THE CITY OF WINNIPEG

TENDER

TENDER NO. 82-2025

SHOAL LAKE AQUEDUCT MANHOLE REPAIRS

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Shoal Lake Aqueduct Manhole Repairs

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, June 6, 2025.

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, two opportunities are provided to meet with the Contract Administrator or an authorized representative:

(a) Bidders conference (B4); and,

(b) Site investigation tour.

B3.2 The Site investigation tour will take place at 10:00 am on May 26, 2025 at the pickup location (intersection of the GWWD railway and Freedom Road). The Bidders will be transferred by GWWD to the following Sites:

(a) Mile 93.69 Manhole;

(b) Mile 94.72 Manhole; and,

(c) Mile 96.69 Boathouse

B3.3 The Bidder is advised that the Sites have restricted access that is only accessible by the Greater Winnipeg Water District (GWWD) Railway and cannot be accessed without authorization. Although the Site investigation tour isn't mandatory, the City strongly encourages bidders to attend.

B3.4 Site Investigation requirements:

(a) Bidders **must** register for the Site investigation tour by contacting the Contract Administrator identified in D6.1 **at least 48 hours in advance. Unregistered Bidders will not be permitted to attend.**

(b) Bidders are responsible for their own transportation to the GWWD Railway pickup location, which is approximately 150 kilometers east of the City of Winnipeg. A map of the pickup location will be provided upon registering for the Site investigation tour.

(c) A signed GWWD Railway Travel Waiver must be submitted by each attendant when they pre-register for the Site investigation tour. The waiver is included in Appendix I – GWWD Waivers.

(d) Attendees are required to wear CSA approved safety footwear while attending the Site investigation.

(e) The Proponent’s representatives will be limited to two (2) for the Site investigation.

(f) It is anticipated that the Site investigation tour will take approximately two (2) hours starting at the pickup location and ending at the pickup location.

B3.5 Proponents registered for the Site investigation **must** provide the City of Winnipeg (City) Consulting Contract Administrator identified in D6.1 with a Global Sanctions & Politically Exposed Persons (PEP) Check obtained not earlier than one (1) year prior to the Site investigation.

(a) The Global Sanctions & PEP Check must be obtained from Sterling Talent Solutions. Proponents will need to set up a Sterling Talent Solutions account prior to requesting

individual background checks. This process should be done a minimum of 72 hours prior to requesting the first check. The account can be setup using the following link: http://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity. Note that the check will take up to 48 hours to complete. Refer to PART F – Security Clearances for further information.

(b) The results of the Global Sanctions & PEP Check must be received by the City directly through Sterling Talent Solutions. Proponents must set up an account with Sterling Talent Solutions directly under their company name and grant Sterling Talent Solutions permission to share the results of the Global Sanctions & PEP Checks with the City.

B3.6 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.

B3.7 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. BIDDERS' CONFERENCE

B4.1 Further to C3.1, the Contract Administrator will hold a Bidders' conference at Stantec's office (500 – 311 Portage Ave, Winnipeg MB) at 9:00 am on May 12, 2025.

B4.2 The Bidder shall not be entitled to rely on any information or interpretation received at the Bidders' Conference unless that information or interpretation is provided by the Contract Administrator in writing.

B5. ENQUIRIES

B5.1 All enquiries shall be directed to the Contract Administrator identified in D6.1.

B5.2 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.

B5.3 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.

B5.4 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.

B5.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Contract Administrator in writing.

B5.6 Any enquiries concerning submitting through MERX should be addressed to:
MERX Customer Support
Phone: 1-800-964-6379
Email: merx@merx.com

B6. CONFIDENTIALITY

B6.1 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.

B6.2 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.

B7. ADDENDA

B7.1 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.

B7.2 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.

B7.3 Addenda will be available on the MERX website at www.merx.com.

B7.4 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.

B7.5 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.

B7.6 Notwithstanding B4, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D6.

B8. SUBSTITUTES

B8.1 The Work is based on the Plant, Materials and methods specified in the Tender.

B8.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B8.3 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.

B8.4 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.

B8.5 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.

B8.6 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.

B8.6.1 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.

B8.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B8.8 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 B19.

B8.9 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.

B9. BID COMPONENTS

B9.1 The Bid shall consist of the following components:

(a) Form A: Bid/Proposal;

(b) Form B: Prices; and,

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

B9.2 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.

B9.3 The Bid shall be submitted electronically through MERX at www.merx.com.

B9.3.1 Bids will **only** be accepted electronically through MERX.

B9.4 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B19.1(a).

B10. BID

B10.1 The Bidder shall complete Form A: Bid/Proposal, making all required entries.

B10.2 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.

B10.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B10.2.

B10.3 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.

B10.4 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.

B10.4.1 The name and official capacity of all individuals signing Form A: Bid/Proposal should be entered below such signatures.

B10.5 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.

B11. PRICES

B11.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B11.1.1 Prices stated on Form B: Prices shall not include any costs which may be incurred by the Contractor with respect to any applicable funding agreement obligations as outlined in D36. Any such costs shall be determined in accordance with D36.

B11.2 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.

B11.3 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.

B11.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B11.5 The Bidder shall enter the Total Bid Price from Form B: Prices into the Total Bid Price field in MERX.

B11.5.1 Bidders are advised that the calculation indicated in B19.4 will prevail over the Total Bid Price entered in MERX.

B12. DISCLOSURE

B12.1 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.

B12.2 The Persons are:

(a) Dyrhoff Ltd – Supply of new Inflatable Dam.

(b) Heidelberg Materials – Availability of pre-cast manhole components.

(c) VersaPile Helical Pile Contractors – Constructability of helical piles.

(d) Access Industrial Inc. – Retractable Ladder.

B13. CONFLICT OF INTEREST AND GOOD FAITH

B13.1 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.

B13.2 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.

B13.3 In connection with their Bid, each entity identified in B13.2 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.

B13.4 Without limiting B13.3, 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.

B13.5 Without limiting B13.3, 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 B13.4 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.

B13.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in their sole discretion.

B14. QUALIFICATION

B14.1 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.

B14.2 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

B14.3 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 B14.10 and D9)

(e) upon request of the Contract Administrator, provide the Security Clearances in accordance with PART F - Security Clearances ;

B14.4 Further to B14.3, the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator to demonstrate qualification of the Project Manager and Site Superintendent in planning and executing schedule critical work on major regional water infrastructure or water control infrastructure in accordance with B14.5, including:

(a) Resume of Project Manager and Site Superintendent; and,

(b) Both shall have a minimum of three (3) examples of successful scheduling and execution of schedule critical construction work on regional potable water systems or water control infrastructure completed in the last ten (10) years.

B14.5 Further to B14.3, the Bidder must be able to demonstrate the following specific qualifications in accordance with B14.11 in one of the following two categories:

B14.5.1 Large Diameter Pipeline Experience

(a) a minimum of two (2) successful projects installing pressure pipe in diameters equal to or greater than 600 mm; and,

(b) a minimum of three (3) successful projects constructing or modifying valve chambers for 450 mm or larger pressure pipe.

B14.5.2 Water Control Structures

(a) A minimum of three (3) successful projects pertaining to the construction or concrete rehabilitation of water control structures, spillways, or dams in the Province of Manitoba.

B14.6 Further to B14.3, the Bidder or any Sub-Contractor completing shoring and excavation work in close proximity (within 10 m) of the SLA must be able to demonstrate the following specific qualifications in accordance with B14.11:

(a) a minimum of three (3) successful projects installing close fit shoring systems within 1.5 m of 600 mm diameter or larger pressure pipe within the City of Winnipeg.

B14.7 Further to B14.3, the Bidder or any Sub-Contractor completing the installation of helical piles must be able to demonstrate the following specific qualifications in accordance with B14.11:

(a) a minimum of ten (10) successful projects of similar size, scope, and complexity;

(b) a minimum of one hundred (100) pile installations of similar size, scope, and complexity in the last five (5) years; and,

(c) be certified by the product manufacturers of the proposed helical pile system.

B14.8 Further to B14.3, the Bidder or any Sub-Contractor operating rail equipment on the GWWD Railway must be able to demonstrate the following specific qualifications in accordance with B14.11:

(a) equipment meeting requirements stipulated in E4; and,

(b) operators meeting requirements stipulated in E4.

B14.9 Further to B14.3(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/.

B14.10 Further to B14.3(d), the Bidder acknowledges they and all Subcontractors have obtained training required by the Accessibility for Manitobans Act (AMA) available at Accessibility Training for anyone that may have any interaction with the public on behalf of the City of Winnipeg.

B14.11 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. The Bidder shall utilize Form L: Contractor Experience or provide similar project sheets containing all information identified in Form L: Contractor Experience. Experience provided for key project personnel must be accompanied by a project specific submission for each referenced project, complete with all identified reference contact information.

B14.12 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.

B15. BID SECURITY

B15.1 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 at Form_G1_Bid_Bond_&_Agreement_to_Bond.

B15.2 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 B15.2(a).

B15.3 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 B19.1(a).

B15.4 Bonds passing the verification process will be treated as original and authentic.

B15.4.1 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.

B15.5 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.

B15.6 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.

B16. OPENING OF BIDS AND RELEASE OF INFORMATION

B16.1 Bids will not be opened publicly.

B16.2 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.

B16.3 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.

B16.4 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).

B16.4.1 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.

B17. IRREVOCABLE BID

B17.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B17.2 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.

B18. WITHDRAWAL OF BIDS

B18.1 A Bidder may withdraw their Bid without penalty at any time prior to the Submission Deadline.

B19. EVALUATION OF BIDS

B19.1 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 B14 (pass/fail);

(c) Total Bid Price; and,

(d) economic analysis of any approved alternative pursuant to B8.

B19.2 Further to B19.1(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.

B19.3 Further to B19.1(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.

B19.4 Further to B19.1(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.

B19.4.1 Bidders are advised that the calculation indicated in B19.4 will prevail over the Total Bid Price entered in MERX.

B19.4.2 Further to B19.1(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.

B20. AWARD OF CONTRACT

B20.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B20.2 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.

B20.2.1 Without limiting the generality of B20.2, 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.

B20.3 If funding for the Work is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, Bidders are advised that the terms of D36 shall immediately take effect upon confirmation of such funding, regardless of when funding is confirmed.

B20.4 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 B19.

B20.4.1 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.

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. SCOPE OF WORK

D3.1 The Work to be done under the Contract shall consist of repairs/upgrades to manholes on the SLA.

D3.2 The major components of the Work are as follows:

(a) Replacement of the Mile 93.69 manhole on the SLA complete with a new access platform and bridging structure;

(b) Replacement of the Inflatable Dam at Mile 93.69 on the SLA; and,

(c) Repair of the Manhole at Mile 94.72 on the SLA.

D3.3 The funds available for this Contract are $2,000,000.00.

D4. SITE INVESTIGATION DUE DILIGENCE AND RISK

D4.1 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 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) the Site conditions, including but not limited to 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.

D5. DEFINITIONS

D5.1 When used in this Tender:

(a) **"AASHTO"** means American Association of State Highway and Transportation Officials;

(b) **"ACI"** means American Concrete Institute;

(c) "**ANSI"** means American National Standards Institute;

(d) **"AREMA"** means American Railway Engineering and Maintenance-of-Way Association;

(e) **"ASTM"** means American Society for Testing and Materials;

(f) "**AWS"** means American Welding Society;

(g) **"AWWA"** means American Water Works Association;

(h) **"Boathouse"** means an opening into the SLA contained within a structure originally intended to permit access into the SLA for inspection boats;

(i) "**CFR"** means Code of Federal Regulations;

(j) **"Cofferdam"** means a watertight shoring system enclosing an area within which construction of permanent works can be safely carried out;

(k) **"CSA"** means Canadian Standards Association;

(l) **"CGSB"** means Canadian General Standards Board;

(m) "**CISC"** means Canadian Institute of Steel Construction;

(n) "**CVN"** means Charpy V-Notch testing;

(o) "**CWB"** means Canadian Welding Bureau;

(p) "**Excavation Shoring**" means a temporary structure, such as sheet piling, soldier piles and lagging, steel rib and lagging, or similar system required to retain earth and water in order to facilitate construction of permanent work;

(q) "**FDA**" means Food and Drug Administration;

(r) "**FRP**" means Fibre Reinforced Polymer;

(s) "**GWWD**" means the Greater Winnipeg Water District;

(t) "**HDPE**" means High Density Polyethylene;

(u) **"ICRI"** means International Concrete Repair Institute;

(v) **"IGN"** means Information and Guidance Notes;

(w) **"Inflatable Dam"** means a rubber Inflatable Dam present within the SLA at Mile 93.69 which is used to hold back water within the SLA at this location;

(x) **"I&I"** means infiltration and inflow;

(y) **"ISO"** means International Organization for Standardization;

(z) **"MBC"** means Manitoba Building Code;

(aa) **"MERP"** means the City's Medical Emergency Response Plan for the SLA and SLA intake facility;

(bb) **"NEMA"** means National Electrical Manufactureers Association;

(cc) "**MT"** means Magnetic Particle testing;

(dd) "**NSF"** means National Sanitation Foundation or NSF International;

(ee) "**OPSS"** means Ontario Provincial Standard Specifications;

(ff) **"PPE"** means personal protective equipment;

(gg) **"Pre-Approved Excavation/Water Control Plan"** means a pre-approved excavation/water control plan which has been prepared in conjunction with the existing conditions and objectives of the work and shows the general concept for completing

excavations at specific locations for use by the Contractor in preparing their excavation and shoring plans;

(hh) "**PTFE"** means Polytetrafluoroethylene;

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

(jj) "**QC"** means Quality Control testing;

(kk) "**RT"** means Radiographic Testing;

(ll) "**RTU"** means Remote Terminal Unit;

(mm) "**SAW"** means Submerged Arc Welding;

(nn) "**SCADA"** means Supervisory Control and Data Acquisition;

(oo) "**SSEMP"** means a Site-Specific Environmental Management Plan;

(pp) **"SLA"** means Shoal Lake Aqueduct, a pipeline that carries water from the intake at Shoal Lake to the Reservoirs at the Winnipeg Drinking Water Treatment Plant;

(qq) "**SMAW"** means Shielded Metal Arc Welding;

(rr) "**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; and,

(ss) **"Upper Reach"** means the portion of the SLA between Mile 93.69 and the intake; and,

(tt) "**UT"** means Ultrasonic Thickness testing;

(uu) **"UV"** means Ultraviolet Light.

D6. CONTRACT ADMINISTRATOR

D6.1 The Contract Administrator is Stantec, represented by:

Adam Braun, P.Eng.
Senior Municipal Engineer

Telephone No. 204-955-1210

Email Address adam.braun@stantec.com

D6.2 At the pre-construction meeting, Mr. Braun will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D7. CONTRACTOR'S SUPERVISOR

D7.1 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.

D8. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON-DISCLOSURE

D8.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

D8.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D8.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;

(a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;

(b) the Contract, all deliverables produced or developed; and

(c) any statement of fact or opinion regarding any aspect of the Contract.

D8.4 A Contractor who violates any provision of D8 may be determined to be in breach of Contract.

D8.5 Relevant documents and drawings listed in the following Appendices are available by request to the City's Consulting Contract Administrator after completion of a Non-Disclosure Agreement. The Non-Disclosure Agreement is included in Appendix L. These documents and drawings will be released at the sole discretion of the City.

(a) Appendix A

(b) Appendix B

(c) Appendix D

(d) Appendix E

(e) Appendix F

(f) Appendix G

(g) Appendix H

(h) Appendix J

D9. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

D9.1 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.

D9.1.1 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.

D9.1.2 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.

D10. UNFAIR LABOUR PRACTICES

D10.1 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.

D10.2 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.

D10.3 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.).

D10.4 Failure to provide the evidence required under D10.3, may be determined to be an event of default in accordance with C18.

D10.5 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.

D10.5.1 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.

D10.5.2 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 D10.5. The City may also hold back the amount of the Unfair Labour Practice Penalty from payment for any amount it owes the Contractor.

D10.5.3 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.

D11. FURNISHING OF DOCUMENTS

D11.1 Upon award of the Contract, the Contractor will be provided with 'issued for construction' Contract Documents electronically, including Drawings in PDF formal only.

SUBMISSIONS

D12. AUTHORITY TO CARRY ON BUSINESS

D12.1 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.

D13. SAFE WORK PLAN

D13.1 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.

D13.2 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

D13.3 Notwithstanding B14.9 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.

D14. INSURANCE

D14.1 The Contractor shall provide and maintain the following insurance coverage:

(a) commercial general liability insurance, in the amount of at least two million dollars ($2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period.

(b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than $2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;

(c) Contractor's Pollution Liability insurance not less than in the amount of one million dollars (1,000,000) per occurrence and one million dollars (1,000,000) annual aggregate insuring against claims covering third party injury and property damage and including clean up costs and transported cargo and a result of pollution conditions arising suddenly or gradually from the Contractors operations and completed operations. Such policy to include The City as an additional insured and shall remain in place throughout the warranty period.

(d) 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; and,

(e) property insurance and/or property in transit for all equipment, machinery, tools to be used in connection with the work while being transported via the GWWD Railway or while performing Work and/or located at the site

(f) evidence of operations to include that work is on the GWWD Railway

(g) A signed waiver of liability and assumptions of risk agreement prior to the transporting of any supplies, equipment, machinery, material and personnel.

D14.2 Deductibles shall be borne by the Contractor.

D14.3 All policies shall be taken out with insurers licensed to carry on business in the Province of Manitoba.

D14.4 All subcontractors performing work on the project shall provide the contractor with evidence of comparable insurances as outlined in D14.1(a) and D14.1(b) above and be registered with Workers Compensation Board of Manitoba and maintain insurance and workers compensation coverage throughout the performance of the Work, the Contractor shall provide the Contract Administrator with evidence of the same prior to the commencement of any Work by the subcontractors.

D14.5 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.

D14.6 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. CONTRACT SECURITY

D15.1 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, 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, Form_H2_Labour_and_Material_Bond , in an amount equal to fifty percent (50%) of the Contract Price.

D15.1.1 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 D15.1(b).

D15.1.2 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.

D15.1.3 Digital bonds passing the verification process will be treated as original and authentic.

D15.2 The Contractor shall provide the Contract Administrator identified in D6 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.

D15.3 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 D15.1(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.

D16. SUBCONTRACTOR LIST

D16.1 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.

D17. EQUIPMENT LIST

D17.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.

D18. DETAILED WORK SCHEDULE

D18.1 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 C4.1 for the return of the executed Contract Documents if applicable.

D18.2 The detailed work schedule shall consist of the following:

(a) A critical path method (C.P.M.) schedule for the Work; or,

(b) A Gantt chart for the work.

all acceptable to the Contract Administrator

D18.3 Further to D18.2(a), the C.P.M schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path.

(a) inspection of new inflatable dam;

(b) manhole site working pad upgrades;

(c) delivery of materials and equipment to site;

(d) installation of water management systems, shoring, and excavations;

(e) manhole construction at Mile 93.69;

(f) manhole abandonment at Mile 93.69;

(g) Inflatable Dam replacement at Mile 93.69;

(h) Footbridge and access platform construction at Mile 93.69;

(i) manhole repairs at Mile 94.72;

(j) all SLA shutdowns; and,

(k) any breaks in construction.

D18.4 Further to D18.2(b), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

D18.5 The Contractor shall be aware that more detailed scheduling is required for work involving a SLA shutdown, see D22 and E11.

SCHEDULE OF WORK

D19. COMMENCEMENT

D19.1 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.

D19.2 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 D12;
(ii) evidence of the workers compensation coverage specified in C6.15;
(iii) the Safe Work Plan specified in D13;
(iv) evidence of the insurance specified in D14;
(v) the contract security specified in D15;
(vi) the Subcontractor list specified in D16;
(vii) the equipment list as specified in D17;
(viii) the detailed work schedule as specified in D18; and,
(ix) the direct deposit application form specified in D31

(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.

(c) The Contractor has obtained all necessary Security Clearances in accordance with PART F - Security Clearances.

D20. WORK BY OTHERS

D20.1 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, GWWD Railway, 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.

D20.2 Work by others on or near the Site will include but not necessarily be limited to:

(a) GWWD Railway and SLA operations.

D20.2.1 Further to D20.1 the Contractor shall cooperate and coordinate all activities with all parties performing required Work by Others identified in D20.1 and accommodate the necessary area on Site required for the Work by Others to complete the Work

D21. WORKING DAYS

D21.1 Further to C1.1(tt), the Contract Administrator's determination of whether or not atmospheric and Site conditions are such that a Working Day is deemed to have elapsed may be based at one time on one type of work while at another time a Working Day may be based on another type of work. When more than one type of major work is involved, the quantity of equipment that must be able to work in order to meet the requirements of a Working Day may vary considerably from that specified in the General Conditions.

D21.2 In the event that incidental work is behind schedule which, in the opinion of the Contract Administrator, should have been or could have been carried out by the Contractor in conjunction with or immediately following work of a major type, the City hereby reserves the right to charge Working Days on the incidental work until such time as it is up to schedule.

D21.3 When the major type of work involves restoration of the site to the condition it was prior to rainfall, Working Days shall not be charged.

D21.4 The Contract Administrator will furnish the Contractor with a daily record for each major type of work showing various information concerning the equipment, the time it worked, could have worked and Working Days charged. This report is to be signed each day by an authorized representative of the Contractor.

