturer requires the use of a copper sleeve, crimp it securely to wire and remove excess wire protruding from the end of the sleeve.

(iii) After the charge is set, remove mould and slag from the weld area with the welder's hammer. Strike the top and sides of the weld with the hammer to test the secureness of the connection. If the weld does not hold, remove scrap weld material, clean it, and begin the welding process again.

(iv) After welding and before coating the cleaned weld area, the Contract Administrator may test the joint bond and wires for electrical continuity.

(v) When the weld passes the test for soundness and electrical continuity, repair the coating in the weld area with mastic and weld cap placed over the weld. Clean the weld area to remove any loose material and welding residuals. Cover exposed metal on the pipe and wire with a mastic-filled weld cap. Ensure the weld cap covers the entire area of coating removed for installation of the thermite weld. If not, repair the coating as per the coating manufactures recommendations prior to installing the weld cap.

E36.4.2 Install chamber wall thrust restraints as shown on the Drawings and as recommended by the manufacturer.

E36.5 Measurement and Payment

(a) There shall be no separate measurement or payment for the work associated with the supply, fabrication, transportation, handling, delivery and placement of all chamber piping, fittings, miscellaneous metals and appurtenances. Payment for Piping, Fittings and Miscellaneous Metal Fabrications shall be included in the Contract Lump Sum price for "Cast-in-Place Concrete Structures" and "Pre-Cast Valve Chambers".

E37. MISCELLANEOUS VALVES AND APPURTENANCES

E37.1 Description

E37.1.1 This Specification applies to valves within the following chambers as shown on the Drawings:

(a) Valve Chambers 1 & 2 (Drawing 1-0798F-C0017-001)

(i) As listed in Form B: Prices, Valve Chambers 1 & 2 are provisional. These valve chambers are shown on all project drawings except Drawing 1-0798C-C0001-001, (CPKC Railway Crossing). The CPKC Railway crossing application has not yet been approved. Should CPKC approved the crossing as currently shown, without the valve chambers, then the chambers will be removed from project scope. If CPKC determines that these valves chambers are required, then shall be included in the project scope.

(b) AV Chambers 1 & 2 (Drawing 1-0798F-C0010-001)

(c) Check Valve Chamber (Drawing 1-0798F-C0016-001)

(d) Offtake Structures 2 & 3 (Drawing 1-0798F-C0016-001)

E37.1.2 All valves shall close clockwise with black operating nuts.

E37.1.3 All valves shall be designed for a minimum working pressure of 1000 kPa.

E37.2 Submittals

E37.2.1 Submit shop drawings for each valve shown on the Drawings in accordance with E5.

E37.3 Materials

E37.3.1 Air Release Valves

(a) Air release valves shall have the following certifications:
  (i) AWWA C512
  (ii) NSF 61 Certified for Drinking Water
  (iii) NSF 372 Certified Lead-Free

(b) Air release valves for 750 mm feeder main:
  (i) Air release valves shall have a 50 mm threaded inlet.
  (ii) Approved product: Valmatic VMC-38 or approved equal in accordance with B7.

E37.3.2 Check Valves

(a) Double check valves to prevent cross contamination shall meet the following requirements:
  (i) NSF 61 certified.
  (ii) AWWA C510-92 certified.
  (iii) Epoxy coated cast iron body.
  (iv) Flanges drilling to ANSI B16.1, Class 125.

(b) Approved product: Watts Series LF709 or approved equal in accordance with B7.

E37.3.3 Butterfly Valves

(a) Butterfly valves shall conform to AWWA C504 Class 150B and the following:
  (i) NSF 61 certified.
  (ii) Cast iron body conforming to ASTM A-126.
  (iii) Flanges conforming to AWWA 504, drilling to ANSI B16.1, Class 125.
  (iv) Fusion bonded epoxy coating conforming to AWWA C550.
  (v) 50 mm AWWA operating nut.
  (vi) Operating direction in accordance with SD-008.

(b) Gaskets
  (i) O-rings, gaskets and seals shall be made from either styrene-butadiene-rubber (SBR), Buna N nitrile rubber (NBR) or EPDM rubber compound.
  (ii) The manufacturer shall provide complete descriptions of the materials utilized in accordance with the ASTM D2000 designation system.
  (iii) All gaskets, seals and O-rings which come in contact with potable water must meet the requirements of NSF/ANSI Standard 61 as a minimum.

(c) Nuts, Bolts, and Fasteners
  (i) Flange nuts and bolts to ASTM A276, Type 316 stainless steel sized to requirements of flange. Thread on bolts to extend past nut a minimum of 6 millimetres.

(d) Actuators
  (i) Quarter turn, manual geared actuators shall be of worm gear drive type designed for one person to operate. Oriented as shown on the Drawings.
  (ii) Provide mechanical valve position indicator mounted on the outside of each valve actuator.

(e) Approved manufacturer: Mueller Lineseal III Class 150B or approved equal in accordance with B7.

E37.3.4 Gate Valves

(a) Gate valves shall conform to CW 2110, City Approved Product Standard CoW-WM-06, AWWA C509, and shall be supplied with the following:
   (i) NSF 61 certified.
   (ii) Stem sealing shall be with double O-rings.
   (iii) Flanges shall conform in dimensions and drilling to ANSI B16.1, Class 125.
   (iv) Fusion bonded epoxy coating conforming to AWWA C515.
   (v) 50 mm AWWA operating nut.
   (vi) Operating direction in accordance with SD-008.

(b) Gaskets
   (i) O-rings, gaskets and seals shall be made from either styrene-butadiene-rubber (SBR), Buna N nitrile rubber (NBR) or EPDM rubber compound.
   (ii) The manufacturer shall provide complete descriptions of the materials utilized in accordance with the ASTM D2000 designation system.
   (iii) All gaskets, seals and O-rings which come in contact with potable water must meet the requirements of NSF/ANSI Standard 61 as a minimum.

(c) Nuts, Bolts, and Fasteners
   (i) Flange nuts and bolts to ASTM A276, Type 316 stainless steel sized to requirements of flange. Thread on bolts to extend past nut a minimum of 6 millimetres.

E37.4 Construction Methods

(a) Valve installation as per CW 2110 and manufacturer's recommendations.

E37.5 Measurement and Payment

(a) There shall be no separate measurement or payment for the work associated with the supply, fabrication, transportation, handling, delivery and placement of all valves, fittings, and appurtenances. Payment for Miscellaneous Valves and Appurtenances shall be included in the Contract Lump Sum price for "Cast-in-Place Concrete Structures" and "Pre-Cast Valve Chambers".

E38. AUTOMATIC FLUSHING UNIT

E38.1 General Description

(a) The device furnished under this Section shall be an automatic water distribution flushing device designed to be utilized in a permanent or semi-permanent manner for monitoring of water quality conditions; recording water quality results; and automatically flushing of potable water distribution lines when select water quality conditions fail to meet the water quality standards identified by the utility and entered into the logic of the 1200 Series S.M.A.R.T. Flush Management software of the device.

(b) The primary purpose of this device shall be to automatically flush the necessary amounts of water from the water distribution system for the purpose of improving and/or maintaining water quality without exceeding the volume necessary to mitigate for a specific condition.

(c) Secondarily, the device shall be capable of scheduling regular flushing cycles as well as manual over-ride flushing events to flush water into the downstream sewer system for the purpose of managing detention times within the wastewater force main.

(d) This device shall allow authorized water quality and utility personnel to receive and send critical field data from the remote monitoring/flushing station so that they may periodically ascertain current water quality conditions and establish a cost effective and system efficient flushing response program.

(e) Shop drawings off all system components must be submitted for review by the Contract Administrator in accordance with Section E5.

E38.2 Performance Requirements

(a) The self-contained unit shall be designed for automatic flushing of the water distribution system through the opening of a control valve that is an integral part of the unit.

(b) All programming shall be accomplished by means of an integrated telemetry based PLC with proprietary programming logic that will consistently analyze the water quality readings taken by the integrated chlorine (total) analyzer. The system will be powered by 120VAC.

(c) This device shall be capable of measuring, logging and mitigating (by way of initializing a flush event) the following water quality conditions:

  (a) Total Chlorine

  (b) pH

  (c) Turbidity

(d) This device shall be capable of being programmed to activate when chlorine or chloramine residual pH; and/or water temperature levels fall below acceptable standards determined by the operator.

(e) The device shall be capable of monitoring and logging the following conditions:

  (a) Pressure

  (b) Flow

  (c) pH

  (d) Security of Cabinet

(f) Device must allow for scheduled flush events. A minimum of 10 events per day with durations of one minute to 24 hours per event are required.

(g) Communication:

  (a) Cellular Radio: CDMA or GSM

(h) Enclosure Requirements:

  (a) A 60-inch tall, 36-inch wide, and 18-inch deep protective external enclosure that shall include a heating kit, cooling fan and light kit;

  (b) Power Supply (120VAC) shall include circuit breakers and a UL certified electrical box;

  (c) A tamper switch and

  (d) A manual ON/Off switch for on-site shut down.

E38.3 Acceptable Manufacturers

(a) The two-way communication (MODBUS TCP; SCADA compatible required) remote telemetry based automated flushing and water quality management device to be supplied under this Specification shall be Hydro-Guard® as manufactured by Mueller.

E38.4 Submittals

(a) Shop drawings shall be submitted for the Contract Administrator's review for all system components including electrical wiring schematics and recommended installation procedures in accordance with Section E5.

E38.5 Materials

(a) The remote water quality monitoring/management and water distribution flushing system shall be comprised of a premium commercial grade chlorine analyzer (total), turbidity analyzer, pH sensor, pressure sensor and flow meter.

(b) Internal piping must be constructed of Schedule 80 PVC, no-lead brass, or 316L stainless-steel.

(c) A premium grade, industry recognized, double check valve.

  (a) Watts Series 719 or approved equal, in accordance with B7.

(d) A multi-function PLC with proprietary system management logic for the control of at least five water quality condition sensors as described in above (with the potential for future expansion).

(e) All equipment must be housed in a protective external enclosure that shall include the features indicated:

(a) Total Chlorine Analyzer and pH,

(b) A Turbidity Analyzer

(c) A Pressure Monitoring Sensor

(d) Control Valve

(e) Flow Meter

(f) Heating, cooling and light kit

(g) Communication via Cellular Radio: CDMA or GSM

E38.6 Automatic Flushing Unit

E38.6.1 Integral System Management Control Hardware and Software – The 1200 Series S.M.A.R.T. System management and monitoring components shall include the following:

(a) The device's internal control system shall allow for five independently operating condition assessment/water quality analyzers (i.e. total chlorine, pH, flow, turbidity, pressure).

(b) The device's internal control system shall be programmable via both a remote web, SCADA interface and an on-site Ethernet option.

(c) The device's internal control shall be capable of being managed via Windows® Internet Explorer® (or other web browsers) and shall not require a proprietary interface software.

(d) The device's internal control shall be equipped with a unique IP address and shall utilize a proprietary viewer web interface to protect against unauthorized usage.

(e) The device's management system shall allow owners to change or update the IP address of the device.