D21.5 Notwithstanding C1.1(tt), if the Contractor chooses to work on a Saturday, Sunday, or statutory or civic holiday and is able to complete at least seven (7) hours of work during the period between 7:00 a.m. Winnipeg time or the time the Contractor's operations normally commence, whichever is earlier, and 7:00 p.m. Winnipeg time the day shall be considered a Working Day.

D21.6 Working Days shall be incurred by the Contractor for every Working Day as defined herein. Working days shall be incurred starting on the date the Contractor commences work on site, or the date of commencement identified on the Contractors submitted schedule (D18), whichever occurs first.

D22. SCHEDULE RESTRICTIONS

D22.1 SLA Shutdowns will be scheduled based on a number of factors including routine maintenance and repair work, water demand, Shoal Lake levels, weather and other factors. The City shall endeavour to make the specified time periods available to the Contractor to schedule their Work requiring isolation and draining of the SLA, 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.

D22.2 The City shall reserve the right to cancel and/or delay the specified time periods at any time, due to any circumstances that could adversely affect water supply system operation, including but not limited to:

(a) high water demand;

(b) abnormal weather; and

(c) failures of related water system components and/or security concerns.

D22.3 There are three (3) types of shutdowns associated with this contract, defined as:

(a) Main SLA Shutdown

(i) The Main SLA Shutdown is limited to a single fourteen (14) Calendar Day period.

(ii) SLA Shutdowns are typically scheduled in the spring and fall to facilitate maintenance and inspection. The City and Contract Administrator will coordinate with the Contractor regarding timing for the shutdown.

(iii) The Main SLA Shutdown associated with this Contract is currently identified for late October, 2025. The City will provide dates for the shutdown a minimum of 60 Business Days prior to commencement of the shutdown.

(b) Short-Term SLA Shutdown

(i) Short-Term SLA shutdowns are limited to two (2) Calendar Days (48-hours).

(ii) Short-Term SLA Shutdowns associated with this Contract are currently identified to occur prior to the main SLA shutdown to install the internal SLA bracing and after the main SLA shutdown (if required) to remove the internal SLA bracing.

(c) Dewater SLA Upper Reach

(i) Maintaining water in the Upper Reach is critical to protection of the SLA upstream of Mile 93.69 from damage due to buoyancy forces.

(ii) The Upper Reach of the SLA may be dewatered for up to 48-hours (exclusive of dewatering and refilling time).

(iii) The Upper Reach is to be dewatered twice to facilitate replacement of the Inflatable Dam and installation/removal of the temporary cofferdam.

(iv) The Upper reach must be filled within 48-hours and extensions to this window will not be granted under any circumstances. Work during this shutdown must be carefully planned and implemented. The Upper Reach will not be dewatered until all submissions are reviewed and accepted and all materials are on site to complete the work.

D22.4 Due to the criticality of the SLA, it is expected that the Contractor will need to work seven (7) days a week to complete the work within the specified SLA shutdown window.

D22.5 Calendar Days for shutdowns will be counted starting the next Calendar Day after draining by City forces and notification for the Contractor to commence work and continue until the pipeline is handed back to the City for return to service.

D22.6 Refer to E11 for requirements for working around the SLA and list of operations requiring a shutdown of the SLA.

D23. CRITICAL STAGES

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

(a) Critical Stage 1 – Short-Term SLA shutdowns to facilitate the installation and/or removal of bracing within the SLA shall be complete and the SLA handed back to the City for return to service within 2 Calendar Days (48-hours).

(b) Critical Stage 2 – Work within the SLA at Mile 93.69 and Mile 94.72 completed as part of the Main Shutdown shall be complete and the SLA handed back to the City for return to service within 14 Calendar Days.

D24. SUBSTANTIAL PERFORMANCE

D24.1 The Contractor shall achieve Substantial Performance within thirty-five (35) consecutive Working Days of the commencement of the Work as specified in D19.

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.

D25. TOTAL PERFORMANCE

D25.1 The Contractor shall achieve Total Performance within forty (40) consecutive Working Days of the commencement of the Work as specified in D19.

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 (or Calendar Day) for each and every Working Day (or Calendar Day) following the days fixed herein for same during which such failure continues:

(a) Critical Stage 1 - One thousand, one hundred dollars ($1,100) per Calendar Day;

(b) Critical Stage 2 - One thousand, one hundred dollars ($1,100) per Calendar Day;

(c) Substantial Performance - Two thousand, eight hundred dollars ($2,800) per Working Day;

(d) Total Performance - One thousand, five hundred dollars ($1,500) per Working Day.

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 D21 to 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.

CONTROL OF WORK

D28. JOB MEETINGS

D28.1 Regular bi-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.

D28.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever they deem it necessary.

D29. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D29.1 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).

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

D30.1 Further to B14.4, 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 B14.4.

MEASUREMENT AND PAYMENT

D31. PAYMENT

D31.1 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.

D32. FUEL PRICE ADJUSTMENT

D32.1 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.

D32.1.1 Eligible Work will be determined in accordance with D32.5.

D32.1.2 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.

D32.1.3 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.

D32.1.4 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.

D32.2 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.

D32.3 The fuel escalation or de-escalation adjustment will not be applied if the CFI is within ±15% of the BFI.

D32.4 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.

D32.5 The Fuel Factor (FF) rates will be set as follows:

(a) The Fuel Factor rate will be set at 1.2% of the monitory value for all Work identified on Form B: Prices related to Water & Waste Work.

WARRANTY

D33. WARRANTY

D33.1 Warranty is as stated in C13.

DISPUTE RESOLUTION

D34. DISPUTE RESOLUTION

D34.1 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 D34.

D34.2 The entire text of C21.4 is deleted, and amended to read: "Intentionally Deleted"

D34.3 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.

D34.4 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.

D34.4.1 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.

D34.4.2 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.

D34.4.3 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.

D34.4.4 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 D34.4.3, 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

D35. INDEMNITY

D35.1 Indemnity shall be as stated in C17.

D35.2 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.

D35.3 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

D36. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

D36.1 In the event that funding for the Work of the Contract is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, the following terms and conditions shall apply, as required by the applicable funding agreements.

D36.2 Further to D36.1, in the event that the obligations in D36 apply, actual costs legitimately incurred by the Contractor as a direct result of these obligations ("Funding Costs") shall be determined by the actual cost to the Contractor and not by the valuation method(s) outlined in C7.4. In all other respects Funding Costs will be processed in accordance with Changes in Work under C7.

D36.3 For the purposes of D36:

(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.

D36.4 Modified Insurance Requirements

D36.4.1 If not already required under the insurance requirements identified in D14, the Contractor will be required to provide wrap-up liability insurance in an amount of no less than two million dollars ($2,000,000) inclusive per occurrence. Such policy will be written in the joint names of the City, Contractor, Consultants and all sub-contractors and sub-consultants and include twelve (12) months completed operations. The Government of Manitoba and their Ministers, officers, employees, and agents shall be added as additional insureds.

D36.4.2 If not already required under the insurance requirements identified in D14, the Contractor will be required to provide builders' risk insurance (including boiler and machinery insurance, as applicable) providing all risks coverage at full replacement cost, or such lower level of insurance that the City may identify on a case-by-case basis, such as an installation floater.

D36.4.3 The Contractor shall obtain and maintain third party liability insurance with minimum coverage of two million dollars ($2,000,000.00) per occurrence on all licensed vehicles operated at the Site. In the event that this requirement conflicts with another licensed vehicle insurance requirement in this Contract, then the requirement that provides the higher level of insurance shall apply.

D36.4.4 Further to D14.3, insurers shall provide satisfactory Certificates of Insurance to the Government of Manitoba prior to commencement of Work as written evidence of the insurance required. The Certificates of Insurance must provide for a minimum of thirty (30) days' prior written notice to the Government of Manitoba in case of insurance cancellation.

D36.4.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

D36.5 Indemnification By Contractor

D36.5.1 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.

D36.5.2 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.

D36.6 Records Retention and Audits

D36.6.1 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.

D36.6.2 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 D36.6.1 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.

D36.7 Other Obligations

D36.7.1 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.

D36.7.2 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.

D36.7.3 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.

D36.7.4 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.

D36.7.5 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.

D36.7.6 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 J: SUBCONTRACTOR LIST
(See D16)

SHOAL LAKE AQUEDUCT MANHOLE REPAIRS

Name	Address

FORM K: EQUIPMENT
(See D17)

SHOAL LAKE AQUEDUCT MANHOLE REPAIRS

1. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

2. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

3. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

FORM K: EQUIPMENT
(See D17)

SHOAL LAKE AQUEDUCT MANHOLE REPAIRS

4. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

5. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

6. Category/type:

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

Make/Model/Year: _____ Serial No.: _____

Registered owner: _____

FORM L: CONTRACTOR EXPERIENCE
(See B14)

SHOAL LAKE AQUEDUCT MANHOLE REPAIRS

Attach additional resumes and documents as required. Indicate whether Projects/Project Personnel are for the Bidder, Subcontractor, or Key Personnel.

Project References:

Project Client/Contact: _____
(Name)

_____
(Address)

_____
(phone) (email)

Year	Description of Project	Value

Project References:

Project Client/Contact: _____
(Name)

_____
(Address)

_____
(phone) (email)

Year	Description of Project	Value

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 B8. 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 B8.

E1.4 The following are applicable to the Work:

Appendix No.	Appendix Title
A	Record Drawings
B	Site Photos
C	Stantec Confined Space Entry Policy
D	Geotechnical Reports
E	Mile 96.69 Boathouse Access
F	Original Inflatable Dam Shop Drawings
G	New Inflatable Dam Shop Drawings and Installation Manual
H	Pre-Approved Water Management Plan
I	GWWD Waivers
J	SLA MERP
K	SLA Intake Staff House Documentation
L	Non-Disclosure Agreement

Drawing No.	Drawing Name/Title	
1	1-0751A-D0008-001	Cover Page
2	1-0751A-D0009-001	Index Page – Drawing Index, Construction Notes, Legend & Abbreviations
3	1-0751N-G0001-001	Location Plan – Mile 93.69 and Mile 94.72
4	1-0751N-C0001-001	Existing Manhole Details from Historic Drawings
5	1-0751N-G0002-001	Mile 93.69 – Site Plan
6	1-0751N-C0002-001	Mile 93.69 – Manhole Plans and Sections
7	1-0751N-C0003-001	Mile 93.69 – Manhole Abandonments
8	1-0751N-C0004-001	Mile 93.69 – Inflatable Dam Replacement Details
9	1-0751N-S0001-001	Mile 93.69 Footbridge and Platform – General Arrangement
10	1-0751N-S0002-001	Mile 93.69 Connection Details – Connection Details I
11	1-0751N-S0002-002	Mile 93.69 Connection Details – Connection Details II
12	1-0751N-S0003-001	Mile 93.69 Footbridge and Platform – Handrail and Steel Decking Details
13	1-0751N-C0005-001	Mile 94.72 – Manhole Repairs
14	1-0751N-C0006-001	Mile 93.69 and Mile 94.72 – Sections
15	1-0751M-S0004-001	Temporary Cofferdam

E2. SOILS INVESTIGATION REPORT

E2.1 Further to C3.1, the following geotechnical reports have been prepared for this project and are attached in Appendix D:

(a) Shoal Lake Aqueduct Mile 93.69 and 94.72 Manhole Repairs – Geotechnical Investigation Report.

E2.2 The following additional historical geotechnical reports are available upon request and submission of a signed Non-Disclosure Agreement:

(a) Buoyancy Assessment Program - Geotechnical Investigation – Mile 84 to Mile 95 (Working Paper 1B), January 2000.

GENERAL REQUIREMENTS

E3. SHOP DRAWINGS

E3.1 Description

E3.1.1 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, 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.

E3.1.2 Shop Drawings

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

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

E3.2 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:

(i) Field measurements;

(ii) Field construction criteria; and,

(iii) Catalogue numbers and similar data.

(c) Coordinate each shop drawing submission with the requirements of the Work and Contract Documents. Shop drawings of separate components of a larger system will not be reviewed until all related drawings are available.

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

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

(f) Responsibility for errors and omissions in Shop Drawing submission is not relieved by the Contract Administrator’s review of the 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 has reviewed and returned the copies, distribute the copies to sub-trades as appropriate.

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

E3.3 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 will not be paid for until pertinent Shop Drawings have been submitted and reviewed.

(c) Incomplete shop drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.

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

E3.4 Submittal Requirements

E3.4.1 Schedule submissions at least fourteen (14) Calendar Days before the dates the reviewed submissions will be needed and allow for a five (5) Business Day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.

E3.4.2 Submit one (1) digital copy (PDF) of Shop Drawings.

E3.4.3 Accompany shop drawing submissions with a transmittal letter containing:

(a) Date;

(b) Project title and Tender number;

(c) Contractor's name and address;

(d) Number of each shop drawing, product data, and sample submitted;

(e) Specification Section, Title, Number, and Clause;

(f) Drawing Number and Detail/Section Number; and,

(g) Other pertinent data.

E3.4.4 Shop drawing submissions shall include:

(a) Date and revision dates;

(b) Project title and Bid Opportunity number;

(c) Name of:

(i) Contractor;

(ii) Subcontractor;

(iii) Supplier; and,

(iv) Manufacturer.

(d) Separate detailer when pertinent;

(e) Identification of product or material;

(f) Relation to adjacent structure or materials;

(g) Field dimensions, clearly identified as such;

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

(i) Applicable standards, such as CSA or CGSB numbers; and,

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

E3.4.5 Shop Drawings not meeting the requirements of CW 1110 or the requirements specified herein will be returned to the Contractor without review for resubmission.

E3.4.6 Shop drawing submissions will be limited to two (2) reviews per shop drawing. This shall include a review of the initial submission and a review of the revised submission. Costs associated with subsequent reviews will be charged to the Contractor.

E3.5 Measurement and Payment

E3.5.1 Preparation and submission of Shop Drawings will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E4. SLA AND GWWD RAILWAY ACCESS

E4.1 Description

(a) This section covers access requirements for the SLA and GWWD Railway.

(b) The City of Winnipeg owns and operates the GWWD Railway between the Railway Yard in St. Boniface (598 Plinguet Street) and the Intake at Shoal Lake. Typically, once every two weeks, work trains deliver fuel, sodium hypochlorite and other supplies to the intake, as well as materials for track upgrading and maintenance.

E4.2 SLA Right-of-Way

(a) The SLA is located within a City of Winnipeg owned right-of-way. The width of the right-of-way is 150 m between Mile 85 and 96.

(b) The Contractor is to develop working areas at both manhole sites and has access to an equipment laydown and staging area at the East Braintree GWWD Yard (Mile 77).

(i) In all locations, stockpiles and equipment and shall be kept a minimum of 10 m away from the SLA, except as shown on the Drawings.

(c) The Contractor is advised that the SLA runs through poorly drained, flat swampy areas for long stretches. Water levels are commonly found near the ground surface along the SLA and in certain locations the SLA berm is completely submerged. Water levels within the right-of-way and ditches can be variable.

(d) Drainage ditches and localized sink holes may be encountered within the SLA right-of-way and some of the ditches have been overgrown and may not be visually evident. Longitudinal ditches are present immediately south and north of the existing SLA berm.

(e) The Contractor is responsible to control surface and subsurface water during construction and shall restore existing drainage paths upon completion of the work.

E4.3 General Rail Requirements

(a) No work or the situating of vehicles or equipment closer that 4 m to the nearest rail on the GWWD main line is allowed without prior consent of the GWWD Railway.

(b) The Contractor shall utilize their own or Sub-Contractor railway equipment to transport plant, materials, and personnel to and from the work sites suitable for transport with hi-rail vehicles for the duration of the Work. For large equipment and heavy materials (exceeding what can be transported using hi-rail equipment) the GWWD Railway equipment and crews (diesel locomotive with an assortment of rolling stock) is available as specified herein.

(c) The GWWD Railway assumes no risk for the transportation of these goods and the Contractor must provide evidence of insurance as per D14 to utilize the GWWD Railway.

(d) Prior to GWWD Railway use all non-City of Winnipeg personnel and the transportation of Contractor equipment will be required to have signed GWWD Railway Waiver Forms included in Appendix I.

(e) The Contractor shall not have unlimited use of the GWWD Railway facilities. The Contractor shall develop and submit a preliminary schedule outlining all required GWWD Railway activities and resources and the associated timetable prior to the commencement of construction as specified herein. The City requires this schedule to deploy the necessary level of railway resources to the project in a timely manner and to schedule the Contractor's requirements with routine track usage.

(f) Bidders are advised that City railway services will take precedence over material and equipment deliveries. Neither the City, nor the Contract Administrator shall be held liable for failing to provide rail transportation in any event.

(g) The Contractor shall ensure that all equipment, vehicles, personnel, and materials are kept off the railway and away from the track bed when not operating on the GWWD Railway in accordance with the requirements found herein. The Contractor shall provide all labour and equipment necessary for loading and unloading equipment and materials including all equipment necessary to tie down loads hauled by City forces.

(h) The GWWD Railway right-of-way has sufficient horizontal clearances to transport loads up to 3.66 m wide.

(i) Railway Access Points:

(i) GWWD Railway Yard in St. Boniface –Train loading.

(ii) East Braintree GWWD Railway Yard – Equipment staging and train loading.

(iii) Freedom Road GWWD crossing at Mile 93 – Railway access for personnel transport and hi-rail vehicle access to the GWWD Railway. The crossing is approximately 1.1 km from the Mile 93.69 manhole. A small parking lot is available at this location.

E4.4 GWWD Railway Train Service

(a) A train consists of one (1) locomotive, one (1) caboose and any combination of the remaining rolling stock identified herein.

(b) GWWD Railway railcar stock:

(i) Five (5) flatbed cars with a deck width of 2.44 m, deck length of 16.9 m and a maximum load capacity of 55,000 kg;

(ii) One (1) ramp car with a deck width of 2.44 m, deck length of 16 m and maximum load capacity of 55,000 kg;

(iii) One (1) caboose; and,

(iv) Two (2) side dump cars with a capacity of 20 to 30 cubic metres.

(c) The City also has a hi-rail trailer available for use by the contractor with a load capacity of 6,800 kg. The City use of the hi-rail trailer has priority over Contractor use, and the City reserves the right to limit use by the Contractor. The Contractor is responsible for restoring any damage to the trailer to its original condition upon completion of the project.

E4.5 Transportation of Contractor's Equipment

(a) Large equipment to be transported by the GWWD Railway staff may be loaded and unloaded at the following locations:

(i) East Braintree GWWD Railway Yard - If only one (1) piece of equipment is required to be transported.

(ii) GWWD Railway Yard in St. Boniface - If additional pieces of equipment are required to be transported the equipment will be loaded and unloaded at the GWWD Railway Yard in St. Boniface.

(b) A mobile loading ramp is available at East Braintree with a capacity of 34,500 kg.

(c) Earthen loading ramps are available at the GWWD Railway Yard in St. Boniface and at the SLA Intake.

(d) The loading and securing of Contractor's equipment is the responsibility of the Contractor.

(e) Equipment Staging:

(i) Equipment may be staged at the East Braintree GWWD Railway Yard as shown on the Drawings.

(ii) Equipment staging for transport should be limited to one (1) week in advance of transportation at the GWWD Railway Yard in St. Boniface to limit the impacts on GWWD Railway operations.

E4.6 Use of Contractor Railway Equipment on GWWD Railway

E4.6.1 The Contractor is required to transport personnel and small equipment/materials to and from the project work site utilizing their own or Sub-Contractor hi-rail equipment throughout the duration of the project.

E4.6.2 The Contractor is advised that the GWWD Railway will remain in operation throughout the construction period and they must follow the GWWD Railway Time Table and General Operating Instructions and coordinate running rights with the GWWD Railway Dispatch and operations be maintained for the duration of the project. At no time shall the Contractor operate equipment on the GWWD Railway or block the railway without authorization from the City's Railway Controller.

E4.6.3 The GWWD General Operating Instructions will be provided to the Contractor and the City will complete track orientation with the Contractor prior to commencement of the work.

E4.6.4 The Contractor shall be responsible to meet all railway company and GWWD constraints, requirements, and safety measures.

E4.6.5 Contractor safety requirements shall conform to the latest version of CP Rail Minimum Safety Requirements for Contractors. The Contractor is advised that the requirements are applicable to all of the Contractor's personnel and equipment crossing GWWD tracks and property.

E4.6.6 The Contractor shall not use vehicles taller than 4.15 m above ground level.

E4.6.7 All Contractor railway equipment shall meet all applicable Transport Canada requirements.

E4.6.8 All Contractor personnel operating railway equipment on the GWWD railway must have valid certification meeting Transport Canada requirements.

E4.7 Submittals

E4.7.1 GWWD Railway Operations:

(a) The Contractor shall submit a preliminary list of GWWD Railway operations they will require for the duration of the Work a minimum of ten (10) Business Days prior to the pre-construction meeting.

(b) The Contractor shall submit a schedule detailing the required GWWD Railway operations, GWWD Railway Track Car Units, and GWWD Operators and associated timetable a minimum of twenty (20) Business Days prior to commencement of the Work. The schedule shall be accompanied by a complete list of equipment to be hauled by the City utilizing the GWWD locomotive and rolling stock. Identify:

(i) reference to equipment number;

(ii) rolling stock needs;

(iii) location for movement to;

(iv) when and where equipment and materials will be delivered to; and,

(v) priority for movement.

(c) Submit to the Contract Administrator any revisions to the schedule for rail service (i.e. materials, equipment, etc.) a minimum of ten (10) Business Days in advance of the requirement.