(f) The devices shall feature user access level settings that will allow the utility to establish permission levels for Administrators/Engineers, Technicians, and Users with access to the data generated by the device. The purpose of this functionality is to limit function control yet provide access to critical system data to all authorized personnel.

(g) The device's internal controller shall be capable of two-way communication, in real-time, via cellular communication (CDMA or GSM).

(h) The device's internal controller must be capable of sending and receiving data packages, as well as storing information on-site for up to one (1) calendar year.

(i) The device's internal controller must be capable of sending alarm codes in the event of a probe failure; the device's protective enclosure is accessed or when a flow or no-flow condition occurs in contrast with what the device's controller has initiated.

(j) The Analyzer, PLC, electrical components and protective enclosures shall be UL certified.

(k) The device internal controller must be SCADA compatible and be capable of communicating with the City's of Winnipeg's existing SCADA networks via MODBUS-TCP.

E38.6.2 Integral Piping and Control Valve – The piping and control valve components shall include the following:

(a) Adjustable control valve powered by a constant powered, 24VDC solenoid.

(b) The device's internal 50 mm ductile iron control valve shall be capable of being activated by a 24VDC solenoid and must feature a built-in flow meter capable of providing GPM and Total Flow.

(c) The control valve shall be a globe valve type design capable of passing sand and other debris up to 16 mm in diameter without obstructing the valve's throat.

(d) The device standard internal and external piping shall be Schedule 80 PVC.

(e) The device internal piping and control valve shall have a minimum operational rating of 150 psi (1,034 kPa).

(f) Internal piping and control valve shall be capable of being removed from the housing by means of a flange coupling allowing for quick disassembly, permitting easy maintenance and repairs.

(g) The control valve shall be constructed of a non-corrosive glass-reinforced nylon, or equal, and shall be fitted with stainless steel hardware. The valve shall be of a type that can be easily rebuilt.

(h) The unit shall be supplied with a 50 mm modular double check valve backflow prevention system that can be removed from its cradle system for annual checks without being disassembled from the piping of the device.

(i) The unit shall be a directed discharge system, utilizing flange connections, to connect the inlet and outlet piping to the utility's service lines and discharge piping.

E38.6.3 Enclosure:

(a) The self-contained unit shall be supplied with an above-grade, NEMA 3R (minimum) environment-resistant, vented cabinet to provide stability and protection for the internal components of the device. The cabinet shall be constructed of high grade, heavy gage aluminum. A secondary NEMA 6x (minimum) cabinet must be used to house the system-management electronics.

(b) The enclosure shall be equipped with a unit heater capable of maintaining an interior temperature greater than 4 C when ambient temperatures are -35 C.

(c) The enclosure shall be equipped with a cooling fan capable of preventing all internal components from overheating when ambient temperatures are 35C.

E38.7 The sampling system shall include the following features:

(a) The sampling system shall be constructed of polyethylene or stainless steel with equal or greater resistance to bacterial regrowth and be connected with brass or stainless steel fittings.

(b) The sampling system shall be designed in such a way to reduce the potential for sampling system contamination by allowing access and inspection of the internal piping compartment and components without disassembly or depressurization of the sampling system.

(c) Connection to the device sampling system shall be by means of a quick access sample valve located at the top of the device for ease of access. The device sampling connection shall be housed in a secure weather-tight area to minimize contamination of the sampling connection.

(d) The sampling system must allow water quality samples to be obtained on-site with the flushing device in either a flushing or non-flushing state.

E38.7.2 The Electrical/Electronic System shall include the following features and capabilities:

(a) Be capable of storing instructions and data for a minimum of 12 months via an integrated programmer and capable of operating the device internal control valve using a 120VAC power supply.

(b) Offer continuous monitoring of water quality conditions and 10 flushing program events per day.

(i) Analyzer must sample water quality conditions a minimum of every five (5) minutes.

(ii) 1200 Series S.M.A.R.T. Management System must record conditions in a daily mode a minimum of every five (5) seconds.

(iii) 1200 Series S.M.A.R.T. Management System must record conditions in a monthly mode a minimum of every ten (10) minutes.

(c) Capable of transmitting data to a remote site in real-time or on a periodic basis determined by authorized operators.

(d) Capable of receiving data from a remote site in real-time or on a periodic basis determined by authorized operators.

(e) Offer downloadable data transfers that can be saved as CSV or XLSX files for use in management spreadsheets.

(f) Must feature on-site Ethernet interface to allow for on-site access to data and system management controls.

(g) Incorporate a chlorine analyzer with an LCD readout.

(h) Offer optional manual on and off functions on-site with remote ON/OFF functionality via remote management software.

(i) Be secured and water-resistant.

(j) Use an integrated 24-volt solenoid to operate the control valve that directly turns into a 50 mm control valve.

E38.8 Execution

E38.8.1 The Contractor shall adhere to all manufacturer recommendations; Provincial and local regulations and codes; and the guidance provided by the Contract Administrator.

E38.8.2 Install service piping in accordance with Section E27 and CW 2110.

E38.8.3 Concrete Base Pad

(a) Reinforced concrete base pad shall be constructed in accordance with CW 3310 and the Drawings.

(i) Granular materials shall be supplied and installed in accordance with CW 3110.

(b) Coordinate concrete base dimensions and location with Section E27. Install PVC conduit through concrete base for service pipes to pass through.

E38.8.4 Coordinate electrical servicing works with Manitoba Hydro as per E50.

E38.9 Commissioning

E38.9.1 The automatic flushing unit shall be disinfected in accordance with AWWA standards.