E4.7.2 The Contractor shall submit the following a minimum of twenty (20) Business Days prior to any work on the GWWD Railway:

(a) A complete numbered list of Contractor equipment to be operated on the GWWD Railway c/w with specifications detailing weights, dimensions, and inspections/certifications.

E4.8 Waivers

E4.8.1 Waivers are required for the following prior to work on the GWWD Railway (Appendix I):

(a) Personnel being transported on the GWWD Railway;

(b) Equipment being transported on the GWWD Railway; and,

(c) Operators operating equipment on the GWWD Railway.

E4.9 Measurement and Payment

E4.9.1 SLA access and GWWD Railway operations will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E5. STAFF HOUSE ACCOMODATIONS

E5.1 General

(a) Accommodations are available at no cost to the Contractor in the Staff House or one of the residences located at the SLA Intake at Indian Bay (Shoal Lake). The Intake is located approximately 150 km from Winnipeg and is only accessible by rail. The nearest road crossing with the GWWD Railway is on Freedom Road, approximately 7 km from the Intake, see E4. There are no medical services available. Portions of the Intake available to the Contractor and Subcontractors include sleeping quarters, dining room, recreation area, and washroom/shower facilities.

(b) The City will provide at no cost to the Contractor accommodations in the Staff House for up to 12 Contractor personnel and if required, arrangements can be made for short term accommodations in City employee designated areas of the Staff House.

(i) The Contractor shall not have unlimited or exclusive use of the Staff House and residence

(ii) The Staff House and residence may be used to accommodate City or other Contract personnel in addition to the Contractor's personnel

(iii) The City reserves the right to reassign Contractor room allocations within the Staff House and residences to accommodate other personnel as required

(c) The Contractor shall be responsible for all food, meal preparation and housekeeping associated with the use of the Staff House and any residence being used by the Contractor. Appendix K includes the housekeeping requirements for the Staff House and residences.

(d) The City will provide at no cost to the Contractor toilet paper, paper towels and bedding.

(e) The Contractor shall provide all cleaning supplies for use in the Staff House and residence.

(f) The Contractor will be responsible for all other personal incidentals including towels, soap, shampoo, toothpaste, toothbrushes, etc.

(g) A safety orientation will be provided by the Intake Foreman in accordance with Appendix K.

E5.2 Operation of Staff House and residences at Indian Bay – Person in Charge

(a) If arrangements are made for personnel to stay at the Staff House or residence at Indian Bay, the Contractor shall designate a "person in charge". This person shall ensure that all Contractor's personnel follow all Staff House, residence and Railway requirements in effect for the duration of the Contract. As soon as the "person in charge" becomes aware of a breach in requirements, or is informed of same by Railway or Intake staff, the "person in charge" shall immediately rectify the condition.

(b) The "person in charge" shall clearly instruct the group as to the requirements in place and note that failure to follow the rules may result in ejection from the premises. Failure by the

"person in charge" to enforce these requirements may also result in ejection from the premises. The requirements in effect at this time are attached in Appendix K for reference and are posted in the Staff House and residence.

(i) Alcoholic beverages and other intoxicating substances are not to be consumed or carried outside the Staff House or residences. Intoxication on City of Winnipeg property is prohibited at all times.

(c) The "person in charge" is responsible for responding to any medical emergency which affects a member of the group. Personnel are required to complete the Personal Information (Appendix K) and Waiver Form (Appendix I) indicating any medical condition which may be of concern and should be retained by the "person in charge".

E5.3 Staff House and Transportation Scheduling

(a) The Contractor shall develop a preliminary schedule outlining all required Staff House and personnel transportation requirements to and from the site prior to the commencement of construction. The City requires this schedule to coordinate the onsite accommodations. Submit this schedule a minimum of twenty (20) Business Days prior to the need for accommodations.

(b) Submit to the Contract Administrator any revisions to the schedule a minimum of ten (10) Business Days in advance of the requirement.

E5.4 Measurement and Payment

(a) Use of the Staff House at the SLA Intake and transportation to and from by the Contractor will be considered incidental to the Work will not be measured for payment. No additional payment will be made.

E6. SLA INTAKE FACILITY HOURS OF OPERATION

E6.1 The standard hours of operations for the SLA Intake facility at Indian Bay is 0730 to 1600 hours during weekdays.

E7. OFFICE FACILITIES

E7.1 The Contractor shall supply office facilities meeting the following requirements:

(a) The field office shall be for the exclusive use of the Contract Administrator and be located at Mile 93.69 work site or at a mutually agreed upon location.

(b) The building shall have a minimum floor area of 25 square meters, a height of 2.4 m, two windows for cross-ventilation, and a door entrance with a suitable lock.

(c) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16-18 °C or 24-25 °C.

(d) The building shall be adequately lighted with florescent fixtures and have a minimum of three wall outlets.

(e) The building shall be furnished with one desk, one drafting table, table 3 m x 1.2 m, one stool, one four-drawer legal size filing cabinet, and a minimum of 12 chairs.

(f) A portable toilet shall be located near the field office building. The toilet shall have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.

(g) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each site meeting. The Contract Administrator may request additional cleaning when deemed necessary.

E7.2 Contractor shall coordinate or otherwise provide power for the office.

E7.3 Measurement and Payment

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

(b) The provision of a site office and associated facilities and work identified herein will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E8. MOBILIZATION AND DEMOBILIZATION PAYMENT

E8.1 Description

(a) This Specification shall govern mobilization and demobilization from site.

E8.2 Measurement and Payment

E8.2.1 Mobilization and Demobilization

(a) Mobilization and demobilization will be measured on a lump sum basis and paid for at the Contract Lump Sum Price for “Mobilization and Demobilization”. Payment for Mobilization and demobilization shall include all costs associated with mobilization and demobilization, site set up, and cleanup. Payment will be made on the following schedule:

(b) 50% payment of the Mobilization and Demobilization lump sum price will be paid once site preparation work has been completed and equipment has been mobilized to site to commence with the SLA manhole repair work.

(c) The remaining 50% of the Mobilization and Demobilization lump sum price will be paid subsequent to completion of the Work and site cleanup.

E9. CONFINED SPACE ENTRY AND INSPECTION SUPPORT

E9.1 Description

(a) This specification covers provision of confined entry and access support for specialized inspection Contractors and inspection personnel.

E9.2 General

E9.2.1 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 Space Entry Work and in particular the requirements for conducting hazard/risk assessments and providing PPE.

E9.2.2 Consultants and City personnel require dedicated confined entry support services for the purposes of inspection. The Contractor shall provide confined space support as required throughout the course of the Work.

E9.3 Methods

E9.3.1 The Contractor shall be fully responsible for confined entry access on site, in accordance with Manitoba Workplace Health and Safety Regulation 217/2006 and subsequent amendments.

E9.3.2 Safety Personnel shall be dedicated to confined entry access when inspection personnel are in confirmed areas.

E9.3.3 The Contractor shall maintain confined entry permit logs.

E9.3.4 Hazard Assessment

(a) In conjunction with securing the site and obtaining underground clearances, the Contractor shall conduct a hazard assessment for each site requiring work within a confined space. The assessment shall identify and evaluate the hazards, including but not be limited to review of the following as it pertains to the work to be performed:

(i) nature of the work;

(ii) structural condition of the existing structure; and,

(iii) atmospheric conditions within the structure.

(b) The hazard assessment shall be based on the Contractors review of structures and external conditions. Prior to the inspection, the Contractor shall conduct the necessary atmospheric monitoring of the affected structures to establish acceptable entry conditions.

E9.3.5 Safe Work Plan

(a) Subsequent to performing a hazard assessment the Contractor shall develop a safe work plan to address the potential hazards associated with each site. In addition to addressing the potential hazards the safe work plan shall address but not be limited to the following:

(i) guidelines for confined space entry work established by The Manitoba Workplace Safety and Health Act;

(ii) provision for emergency response;

(iii) training and duties for entry personnel;

(iv) rescue and emergency services;

(v) requirement for purging, flushing, and/or continuous ventilation to eliminate or control atmospheric hazards;

(vi) requirement for and provision of supplied air;

(vii) communication between members of the repair crew in the pipe/trench and on the ground's surface;

(viii) current and forecasted weather conditions;

(ix) provision of back-up equipment;

(x) method of ingress into the structure; and,

(xi) method of egress out of the structure.

(b) The Contactor shall not enter the structures to begin the work until they have completed a hazard assessment and safe work plan for the specific repair and reviewed the plans with their designated safety officer for acceptance. The safe work plan procedures and practices shall conform to all federal, provincial and municipal codes, regulations and guidelines including Manitoba Workplace Safety and Health Regulations.

E9.3.6 Third Party Inspections

(a) The Contractor's safe work plan and confined space entry procedures for inspections involving Stantec or City personnel shall meet or exceed all requirements outlined in Stantec's Safe Work Procedure, attached in Appendix C and those of any entrants.

(b) The Contractor shall provide confined space support for third party inspections by Stantec and City personal. Stantec and City personal will provide personal PPE and harnesses. Support shall include but is not limited to:

(i) Furnishing all confined space entry documentation and permits. Copies of the signed and closed out permits shall be provided to the Contract Administrator within five (5) Business Days of the confined space entry;

(ii) Provision of an attendant and supervisor dedicated to the confined space entry;

(iii) Provision of a retrieval tripod, complete with retractable winch line;

(iv) Provision of atmospheric monitors for each entrant. Atmospheric monitors shall be calibrated and tested in accordance with the manufacturer's recommendations; and,

(v) The Contractor shall complete and document atmospheric monitoring prior to and during entry in accordance with submitted confined space procedures.

(c) Inspections may be delayed or postponed where onsite confined space procedures, hazard mitigation measures, or confined space entry support do not meet the Contractor's submitted and accepted safe work plan and procedures until such a time that discrepancies have been addressed to the satisfaction of the entrants. Claims for delays resulting from improper confined space operations will not be considered.

E9.4 Measurement and Payment

(a) Confined entry support will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E10. ENVIRONMENTAL PROTECTION

E10.1 The Contractor shall be aware that the SLA and associated infrastructure is for potable water and no contamination by fuel, chemicals, etc. shall be permitted at any time. Fuels or chemicals shall not be stored within 30 metres of the SLA and the use of secondary containment is mandatory.

E10.2 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.

E10.3 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

E10.3.1 Federal

(a) Canadian Environmental Protection Act (CEPA) c.16;

(b) Canadian Environmental Assessment Act (CEAA) c.37;

(c) Transportation of Dangerous Goods Act and Regulations c.34;

(d) Migratory Birds Convention Act, 1994;

(e) Fisheries Act (c. F-14); and,

(f) The Canadian Navigable Waters Act.

E10.3.2 Provincial

(a) The Dangerous Goods Handling and Transportation Act D12;

(b) The Endangered Species Act E111;

(c) The Environment Act c.E125;

(d) The Fire Prevention Act F80;

(e) The Manitoba Heritage Resources Act H39.1;

(f) The Manitoba Noxious Weeds Act N110;

(g) The Manitoba Nuisance Act N120;

(h) The Public Health Act c.P210;

(i) The Workplace Safety and Health Act W210; and,

(j) And current applicable associated regulations.

E10.3.3 Municipal

(a) Other applicable Acts, Regulations and By-laws.

E10.4 The Contractor is advised that the following environmental protection measures apply to the Work.

E10.4.1 Materials Handling and Storage

(a) Construction materials and debris shall be prevented from entering drainage pipes or channels.

(b) Construction materials and debris shall also be prevented from accumulating on site and on local roadways.

(c) Excess excavated materials shall be stockpiled in designated locations.

(d) The Contractor shall provide on-Site measures to mitigate the tracking of sediment off-Site and therefore reduce the amount of cleanup required.

E10.4.2 Fuel Handling and Storage

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

(b) 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.

(c) 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.

(d) 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.

(e) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.

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

(g) 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.

(h) Refuelling of mobile equipment and vehicles shall take place at least 30 metres from the SLA.

(i) 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.

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

E10.4.3 Waste Handling and Disposal

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

(b) 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.

(c) 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).

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

(e) No burning of waste (on-site or elsewhere) is permitted.

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

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

(h) 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.

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

E10.4.4 Dangerous Goods/Hazardous Waste Handling and Disposal

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

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

(c) 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.

(d) Different waste streams shall not be mixed.

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

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

(g) 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.

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

(i) Dangerous goods/hazardous waste storage areas shall be located at least 30 metres away from the high water line and be diked.

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

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

(l) 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.

E10.4.5 Emergency Response

(a) The Contractor shall report all major spills of petroleum products or other hazardous substances with the potential for impacting the environment and threat to human health and safety to Manitoba Environment, immediately after occurrence of the environmental accident, by calling the 24-hour emergency telephone phone number (204) 945-4888. The Contract Administrator shall also be notified.

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

(c) 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 coordinator:

(i) Notify emergency-response coordinator of the accident:
- identify exact location and time of accident;
- indicate injuries, if any; and,
- request assistance as required by magnitude of accident (Manitoba Environment 24-hour Spill Response Line (204) 945-4888, Police, Fire Department, Ambulance, company backup).

(ii) Attend to public safety:
- stop traffic, roadblock/cordon off the immediate danger area;
- eliminate ignition sources; and,
- initiate evacuation procedures if necessary.

(iii) 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; and,
- proximity to waterways and the SLA.

(iv) 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 sorbent material or dry clay soil or sand;
- prevent spill material from entering waterways and utilities by diking; and,
- prevent spill material from entering SLA manholes and other openings by covering with rubber spill mats or diking.

(v) Resume any effective action to contain, clean up, or stop the flow of the spilled product.

(d) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to the Manitoba Environment according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.

(e) 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.

(f) 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.

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

E10.5 Vegetation

(a) 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.

(b) Herbicides and pesticides shall not be used adjacent to any surface watercourses. Any application must be conducted by a licensed individual.

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

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

(e) Areas where vegetation is removed during clearing, construction, and decommissioning activities, shall be revegetated as soon as possible in accordance with the requirements outlined herein, or as directed by the Contract Administrator.

E10.6 The Contractor is advised that the following environmental permits and submittals apply to the Work.

E10.6.1 Site Specific Environmental Management Plan (SSEMP)

(a) The Contractor will prepare a SSEMP specific to the SLA Manhole Repair. The plans will be submitted to the Contract Administer a minimum of ten (10) Business Days prior to construction start. Construction shall not commence until the SSEMP has been reviewed and confirmed to be in compliance with the requirements of the contract. At a minimum, the SSEMP shall:

(i) Be site specific and prepared by the Contractor with detail on activities to facilitate both temporary and permanent works (e.g., water control plan, dewatering, discharge points, etc.).

(ii) Include details on erosion and sediment control products used, their placement location and maintenance. Include measures necessary to protect exposed

areas in the work sites from erosion and potential sediment release considering precipitation events and freeze/thaw conditions. Describe how maintenance and removal or erosion and sediment control measures will be conducted to satisfy both contractual and regulatory requirements.

(iii) Include a Site Plan providing sufficient detail, description, or illustration to clearly show all environmental management and protection measures to be used on the site(s) by the Contractor during construction. This includes spill containment, waste storage/handling, etc. Noting a mark up of general arrangement can form part of this information.

(iv) Identify all access, staging, laydown areas and applicable construction procedures and activities. Including sub-contractor activities.

(v) Identify and describe how the installation of all environmental protection measures shall be in accordance with the manufacturer's specifications / recommendations.

(vi) Provide product data and specifications for environmental protection measures and products to be used on site.

(vii) Contain an emergency response plan.

(viii) Describe any proposed or required regulatory monitoring and reporting requirements.

E10.7 Measurement and Payment

(a) The work covered in this section will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E11. WORK IN CLOSE PROXIMITY TO THE SLA

E11.1 Description

(a) This specification details operating constraints for all Work to be carried out in close proximity to the SLA. Close proximity shall be deemed to be any construction activity within a 10 m horizontal offset from the centreline of the SLA.

(b) The requirements of this section should be read in conjunction with all other specifications for work in close proximity to the SLA.

E11.2 General Considerations for Work in Close Proximity to the SLA

(a) The SLA is a critical component of the City of Winnipeg's regional water supply system and work in close proximity to it shall be undertaken with an abundance of caution. The SLA cannot be taken out of service for extended periods of time to facilitate construction and inadvertent damage caused to the pipe would have catastrophic consequences.

(b) The SLA in the vicinity of the proposed work consist of the "S" Section a cast in place concrete arch pipe measuring 3.27 m wide x 2.74 m tall. The S Section was constructed from 4.57 m (15') long reinforced concrete invert sections overlain with 13.72 m (45') long unreinforced concrete arch sections. The SLA is extremely sensitive to changes in loading, including asymmetric loading conditions.

(c) Work around the SLA shall be planned and implemented to minimize the time period that Work is carried out in close proximity to it and to ensure that it is not subjected to excessive construction related loads, including excessive vibrations and/or concentrated or asymmetrical lateral loads during backfill placement.

(d) The SLA has limited ability to withstand increased earth and live loading. Failure of the SLA has the potential to cause extensive consequential damage to infrastructure. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters.

E11.3 Pre-Work, Planning and General Execution

(a) No work shall commence in close proximity to the SLA until the equipment specifications and construction method statement have been submitted and accepted, and the SLA location has been clearly delineated in the field. Work in close proximity to the SLA shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications on the pipe.

(b) Notify the Contract Administrator five (5) Business Days prior to commencement of any work near the the SLA.

(c) The Drawings provide the location of the SLA through the construction site. The SLA locations noted on the Drawings are based on the original record drawings. Locate the SLA and confirm its position horizontally utilizing soft dig or similarly non invasive methods and vertically prior to undertaking work. Visually delineate the SLA on Site by use of paint, staking/flagging, construction fencing, snow fencing, or other suitable methods

(d) Only utilize construction practices and procedures that do not impart excessive vibratory loads on the SLA or that would cause settlement of the subgrade below the SLA.

(e) Crossing of the SLA with equipment shall be prohibited except at existing roadway crossings.

(f) 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 the SLA.

(g) Granular material, construction material, soil, and/or other material shall not be stockpiled on or within 10 m of the SLA except as shown on the Drawings.

(h) The Contractor shall ensure that all crew members understand and observe the requirements of working near the SLA. 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 the SLA. 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.

E11.4 Protection of the SLA

(a) The Contractor shall take every reasonable precaution during construction to prevent debris from entering the SLA and prevent plant and material from washing downstream in the SLA. Plans and procedures to prevent plant and material from being washed downstream shall be included in the submitted construction method statements.

(b) No fossil fuel equipment may be operated within the SLA.

(c) Generators and fossil fuel operated equipment shall be operated at a sufficient distance from the SLA to prevent the potential for fuel contamination of the SLA and in order to maintain air quality within the SLA.

(d) The Contractor shall securely close up all openings into the SLA while not on site to prevent the entry of animals or foreign materials into the SLA.

(e) It is recommended that plant and material be removed from the SLA when work is not occurring, specifically during overnight and periods when personnel are not on site.

(f) Materials and equipment used in the SLA shall not have been previously used in sewer applications or been exposed to sewage. All materials and equipment entering the SLA shall be safe for use with potable water systems including NSF-61 certification, where applicable. All plant and material entering the SLA shall be disinfected in accordance with E20.

(g) The work areas within the SLA at both manholes shall be disinfected in accordance with E20 prior to draining of the Upper Reach and placing the SLA back into service.

E11.5 Access into the SLA

(a) Access into the SLA is limited by the size of existing manholes/Boathouses and their locations along the SLA. Manhole/Boathouse locations and sizes are shown on the Drawings and Appendix E. Existing manholes are typically 685 mm in diameter.

(b) The Contractor is responsible for ensuring that all plant and material entering the SLA can be brought into the SLA through existing manholes and removed upon completion of the Work.

E11.6 Submittals

E11.6.1 Submit proposed construction equipment specifications to the Contract Administrator for review a minimum of twenty (20) Business Days prior to construction in conjunction with the associated construction method statement. The equipment submission shall include:

(a) operating locations;

(b) equipment operating and payload weights;

(c) equipment dimensions, including wheel or track base, track length or axle spacing, track widths or wheel configurations; and

(d) load distributions in the intended operating configuration.

E11.6.2 Submit a construction method statement to the Contract Administrator a minimum of twenty (20) Business Days prior to construction. The construction method statement shall contain the following minimum information:

(a) proposed construction plan including excavation locations, haul routes, excavation equipment locations, and loading positions;

(b) excavation plans, including shoring designs, for excavations occurring in close proximity to the SLA (within 10 m horizontal of the pipe's centerline), refer to E13;

(c) Plans for work within the SLA, including bracing plans and means of safely and securely working with the SLA, refer to E14; and,

(d) any other pertinent information required to accurately describe the construction activities in close proximity to the SLA and permit the Contract Administrator to review the proposed construction plans.

E11.7 Measurement and Payment

E11.7.1 Protection of the SLA

(a) Protection of the SLA will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E12. SLA SHUTDOWNS

E12.1 Description

(a) This specification details SLA shutdown requirements, including managing water levels in the Upper Reach of the SLA

E12.2 General

(a) Refer to E11 for general requirements for work in close proximity to the SLA.

E12.3 Submittals

E12.3.1 Submit the following documentation for inclusion in the City's shutdown protocol for each planned shutdown a minimum of twenty (20) Business Days prior to the proposed shutdown and the Contractor shall allow for a ten (10) Business Day review period by the City once accepted by the Contract Administrator:

(a) a detailed schedule for the work, including a step by step list of tasks to be undertaken during the shutdown. Due to the criticality of refilling the upper reach within 48-hours, the associated work plans must be to an hour-by-hour level of detail (or better);

(b) a contingency plan for any problems, issues, or unforeseen circumstance that might occur; and,

(c) check list of equipment, materials, tools required to complete the work that need to be on site prior to undertaking the shutdown.