E38.9.2 Test all functions of the automatic flushing unit, including all sensors, alarms, programable logic operations, scheduled operation and manual operation of all control functions.

(a) Sewer main shall be completed prior to commissioning of the flushing unit in order to properly test and commission the system.

(b) Submit Commissioning Plan in accordance with Section E41.

E38.10 Measurement and Payment

(a) Supply and installation of Automatic Flushing Unit will not be measured and will be paid for at the Lump Sum Price for “Automatic Flushing Unit” which shall be payment in full for supplying all materials and performing all operations herein described, and all other items incidental to the Work. Note: 50 mm service piping outside of the unit shall be paid for in accordance with Section E27.

CONNECTIONS AND COMMISSIONING

E39. SEWER MAIN CONNECTION TO MH-04

E39.1 As noted on the Drawings and Form B, this Work is included as a Provisional Item. It is not known precisely when MH-04 (By Others) will be installed, depending on the construction schedule.

E39.2 If the Contractor completes this sewer main installation before MH-04 is installed by others:

(a) Install end cap 5.0 m from future manhole, as shown on Drawing 13434.

(i) Product shall be mechanically restrained end cap in conformance with City Approved Product Standard CoW-WM-08.

E39.3 If MH-04 is installed before the Contractor completes the sewer main installation:

(a) Complete manhole connection by coring into existing pre-cast concrete manhole and grouting pipe in place.

(i) Install concrete manhole adapter. Approved manufacturer: Fernco or approved equal in accordance with B7.

E39.4 The Contractor shall not proceed with either of the two Provisional Work items listed above unless directed by the Contract Administrator.

E39.5 Measurement and Payment

(a) Sewer Main Connection to MH-04 will not be measured and will be paid for at the Lump Sum Price for each type of “Sewer Main Connection to MH-04” which shall be payment in full for all excavation, temporary shoring, backfill, piping, fittings, appurtenances and performing all operations herein described, and all other items incidental to the Work.

E40. ROUGE ROAD FEEDER MAIN SHUTDOWN

E40.1 Description

(a) This Specification shall cover the shutdown of the Rouge Road Feeder Main for the connection of the proposed piping at Offtake Structure 2.

(b) Feeder main shutdowns and disassembly of feeder main components will not be permitted until all required submissions and protocols have been reviewed and accepted by the Contract Administrator and City. Further, all materials shall be on site, inspected, and test fit prior to disassembly of the feeder mains.

(c) Isolation of the feeder main crossings will be completed by City forces using mainline valves and secondary valves wherever possible.

(d) The Contractor shall be responsible for dewatering the feeder main. Disposal of chlorinated water to locating anywhere other than a sanitary sewer require dechlorination measures as described in E43.

E40.2 Lock-out and Tag-out Procedures

(a) Redundant valve closures (double blocking) are not available for this project, only non-redundant valve closures (single blocking) will be provided.

(b) Additional safety measures and monitoring will be required in order to provide a safe work environment for employees. Development of adequate safety plans in accordance with the Workplace Safety and Health Act and Regulation 217/06 are the responsibility of the Contractor, but as a minimum shall include:

(i) Provision of adequate egress from confined spaces including removal of removable roof slabs and manhole covers, and provision of ladders and other means of site exit.

(ii) Use of body harnesses and safety hoisting equipment at all times when pressurized systems are disassembled and protected only by single block valves.

(iii) Monitor and assess water leakage in closed system prior to disassembly of system. Monitor water leakage rate and advise Contract Administrator immediately of change in inflow rates. Evacuate confined space if necessary.

(c) The Contractor, City of Winnipeg Water and Waste Department, and Contract Administrator will all be required to lock out all valves closed in order to facilitate this work. Where site access and lockout space on system valves is limited, the following lockout/tag out procedures will be implemented;

(i) lockout locations for valves will be identified by the City;

(ii) City of Winnipeg will provide a single lock, chains and other devices to adequately secure valves within pits and chambers. The Contractor has the right to inspect the installation and satisfy that the lockout system is adequate. All locks utilized will be commonly keyed;

(iii) Key(s) for single locked valves will be placed in secure lock box at the site. City staff, Contractors, and Contract Administrator will place personal/company locks complete with identification and tag out information on this lock box;

(iv) Key(s) placed within the secure lock box will not be removed until all City staff, Contractor, and Contract Administrator locks have been removed from the lock box, and verified that the work is completed; and,

(v) City staff will then unlock all valves and will commence with restoration of the systems to service.

E40.3 Submittals

E40.3.1 Submit Rouge Road Feeder Main Shutdown Plan to the Contract Administrator in accordance with E5. The shutdown plan shall be submitted a minimum 20 business days in advance of the proposed works and shall include the following:

(a) A detailed description of the Works to be undertaken.

(b) A description of dewatering operations.

(c) A detailed list of equipment, material, vehicles, and personnel required to be on-site prior to the commencement of the Work.

(d) Step-by-step procedure for installing all piping and completing both feeder main connections.

(e) A contingency plan for any problems, issues, or unforeseen circumstance that might occur. The contingency plan shall include a detailed procedure and schedule for putting the feeder main back into service on an emergency basis.

E40.4 Site-Specific Requirements and Restrictions

(a) Complete verification of pipe sizing, location and tie-in requirements as specified in Section E23.4(h) prior to submission of the shutdown plan.

(b) Feeder main shutdowns will not be permitted until all required submissions and protocols have been reviewed and accepted by the Contract Administrator and the City. All materials required to complete the Work must be on site, inspected and test fit prior to the feeder main shutdown.

(c) In order to minimize feeder main down time, a minimum of two crews must be used to complete both feeder main connections simultaneously.

(d) The Shutdown Plan is subject to approval from the City's Water and Waste Department.

(i) Once the Shutdown Plan is submitted, the Water and Waste Department will review the hydraulic impacts of the proposed shutdown. The Contractor shall coordinate with the City and incorporate any additional requirements resulting from the hydraulic analysis.

(ii) The Contractor is advised that the City typically does not permit feeder main shut downs between May-long weekend and September-long weekend. However, depending on the water consumption rates at the time of construction, exceptions may be permitted.

(iii) Feeder main shutdowns will be scheduled based on a number of factors including routine maintenance and repair work, water demand, weather and other factors. The City shall endeavour to make the requested time periods available to the Contractor to schedule his Work requiring isolation and draining of various feeder mains, without limiting the City's control over the operation of the regional water system to complete other work, maintain adequate system service and maintain the integrity of the infrastructure. The City shall reserve the right to cancel and/or delay these schedule dates at any time, due to any circumstances that could adversely affect water supply system operation, including but not limited to high water demand, abnormal weather, failures of related water system components and/or security concerns.

(e) City personnel will confirm operability of the required existing valves prior to construction.

(f) Feeder main pipe ends shall not be left open or exposed overnight. The Contractor shall employ a means of protecting all un-connected pipe ends to prevent any contaminants from entering the pipe.

(g) All components/equipment etc. required for the work must be on site prior to shutdown.

(h) Install piping, fittings and connections as shown on the Drawings.

E40.5 Measurement and Payment

(a) There shall be no separate measurement or payment for the work associated with the Rouge Road Feeder Main Shutdown. Payment for supplying all materials and performing all operations herein described and all other items shall be incidental to "Connecting to Existing Feeder Mains" as listed in Form B: Prices.

E41. COMMISSIONING PLAN

E41.1 Refer to Appendix E for a sample commissioning plan, including minimum requirements and expectations. The Contractor may submit an alternate commissioning procedures to the Contractor Administrator as described below.

E41.2 The Contractor shall submit their proposed Commissioning Plan to the Contract Administrator for approval at least twenty (20) Working Days prior to the proposed commissioning date. At a minimum, the Commissioning Plan shall take into account all activities described in the sample commissioning plan provided in Appendix E. The Commissioning Plan shall include timelines and step-by-step procedures for the following tasks:

(a) Feeder main pigging,

(b) Feeder main hydrostatic leakage testing;

(c) Sewer main flushing;

(d) Sewer main hydrostatic leakage testing;

(e) Automatic flushing unit pressure testing;

(f) Automatic flushing unit commissioning and

(g) Proposed locations of bleeder lines and dewatering operations.

(h) Proposed locations and methods for dechlorinating and disposal of chlorinated water.

(i) Proposed methods for metering the volume of water used for commissioning.

E41.3 Commissioning of each of the items listed above shall paid as described in E43.

E42. WATER SUPPLY FOR COMMISSIONING WORK

E42.1 Further to Specifications CW 1120, Section 3.1 and CW 2125, water supply for the Work may be taken from City of Winnipeg hydrants or a direct feeder main connection in accordance with the following:

(a) Water for filling, pigging and commissioning the feeder main may be obtained from the Rouge Road Feeder Main by opening the 750 mm butterfly valve in Offtake Structure 2, as described in Appendix E.

(i) Water used for commissioning in this manner shall be metered at the downstream end in OS 3 or via an alternative measurement method approved by the Contract Administrator.

(b) Alternatively, water may be obtained from fire hydrants for all commissioning or general construction activities in accordance with the following:

(i) Only hydrants approved by Water Services Division (WSD) shall be used for water supply.

(ii) The Contractor shall supply and use a Backflow Protection Arrangement as shown on Standard Drawing SD-019 when taking water from City hydrants. Alternatively, the Contractor may rent the Backflow Protection Arrangement from the WSD if available. WSD will supply a meter and locks for the Backflow Protection Arrangement.

(iii) The Contractor is permitted to turn approved hydrants on and off provided the Contractor has received training from the Water Services Division and the turn-ons and turn-offs are done in the presence of the Contract Administrator.

(iv) Hydrants approved for use shall be considered to be “in the Contractor’s control” from the time the City has turned the hydrant on until the Contractor has notified the City the hydrant is no longer being used and the meter box has been removed.

(v) Between November 1 and April 30 of any year, the Contractor shall take all necessary precautions to prevent freezing of hydrants and related appurtenances for hydrants in their control and shall be responsible to pump out hydrants turned off by Emergency Services. Heating and hoarding of hydrants will be required by the Contractor when the ambient air temperature reaches below 0°C at any time during the period of time under which the hydrant is in the Contractor’s Control.

(vi) If a hydrant or appurtenance is damaged due to freezing or improper turn-on or turn-off procedures while in the Contractor’s control, WSD will assess the damage and determine if WSD will repair the damage or if the Contractor will be responsible to repair the damage. Costs for repairs completed by WSD will be deducted from payments owing the Contractor. Repairs completed by the Contractor will be at the Contractor’s expense.

(vii) Erect and maintain signage (bump signs) warning oncoming traffic of hose crossings to the satisfaction of the Contract Administrator and the Manual of Temporary Traffic Control.

(viii) Direct hook-up of pipeline flushing equipment to a hydrant is not permitted unless approved by the Contract Administrator.

(ix) WSD may instruct the Contractor to make other arrangements for hydrant turn-ons and turn-offs. The Water Services Division of the City’s Water and Waste Department will provide and install metering equipment once a permit has been obtained.

E42.2 All water used from City sources must be metered and paid for by the Contractor. Water used will be billed to the Contractor at the most current Water Rate published on the City’s website.