E12.4 SLA Shutdowns

E12.4.1 Refer to D22 for SLA shutdown scheduling restrictions. Work shall be scheduled to minimize the duration of all shutdowns.

E12.4.2 Shutdowns and excavation of the SLA will not be permitted until all required submissions and protocols have been reviewed and accepted by the Contract Administrator and City.

E12.4.3 Isolation of the SLA will be completed by City forces using both sluice gates and stop logs at the SLA Intake providing a double blocked scenario. Lockout and tagout of the gates will be completed for all shutdowns.

E12.4.4 The City shall be responsible for dewatering and refilling of the SLA for the Main SLA Shutdown and Short-Term shutdowns identified in D22 and as noted below, except for the following, which shall be completed by the Contractor:

(a) control of nuisance water (I&I) as required throughout construction; and,

(b) dewatering of the upper reach to facilitate the removal of the temporary cofferdam.

E12.4.5 SLA Shutdown Terminology as defined in D22:

(a) Main SLA Shutdown:

(i) The SLA will be shutdown for up to fourteen (14) Calendar Days to facilitate the Work.

(b) Short-Term SLA Shutdown:

(i) The SLA may be shutdown for up to two (2) Calendar Days (48-hours) to facilitate pre- and post-work outside of the Main SLA Shutdown.

(c) Dewater SLA Upper Reach

(i) The Upper Reach of the SLA may be dewatered for up to 48-hours (exclusive of dewatering and refilling time) to facilitate the Inflatable Dam replacement work.

E12.4.6 Major work activities requiring a SLA Shutdown:

(a) installation of bracing and measurements within the SLA prior to construction – Short-Term SLA Shutdown;

(b) manhole repairs at both sites – Main SLA Shutdown;

(c) manhole abandonment at Mile 93.69 – Main SLA Shutdown;

(d) Inflatable Dam replacement and temporary cofferdam installation and removal;

(i) completed as part of the Main SLA Shutdown; and,

(ii) requires the Upper Reach to be dewatered twice.

(e) removal of bracing within the SLA – Main or Short-Term SLA Shutdown.

E12.4.7 Major work activities that may be completed without a SLA Shutdown:

(a) installation of water management systems and excavation, except for the installation of bracing within the SLA, which requires a Short-Term SLA Shutdown;

(b) installation of the new manhole access footbridge and platform; and,

(c) removal of water management systems.

E12.5 Lockout and Tagout Procedures

E12.5.1 Lockout and tagout of the SLA Intake gates and pumps will be completed for all shutdowns.

E12.5.2 The Contractor, City of Winnipeg Water and Waste Department, and Contract Administrator will all be required to lock out all valves, gates, and pumps to facilitate this work. The following lockout/tag out procedures will be implemented;

(a) Lockout locations for valves, gates, and pumps, and other lockout items will be identified by the City;

(b) City of Winnipeg will provide a single lock, chains and other devices to adequately secure gates and operators. The Contractor has the right to inspect the installation and satisfy that the lockout system is adequate. All locks utilized will be commonly keyed;

(c) 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;

(d) 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,

(e) City staff will then unlock all valves and will commence with restoration of the systems to service.

E12.6 Maintaining Water Levels in the SLA Upper Reach

E12.6.1 1200 mm of water must be maintained upstream Mile 93.69 (Upper Reach) to prevent structural damage to the SLA due to floatation of the pipe. The Inflatable Dam at Mile 93.69 is employed to retain water upstream of this location during SLA shutdowns. SLA operating procedures only permit the Upper Reach to be dewatered for periods of up to 48-hours to facilitate inspections and work within this section of the pipe with the intent of reducing the risk of a floatation related failure.

E12.6.2 Dewatering of the SLA Upper Reach is only permitted for up to 48-hours at a time as identified in D22. These periods will be utilized to facilitate staging of the Inflatable Dam replacement. Extensions of this window will not be granted.

E12.6.3 To facilitate the Inflatable Dam replacement, a temporary cofferdam will be constructed within the SLA, upstream of the Inflatable Dam location by the Contractor.

E12.6.4 The Contractor is responsible for maintaining water levels upstream of the temporary cofferdam at all times during the course of the Work. The range for water levels to be maintained by the Contractor is 1200 ± 150 mm (1050 mm to 1350 mm) at Mile 93.69.

E12.6.5 The proper scheduling/logistics of the work while the Upper Reach is dewatered is critical to completing the tasks within the allotted 48 hour dewatered period. The following identifies the work required during each dewatered period, including dewatering and refilling.

(a) Upper Reach dewatering prior to replacement of the Inflatable Dam:

(i) Pre 48-hour Dewatered Period:

- Dewatering of the Upper Reach by the City by deflating the existing Inflatable Dam, see E12.6.6.

(ii) During 48-hour Dewatered Period:

- Removal of temporary bracing within the SLA at Mile 94.72. Note, temporary bracing must be removed to facilitate transport of the new Inflatable Dam.
- Transport of the new Inflatable Dam from Mile 96.69 to Mile 93.69 within the SLA.
- Construction of the temporary cofferdam at Mile 93.69. Note, the new Inflatable Dam must be transported to Mile 93.69 within the SLA prior to erection of the temporary cofferdam.

- Erection of temporary working platforms within the SLA at Mile 94.72. Note, the new Inflatable Dam must be transported to Mile 93.69 within the SLA prior to erection of the temporary working platforms.

(iii) Post 48-hour Dewatered Period:

- Refilling of the Upper Reach by the City against the temporary cofferdam, see E12.6.7.

(b) Upper Reach dewatering after completion of the Inflatable Dam replacement:

(i) Pre 48-hour Dewatered Period:

- Dewatering of the Upper Reach by the Contractor using the temporary cofferdam, see E12.6.6.

(ii) During 48-hour Dewatered Period:

- Removal of the temporary cofferdam at Mile 93.69.
- Removal of temporary working platforms within the SLA at Mile 94.72.

(iii) Post 48-hour Dewatered Period:

- Refilling of the Upper Reach by the City against the new Inflatable Dam, see E12.6.7.

E12.6.6 Draining of water upstream of Mile 93.69 (Upper Reach)

(a) Draining of the Upper Reach via the Inflatable Dam will be completed by the City. The City will deflate the dam, allowing water to flow past the manhole at Mile 93.69 (worksite).

(b) Draining of the Upper Reach via the temporary cofferdam shall be completed by the Contractor. The Contractor is responsible for ensuring the draining operation occurs within a 24-hour timeframe as detailed in E19.

(c) The Contractor shall ensure all plant and material is removed from the SLA or adequately secured to prevent being washed downstream during draining operations.

E12.6.7 Refilling the Upper Reach

(a) The City will fill the Upper Reach by opening one gate at the SLA Intake by a set amount to achieve a controlled filling rate.

(b) A trial fill was completed in October 2024 and a steady fill rate of 815 L/s was achieved, filling the Upper Reach in 6-hours.

(c) There are several variables which impact the flow rate through the gate, including lake levels. Notwithstanding, the intent is to achieve a similar result when filling the Upper Reach during construction. The City will endeavour to fill the Upper Reach to a level of between 1050 and 1200 at Mile 93.69.

(d) During the filling process the lockout/tagout of the gates must be removed. The Contractor must coordinate with the Contract Administrator to facilitate removal of the lockout/tagout for this operation and reestablish lockout/tagout upon completion. The Contractor is not permitted to work within the SLA until lock out and tag out at the SLA Intake has been re-established.

E12.6.8 The following volumes of the stored water upstream of the Mile 93.69 (Upper Reach) have been estimated based on the listed water depths at Mile 93.69:

(a) 1050 mm depth – 19,000,000 L

(b) 1200 mm depth – 26,000,000 L

(c) 1350 mm depth – 34,000,000 L

E12.6.9 Infiltration and inflow (I&I) Upstream of Mile 93.69

(a) SLA I&I upstream of Mile 93.69 was monitored in October 2024 as part of the annual shutdown. I&I of 4 L/s was witnessed over approximately a 24-hour period based on a water level rise of 17 mm at Mile 93.69 during this period.

(b) SLA I&I rates are variable and fluctuate based on groundwater and surface water conditions. Higher surface water conditions could result in considerably more I&I than what was witnessed in Oct 2024.

(c) The Contractor shall be prepared to address I&I rates of up to 20 L/s during construction which equates to an increase in water levels at Mile 93.69 of approximately 100 mm /day. The Contractor will need to utilize pumps or otherwise ensure levels are maintained within the range stipulated herein.

(d) Contractor shall notify the Contract Administrator if I&I rates above 20 L/s are present and implement contingency measures as necessary. Deployment of measures to address I&I rates above 20 L/s will be considered a Change in Work.

E12.7 Measurement and Payment

E12.7.1 Maintaining Water Levels in the Upper Reach and Support for Operation of the SLA

(a) Maintaining water levels in the Upper Reach, including managing I&I, facilitating dewatering and filling, and any other Contractor operations related to operation of SLA as identified herein will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E13. EXCAVATION, SHORING, AND BACKFILL

E13.1 Description

(a) This specification covers the requirements for excavations, shoring, and backfilling of trenches, pipelines, and structures on this project.

E13.2 General

(a) Refer to E11 for general requirements for work in close proximity to the SLA.

E13.3 General Considerations for Work in Close Proximity to the SLA

(a) The SLA has limited ability to withstand increased earth and live loading. Failure of the SLA has the potential to cause extensive consequential damage to infrastructure. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters.

E13.4 Submittals

E13.4.1 Submit shoring designs with the construction method statement for work around the SLA and the excavation plans, refer to E11.

E13.4.2 Shoring design submissions shall be prepared and submitted a minimum of twenty (20) Business Days prior to undertaking the excavation and shoring installation. Shoring Shop Drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in the design of excavation shoring systems.

E13.5 Shoring Design:

E13.5.1 General

(a) Shoring shall be provided for excavations in accordance with CW 2030.

(b) Excavation shoring shall be designed to accommodate all existing and new piping and associated infrastructure.

(c) All shoring systems shall comply with Manitoba Workplace Safety and Health requirements.

(d) Groundwater and surface water at Mile 93.69 and Mile 94.72 can be expected and without mitigation will result in challenging excavation conditions. A Pre-Approved Water Management Plan has been developed for use by the Contractor in developing their shoring methods. Refer to E15 and Appendix H for the Pre-Approved Water Management Plan.

E13.5.2 Shoring Performance Requirements

(a) Be substantially watertight or utilize a Water Management Plan to achieve similar objectives;

(b) Prevent disturbance, destabilization or failure of the sides and/or bottom of the excavation; and,

(c) Resist all loads to which it will be subjected, including vertical and lateral loads from construction equipment, without transmitting such loads onto the SLA either directly or indirectly.

E13.6 Demolition, Excavation, and Shoring

(a) All work shall be completed in accordance with the submitted excavation and shoring plans.

(b) Frozen Soils:

(i) When excavating in frozen ground, employ methods which will not cause damage to the SLA. Alternatively, thaw out the frozen ground by heading and hording the excavation area prior to excavating with conventional equipment.

(ii) The Contractor will be permitted to install a secure layer of insulating material over the proposed excavation areas, prior to freeze-up, to minimize frost penetration in proposed excavation areas.

(c) Use of pneumatic concrete breakers within 10 m of the SLA is prohibited. Small handheld jackhammers are permitted.

(d) Excavations:

(i) Offset excavation equipment a minimum of 5 m from the centerline of the SLA and as shown on the Drawings.

(ii) Carefully excavate to expose existing pipelines. Utilize only smooth-edged excavation buckets, soft excavation, or hand excavation techniques with full time supervision where there is less than 1.5 m of earth cover over the SLA. Where there is less than 1.0 m of soil cover above the SLA complete the excavation utilizing hand excavation or soft excavation methods.

(e) Shoring:

(i) Excavations within 5 m of the outside edge of the SLA (hydrovac holes for confirming the SLA location excluded) and which extend below obvert of the SLA shall utilize shoring methods that precludes the movement of native in-situ soils (i.e. a tight shoring system).

(ii) Shoring shall not touch the pipe and must be restrained from inadvertent movement which could result in damage to the SLA.

(iii) High water tables are present at both Mile 93.69 and 94.72. Said high water tables, in conjunction with existing fill soils overtop of the SLA may lead to challenging excavation conditions. Thus, shoring and excavation plans must account for the control of groundwater during the excavation and construction process, see E12.

(iv) Pre-bore all piles to below the invert of the SLA within 5 m (horizontally) of the pipeline’s outside edge. Piles shall have a minimum 500 mm clear separation from the SLA.

(v) Offset pile driving equipment a minimum of 5 m (horizontally) from the centerline of the pipeline during piling operations.

(f) Where shoring is not installed the Contractor shall maintain safe excavation side slopes to suit the excavated material and site conditions.

(g) Materials shall not be stockpiled over pipelines.

(h) Excess excavation material from excavations shall be disposed at designated locations as shown on the Drawings.

(i) Concrete and other materials from demolitions must be disposed of off site.

(j) The Contractor shall undertake all efforts to prevent freezing of soils underlying existing pipelines, bedding and backfilling will not be permitted overtop of frozen soils. Excavations left open when nighttime atmospheric temperatures are expected to drop below 0°C shall be horded and heated as required to keep soils and pipelines from freezing.

E13.7 Backfill and Working Pad Construction

(a) Backfill of the SLA shall be completed with existing excavated in situ materials.

(b) Excavation and backfill shall proceed simultaneously on both sides of the SLA, with not more than 0.6 m of grade differential maintained between both sides of the SLA at any time.

(c) Compaction of backfill materials is not required.

(d) Subgrade, base/subbase compaction within 5 metres (horizontal) of the SLA shall be limited to non-vibratory methods only. Small walk behind vibratory packers will be permitted.

(e) Permanent and temporary pad construction shall be bucket and/or track packed sufficient to create a solid working platform and minimise long-term settlement to the greatest extent possible.

(f) Backfill material shall not be dumped directly on the SLA but shall be stockpiled outside the limits noted in these recommendations and be carefully placed utilizing excavators.

E13.8 Measurement and Payment

E13.8.1 Excavation and Shoring

(a) Excavation and shoring will be measured and paid on a lump sum basis at the Contract Unit Price for each site as identified in Form B: Prices. Payment shall include all materials and labour to complete the work required to facilitate the identified work at each site, including but not limited to installation of water control works, excavation, and backfill.

(b) Payment will be made on the following schedule:

(i) 70% payment upon completion of the shoring and excavation work suitable to commence the identified work at each site.

(ii) The remaining 30% payment upon removal of all water management systems, shoring, and completion of backfill at each site.

E14. TEMPORARY WORKS WITHIN THE SLA

E14.1 Description

(a) This specification details the requirements for temporary bracing and working platforms within the SLA.

E14.2 General

(a) Refer to E11 for general requirements for work in close proximity to the SLA.

E14.3 Submittals

E14.3.1 Submit internal bracing and platform shop drawings with the construction method statement for work around the SLA, refer to E11.

E14.3.2 Internal bracing submissions shall be prepared and submitted a minimum of twenty (20) Business Days prior to undertaking the excavation and shoring installation. Shoring Shop Drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in the design of excavation shoring systems.

E14.4 Internal SLA Bracing and Work Platforms

(a) Internal bracing and work platforms are required to be installed where identified on the Drawings and herein.

(b) Internal bracing shall provide support to the arch and manholes over the arch of the SLA as shown on the Drawings.

(c) Internal bracing will be installed during pre-work short-term SLA shutdowns and will be in place during live flow within the SLA.

(d) Internal bracing shall be adequately braced laterally and tied as required to prevent movement during the Work and under live flow conditions. The bracing must be designed, braced laterally, and anchored to resist the forces imposed by water flowing at approximately 1.75 m deep at a velocity of 1.0 m/s.

(e) Install screw jack type braces by hand tightening only.

(f) All materials and equipment entering the SLA shall be safe for use with potable water systems including NSF-61 certification, where applicable.

(g) The SLA shall be free of foreign material and debris after removal of the bracing.

E14.5 Measurement and Payment

E14.5.1 Bracing and Temporary Work Platforms

(a) Supply and installation of temporary bracing and work platforms within the SLA will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E15. GROUND AND SURFACE WATER MANAGEMENT PLAN

E15.1 Description

E15.1.1 The specification shall cover the following water management items:

(a) Construction of seepage control measures such as sheet piling;

(b) Installation of sump pits; and,

(c) Dewatering pump installation and operation.

E15.2 General

(a) Refer to E11 for general requirements for work in close proximity to the SLA and E13 and E14 for excavation, shoring, backfill, and temporary works within the SLA.

E15.3 The work to be done 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 hereinafter specified.

E15.4 The Contractor shall be responsible to dewater the SLA manhole excavations sufficient to construct the Work. The Contractor is advised that the manhole locations are situated within a berm located between water-filled drainage ditches on the north and south sides and high groundwater levels and soft, permeable materials can be expected to be present within the area of the Work. A water management plan is expected to include a cofferdam such as sheet piles embedded into native clay soils to permit the construction of the work below the waterline in a dry condition and maintain an adequate level of stability of excavated slopes.

E15.5 A Pre-Approved Water Management Plan has been developed for use by the Contractor and can be found in Appendix H. The Contractor may use the pre-approved concept as the basis for their Water Management Plan.

E15.6 Submittals

E15.6.1 Water Management Plan

(a) The Contractor shall submit a Water Management Plan at least twenty (20) business days prior to commencement of construction. The Water Management Plan shall be sufficient to satisfy the Contract Administrator that the proposed water management measures will be in accordance with this Specification and will not adversely impact

the integrity of the SLA for the duration of the project. Acceptance of the Water Management Plan shall not diminish the Contractor's responsibility for control of water in the excavation and maintaining the integrity of the SLA.

(b) The Water Management Plan shall be prepared by a qualified Professional Engineer and shall include the proposed materials, layout, grades and installation method for all components of the system. Detailed fabrication and construction drawings are required. The plan shall be sealed by a Professional Engineer, registered in the Province of Manitoba

(c) If seepage cutoff components are to retain soil and function as shoring, the Water Management Plan must satisfy the requirements for shoring Shop Drawings in accordance with E13.

(d) The water management plan shall detail measures to prevent over-penetration of sheet piles (if used), such that they do not come into contact with the SLA. Such measures may include a rigid guide frame and flanges or pins attached in the field at a specific height above the base of the sheet that limit the embedment of the sheets below the guide frame.

(e) The Water Management Plan shall identify the number and locations of sump pits, specifications for any dewatering pumps, and procedures for operation and monitoring of pumping systems.

E15.7 Provision of Materials

E15.7.1 The Contractor shall provide all major structural components of the water control works (sheet piles and associated supporting structural components and guides) to the City upon completion of the work.

E15.7.2 Components shall be delivered to the City of Winnipeg's GWWD Hadashville Yard.

E15.8 Measurement and Payment

E15.8.1 Developing and implementing the Water Management Plan will be considered incidental to the SLA Excavation and Shoring and will not be measured for payment. No additional payment will be made.

E16. SLA MANHOLE SITE IMPROVEMENTS

E16.1 Description

(a) This specification covers upgrades to the access and working pads at the SLA manhole sites.

E16.2 Materials

(a) 915 m^3 of OPSS 1010 Type II B crushed granular material will be supplied for use on the project. Specific volumes of material provided to each site will be confirmed once complete. Excess material not used in the pad construction shall remain on site for future use.

(b) City railways crews will transport granular materials to each site via the GWWD railway prior to commencement construction. Material will be stockpiled at the locations identified on the Drawings.

(c) Non-woven geotextile shall meet the requirement of CW 3130 for Separation/Filtration Geotextile Fabric.

E16.3 Methods

(a) Upgrade and expand existing works pads as shown on the drawings.

(b) The material may contain up to 100 mm aggregate. The contractor shall blade materials to provide a reasonable smooth and level final surface.

(c) Areas requiring clearing and grubbing shall be completed in accordance with CW 3010. Burning or burying of any materials from clearing and grubbing operations will not be allowed within the SLA right-of-way.

(d) The Contractor shall touch up the pad surfaces upon completion of the work and demobilization of equipment.

E16.4 Measurement and Payment

E16.4.1 Manhole Site Access/Working Pad Upgrades

(a) Upgrades to access the manhole site access/working pads will be measured and paid on a lump sum basis at the Contract Unit Price at each location as identified in Form B. Payment shall include all materials and labour to complete the work, except for the supply of granular materials, which shall be supplied by the City for use.

E17. SLA MANHOLE MODIFICATIONS

E17.1 Description

(a) This specification covers the construction of new manholes and repairs and abandonment of existing SLA manholes.

E17.2 Submittals

E17.2.1 Submit Shop Drawings for all proposed materials in accordance with E3.

E17.2.2 The Contractor shall submit the following Shop Drawings and construction method statements in accordance with E3:

(a) construction method statements for both sites in accordance with E11;

(b) excavation and shoring plans for both sites in accordance with E13;

(c) water management plan for both sites in accordance with E15;

(d) temporary work platform plan; and,

(e) construction method statements for the following:

(i) construction of new manhole at Mile 93.69;

(ii) abandonment of existing manhole at Mile 93.69; and,

(iii) repair of manhole at Mile 94.72.

E17.2.3 SLA manhole construction method statements shall be submitted a minimum of twenty (20) Business Days in advance of the work and shall include the following:

(a) Clear reference to the construction method statements and excavation and shoring plans for the respective sites. Plans for the construction must take into account the excavation and shoring plans and vice versa.

(b) Construction sequence/schedule complete with all required materials, equipment, crews, and sub-contractors required to complete each phase of the work.

(c) SLA arch coring procedure (required for the new manhole at Mile 93.69).

(d) List of all materials required, complete with references to submitted Shop Drawings.

(e) Detailed drawings for all temporary works required within the SLA, including a list of all materials, and erection/dismantling procedures.

E17.2.4 FRP ladder Shop Drawings and any accompanying design calculations shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in the design of FRP ladder systems. Shop drawings and/or accompanying design calculations shall clearly indicate all design inputs.

E17.3 Materials

E17.3.1 Circular Steel Shoring

(a) Steel shoring can to be designed by the Contractor in accordance with E13.

(b) Minimum diameter of 2590 mm.

E17.3.2 Cast-in-Place Concrete

(a) Refer to E25 and E27.

E17.3.3 Pre-Cast Concrete Manhole Components

(a) Pre-cast concrete manhole components shall be manufactured to CW 2130.

(b) Custom components shall be manufactured to the dimensions shown on the drawings and be compatible with the standard pre-cast components to be used.

(c) The new GWWD Cover frames shall be cast directly into the concrete components.

E17.3.4 Concrete Anchors and Sealants

(a) All products shall be NSF-61 certified for use in potable water environments.

(b) Polyurethane sealants:

(i) Shall be non sag, polyurethane sealant

(ii) Approved Products: Sikaflex 1A, 2C NS, or approved equal in accordance with B8. Colour: Precast.

(c) Epoxy Anchors:

(i) All threaded anchor studs shall be type 316 stainless steel meeting the following:

- Studs shall be ASTM F593 or ASTM F738M.
- Nuts shall be ASTM F594 or ASTM F836M.

(ii) Epoxy system shall be a two part adhesive designed for epoxy anchor systems. Hilti HIT-RE 500 V3 or approved equal in accordance with B8.

(iii) Install anchors to depths recommended by the manufacturer.

(iv) Wedge style anchors will not be permitted within the SLA.

E17.3.5 Self Adhered Water Barrier Membrane

(a) Self-adhesive air barrier membrane: SBS rubberized asphalt on high-density polyethylene film, with silicone release paper on adhesive side, nominal thickness (minimum) 1.5 mm (60 mils).

(b) Approved product: Henry Blueskin WP200 or approved equal in accordance with B8.

E17.3.6 Pre-Formed Metal Cladding

(a) Refer to E29.

E17.3.7 FRP Ladder System

(a) The new manhole at Mile 93.69 requires a fixed and retractable FRP ladder system. Both shall be installed in the precast manhole section with the retractable system designed to extend into the SLA.

(b) The retractable ladder is to be designed by the manufacturer to suit the intended application.

(c) The ladder system shall include a fixed section mounted within the new manhole and an extendable section which, utilizing a rope and pully system, shall be capable of extending to the invert of the SLA and retracting up within the manhole.

(i) The ladder system may extend below the obvert of the SLA, but when retracted, there shall be a minimum of 1800 mm of clear distance to the invert of the SLA, as shown on the Drawings.

(ii) The extendable section shall be extendable and retractable from within the manhole.

(iii) The ladder system shall include a locking mechanism to securely lock the extendable section in the retracted position to prevent inadvertent movement when not in use.

(d) Support brackets may be installed within the SLA as shown on the drawings.

(e) While normal SLA flows do not exceed 1800 mm in height at Mile 93.69, the ladder system must be designed to support an SLA flow rate of 1.0 m/s.

(f) The ladder shall be manufactured from NSF-61 compliant materials suitable for use in potable water applications.

(g) The main ladder components shall be constructed from corrosion resistant fibre reinforced polymer (RFP) suitable for use in chlorine environments.

(h) All metal components shall be constructed from type 316 stainless steel.

(i) The ladder must be secured utilizing type 316 stainless steel mounting hardware. Any anchors installed within the SLA itself shall be an adhesive style as specified herein.

(j) Ladder steps shall be of a non-slip style.

(k) Approved manufacturer: Access Industrial Inc or approved equal in accordance with B8.

E17.3.8 HDPE Studded Liner

(a) The HDPE studded line shall be a concrete lining system designed for embedment in concrete to protect from environmental related degradation.

(b) Liner material: HDPE suitable for UV exposed and cold weather environments.

(c) Minimum HDPE material properties:

(i) Tensile strength: 14.5 MPa

(ii) Elongation at Break: 300%

(d) Minimum thickness: 5 mm.

(e) Minimum number of studs: 400 per m^2

(f) Approved products: GSE Studliner manufactured by Solmax, Sure-Grip manufactured by Agru, or approved equal in accordance with B8.

E17.3.9 HDPE Outer Frost Sleeve

(a) Material: HDPE suitable for UV exposed and cold weather environments and thermal welding into finished products.

(b) Minimum HDPE material properties:

(i) Tensile strength: 14.5 MPa

(ii) Elongation at Break: 300%

(c) Minimum thickness: 6 mm.

E17.3.10 Food Grade Grease

(a) Food grade grease shall be NSF 21469 certified and be suitable for cold temperature use.

E17.3.11 Aluminum SLA Vent

(a) Vent pipe extensions shall be fabricated from aluminum tube and plates confirming to ASTM B221.

E17.3.12 New GWWD Manhole Cover Frame

(a) Fabrication of new GWWD manhole cover frames shall be completed in accordance with E22.

(b) Frames shall be sized to match the existing frames, be manufactured to equivalent dimensions, and be compatible with the existing GWWD cast iron covers. Existing covers will be installed on the new frames.

E17.3.13 Rigid Polystyrene Insulation

(a) Rigid polystyrene insulation for below grade: 50 mm thick rigid insulation to CAN/ULC S701, Type 4 rigid, closed cell type, with integral high-density skin, extruded polystyrene insulation, 610 mm wide x 2440 mm long, edge treatment: butt edge and ship lapped.

(b) As manufactured by DOW Chemical, Owens Corning, or approved equal in accordance with B8.

E17.3.14 Spray Foam Insulation

(a) Closed-cell foam with water-resistant outer skin when cured.

(b) Approved Products: Dupont Great Stuff, Sika Boom AS, or approved equal in accordance with B8.

E17.3.15 Spray Applied Polyurethane Insulation

(a) Polyurethane foam shall be closed cell, less than 1% open cell content to ASTM D-6226.

(b) Approved Products: BASF Walltite CM01 or approved equal in accordance with B8.

E17.4 Methods

E17.4.1 Salvaging Manhole Components

(a) The Contractor shall salvage the following components from the existing Manholes:

(i) GWWD cast iron manhole covers shall be reused at each manhole location.

(ii) Existing GWWD cast iron manhole cover frames shall be salvaged from the existing manhole chimneys and provided to the City for future use. The cover frames shall be carefully removed from the existing concrete manholes and cleaned of existing concrete before providing to the City.

(iii) Existing inner manhole covers shall be salvaged and reused if possible.

E17.4.2 Cast-in-Place Concrete

(a) Refer to E25 and E27.

E17.4.3 Coring SLA Arch

(a) The SLA arch may be cored after completion of the cast in place concrete base for the new manhole at Mile 93.69.

(b) Coring methods must minimise vibration and loading on the SLA.

(c) Regardless of the coring method selected, portions of the SLA arch being removed must be secured and restrained during cutting operations to prevent them from dropping into the SLA.

(d) Coring may take the form of single 900 mm core, or multiple small diameter cores to achieve a 900 mm diameter opening. If the latter option is selected, the hole shall be cleaned up to provide a smooth and uniformly circular opening into the SLA.

E17.4.4 Abandon Existing SLA Manhole

(a) Abandonment of the existing SLA manhole at Mile 93.69 can commence once the new manhole is complete to the point of facilitating entry to the SLA.

(b) Complete abandonment as shown on the Drawings.

E17.4.5 Spray Applied Polyurethane Insulation

(a) Apply insulation in accordance with the manufacturer’s recommendations.

(b) Where filling cavities, the insulation shall be applied at a rate to minimise heat buildup and prevent damage to the confining structures.

E17.4.6 HDPE Liners and Frost Sleeves

(a) HDPE components shall be manufactured and installed as shown on the Drawings. The Contractor shall submit Shop Drawings for all components and confirm sizing for all associated components, including concrete manholes, steel shoring, and other HDPE components.

(b) HDPE sheets shall be thermal welded via extrusion welding, wedge welding, or an electro-fusion process. The selected welding process shall result in uniform and monolithic HDPE liner once complete.

(c) HDPE welding shall be completed in accordance with the manufacturer's recommendations.

(d) Surface preparation:

(i) Preparation of the material surface is vital to the quality of the weld. The surfaces must first be cleaned, dried and free of debris prior to welding. In order to achieve a strong bond between the extrusion material and the surface, the liner should be slightly scored using a grinder and proper techniques.

(ii) The welder should be set to parameters defined by the manufacturer of the welding equipment. All seams and penetrations must be properly ground to roughen the surface if an extrusion welder is to be used.

(e) Weld Testing:

(i) Prior to any field welding of a lined surface, it is advantageous to perform a trial seam to ensure that the technician and method are adequate. Trial seams should be performed on materials from the current project; 1 m length is adequate. Trial weld seams should then be tested to ensure equipment settings are sufficient to produce quality welds.

(ii) A shear weld test shall be completed on the trail welding seem and shall meet or exceed at least 80% strength of parent material in a destructive test, which pulls the sample apart to test the strength and integrity of the extrusion weld.

(iii) Vacuum box testing per ASTM D5641 will be performed on all accessible welds according to procedures set forth by a manufacturer. A negative pressure of 35 kPa shall be applied to the seam. A defect in the weld will be noted by the presence of bubbles along the seam. The defect shall be marked and repaired with acceptable methods.

(iv) Spark testing of the finished seams is required per ASTM D6365, a copper wire may be set into the weld joint prior to welding. This will allow for spark testing for the welded seam to determine the presence of possible leaks in the weld.

(v) Repairs of pinholes and defective areas should be performed by extruding a bead of molten plastic over the surface, or if too large, a patch shall be utilized. Retest once complete.

(f) The Contractor shall utilize a suitable HDPE compatible sealant to seal the HDPE top cap to the Concrete manhole.

E17.5 Measurement and Payment

E17.5.1 New Mile 93.69 Manhole

(a) Construction of a new manhole at Mile 93.69 will be measured and paid on a lump sum basis at the Contract Unit Price as identified in Form B. Payment shall include all materials and labour to complete the work including, but not limited to construction of new manhole complete with all identified components.

E17.5.2 Abandon Existing Mile 93.69 Manhole

(a) Abandonment of the existing manhole at Mile 93.69 will be measured and paid on a lump sum basis at the Contract Unit Price as identified in Form B. Payment shall include all materials and labour to complete the work.

E17.5.3 Extension of Existing SLA Vent at Mile 93.69

(a) Extension of the SLA vent at Mile 93.69 will be measured and paid on a lump sum basis at the Contract Unit Price as identified in Form B. Payment shall include all materials and labour to complete the work.

E17.5.4 Repair of Mile 94.72 Manhole

(a) Repair of the manhole at Mile 94.72 will be measured and paid on a lump sum basis at the Contract Unit Price as identified in Form B. Payment shall include all materials and labour to complete the work including, but not limited to repair of the manhole complete with all identified components.

E18. SLA MILE 93.69 INFLATABLE DAM REPLACEMENT

E18.1 Description

(a) This specification covers the replacement of the Inflatable Dam within the SLA at Mile 93.69.

(b) Refer to E19 for the temporary cofferdam to be utilized to retain water within the Upper Reach to facilitate the Inflatable Dam replacement.

E18.2 Existing Information and Documentation

E18.2.1 The Contractor is directed to the following information related to the replacement of the Inflatable Dam

(a) Appendix E – Mile 96.69 Boathouse Access details the requirements for insertion of the new Inflatable Dam into the SLA and transport to Mile 93.69;

(b) Appendix F – Original Inflatable Dam Shop Drawings; and,

(c) Appendix G – New Inflatable Dam Shop Drawings and Installation Manual.

E18.2.2 The following additional information is also available upon request and submission of a signed Non-Disclosure Agreement:

(a) Photographic Record – Installation of Inflatable Rubber Dam – Anchor Line Installation, October 2000; and,

(b) Photographic Record – Installation of Inflatable Rubber Dam – Dam Installation, May 2001.

E18.3 Scheduling of Inflatable Dam Manufacturer Inspection of Installation Work

(a) The Contractor must confirm installation dates a minimum of forty (40) Business Days in advance of the work to permit the representative of the Inflatable Dam manufacturer to be on site.

E18.4 Submittals

E18.4.1 Submit Shop Drawings for all proposed materials in accordance with E3.

E18.4.2 Inflatable dam replacement construction method statements shall be submitted a minimum of twenty (20) Business Days in advance of the work in accordance with E3 and include the following:

(a) Clear reference to the construction method statements for both manhole sites and the excavation and shoring plans for Mile 93.69. Plans for the construction must take into account the other work planed for the sites and vice versa.

(b) Construction sequence/schedule complete with all required materials, equipment, crews, and sub-contractors required to complete each phase of the work.

(c) Storage and transportation procedures for the new Inflatable Dam. The plans must include all temporary measures, rigging, and equipment required to lower the Inflatable Dam into the SLA and transport it from Mile 96.69 to Mile 93.69.

(d) Must address, reference, and/or incorporate the installation manual provided by the dam manufacturer.

(e) List of all materials required, complete with references to submitted Shop Drawings.

(f) Detailed drawings for all temporary works required within the SLA, including a list of all materials, and erection/dismantling procedures.

(g) Detailed procedures for disassembly of the existing dam, including removal and salvage of existing hardware.

E18.5 Materials

E18.5.1 Inflatable Dam Materials

(a) The City will supply the new Inflatable Dam and sealants as shown in the Shop Drawings found in Appendix G.

(b) The Inflatable Dam materials will be stored at the City's Water Treatment Plan and the Contractor shall coordinate with the Contract Administrator for pickup and transportation to site.

(c) A representative from the Inflatable Dam manufacturer will be on site to provide advisory services.

E18.5.2 Inflatable Dam Mounting Hardware

(a) Existing hardware is to be used for installation of the dam.

(b) Notwithstanding, the Contractor shall supply Ten (10) stainless steel nuts and washers as spares for the work. Size: 3\4" NC.

(c) Stainless steel nuts shall confirm to ASTM F594, type 316 stainless steel.

(d) Stainless steel washers shall be manufactured from material meeting the requirements of ASTM A240, type 316 stainless steel.

E18.5.3 SCADA Cable

(a) 600V Instrumentation ACIC Cable.

(b) Pairs: Twisted 2 Pair Analog.

(c) Cable: to CAN/CSA-C22.2 No. 239:21, Control and Instrumentation Cables.

(d) Direct Burial: Conduit containment to CSA C22.1:24.

(e) Conductors: 18 AWG.

(f) Insulation: PVC, 75°C Wet, 105°C Dry (-40°C), 600 V.

(g) Shielding: Individually Beldfoil Shielded Pairs and overall Beldfoil Shielding or approved equal in accordance with B8.

(h) Armour: Interlocking Aluminum or Steel.

(i) Overall Covering: PVC.

(j) Connectors: Watertight, explosion proof connectors approved for armoured cable.

E18.5.4 Air Hose

(a) Length: As required.

(b) Diameter: 9.6 mm (3/8").

(c) Materials:

(i) Silicone covered PTFE.

(ii) Noncontaminating.

(iii) FDA 21 CFR Part 177.1550, NSF/ANSI 51, or equivalent in accordance with B8.

(iv) Kink proof.

(v) Chemical resistant (chlorine).

(vi) Rated to minimum -40°C.

(d) Connection Type: 316 stainless steel:

(i) In SLA: Face seal fitting to threaded fitting.

(ii) At surface: Quick connect fitting matching existing.

(e) Working Pressure: 300 PSIG (20 Bar).

E18.5.5 Electrical Conduit, Boxes, Fastenings, and Connections

(a) PVC Conduit shall meet CSA C22.2 No. 211.2.

(b) Conduit Boxes:

(i) Non-metallic PVC boxes with mounting feet for surface wiring of devices.

(ii) Shall be manufactured to CSA C22.2 No. 18.

(iii) NEMA 4X, unless otherwise indicated.

(c) Conduit fittings:

(i) Shal be manufactured for use with conduit specified.

(ii) Factory "ells" where 90° bends are required for 25 mm and larger conduits.

(iii) Watertight connectors and couplings for EMT. Set-screws are not acceptable.

(d) PVC Conduit fasteners:

(i) One hole steel straps to secure surface conduits 50 mm and smaller. Two hole steel straps for conduits larger than 50 mm.

(ii) Beam clamps to secure conduits to exposed steel work.

E18.6 Sequencing of the Work

E18.6.1 Sequencing of the work is critical to completion of the work within the SLA shutdown timeframes available. The following sequencing has been developed to facilitate the work. The Contractor shall review and advise if they have any concerns with the proposed sequencing and/or proposed changes to what's been presented. The Contractor is directed to the limitations on dewatering the SLA Upper Reach and additional information related to the Upper Reach dewatering work found in E12.

E18.6.2 Anticipated Inflatable Dam Replacement Sequencing:

(a) Dewater the Upper Reach via the existing Inflatable Dam by City forces (E12)

(b) While the Upper Reach is dewatered (max 48-hours):

(i) Transport of the new Inflatable Dam to Mile 93.69.

(ii) Construct temporary cofferdam at Mile 93.69.

(c) Refill the Upper Reach by City Forces (E12).

(d) Replace the Inflatable Dam.

(e) Pressure test the Inflatable Dam.

(f) Dewater the Upper Reach via the temporary cofferdam by the Contractor (E12 and E19).

(g) While the Upper Reach is dewatered (max 48-hours):

(i) Remove the temporary cofferdam

(h) Refill the Upper Reach by City Forces (E12).

E18.7 Methods

E18.7.1 New Inflatable Dam Inspection

(a) The Contractor shall complete an inspection of the new Inflatable Dam with the Contract Administrator prior to moving the Inflatable Dam to site. The inspection may occur at the City's Water Treatment Plan or at a mutually agreed upon location within or near the City of Winnipeg.

(b) The intent of the inspection is to both inspect the new Inflatable Dam and for the Contractor to gain practice handling the dam in advance of the installation work.

(c) The inspection shall include unwrapping and unfolding the rubber material, thorough inspection of the dam materials, refolding and preparation for transport.

(d) The Contractor must supply equipment and materials and equipment to complete the inspection.

(e) The inspection must be completed in a clean shop with a floor free of debris, sharp objects, or other hazards which may damage the dam material.

(f) Once refolded, the dam shall be wrapped up in a protective plastic wrap and re crated for transport.

E18.7.2 The Contractor shall refer to requirements for maintaining water levels upstream of Mile 93.69 in E12 and the requirements for construction of the temporary cofferdam and draining of the Upper Reach in E19.

E18.7.3 The Inflatable Dam shall be replaced following the manufacturers installation manual and the Contractors submitted construction method statement(s).

E18.7.4 Inflatable Dam Transport

(a) The new Inflatable Dam is currently located at the City's Water Treatment Plant. The Contractor can elect for one of the following:

(i) Pick up the new Inflatable Dam at the City's Water Treatment Plant and transport to the Mile 93.69 Boathouse utilising their own forces.

(ii) Have the new Inflatable Dam transported to the Mile 96.69 Boathouse directly from the Water Treatment Plan by the GWWD Railway locomotive.

(b) In both cases, the Contractor must supply equipment and operators to load and unload the Inflatable Dam.

(c) Once at the Mile 96.69 Boathouse, the Contractor must transport the new Inflatable Dam within the SLA from Mile 96.69 to Mile 93.69.

(d) The Contractor is directed to review the information provided in Appendix E, which provides information on access to the Mile 96.69 Boathouse, and the SLA between Mile 96.69 and Mile 93.69.

(e) There is limited space to maneuver the new Inflatable Dam and lower it into the SLA from the Mile 96.69 Boathouse. Existing overhead crane equipment cannot be used and the City will be removing it prior to undertaking this work. The contractor shall provide temporary overhead rigging as required to complete the installation. Temporary works to lower the Inflatable Dam must be free standing and not anchored to or otherwise supported off the roof or walls of the existing structure.

(f) The Contractor shall provide a cart for transport of the new Inflatable Dam from Mile 96.69 to Mile 93.69. The cart must be designed to be disassembled and removed from the SLA at Mile 93.69 or brought back to the Mile 96.69 Boathouse after unloading.

E18.7.5 Inflatable Dam Storage

(a) If picked up from the City and not delivered to Mile 96.69 via the GWWD Railway locomotive, the new Inflatable Dam shall be stored inside in a secure facility prior to transport to site. Notwithstanding, the new Inflatable Dam may be stored outside at the Mile 96.69 Boathouse once brought to site.

(b) When stored outside, the new Inflatable Dam shall be protected from the elements (rain, snow, mechanical damage, and UV) by securely tarping the crate with heavy duty poly tarps or equivalent.

(c) The time period of outdoor storage of the new Inflatable Dam at the Mile 96.69 Boathouse should be minimised to the greatest extent possible. Ideally, less than 14 Calendar Days.