(a) Should the Contractor dispose of water used for commissioning into the City’s sewer system, then the most current Sewer Rate published on the City website will also be billed to the Contractor at the metered volume of water usage.

E42.3 Measurements and Payment

(a) There will be no separate measurement or payment for permits or equipment, water usage and water disposal and it will be considered incidental to the Work being done.

E43. PIGGING, FLUSHING AND HYDROSTATIC LEAKAGE TESTING OF FEEDER MAINS AND SEWER MAINS

E43.1 Description:

(a) Pipe pigging and hydrostatic pressure testing shall be completed for all feeder mains.

(b) Pipe flushing and hydrostatic pressure testing shall be completed for all sewer mains.

E43.2 General:

(a) Complete all works in accordance with CW 2125 except as amended below.

(b) Pigging, flushing and hydrostatic leakage testing must be witnessed by the Contract Administrator.

(c) Piping may only be tested after complete backfilling of the trench.

(d) The Contractor shall be responsible for all installing all bleeder lines and dewatering operations required to complete the works.

(e) Submit Commissioning Plan in accordance with Section E41.

E43.3 Pipe Pigging

(a) Pipe pigging shall be completed for the feeder main only.

(i) In lieu of pigging the internal piping within offtake structures and the 600 mm PVC piping for the Rouge Road Feeder Main connections, this piping may be thoroughly washed and televised to verify that all sediment and debris has been removed from the segments of pipe.

(b) Pigs shall be medium density urethane bullet type and shall have a diameter of at least 50 mm larger than the largest nominal pipe diameter.

(i) Feeder mains shall be pigged with a minimum four pigs. Two wire brush scrubbing pigs and two foam swabs shall be used.

(ii) Pigs shall be able to traverse standard piping configurations such as 45-degree elbows and tees.

(c) Insert pigs, ensuring that the pipe in front of the pig is at least 25% full of water while pigging.

(i) As part of the Commissioning Plan, the Contractor submit their proposed method for inserting and retrieving pigs from the feeder main.

(ii) Ensure the water fill rate behind the pigs is at a constant rate, providing a minimum velocity of 0.2 m/s.

(d) Ensure no air is introduced into the pipe after pigging and before leakage testing.

(e) Water Sampling:

(i) Once pigging is complete, the Contractor shall take water samples at OS 2, OS 3, AV Chamber 1 and AV Chamber 2 for lab analysis.

(ii) Turbidity levels in the water samples taken from OS 3 and AV Chambers 1 & 2 shall be less than or equal to that of the sample taken at OS 2. If turbidity level in any of the three samples fail to meet this standard, the Contractor shall re-pig the feeder main piping until turbidity levels are acceptable.

E43.4 Flushing

(a) Pipe flushing shall be completed for the sewer main only.

(b) Complete flushing in accordance with CW 2125.

E43.5 Hydrostatic Leaking Testing

(a) After pigging is completed (feeder main only), the Contractor shall complete hydrostatic leakage testing for both the feeder main and sewer main in accordance with CW 2125 and AWWA C605.

(i) Apparent leakage for 750 mm PVC feeder mains shall not exceed 9.45 litres per 50 joints per hour at a test pressure of 1,050 kPa.

(ii) Apparent leakage for 600 mm PVC feeder mains shall not exceed 7.56 litres per 50 joints per hour at a test pressure of 1,050 kPa.

(b) Testing shall be completed in the shortest segments possible (between valves) unless otherwise approved by the Contract Administrator.

E43.6 Dechlorination

(a) The Contractor is advised that no sanitary sewer or land drainage sewer infrastructure is present near Offtake Structure 3 for flushed water to be disposed into. The Contractor shall submit the proposed method of water disposal and dechlorination as part of the Commissioning Plan.

(i) Discharging of chlorinated water directly into the environment is not permitted. The Contractor shall employ a means of dechlorinating all chlorinated water before discharging into ditches or land drainage sewer systems.

(ii) Chlorine concentrations must be less than 0.01 mg/L when discharging to the environment. Contractor must test discharged water on site and provide evidence of chlorine concentrations meeting this requirement prior to discharging.

E43.7 Measurement and Payment

(a) Pigging, flushing and hydrostatic leakage testing will not be measured and will be paid for at the Contract Lump Sum Price for “Testing and Commissioning”. This price shall be payment in full for supplying all labour, equipment, and materials, and performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

SURFACE WORKS

E44. CORRUGATED STEEL PIPE CULVERTS

E44.1 General

(a) This Specification covers the supply and installation of culvert pipe, couplers and fittings for connections.

E44.2 Materials

(a) Corrugated steel pipe, couplers and bolts shall conform to CSA G401.

(b) Corrugated steel pipe shall be galvanized.

(c) Pipe less than 600 mm diameter shall have a minimum wall thickness of 1.6 mm.

(d) Pipe 600 mm to 900 mm diameter shall have a minimum wall thickness of 2 mm.

(e) Helical corrugated pipe shall have end sections corrugated to annular corrugations over a length of 300 mm at the ends of each pipe.

(f) Provide culvert end markers for all culverts installed.

E44.3 Execution

(a) Install corrugated steel pipe culverts in accordance with CW 3610.

E44.4 Measurement and Payment

(a) Measurement and payment for corrugated steel pipe culverts shall be in accordance with CW 3610.

E45. TOPSOIL STRIPPING, STOCKPILING AND REPLACEMENT FOR NATURALIZED AREAS

E45.1 General

(a) The City has designated areas within the Project Site that will be revegetated with naturalized seeding. City crews will be responsible for the placement of the seeds and the maintaining of the seed.

(b) The Contractor will be responsible for stripping of the topsoil, stockpiling of the topsoil and replacement of the topsoil following backfilling of the Work as shown on Drawing 1-0798F-B0001-001. Stripped topsoil found to be unsuitable for naturalized seeding (containing noxious weeds) need to be removed from site in accordance with E45.3(a).

E45.2 Materials

(a) Topsoil placement for naturalized areas shall utilize suitable native topsoil that has been stripped and stockpiled prior to construction.

(b) Should there be insufficient volume of native topsoil to replace due to disposal of unsuitable material in accordance with E45.3(a), the Contractor shall utilize imported topsoil in accordance with CW 3540.

E45.3 Construction Methods

(a) Prior to topsoil excavation, the Contractor shall schedule a meeting with the Contract Administrator and City of Winnipeg Public Works representative to review the entire pipe alignment for areas of unsuitable topsoil (contaminated with noxious weeds). Where patches of noxious weeds are identified for removal by the City representative, the Contractor shall excavate all organic material within the designated area and dispose of it as specified in Section E21.

(b) The Contractor shall complete topsoil excavation to a depth of 100 mm as defined in CW 3170 Clause 9.2 (a) for all naturalized grass areas, as shown on Drawing 1-0798F-B0001-001 prior to pipe installation.

(c) Excavated topsoil that is not designated for disposal shall be temporarily stockpiled for re-use at an approved location.

(d) Following pipe backfill and prior to replacing topsoil, all sub-grade areas shall be scarified to a minimum depth of 150 mm.

(e) Complete fine grading and topsoil placement in accordance with CW 3540.

E45.4 Method of Measurement

(a) The stripping, stockpiling and replacement of topsoil will be measured on a volume basis, via a survey by the Contract Administrator of the excavated material once stockpiled. The maximum volume to be paid for shall be the volume indicated on Form B: Prices, which is based on the area to be stripped and re-topsoiled as a direct result of the specified works. Topsoil stripping and replacement above this quantity shall be considered incidental to Site Development and Restoration.

(b) The formula used to calculate topsoil stripping and replacement volumes is: *[3*(pipe diameter) +6] * pipe length * 100 mm topsoil depth* for all excavated pipe sections.

(c) Where areas vary due to field conditions or instruction from the Contract Administrator, the quantity of each pay item listed below will be adjusted as appropriate.

(d) Disposal of topsoil and importing of topsoil for placement shall be measured based on certified tickets provided by the disposal facility and topsoil supply facility respectively.

E45.5 Basis of Payment

(a) Stripping and Stockpiling Topsoil will be paid for at the Contract Unit Price per cubic meter of “Stripping and Stockpiling Topsoil” measured as specified, herein, which price shall be payment in full for supplying all labour and materials and performing all operations herein described, and all other items incidental to the Work included in this Specification.

(b) Disposal of Unsuitable Topsoil will be paid for at the Contract Unit Price per cubic meter of “Disposal of Unsuitable Topsoil” measured as specified, herein, which price shall be payment in full for supplying all labour and materials and performing all operations herein described, and all other items incidental to the Work included in this Specification.

(c) Placement of Stockpiled Topsoil for Seeding will be paid for at the Contract Unit Price per cubic meter of "Placement of Stockpiled Topsoil for Seeding" measured as specified, herein, which price shall be payment in full for supplying all labour and materials and performing all operations herein described, and all other items incidental to the Work included in this Specification.

(d) Placement of Imported Topsoil for Seeding will be paid for at the Contract Unit Price per cubic meter of "Placement of Imported Topsoil for Seeding" measured as specified, herein, which price shall be payment in full for supplying all labour and materials and performing all operations herein described, and all other items incidental to the Work included in this Specification.

E46. SODDING

E46.1 General

(a) This Specification shall cover the supply and installation of topsoil and sod as shown on Drawing 1-0798F-B0001-001. Topsoil and sodding shall be completed for maintained grass areas.

(b) Topsoil and sodding shall be the responsibility of the Contractor and shall be done in accordance with CW 3510 and this Specification.

E46.2 Materials

(a) Topsoil

(i) Shall be supplied in accordance with Clause 5.2 of CW 3540.

(b) Sod

(i) Shall be supplied in accordance with Clause 2.3 of CW 3510.

E46.3 Construction Methods

(a) Construction methods shall be in accordance with CW 3510.

E46.4 Method of Measurement

(a) The supply and placement of topsoil and sod will be measured on an area basis. The maximum areas to be paid for shall be the area indicated on Form B: Prices, which is based on the area to be topsoil and sodded as a direct result of specified works. Sodding area above this quantity shall be considered incidental to Site Development and Restoration.

(b) The formula used to calculate sodding areas is: *[3*(pipe diameter) +6] * pipe length* for all excavated pipe sections.

(c) Where areas vary due to field conditions or instruction from the Contract Administrator, the quantity of Sodding to be paid will be adjusted as appropriate.

E46.5 Basis of Payment

(a) Sodding

(i) The supply and installation of topsoil and sod for Sodding will be paid for at the Contract Unit Price per square meter of "Sodding" measured as specified, herein, which price shall be payment in full for supplying all materials and performing all operations herein described, and all other items incidental to the Work included in this Specification.

E47. ROAD RECONSTRUCTION

E47.1 General

(a) This Specification shall cover the road reconstruction as required to facilitate the Works.

(b) Road reconstruction shall be the responsibility of the Contractor and shall be done in accordance with CW 3110, 3130, 3310 and as amended in this Section.