E18.7.6 Temporary Relocation of Inflatable Dam Controls

(a) Prior to commencement of construction on site, the Contractor shall relocate the Inflatable Dam controls from the existing wooden platform to the granular pad next to the existing RTU building, as shown on the Drawings.

(b) The Contractor shall provide a wooden, insulated enclosure similar to the existing enclosure for use by City in operating the Inflatable Dam through the construction process, until such a time that the dam can be operated from the new control box location on the new access platform.

(c) The Contractor shall provide an extension to the existing airline and SCADA cable and support it across the ditch from the Inflatable Dam air hose enclosure to the new controls enclosure. It may be feasible to relocate the existing SCADA cable (depending on depth of bury) vs splicing an extension. The Contractor shall investigate at the start of the work.

E18.7.7 Inflatable Dam Installation

(a) Carefully disassemble the existing Inflatable Dam.

(b) The existing anchor studs appear to have been cut off after installation of the Inflatable Dam in 2001. The Contractor shall clean up the threads on the existing anchor studs prior to removal of the anchor hardware. This may includes the use of dies and files to ensure disassembly without damage to existing anchors and hardware. All hardware is to be salvaged for reuse if possible.

(c) Existing mounting plates are required for installation of the new Inflatable Dam. These components must be salvaged for reuse.

(d) Existing Inflatable rubber sheet shall be removed in one piece and shall not be cut/altered in any way until after the existing rubber sheet and spacer set has been measured/photographed.

(e) The existing air line embedded in the aqueduct concrete arch shall be pressure tested for leaks upon removal of the existing dam. The Contractor shall be prepared to replace the existing air line, if required.

(f) Remove all debris at the drainage outlet located in the aqueduct invert approximately 300 mm upstream of the anchor line. Ensure the drainage line still functions and flush line if needed.

(g) Pressure wash the area as recommended by the manufacturer. The Contractor may use water stored upstream of the temporary cofferdam (Upper Reach) for this work.

(h) Install the new Inflatable Dam following the manufacturer’s procedures as outlined in Appendix G.

(i) Complete a pressure test of the new Inflatable Dam following the manufacturer’s procedures. Coordinate with the City and Contract Administrator to facilitate the test. Pressure testing of the new Inflatable Dam shall be completed with the relocated air hose, though testing is anticipated to occur prior to completion of the access platform. Under this condition, the Contractor shall connect a temporary hose to the new air hose, which will be coiled up in the new manhole and operate the Inflatable Dam from the temporary enclosure.

(j) Once the dam has been successfully tested, the existing Inflatable Dam can be removed from the SLA. The existing dam may then be cut up to facilitate removal through the manhole at Mile 93.69.

E18.7.8 New Inflatable Dam Controls

(a) The Contractor shall relocate the Inflatable Dam control box to the new access platform as shown on the Drawings.

(b) New air hoses shall be routed from the existing embedded air ling for the Inflatable Dam to the new manhole and ultimately to the relocated control box.

(c) Install new SCADA cables as shown on the Drawings.

E18.8 Measurement and Payment

E18.8.1 Transport of New Inflatable Dam to Mile 93.69

(a) Transport of the new Inflatable Dam to Mile 93.69, including transport to site, insertion into the SLA, and transport from mile 96.69 will be measured and paid on a lump sum basis at the Contract Unit Price identified in Form B. Payment shall include all materials and labour to complete the work.

E18.8.2 Replacement of Inflatable Dam

(a) Replacement of the Inflatable Dam at Mile 93.69 will be measured and paid on a lump sum basis at the Contract Unit Price identified in Form B. Payment shall include all materials and labour to complete the work, including but not limited to:

(i) temporary relocation of Inflatable Dam controls;

(ii) removal of the old Inflatable Dam;

(iii) installation of the new Inflatable Dam; and,

(iv) testing of the new Inflatable Dam.

E18.8.3 Relocation of Inflatable Dam Controls

(a) Relocation of the Inflatable Dam controls at Mile 93.69 will be measured and paid on a lump sum basis at the Contract Unit Price identified in Form B. Payment shall include all materials and labour to complete the work, including, but not limited to:

(i) installation of new air hoses;

(ii) installation of new SCADA cable; and,

(iii) relocation of existing Inflatable Dam control box complete with all connections and conduits;

E19. SLA TEMPORARY COFFERDAM

E19.1 Description

E19.1.1 This specification covers the installation and operation of the temporary cofferdam within the SLA to facilitate replacement of the Inflatable Dam at Mile 93.69.

E19.2 Submittals

E19.2.1 Submit Shop Drawings and a construction method statement to the Contract Administrator a minimum of twenty (20) Business Days prior to construction. Shop Drawings shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in the design of temporary shoring and water control works. The construction method statement shall contain the following information at a minimum:

(a) detailed fabrication drawings; indicate all details and information necessary for assembly and erection purposes such as, description of methods, sequence of erection, type of equipment used in erection and temporary bracings.

(b) detailed installation procedures; and,

(c) means of draining the Upper Reach, see Upper Reach dewatering plan.

E19.2.2 The Contractor shall submit an Upper Reach dewatering plan a minimum of twenty (20) Business Days prior to construction. The dewatering plan shall detail the requirements for drainage appurtenances to be built into the temporary cofferdam to permit drainage within the identified timeframes. The plan shall be sealed by a Professional Engineer, registered in the Province of Manitoba, experienced in hydraulics and temporary flow bypass operations and include the following:

(a) Proposed configuration and sizing of the drainage appurtenances to be constructed as part of the temporary cofferdam;

(b) hydraulic calculations confirming the proposed works;

(c) staging of the draining operation; and,

(d) review and consideration for worker safety during the draining operation.

E19.3 Cofferdam Design

E19.3.1 General

(a) The cofferdam shall comply with Manitoba Workplace Safety and Health requirements.

(b) The Major structural components and configuration has been designed and shown on the Drawings. The Contractor shall complete design of all other components of the temporary cofferdam.

E19.3.2 Performance Requirements

(a) Minimum height of 1500 mm.

(b) Be structurally capable of resisting the loads imparted from 1500 mm of water upstream of the cofferdam.

(c) Be sufficiently modular in design and construction to facilitate insertion of components through the existing SLA manhole at Mile 93.69. Alternatively, the components could be inserted into the SLA at the Mile 96.69 Boathouse and transported within the SLA to Mile 93.69.

(d) Be sufficiently watertight to maintain water levels upstream of Mile 93.69 and permit replacement of the Inflatable Dam under dry conditions. It is expected that the Contractor will require secondary containment of nuisance water during the dam replacement work.

(e) Permit draining of the Upper Reach as specified herein.

E19.4 Materials

(a) All products and sealants shall be food grade or NSF 61 approved for use in potable water.

(b) Structural Steel

(i) Structural Steel: CSA G40.20-13/G40.21-13, Grade 350W and as indicated on Drawings and CSA S136-16.

(ii) Anchor Bolts: CSA G40.20-13/G40.21-13, Grade 300W.

(iii) Bolts, Nuts, and Washers: ASTM F3125/F3125M-19.

(iv) Structural steel work: to CSA S16:19 and CSA S136-16.

(v) Welding: to CSA W59-18.

(vi) Companies to be certified under Division 1 or 2 of CSA W47.1:19 for fusion welding of steel structures and/or CSA W55.3:08 for resistance welding of structural components.

(c) Lumber

(i) Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:

(ii) CAN/CSA-O141 - Softwood Lumber.

(iii) NLGA Standard Grading Rules for Canadian Lumber.

(iv) Glued end-jointed (finger-jointed) lumber is not acceptable.

(v) Framing and board lumber: in accordance with National Building Code (NBC), except as follows:

(vi) Structural light framing (beams, joists): Douglas Fir, NLGA No.2 grade or better.

(vii) Wood studs: Spruce, NLGA No.1 grade.

(viii) Furring, blocking, nailing strips, grounds, rough bucks, fascia backing:

(ix) Board sizes: SPF species, "Standard" or better grade.

(x) Dimension sizes: SPF species, "Standard" light framing or better grade.

(d) Anchors as per E17.3.4.

E19.5 Methods

E19.5.1 Temporary Cofferdam Installation

(a) Verify dimensions and condition of existing work, report any discrepancy and potential problem areas to Contract Administrator t for direction before commencing fabrication.

(b) Structural Steel

(i) Fabricate structural steel to CSA S16:19, CSA S136-16, and to reviewed shop drawings.

(ii) Install shear studs to CSA W59-18.

(iii) Continuously seal members by continuous smooth welds. Grind smooth as required.

(iv) Provide holes in top and bottom flanges or weld threaded studs to top and bottom flanges for attachment of wood nailers.

(v) Erect structural steel, as indicated and to CSA S16:19, CSA S136-16, and to reviewed erection drawings.

(vi) Field cutting or altering structural members: to be reviewed by Consultant.

(vii) Clean with mechanical brush and touch up shop primer to bolts, rivets, welds, and burned or scratched surfaces at completion of erection.

(viii) Continuously seal members by continuous smooth welds where indicated. Grind smooth as required.

(c) Lumber Installation

(i) Comply with requirements of NBC, Part 9 supplemented by following paragraphs.

(ii) Refer to Structural drawings for additional requirements.

(iii) Install members true to line, levels and elevations. Space uniformly.

(iv) Construct continuous members from pieces of longest practical length.

(v) Install spanning members with "crown-edge" up.

(vi) Install continuous air seal under sill plates of all exterior wall framing, and elsewhere indicated. Air seals same width as studs

(vii) Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed. Sanding is acceptable only in locations where defacement will not be evident after finishing.

(d) Lumber Erection

(i) Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

(ii) Countersink bolts where necessary to provide clearance for other work.

(iii) Use fastenings of following types, except where specific type is indicated or specified:

(iv) To solid concrete use expansion shield with lag screw, lead plug with wood screw unless otherwise specified.

(v) To structural steel use bolts through drilled hole, or welded stud-bolts or power driven self-drilling screws, or welded stud-bolts or explosive actuated stud-bolts.

(e) Nailing Strips, Grounds and Rough Bucks

(i) Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work, using galvanized fasteners.

(ii) Except where indicated otherwise, use material at least 1½” thick.

E19.5.2 Installation of Anchors in the SLA

(a) Provide anchors as per structural sections and details.

(b) Install mechanical anchors as per manufacturer specifications.

(c) Upon completion of SLA repairs, anchors to be abandoned by grinding down flush with SLA side walls.

E19.5.3 Draining the Upper Reach

(a) The Contractor shall drain the Upper Reach within a 24-hour period as per E11.

(b) The temporary cofferdam shall be designed/constructed with drain ports to facilitate the release of water in a controlled and safe manner.

(c) Workers in the SLA during the draining process must be tied off, and all plant and material secured to prevent washing it downstream.

(d) The following flow rates are required to achieve draining of the SLA within 24-hours, based on the upstream storage volumes listed in E11:

(i) 1050 mm depth at Mile 93.69 – 220 L/s

(ii) 1200 mm depth at Mile 93.69 – 301 L/s

(iii) 1350 mm depth at Mile 93.69 – 394 L/s

(e) The Contractor should consider the use of flexible discharge hose or similar means of directing drainage flows past the work site during the drainage operation.

E19.6 Measurement and Payment

E19.6.1 Installation and removal of the temporary cofferdam at Mile 93.69 to facilitate replacement of the Inflatable Dam will be measured and paid on a lump sum basis at the Contract Unit Price identified in Form B. Payment shall include all materials and labour to complete the work.

E20. SLA AND EQUIPMENT DISINFECTION

E20.1 Description

(a) This specification covers the disinfection of the SLA and equipment working within.

E20.2 Submittals

E20.2.1 If required, the Contractor shall submit a chlorinated water disposal plan in writing to the Contract Administrator a minimum of five (5) working days prior to performing any cleaning or flushing of the SLA. The disposal plan shall at a minimum include the following:

(a) Intended means of disposal for each site.

(b) Means of de-chlorination (if required).

(c) Means of storing water for discharge (if required).

E20.3 Disinfection

(a) Disinfection of the SLA shall be completed in accordance with CW2125 and AWWA C651.

(b) All components and equipment being used within the SLA shall be spray or swab disinfected using a 200 mg/L free chlorine solution prior to entering or coming in contact with the pipe.

(c) The interior of the SLA shall be spray or swab disinfected using a 200 mg/L free chlorine solution prior to draining of the Upper Reach and placing the SLA back into service.

E20.4 Health Testing

(a) Health testing will be completed at the discretion of the City.

E20.5 Disposal of Chlorinated Water

E20.5.1 If required, chlorinated water shall be treated by one of the following methods, as recommended in AWWARF – Guidance Manual For The Disposal Of Chlorinated Water:

(a) De-chlorination of water with discharge into the environment. De-chlorination may be accomplished using the following:
  (i) Sodium Ascorbate,
  (ii) Vita-D-Chlor TM by Integra Chemical,
  (iii) or approved equal in accordance with B8.

(b) Contain chlorinated water on Site until chlorine has dissipated to acceptable limits.

E20.5.2 The Contractor shall ensure that the selected means of disposing of chlorinated water does not result in unsafe site conditions as a result of freezing atmospheric temperatures.

E20.6 Measurement and Payment

E20.6.1 Disinfection and disposal of chlorinated water will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E21. SLA FOOTBRIDGE AND ACCESS PLATFORM

E21.1 Description

(a) This specification covers the design and construction requirements of the SLA access platform. Also refer to E22 Supply and Delivery of Structural Steel, E23 Erection of Structural Steel, and E24 Helical Piles.

E21.2 Submittals

E21.2.1 The Contractor shall submit the following to the Contract Administrator for approval a minimum of twenty (20) Business Days prior to commencing fabrication and erection of the access platforms in accordance with the Specification:

(a) Existing platform removal plan detailing the removal method and disposal location;

(b) Precast concrete pad Shop Drawings;

(c) All submittals outlined in specification E26 Precast Concrete, E25 Cast-In-Place Concrete, E22 Supply and Delivery of Structural Steel, E23 Erection of Structural Steel, and E24 Helical Piles.

E21.3 Materials

E21.3.1 All materials supplied under this Specification shall be of a type accepted by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator. The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E21.3.2 Confined Space Entry Mount

(a) The sleeve mount shall be 3M DBI-SALA Advanced Center Mount Sleeve Davit Base, 8516563, Silver W200x46 steel product data sheet or approved equal in accordance with B8.

E21.3.3 Steel Grating

(a) Steel grating shall be Standard Tru-Weld-Type 30 (SF19-4 1 X 3/16) or approved equal in accordance with B8.

(b) Steel grating shall be fastened to the platform using Type GF Grate-Fast Model LGF037 Lindapters or approved equal in accordance with B8.

E21.4 Methods

E21.4.1 Platform construction shall generally be sequenced as follows:

(a) Construct temporary work pads at locations shown on the drawings. Place equipment within designated areas to limit aqueduct loading;

(b) Remove the existing access platform;

(c) Helical piles shall be installed at the locations shown on the plans within +/- 25mm of horizontal position shown. Contractor shall be prepared to winch piles into location for installation of platform beams. Winching method shall limit stress placed on piles.

(d) Cutoff helical piles to elevation and grind flat for a level bearing surface on the base plate.

(e) Place precast concrete footing at the end of the ramp.

(f) Erect beams into place and securely fastened in place. Bolts shall be fully torqued prior to placement of steel grating on the platform.

(g) Steel decking shall be placed and securely fastened to the platform.

(h) Handrail to be erected and bolts immediately torqued.

E21.5 Measurement and Payment

E21.5.1 Removal of Existing Access Platform at Mile 93.69

(a) Removal of the existing SLA footbridge and access platform at Mile 93.69 will be measured and paid on a lump sum basis at the Contract Unit Price identified in Form B. Payment shall include all materials and labour to complete the work.

E21.5.2 Construction of New SLA Access Platform

(a) Construction of the new SLA footbridge and access platform at Mile 93.69 will be measured and paid on a lump sum basis at the Contract Unit Price identified in Form B. Payment shall include all materials and labour to complete the work.

(b) Payment will be made on the following schedule:

(i) 30% payment upon supply of materials and inspection and acceptance by the Contractor Administrator.

(ii) Remaining 70% payment upon successful completion of the structure's construction on site.

E22. SUPPLY AND DELIVERY OF STRUCTURAL STEEL

E22.1 Description

E22.1.1 This specification shall cover the supply, fabrication, transportation, and handling of the structural steel beams, grating, handrail, stiffeners, confined space entry mount connections, supporting elements, and all incidental structural steel elements, components and fasteners as specified herein and as shown on the Drawings.

E22.1.2 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, handling and storage, and all things necessary for and incidental to the satisfactory performance and completion of all Work as herein specified and as indicated on the Drawings.

E22.2 References

E22.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) CAN/CSA G40.20/G40.21 – General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

(b) CAN/CSA S16 – Design of Steel Structures

(c) CAN/CSA W47.1 – Certification of Companies for Fusion Welding of Steel Structures

(d) CAN/CSA W48 – Filler Metals and Allied Material for Metal Arc Welding

(e) CAN/CSA W59 – Welded Steel Construction (Metal Arc Welding)

(f) CAN/CSA W178.1 – Certification of Welding Inspection Organizations

(g) CAN/CSA W178.2 – Certification of Welding Inspectors

(h) Canadian Institute of Steel Construction (CISC) – Handbook of Steel Construction

(i) CGSB 48.9712 – Non-destructive Testing – Qualifications and Certification of Personnel

(j) ANSI B46.1 – Surface Texture (Surface Roughness, Waviness and Lay)

(k) ASTM F3125 – Grade A325 Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

(l) ASTM F3125M– Grade A325M Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric)

(m) ASTM A108 – Grade 1018 or 1020 shear studs

(n) ASTM A563/A563M – Carbon and Alloy Steel Nuts

(o) ASTM A588/A588M – High-Strength Low-Alloy Structural Steel, up to 50 ksi (345 MPa) Minimum Yield Point, with Atmospheric Corrosion Resistance

(p) ASTM F436/F436M – Hardened Steel Washers

(q) AWS A5.XX – XX: All Applicable Filler Metal Specifications

(r) AWS D1.1/D1.1M – Structural Welding Code – Steel

(s) AWS D1.5/D1.5M – Bridge Welding Code

(t) ISO/IEC 17025:1999 – General Requirements for the Competence of the Testing and Calibration Laboratories

E22.3 Submittals

E22.3.1 The Contractor shall submit the following to the Contract Administrator for approval 20 Business Days prior to commencing fabrication in accordance with the Specification:

(a) Design calculations and Shop Drawings for all structural steel components as specified in Section E3, Shop Drawings, and shall bear the seal of a Professional Engineer registered in the province of Manitoba.

(b) Further to Section E3, Shop Drawings, Shop Drawings submitted for review shall include the following:

(i) Full detail dimensions and sizes of all component parts of the structure. Components shall be detailed to compensate for changes in shape due to weld shrinkage, camber, and any other effects that cause finished dimensions to differ from initial dimensions;

(ii) Erection marks to uniquely identify all fabricated components;

(iii) All necessary specifications for the materials to be used;

(iv) Identification of areas requiring special surface treatment;

(v) Identification of fracture-critical and primary tension members and components parts. Attachments having a length of more than 100 mm in the direction of tension and welded to the tension zone of a fracture-critical or primary tension member shall be treated as part of that member;

(vi) Bolt installation requirements, including number of fitting up bolts and drift pins required at each connection and oversized and slotted holes;

(vii) Details of all welds;

(viii) Identification of materials and welds requiring non-destructive testing, including the limits of the weld to be tested and the frequency and type of testing;

(ix) Temporary welds; and,

(x) Location of shop welded and field welded and bolted splices;

(c) An Erection Diagram that is stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba and includes at least the following:

(i) Principal dimensions of the structure;

(ii) Erection marks;

(iii) Sizes of all members;

(iv) Field welding requirements, including identification of welds requiring non-destructive testing;

(v) Size and type of bolts;

(vi) Bolt installation requirements, including the number of fitting up bolts and drift pins required at each connection and identification of oversize and slotted holes;

(vii) Bracing and all other temporary works required for erection of structural steel; and,

(viii) Treatment at faying surfaces for joints designed as slip critical.

(d) Proposed welding procedures conforming to AWS D1.5 or CAN/CSA W59 and CAN/CSA W47.1 to be used in fabricating the various components. The following shall be included in the submitted welding procedures:

(i) The welding process, position of weld, filler metal, flux, shielding gas if required, joint configurations, number and size of passes, preheat and inter-pass temperatures if required, sequence of passes, current, rate of pass, electrode size, electrical stick-out and polarity;

(ii) Methods proposed for edge preparation;

(iii) Measures proposed to control distortion, shrinkage and residual stresses;

(iv) Proposed methods and sequence of assembly; and,

(v) Welding equipment to be used.

(e) Mill test certificates showing chemical analysis and physical tests of all structural steel shall be submitted to the Contract Administrator for review prior to commencement of fabrication. In addition to the submission of the mill test certificates, the following shall be submitted:

(i) One copy of the mill test certification for all material to be used in the fabrication shall be available for review at the fabricating plant during fabrication;

(ii) If material cannot be identified by mill test certificates, coupons shall be taken and tested and these test certificates shall be made available; and,

(iii) Where mill test certificates originate from a mill outside Canada or the United States of America, the Contractor shall have the information on the mill test certificate verified by independent testing by a Canadian laboratory. This laboratory shall be certified by an organization accredited by the Standards Council of Canada to comply with the requirements of ISO/IEC 17025 for the specific tests or type of tests required by the material standard specified on the mill test certificate. The mill test certificates shall be stamped with the name of the Canadian laboratory and appropriate working stating that the material is in conformance with the specified requirements. The stamp shall include the appropriate material specification number, testing date, and the signature of an authorized officer of the Canadian laboratory.

(f) Proof shall be submitted to the Contract Administrator demonstrating that the bolts, nuts, and washers meet the chemical composition, mechanical properties, dimensions, workmanship, and head burst as required by F3125/F3125M Grade A325/A325M, A563/A563M or F436/F436M. Verification of the acceptability of assemblage of zinc coated bolts shall be provided with the bolts, nuts, and washers delivered to the job site shall also be submitted to the Contract Administrator.

(g) For bolts supplied from a manufacturer outside Canada or the United States of America, the above information shall be independently verified by testing by a Canadian laboratory as outlined in E22.3.1(e).

(h) Repair procedures, if required, for repair of fabricating defects or other damage to structural steel components.

E22.4 Materials

E22.4.1 General

(a) The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E22.4.2 Structural Steel

(a) Structural steel shall be new and of the grade and category specified on the Drawings and in this Specification and shall be in accordance with CAN/CSA G40.20/G40.21.

(b) ASTM A588M may be substituted for CAN/CAS G40.20/G40.21 grade 350A steel. When the Charpy impact energy requirements are verified by the submission of test documentation, ASTM A588M may be substituted for CAN/CSA G40.20/G40.21 grade 350AT steel.

(c) Substitution of material for size and grade is not permitted unless approved in writing by the Contract Administrator.

(d) All steel shall be galvanized after fabrication in accordance with ASTM A123/A123M17.

E22.4.3 High Strength Bolts, Nuts, and Washers

(a) High strength bolts, nuts, and hardened washers shall be in accordance with ASTM F3125/F3125M Grade A325/A325M, A563/A563M, and F436/F436M. The nuts, bolts, and washers shall be shipped together as an assembly.

(b) Bolts, nuts, and washers used with steel specified on the Drawings or in this Specification to be painted or to be metallized, shall be Type 1.

(c) Galvanized fastener nuts shall be over-tapped by the minimum amount required for assembly and shall be lubricated with a lubricant containing a visible dye.

E22.4.4 Welding Consumables

(a) The selection, supply, and storage of electrodes for SMAW and fluxes for SAW shall be according to CAN/CSA W59 requirements. Only controlled hydrogen designation electrodes and low hydrogen wire consumables shall be used for the SMAW and flux-cored arc welding processes, respectively. Electrodes and fluxes shall be strictly stored and maintained as required by CAN/CSA W59, section 5.2.

(b) The weld filler metal in fracture critical and primary tension members shall meet the Charpy V notch impact energy requirements of Table E19.7.

(c) Weld metal used with corrosion resistant steels shall have similar corrosion resistance and colour to the base metal and shall be supplied according to CAN/CSA W59.

E22.4.5 Replacement of Damaged Materials

(a) All material supplied by the Fabricator that in the opinion of the Contract Administrator has been damaged or otherwise rendered unusable by improper storage or handling by the Contractor shall be replaced by the Contractor at his expense.

E22.5 Equipment

E22.5.1 All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

E22.6 Construction Methods

E22.6.1 Material Preparation

(a) Straightening Material

(i) All steel shall be flat and straight according to the specified mill tolerances before commencement of fabrication. Material with sharp kinks or bends shall only be straightened with the approval of the Contract Administrator. The Contractor shall submit written procedures for approval to the Contract Administrator and shall not commence straightening work until he has received permission from the Contract Administrator.

(ii) When straightening is approved, material may be straightened using mechanical means or by the application of controlled heating according to CAN/CSA W59.

(iii) Details of the method of straightening shall be according to CAN/CSA W59 and submitted to the Contract Administrator two (2) weeks prior to the Contractor arranging for inspection of the straightened material and non-destructive testing.

(iv) The Contract Administrator shall be given one (1) week notice to arrange for their inspections.

(b) Edge Preparation

(i) Sheared edges of plates with a 16 mm thickness or greater and that carry calculated tension shall have 3 mm of edge material removed by planing, milling or grinding.

(ii) Oxygen cutting of structural steel shall be done by machine except hand-guided cutting will be allowed for copes, blocks and similar cuts where machine cutting is impractical. Re-entrant corners shall be ground smooth and shall have a fillet of the largest practical radius, but in no case shall the radius be less than 25 mm.

(iii) Plasma arc cutting shall only be done when approved in writing by the Contract Administrator. All nitrogen plasma arc cut edges shall be ground back by 0.5 mm when welding will be carried out on these edges.

(iv) The quality of the cut edges and their repair shall be according to CAN/CSA W59. All cut edges that are not to be welded shall have a surface roughness not greater than 1000 as defined by CAN/CSA B95. Edges of all flanges shall be rounded to a 1.5 mm radius by grinding. In addition all edges of all members and plates exposed to view or weather in the finished assembly shall be rounded to a 1.5 mm radius by grinding.

(v) All steel edges that will be painted whether resulting from rolling, cutting or, shearing operations shall be rounded to a 1.5 mm radius by grinding prior to blast cleaning.

(vi) The Brinell hardness of the edges of flange and plates for fracture critical or primary tension members shall not exceed 220. If the measured hardness exceeds 220, the edges shall be ground to remove the harder layer or annealed by means of a preheating torch.

(c) Direction of Rolling

(i) Steel plate for main members shall be cut so that the primary direction of rolling is parallel to the direction of tensile or compressive stress.

(d) Bolt Holes

(i) Hole Size

- The nominal diameter of a hole other than oversize or slotted holes shall not be more than 2 mm greater than the nominal bolt size with the exception of the following bolt and hole combinations:

  (a) either a 19 mm (3/4") or an M20 bolt in a 22 mm hole;

  (b) either a 22 mm (7/8") or an M22 bolt in a 24 mm hole; and,

  (c) either a 25 mm (1") bolt or an M24 bolt in a 27 mm hole.

- Unless otherwise approved by the Contract Administrator, oversize or slotted holes shall only be used when specified on the Drawings or in the Specification. Non-specified oversize or slotted holes will only be considered for use in bracing and diaphragms.
- Oversize holes when permitted shall not be more than 4 mm larger than the nominal bolt size for bolts 22 mm or less in diameter; 6 mm larger than the nominal bolt size for bolts between 23 and 26 mm in diameter; and 8 mm larger than the nominal bolt size for bolts 27 mm and greater in diameter.

(ii) Punched Holes

- Holes shall only be punched to finish size in material 16 mm or less in thickness.
- The diameter of a hole punched to finish size shall not be more than 2 mm larger than the nominal diameter of the bolt unless oversize holes are approved.
- The diameter of the die shall not exceed the diameter of the punch by more than 2 mm. Holes shall be clean cut without ragged or torn edges. Sharp edges shall be ground smooth without reducing the cross-section of the member. The slightly conical hole that results from this operation is acceptable.

(iii) Drilled Holes

- Holes which are drilled to finished diameter shall be 2 mm larger than the nominal diameter of the bolt unless oversize or slotted holes have been specified. Holes to be drilled shall be accurately located by using suitable numerically-controlled drilling equipment, or by using a steel template carefully positioned and clamped to the steel. The dimensional accuracy of holes and locations prepared in this manner shall be such that like parts are exact duplicates and require no match marking.
- The holes for any connection may be drilled to the required finished diameter when the connecting parts are assembled and clamped in position, in which case the parts shall be match-marked before disassembling.
- Cover plate holes shall be field drilled in place. Cover plate to be securely fastened to the girder prior to drilling. Bolt holes may be shifted slightly to avoid conflicts.

(iv) Reamed Holes

- Holes which are to be reamed to the specified finished diameter shall first be sub-drilled or sub-punched to 4 mm less than the finished hole diameter. The holes shall be reamed to 2 mm larger than the nominal diameter of the bolts with connecting parts assembled and securely held in place during reaming. The connecting parts shall be match-marked before disassembling. Reamed holes shall be truly cylindrical and perpendicular to the member. All burrs shall be removed without reducing the cross section of the member.

(v) Tolerances

- Center to Center – 12 m or less: +/- 1.0 mm
- Center to Center – 12 to 18 m: +/- 1.5 mm
- Center to Center – 18 to 24 m: +/- 2.5 mm
- Center to Center – over 24 m: +/- 3.0 mm

(vi) Pins and Rollers

- Pins and rollers shall be accurately turned to the dimensions and finish shown on the Drawings and shall be straight and free from flaws. Pins and rollers more than 175 mm in diameter shall be forged and annealed.

Pins and rollers 175 mm or less in diameter may be either forged and annealed or may be made from cold finished carbon-steel shaft.

- Holes for pins shall be bored to the diameter and to the finish specified on the Drawings or in the Specification and at right angles to the axis of the member. The diameter of the pin hole shall not exceed that of the pin by more than

  (a) 0.5 mm for pins 125 mm or less in diameter or by 0.75 mm for larger pins. Built up members shall be completely assembled prior to boring of pin holes.

(i) Bent Plates

- General

  (a) Rolled steel plates to be bent shall be cut from the stock plates so that the bend line is at right angles to the direction of rolling except as otherwise approved for orthotropic decks.

  (b) Before bending, the edges of the plate within the bend region shall be rounded to a 3 mm radius by grinding in the region of the bend.

- Cold Bending

  (a) Cold bending shall be carried out in such a manner that no cracking or tearing of the plate occurs. Minimum bend radii for various plate thicknesses (t), measured to the concave face of the metal shall be:

Table 19.1 – Plate Cold Bending Radius

t (mm)	Radius (mm)
t ≤ 12	2 t
12 ≤ t ≤ 25	2.5 t
25 ≤ t ≤ 38	3 t
38 ≤ t ≤ 65	3.5 t
65 ≤ t ≤ 100	4 t

- Hot Bending

  (a) Forming radii less than that permitted for cold bending shall be done by hot bending at a plate temperature not greater than 600°C. Accelerated cooling of a hot bent component will only be permitted when the temperature of the component is below 300°C. Only compressed air or water shall be used for accelerated cooling.

(i) Faying Surfaces

- All faying surfaces shall be cleaned by sand blasting in the shop for new components and in the field for existing steel components.

(ii) Marking

- Each member shall carry a unique erection mark for identification.
- Permanent marking shall be affixed in an area not exposed to view in the finished structure.

(iii) Temporary Works

- Temporary welds shall not be used on fracture-critical and primary tension members.
- Temporary welds shall not be used on flange material in compression unless approved by the Contract Administrator.

E22.6.2 Welded Fabrication

(a) Fabrication Company Certification

(i) The company(ies) undertaking welded fabrication shall be certified according to CAN/CSA W47.1, Division 1 or Division 2.

(b) Assembly

(i) Assembly shall be according to AWS D1.5 or CSA W59 and the following:

- Bearing stiffeners shall be vertical under full dead load;
- Intermediate stiffeners shall be either vertical or perpendicular to fabrication worklines;
- Longitudinal web stiffeners shall be cut 25 mm short of the transverse web stiffeners; and,
- Tack welds of 75 mm or greater in length shall be incorporated into the final weld.

(c) Welding of Fracture Critical and Primary Tension Members

(i) Only welding consumables certified by the CWB to applicable CAN/CSA W48 or AWS A5 requirements shall be used which includes Charpy V-notch toughness meeting the requirements of Table E19.7.

(ii) In groove welds connecting two different grades of steel, the classification of consumables used, including CVN impact requirements shall be that applicable to the grade having the lower ultimate tensile strength.

(iii) For groove welds in fracture critical and primary tension members using certified consumables where the CVN test temperature required by Table 6 is lower than the test temperature in the CAN/CSA W48 or AWS A5 classifications, or where the standards are not applicable, welding consumables shall be approved by the CWB and qualified using a verification test assembly to establish the impact properties of the weld metal.

- Testing Procedures shall follow those of the relevant CAN/CSA W48 or AWS A5 standard except that only CVN tests are required and that welding shall be carried out using the preheat and the maximum heat input to be used in practice.
- CVN results shall meet the requirements of Table E19.7.
- Qualifications are required for each electrode diameter used and for the consumables supplied by each manufacturer.
- The qualification is valid for consumables for all grove weld procedures of the same or lower heat input as that used in the qualification test.

(iv) For groove weld procedures in fracture critical and primary tension members of 700Q and 700QT material, consumables shall be qualified by welding procedure tests approved by the Canadian Welding Bureau.

- Tests shall be conducted according to CAN/CSA W47.1 using 700Q or 700QT material for the base plate and shall include weld metal and heat affected zone CVN impact tests according to CAN/CSA W47.1 Appendix D.
- Weld metal impact tests shall meet the requirements of Table E19.7 and HAZ impact tests shall meet the requirements of Table E19.7 for the base plate as appropriate.
- Only consumables supplied by the manufacturer supplying those qualified shall be permitted in fabrication.
- The qualification is valid for consumables for all groove weld procedures of the same or lower heat input as that used in the qualification test.

(v) When the welding consumables have not been previously certified by the CWB, consumables shall be qualified by welding procedure tests in

accordance with CAN/CSA W48 and shall include CVN impact tests of the weld metal.

- For steel other than 700Q or 700QT, CVN tests in the HAZ are not required.
- Weld metal CVN properties shall be established by qualification tests in accordance with CAN/CSA W47.1 (including CAN/CSA W47.1, Appendix D) and shall meet the requirements of Table 19.7.
- Only consumables supplied by the manufacturer supplying those qualified shall be permitted in fabrication.
- Qualification shall be done for each lot or batch of consumables.
- The qualification is valid for consumables for all groove weld procedures of the same or lower heat input as that used in the qualification test.

(vi) Tack welds shall not be used on fracture critical, primary tension members and flange material in compression, unless approved by the Contract Administrator.

(d) Welding Repairs of Fracture-Critical and Primary Tension Members

(i) General

- Welding repairs shall be performed using any appropriate welding procedure approved by the CWB for the fabrication of fracture-critical members and primary tension members. All repair welding shall be subject to non-destructive testing.
- All welding repair procedures shall be submitted to the Contract Administrator at least fourteen (14) Calendar Days prior to commencement of the Work.

(ii) Non-Critical Repairs

- Repairs that may be classified as non-critical are as follows:

(a) The repair of welds because of rollover, undercut, or insufficient throat; those requiring excavation of defects including porosity, slag, and lack of fusion; the repair of arc strikes; and removal of tack welds not incorporated into a final weld;

(b) Visually detected planar and laminar discontinuities as defined in CAN/CSA W59, Table 5-2 but not deeper than 25 mm, or half of the thickness of the edge of the cut plate, whichever is less; and such discontinuities shall not be within 300 mm of a tension groove weld.

(c) There shall also be no visible planar or laminar discontinuity on any prepared face of a tensioned groove joint prior to welding;

(d) Gouges not more than 5 mm deep on otherwise satisfactory cut or rolled surfaces that may be repaired by machining or grinding without welding; and

(e) Occasional gouges that may be repaired by welding, exceeding 5 mm but not more than 10 mm in depth on edges not to be welded.

- Work on non-critical repair shall not commence until the Contract Administrator has verified that the repair is a non-critical repair and has given written approval to proceed. The repair of gouges not more than 5 mm on otherwise satisfactory cut or rolled surfaces that may be repaired by machining or grinding without welding does not require prior approval.

(iii) Critical Repairs

- Repair procedures for more severe conditions than those described for non- critical repairs are considered critical and shall be individually approved by the Contract Administrator before repair welding is begun.
- Critical repairs include the following:

  (a) Repair of lamellar tearing, laminations, and cracks;

  (b) Repair of surface and internal defects in rolled products;

  (c) Dimensional corrections requiring weld removal and rewelding; and,

  (d) Any correction by welding to compensate for a fabrication error such as improper cutting, punching, or incorrect assembly other than tackwelded or temporary assemblies.

(iv) Repair Procedures

- Repair procedures shall be submitted to the Contract Administrator at least two weeks prior to commencement of repair work and shall include sketches or full size drawings as necessary to adequately describe the deficiency and the proposed method of repair.
- Procedures for critical repairs shall also include the location of the discontinuity.
- Repair procedures shall include the minimum following provisions. The steps shall be listed in the order to be performed.
- Surfaces shall be cleaned and ground as necessary to aid visual and nondestructive tests to identify and quantify the discontinuities.
- The discontinuity shall be drawn as it appears from visual inspection non-destructive testing.
- Arc-air gouging, shall be part of the approved welding procedure when required.
- Magnetic particle inspection or another inspection method approved by the Contract Administrator shall be used to determine whether the discontinuity was removed as planned.
- All air carbon-arc gouged and oxygen-cut surfaces that form a boundary for a repair weld shall be ground to form a smooth bright surface. Oxygen gouging is not permitted.
- All required run-off tabs and back-up bars shall be shown in detail.
- Preheat and interpass temperature shall be according to Table 19.2.
- Preheat and interpass temperatures shall be maintained without interruption until the repair is completed.

Table 19.2 – Preheat and Interpass Temperatures

Thickness, t (mm)	**Grade, CSA G40.21**
	260WT, 300WT, 350WT, 400WT, 480WT, 350AT, 400AT, 480AT
t ≤ 25 25 < t ≤ 40 t > 40	65°C 120°C 175°C
NOTE: For grade 700QT steel, preheat and interpass temperature shall be in accordance with steel manufacturer's recommendations.	

- The repair procedures shall make reference to the applicable welding procedure specification and the related data sheet. If both of these were approved by the CWB prior to fabrication, they need not be

prequalified by test for the specific method of repair unless a change in essential variables has been made or unless otherwise required by the Contract Administrator.

- If the geometry of the repair joint or if the excavation is similar to the geometry of a prequalified joint preparation as defined in CAN/CSA W59, and permits good access to all portions of such joints or excavations during the proposed sequence of welding, the welding procedure shall not require prequalification by test unless required by the Contract Administrator.
- Peening shall be noted as part of the approved procedure when required and shall be completely described. Peening equipment shall not contaminate the joint.
- Post-heat shall be employed and shall continue without interruption from the completion of repair welding to the end of the minimum specified post-heat period. Post-heat of the repair area shall be between 200°C and 260°C and shall be for a period of one (1) hour minimum for each 25 mm of weld thickness or for two (2) hours, whichever is less.
- Faces of repairs shall be ground flush with the plate or blended to the same contour and throat dimension as the remaining sound weld. If stress-relief heat treatment is required, it shall be completely described. Final acceptance by non-destructive testing shall be performed after stress relief is complete. Repairs of groove welds in fracture critical members shall be examined by ultrasonic testing (UT) and radiographic testing (RT). Repairs to groove welds in primary tension members shall be examined by UT or RT. Fillet weld repairs shall be examined by magnetic particle testing (MT). MT, RT, and UT shall be according to CSA W59. RT may be performed as soon as the weld has cooled to ambient temperature; however, final acceptance by MT and UT methods shall not be performed until the steel welds have been cooled to ambient temperature for at least the elapsed time indicated in Table 19.3.

Table 19.3 - Weld Minimum Cooling Period

Plate Thickness	Magnetic Particle for Fillet Weld	Ultrasonic Examination of Groove Welds
t ≤ 50 mm	24 hours	24 hours
t > 50 mm	24 hours	48 hours

- All repair welding and non-destructive testing shall be performed as described in the approved repair procedure.
- All repair procedures for repairs requiring approval shall be retained as part of the project records.

E22.6.3 Bolted Construction

(a) General

(i) ASTM F3125/F3125M Grade A325/A325M high strength bolts shall be used for bolted connections. Bolts shall be sufficiently long to exclude threads from the shear plane.

(b) Assembly

(i) The assembly of joints shall be according to CAN/CSA S16 except that Turn-of- Nut tightening method shall be the only installation method used.

(ii) Prior to assembly, all joint surfaces, including those adjacent to bolt heads, nuts and washers, shall be free of loose scale, burrs, dirt, and foreign material.

(iii) The faying surfaces of connections identified as slip-critical connections shall be prepared as specified below.

- For clean mill scale, the surfaces shall be free of oil, paint, lacquer, or any other coating and then blast cleaned.
- For coated surfaces other than galvanized, the surfaces shall be free of oil, lacquer, or other deleterious coatings.
- Hot dip galvanized surfaces shall be roughened after galvanizing by means of hand wire brushing. Power wire brushing is not permitted.

(iv) This treatment shall apply to all areas within the bolt pattern and for a distance beyond the edge of the bolt hole that is the greater of 25 mm or the bolt diameter.

(c) Bolt Tension

(i) Pretensioned bolts shall be tightened to at least 70% of the specified minimum tensile strength given in the appropriate ASTM standard.

(d) Reuse of Bolts

(i) Bolts shall not be reused once they have been fully tightened. Bolts that have not been fully tensioned may be reused up to two times, providing that proper control on the number of reuses can be established. Retightening of bolts loosened due to the tightening of adjacent bolts is not considered to be a reuse.

(e) Hardened Washers

(i) Hardened washers shall be provided under the head and the nut of each bolt for a total of two (2) washers per bolt.

(ii) Hardened washers are required under the nut and bolt head adjacent to joint surfaces containing oversize or slotted holes.

(f) Bevelled Washers

(i) Bevelled washers shall be used to compensate for lack of parallelism where an outer face of bolted parts deviates by more than 5% from a plane normal to the bolt axis.

(g) Turn-of-Nut Tightening

(i) After aligning the holes in a joint with a properly sized drift pin, sufficient bolts shall be placed and brought to a snug-tight condition to ensure that the parts of the joint are brought into full contact with each other.