E47.2 Materials

(a) All subgrade, geotextiles, granular sub-base, base course, asphaltic concrete and Portland concrete cement shall conform to the latest edition of the City of Winnipeg Standard Construction Specifications.

E47.3 Construction Methods

(a) All works shall be completed in accordance with the latest edition of the City of Winnipeg Standard Construction Specifications and the Street Cuts Manual.

E47.4 Measurement and Payment

(a) Road reconstruction specifically required for the feeder main crossing of Sturgeon Road South will be measured and paid for under Sturgeon Road South Reconstruction in accordance with the appropriate City of Winnipeg Specifications as listed in Form B: Prices. **All road restoration beyond the quantities listed on Form B: Prices will be considered incidental to Site Development and Restoration and no additional payment will be made for the additional quantities.**

(b) All other costs associated with Road Reconstruction for any other road restoration works will be considered incidental to Site Development and Restoration. No payment will be made for restoring the roadways from these Works.

E48. OFFTAKE STRUCTURE AND VALVE CHAMBER SITE WORKS

E48.1 General

(a) This Specification shall cover the site works at each of the valve chambers and offtake structures.

(b) Gravel approaches shall be constructed in accordance with CW 3110, 3130, and as amended in this Section.

E48.2 Materials

(a) All subgrade, geotextiles, granular sub-base, base course, shall conform to the latest edition of the City of Winnipeg Standard Construction Specifications.

(b) Chain fencing as per Planning, Property and Development Drawing SCD-105G – Post and Chain Fencing for Vehicle Access.

(i) 6 mm galvanized chain

(ii) High visibility plastic tubing

E48.3 Construction Methods

(a) All works shall be completed in accordance with the latest edition of the City of Winnipeg Standard Construction Specifications.

(b) Install chain fencing as per Planning, Property and Development Drawing SCD-105G – Post and Chain Fencing for Vehicle Access.

E48.4 Measurement and Payment

(a) Offtake Structure and Valve Chamber Site Works, with the exception of Chain Fencing will be measured and paid as per CW 3110 and as listed in Form B: Prices.

(b) Chain Fencing will not be measured and will be paid for at the Contract Lump Sum Price for “Chain Fencing”. This price shall be payment in full for supplying all labour, equipment, and materials, and performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E49. REMOVAL AND RE-INSTALLATION OF WOODEN BOLLARDS

E49.1 General

(a) This Specification shall cover the removal and re-installation of wooden bollards required to gain site access and complete the Work.

E49.2 Materials

(a) As per Planning, Property and Development Drawing SCD-105B – Post Bollard.
  (i) Pressure treated Alkaline Copper Quaternary (ACQ) posts.
  (ii) 19 mm down limestone backfill.

E49.3 Construction Methods

(a) Take care to remove existing bollards in such a manner as to prevent damage.
  (i) If existing bollards are found to be damaged or rotten and not suitable for re-installation, as determined by the Contract Administrator, the Contractor shall supply new bollards.

(b) Re-install bollards as per Planning, Property and Development Drawing SCD-105B – Post Bollard.

E49.4 Measurement and Payment

(a) Removal and Re-installation of Wooden Bollards
  (i) There will be no separate measurement or payment for removal and re-installation of wooden bollards. It will be considered incidental to Site Development and Restoration.

(b) Supply of Wooden Bollards
  (i) Supply of wooden bollards will be measured on a unit basis and paid for at the Contract Unit Price for “Supply of Wooden Bollards”.

E50. ELECTRICAL SERVICING

E50.1 General

(a) This Specification shall cover the supply and installation of all electrical equipment required for servicing the automatic flushing unit described in E38.

E50.2 Materials as per the Drawings.

E50.3 Construction methods as per the Drawings.

(a) The Contractor shall be responsible for all coordination with Manitoba Hydro to complete the electrical service installation.

E50.4 Measurement and Payment

(a) Electrical Servicing will not be measured and will be paid for at the Contract Lump Sum Price for “Electrical Servicing”. This price shall be payment in full for supplying all labour, equipment, and materials, and performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administraton.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

F1.1 Each individual proposed to perform Work under the Contract shall be required to obtain a Police Information Check from the police service having jurisdiction at their place of residence. This can be obtained from one of the following;

(a) police service having jurisdiction at their place of residence; or

(b) Sterling BackCheck – for existing account holders, log into your account to send individual invitations to employees requiring security clearance. For those that do not have an account, click on the following link to open an account: https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity ; or

(c) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: https://www.commissionaires.ca/en/manitoba/home ;or

(d) FASTCHECK Criminal Record & Fingerprint Specialists, forms to be completed can be found on the website at: https://myfastcheck.com

F1.2 The following is a link to information for obtaining the Police Information Check including the Vulnerable Sector screening from the City of Winnipeg Police Service. http://winnipeg.ca/police/pr/PIC.stm

F1.2.1 The Police Information Check shall include a Vulnerable Sector Screening. This can be obtained by following the link below http://winnipeg.ca/police/pr/PIC.stm .

(a) Individuals will need to state in the form, that they may be working in City of Winnipeg pools, libraries and community centres;

F1.3 The original Police Information Check (Form P–612) 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 Police Information Check (Form P–612) to the Contract Administrator.

F1.4 Prior to the award of Contact, 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 Police Information Check obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform the Work.

F1.5 Any individual for whom a Police Information Check is not provided, or for whom a Police Information Check indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work.

F1.6 Any Police Information Check obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.

F1.7 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at their sole discretion and acting reasonably, require an updated Police Information Check. Any individual who fails to provide a satisfactory Police Information Check as a result of a repeated Police Information Check will not be permitted to continue to perform any Work.