(ii) Following the initial snugging operation, bolts shall be placed in any remaining open holes and brought to snug-tightness. Resnugging may be necessary in large joints.

(iii) When all bolts are snug-tight, each bolt in the joint shall be tightened additionally by the applicable amount of relative rotation given in Table 19.4, with tightening progressing systematically from the most rigid part of the joint to its free edges. During this operation there shall be no rotation of the part not turned by the wrench. The bolt and nut shall be matched marked to enable the amount of relative rotation to be determined.

Table 19.4 - Nut Rotation from Snug-Tight Condition

Outer Face Alignment of Bolted Parts	**Bolt Length L_b**	**Turn From Snug**
Both faces normal to bolt axis or one face normal other face sloped 1:20 max –	$L_b \leq 4\ d_b$	1/3
	$4\ L_b < L_b \leq 8\ d_b$ Not exceeding 200 mm	1/2

bevelled washers not used	$8\ d_b < L_b \leq 12\ d_b$ or exceeding 200 mm but less than12 db	2/3
Both faces sloped 1:20 from normal axis – bevelled washers not used.	All Bolt Lengths up to 12 d_b	3/4

NOTES:

1. Bolt diameter is indicated as d_b.
2. When bolt length exceeds 12 diameters, the required nut rotation shall be determined by actual testing in a suitable tension calibrator that simulates the condition of the solidly fitting steel.
3. Tolerance on rotation is 30 degrees over/under.
4. Table applies to coarse-thread. Heavy-hex structural bolts of all sizes and lengths used with heavy-hex semi finished nuts.
5. Bolt length is measured from the underside of the head to the extreme end point.
6. Beveled washers shall be provided when A490 or A490M bolts are used.

(h) Field Fit-up

(i) Connection holes into existing structural steel materials shall only be drilled in the field with the new structural steel firmly clamped in place.

(ii) Components shall be supported in a manner consistent with the final geometry of the bridge as specified in the Drawings.

(iii) Holes in the webs and flanges of main components shall be drilled to finished diameter while in assembly.

(i) Match Marking

(i) Connecting parts that are assembled in the shop for the purpose of reaming or drilling holes shall be match-marked. A drawing shall be prepared for field use detailing how the marked pieces shall be assembled in the field to replicate the shop assembly.

E22.6.4 Fracture Control

(a) General

(i) The provisions of this clause shall apply to members designated as fracture critical and primary tension members as identified on the Drawings or in the Specification. The Fracture Control requirements shall apply to both bolted and welded construction.

(b) Identification

(i) Shop Drawings shall identify the extent of fracture critical and primary tension members.

(ii) Attachments having a length of more than 100 mm in the direction of tension and welded to the tension zone of a fracture critical or primary tension member shall be treated as part of that member.

(iii) Records shall be kept for each component of a fracture critical or primary tension member to identify the heat number of the material and its corresponding mill test certificate.

(c) Fracture Toughness Requirements

(i) The Charpy V-notch requirements given in Tables E19.5, E19.6 and E19.7 are for standard full-size specimens.

(ii) Fracture Critical Members - For fracture critical members, Charpy V-notch tests shall be specified on a per plate frequency and the steel shall meet the impact requirements given in Table E19.5.

TABLE E19.5 Fracture Critical Member Charpy V-Notch Impact Requirements				
Grade G40.21	**Minimum Average Energy**	**Test Temperature Tt for Minimum Service Temperature Ts**		
		Ts ≤ -30°C	**-30°C > Ts ≤ -60°C**	**Ts < -60°C**
300WT	34 J	0°C	- 20°C	- 40°C
350WT	40 J	0°C	- 20°C	- 40°C
350AT	40 J	0°C	- 20°C	- 40°C

(iii) Primary Tension Members - For primary tension members, Charpy V-notch tests shall be specified on a per heat frequency and the steel shall meet the impact requirements given in Table E19.6.

TABLE E19.6 Primary Tension Member Charpy V-Notch Impact Requirements				
Grade G40.21	**Minimum Average Energy**	**Test Temperature Tt for Minimum Service Temperature Ts**		
		Ts ≤ -30°C	**-30°C > Ts ≤ -60°C**	**Ts < -60°C**
300WT	20 J	0°C	- 20°C	- 30°C
350WT	27 J	0°C	- 20°C	- 30°C
350AT	27 J	0°C	- 20°C	- 30°C

(iv) Service Temperature - The applicable minimum service temperature shall be the minimum daily mean temperature taken from “Canadian Climate Normals” published by Environment Canada.

(v) Permanent Backing Bars - Permanent backing bars shall not be used unless absolutely necessary and approved for use in writing by the Contract Administrator. Steel for permanent backing bars shall meet the requirements of clause 5.5.1.1 of CAN/CSA W59 or equivalent under AWS D1.5 and in addition, shall meet the CVN requirement of Tables E19.5 and E19.6 as appropriate.

(vi) Weld Metal Toughness - For fracture critical and primary tension members, the weld metal shall meet the impact requirements of Table E19.7.

TABLE E19.7 Weld Metal Charpy V-Notch Impact Requirements			
Grade G40.21	**Minimum Average Energy**	**Test Temperature Tt for Minimum Service Temperature Ts**	
		Ts ≤ -40°C	**Ts < -40°C**
300WT	20 J	- 30°C	- 40°C
350WT and AT	27 J	- 30°C	- 40°C

E22.6.5 Fabrication Tolerances

(a) Structural Members

(i) Structural members consisting of a single rolled shape shall meet the straightness tolerances of CAN/CSA G40.20 except that columns shall not

deviate from straight by more than 1/1000 of the length between points of lateral support.

(ii) A variation of 1 mm from the detailed length adjusted for temperature is permissible in the length of members which have both ends finished for contact bearing.

(iii) Members without finished ends may have a variation from the detailed length of not more than 2 mm for members 10 m long or less, not more than 4 mm for members over 20 m in length. The variation for members between 10 and 20 m in length shall be linearly interpolated.

(b) Abutting Joints

(i) Where compression members are specified to bear against one another, the completed joint shall have at least 75% of the entire contact area in full bearing, defined as an area with no more than 0.5 mm of separation. The separation of the remaining area shall in no case and at no point exceed 1 mm.

(ii) At joints where loads are not transferred in bearing, the nominal dimension of the gap between main members shall not exceed 10 mm unless indicated otherwise on the Drawings.

(c) Bearing Plates

(i) Rolled steel bearing plates 50 mm or less in thickness may be used without planing provided that a satisfactory contact bearing is obtained.

(ii) Rolled steel bearing plates over 50 mm but less than 100 mm in thickness may be straightened by pressing or by planing the entire bearing surface to obtain a satisfactory contact bearing.

(iii) Rolled steel bearing plates over 100 mm in thickness shall be planed on all bearing surfaces except for surfaces which are in contact with concrete or grouted to ensure full bearing.

(d) Bearing Surface Finish

(i) The surface finish of bearing surfaces that are in contact with each other or with concrete, shall meet the following roughness requirements as measured according to ANSI B46.1.

- Steel slabs or plates in contact with concrete — 50 μm (2000 Micro inches)
- Plates in contact as part of bearing assemblies — 25 μm (1000 Micro inches)
- Milled ends of compression members — 12 μm (500 Micro inches)
- Milled or ground ends of stiffeners — 12 μm (500 Micro inches)
- Bridge rollers or rockers — 6 μm (250 Micro inches)
- Pins and pin holes — 3 μm (125 Micro inches)
- Sliding bearings: steel and copper alloy or steel and stainless steel — 3 μm (125 Micro inches)

(ii) Surfaces of flanges that are in contact with bearing sole plates shall be flat within 0.5 mm over an area equal to the projected area of the bearing stiffeners and web. Outside this area a 2 mm deviation from flat is acceptable. The bearing surface shall be perpendicular to the web and bearing stiffeners.

(e) Fabricated Components

(i) Tolerances for welded components shall conform to Clause 5.4 of CAN/CSA W59.

(ii) Dimensional tolerances for welded built-up structural members shall conform to those prescribed by Clauses 5.8 and 12.5.3 of CAN/CSA W59.

(iii) Built-up bolted structural members shall satisfy the straightness tolerances for rolled wide flange shapes prescribed by CAN/CSA G40.29.

(iv) Bearing stiffeners fitted to bear shall have a minimum bearing contact area of 75% with a maximum separation not exceeding 1 mm over the remaining area.

(v) Fitted intermediate stiffeners shall have a minimum bearing contact area of 25% and a maximum separation of 2 mm over the remaining area.

E22.6.6 Handling, Storage, and Loading

(a) Structural steel, either plain or fabricated, shall be stored upright above ground in a shored position on platforms, skids or other similar supports and shall be kept free from dirt and other foreign matter.

(b) Structural material, either plain or fabricated, shall be protected from corrosion.

(c) Long members shall be so supported as to prevent deflection.

(i) Structural Steel Beams

- The lifting devices shall be of such a nature as to avoid twisting, racking, or other distortions while handling, storing, moving and erecting the girders. The devices shown on the Drawings are minimum requirements and the Contractor and the Fabricator shall satisfy themselves as to the adequacy of the devices. The girders shall be picked up only by the lifting devices.
- The Fabricator shall be responsible for storage of the girders from the completion of their fabrication until they are required by the Contractor.
- During storage and hauling, the girders shall be maintained in an upright position and shall be supported at the bearing areas only unless otherwise approved in writing by the Contract Administrator. Extreme care shall be exercised during the handling and storage of the structural steel girders to avoid twisting, deflection or other distortion that may result in damage to the girder.

E22.6.7 Transportation and Delivery

(a) The structural steel fabricator shall schedule, coordinate and sequence structural steel transportation and delivery in cooperation with the erection of the structural steel by the structural steel erection Contractor.

(b) The Contractor shall perform all work necessary to ensure safe loading, transportation, unloading and storage of structural steel. The Work shall consist of loading the structural steel at the Fabricator's plant, transporting the structural steel to the Site, and unloading and storing the structural steel at the Site, including temporary works for access.

(c) Structural steel shall be loaded for shipping in such a manner that it can be transported and unloaded at its destination in the correct orientation for erection without being excessively stressed, deformed, or otherwise damaged.

(d) Structural steel shall be stockpiled to avoid excessive stress deformation or other damage while stored.

(e) The transportation plan and schedule shall be provided to the Contract Administrator not less than seven (7) Calendar Days before any shipping begins.

E22.7 Quality Control

E22.7.1 Non-Destructive Testing Agency

(a) The Contractor shall engage an independent testing organization certified by the Canadian Welding Bureau (CWB) to the requirements of CAN/CSA W178.1 for bridge structures by radiographic, ultrasonic, magnetic particle, and liquid penetrant test methods to perform all non-destructive testing of the welds.

(b) All visual inspection of welds shall be performed in accordance with CAN/CSA W59 by a welding inspector certified by the CWB to the requirements of CAN/CSA 178.2 (Level II minimum) for bridges and structures.

(c) Non-destructive testing shall be done by a non-destructive testing technician certified to the Canadian General Standards Board (CGSB) in the test method specified and being performed by the Inspector.

(d) Neither the technician nor the independent testing organization shall be changed without the approval of the Contract Administrator.

E22.7.2 Non-Destructive Testing of Welds

(a) Radiographic, ultrasonic, or magnetic particle testing shall be completed by the Contractor using procedures and frequency of testing according to CAN/CSA W59 however, notwithstanding the CAN/CSA W59 requirements, the amount and location of welding to be tested shall be at least:

(i) All welds shall be visually inspected.

(ii) The frequency of radiographic or ultrasonic inspection of groove welds in flanges and webs of built-up girders shall be:

- Flange splices in tension or stress reversal zones: 100% of all welds.
- Flange splices in compression zones: 100% of the weld of 1 in 4 splices.
- Web splices for 1/2 the depth from the tension flange: 100% of the weld length for each weld.
- Web splices for 1/2 the depth from the compression flange: 100% of the weld length of 1 in 4 splices.

(iii) If defects are found during testing, two additional splices shall be tested for each splice exhibiting defects.

(iv) Magnetic particle inspection of web-to-flange fillet welds:

- Submerged-arc welds: 25% of length of each weld.
- Semi-automatic welds: 50% of length of each weld.
- Manual welds: 100% of length of each weld.

(v) Magnetic particle inspection of fillet welds in connection plates and stiffeners to which diaphragms or cross bracing are attached:

- For 1/2 the depth from the tension flange: 100% of weld length of each weld.
- Transverse welds on tension flanges: 100% of weld length of each weld.

(vi) Arc strikes outside of the completed welds shall be lightly ground and checked for cracks by Magnetic Particle Inspection.

(vii) Radiographic and ultrasonic testing shall be performed prior to the assembly of the flanges to the webs after splice welds have cooled as per CSA W59.

E22.8 Quality Assurance

E22.8.1 Visual inspection and sampling will be done in the fabricating shop and in the field by the Contract Administrator to confirm the material supplied and the fabrication has been done as specified on the Drawings and in this Specification. The Contractor shall supply material specimens for testing when requested by the Contract Administrator.

E22.8.2 The Contractor shall provide full facilities for the unencumbered inspection of material, workmanship and all parts of the Work at all stages of the Work by the Contract Administrator in the shop, in storage facilities and in the field. The Contract Administrator shall be allowed free access to the Work.

E22.8.3 The Contract Administrator will perform non-destructive testing of the works, destructive testing of samples obtained of materials to be incorporated into the Work and any other additional inspection at their discretion.

E22.8.4 Inspection

(a) The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or acceptance that may have been previously given. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

E22.8.5 Access

(a) The Contractor shall allow the Contract Administrator free access to all parts of the Work at all times.

E22.8.6 Inspection Requirements for Fabrication Outside of the Province of Manitoba.

(a) Should all or any part of the structural steel fabrication be undertaken at a facility outside of the Province of Manitoba, expenses incurred by the City and/or the City's representative to carry out audit testing will be deducted as incurred by the City from payments made to the Contractor. Expenses will include, but are not limited to all travel, boarding, lodging and the retention of services from a CWB certified inspection agency of the Department's choice for audit inspections at the fabrication plant of all related works.

E22.9 Measurement and Payment

(a) All work and materials will be considered incidental to construction of the new Mile 93.69 SLA access platform and will not be measured for payment. No separate payment will be made.

E23. ERECTION OF STRUCTURAL STEEL

E23.1 Description

E23.1.1 This Specification shall cover all operations relating to the unloading and erecting of structural steel components as specified herein and as shown on the Drawings.

E23.1.2 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, handling and storage, and all things necessary for and incidental to the satisfactory performance and completion of all Work as herein specified and as indicated on the Drawings.

E23.2 References

E23.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) Section E8 Mobilization and Demobilization.

(b) Section E22 Supply and Delivery of Structural Steel.

E23.3 Scope of Work

E23.3.1 The Work under this Specification shall include:

(a) Unloading and erecting structural steel components including beams, connections, steel grating, handrails, stiffeners, splice plates, filler plates, anchor bolts, nuts and washers, and all incidental structural steel elements as shown and described on the Drawings and in this Specification;

(b) Design, supply, fabrication, installation, maintenance and removal of temporary falsework (where applicable);

(c) Design, supply, delivery, installation, maintenance and removal of erection bracing, temporary wind bracing, lateral stability bracing, longitudinal ties and other temporary works for structural steel erection; and

(d) The Quality Control (QC) testing of all materials and the Work.

E23.4 Submittals

E23.4.1 Structural Steel Erection Procedure

(a) A schedule and detailed plan clearly illustrating the method and sequence by which the Contractor proposes to unload and erect the structural steel components. The erection procedure shall include detailed design notes and Shop Drawings in accordance with E3 Shop Drawings and shall bear the seal of a Professional Engineer registered in the province of Manitoba. Submit erection procedures to the Contract Administrator a minimum of twenty (20) Business Days prior to construction.

(b) The erection procedures shall be sealed, signed and dated by a Professional Engineer, registered or licensed to practice in the Province of Manitoba necessary to describe the following and assume full responsibility that the design is being followed:

(i) Access to work, including earth berms, work bridges, or rock berms. The Professional Engineer shall confirm that the temporary works can fully support all loads during girder erection.

(ii) Type and capacity of proposed equipment.

(iii) Sequence of operation, including position of cranes, trucks, and traffic accommodation.

(iv) Detailed crane position and location, particularly adjacent to substructure elements, such as piers and abutment backwalls, with details of load distribution on wheels and outriggers throughout each lift. If the Contract Administrator, approves the crane positioned on the structure during a portion of the Work, details of crane position on the structure showing wheel loads and axle spacing of equipment moving on structure shall also be submitted.

(v) Loads and their position from crane wheels and outriggers during all positions of lifting when the crane(s) is on or adjacent to the structure.

(vi) Details of temporary falsework, including proposed methods to be used to ensure stability and the required splice elevations and structure shape and details of release (if applicable).

(vii) Method of providing temporary supports for stability.

(viii) Details of lifting of beams, showing vertical forces at lifting points and on the lifting devices.

(ix) Complete details of blocking for bearings where necessary to constrain movement due to horizontal forces and/or gravity effects.

(x) Grout Pad Construction, if applicable.

(xi) Provide an “As Constructed” detailed survey of the substructure showing the following:

1. Location and elevation of all bearing connections;
2. Shim height at each bearing location, if applicable;
3. Top of beam elevations at each bearing (and each splice location where applicable); and,
4. Safety and compliance with Manitoba Workplace Health and Safety Act and Regulations shall be integral to the girder erection procedure.

E23.4.2 Temporary Works

(a) Detailed design notes and Shop Drawings for proposed temporary works, including but not limited to erection bracing, temporary wind bracing and lateral stability bracing for structural steel beams shall be sealed signed and dated by a Professional Engineer, registered or licensed to practice in the Province of Manitoba.

E23.5 Materials

E23.5.1 General

(a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

(b) All materials supplied under this Specification shall be of a type approved by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.

E23.6 Equipment

E23.6.1 General

(a) All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

(b) All cranes, rigging and equipment shall be in good condition and properly maintained at all times during the period of the work. All cranes, rigging and equipment shall be of sufficient capacity to complete every stage of the erection Works.

(c) The Contract Administrator shall, at his/her discretion, verify capacity and state of equipment provided and any equipment found not meeting the requirements for erection work shall be removed and replaced. Slings and other lifting devices that will be in contact with structural steelwork shall be of a type which shall not damage galvanized surfaces.

E23.7 Construction Methods

E23.7.1 General

(a) The Contractor shall schedule, coordinate and sequence structural steel erection in cooperation with the delivery of the structural steel by the structural steel fabricator.

(b) Any structural steel components that in the opinion of the Contract Administrator have been damaged or otherwise rendered useless by the improper handling by the Contractor shall be replaced by the Contractor at his own expense.

(c) If the structural steel components are stored on site, the requirements of the Specification for Section E22, Supply and Delivery of Structural Steel, shall apply.

(d) Erection equipment shall be placed during erection of structure components to limit the potential for added loading on the SLA. Refer to Section E11, Excavation, Shoring, and Work in Close Proximity to the SLA, and the Drawings.

E23.7.2 Erection of Structural Steel

(a) General

(i) Before taking possession and erecting the structural steel, the Contractor shall verify that the lengths of the cover plates and jacking beam components, the layout of the substructure units, the elevations of the bearings seats, and the location of the anchor bolts are in accordance with the Drawings. All discrepancies discovered by the Contractor shall be brought immediately to the attention of the Contract Administrator.

(ii) It is essential that the structural steel be erected with utmost attention being given to beam positioning, alignment, and elevation. The Contractor shall adjust beam position, bearing location, and bearing elevation in order to achieve as closely as possible the lines and grades shown on the Drawings. The Contractor shall minimize any differential camber (beam to beam), and the sweep of the beams by jacking, loading of girders, winching, or whatever means are necessary, and shall provide the necessary temporary attachments to hold the beams in position. The Contract Administrator shall approve of all proposed methods of jacking, loading, winching, etc. prior to the work being undertaken.

(iii) Loose timber blocking will not be permitted for use as temporary works for any aspect of steel erection.

(iv) It is the Contractor’s responsibility to ascertain the actual weight of the structural steel.

(b) Erection

(i) The Contract Administrator shall be notified in writing of the starting date at least fourteen (14) Calendar Days prior to the commencement of field operations. Work shall not be carried out until the Contract Administrator is on the Site.

(ii) Components shall be lifted, placed, and maintained in position using appropriate lifting equipment, temporary bracing, guys, or stiffening devices so that the components are at no time overloaded, unstable, or unsafe. Additional permanent material may be provided, if approved by the Contract Administrator, to ensure that the member capacities are not exceeded during erection. The additional material shall be shown in the erection diagram.

(iii) Release of temporary supports or temporary members, etc. must be gradual, and under no circumstances will a sudden release be permissible.

(iv) For temporary fit ups, main beam splices and connections shall be aligned with drift pins and a sufficient number of fitting up bolts shall be installed to maintain the integrity of the connection.

(v) The fitting up bolts may be the high strength bolts used in the installation. Drift pins shall be 1 mm larger in diameter than the required bolts. Excessive drifting that distorts the metal and enlarges the holes is not allowed. Reaming up to 2 mm over the nominal hole diameter is permitted, except for oversize or slotted holes.

(vi) Repairs to erected material will only be permitted after the repair procedure has been approved by the Contract Administrator.

(vii) Filling of misplaced holes by welding is permitted only with the written approval of the Contract Administrator.

(viii) Material intended for use in the finished structure shall not be used for erection or temporary purposes unless such use has been shown on the Shop Drawings, erection diagram, or authorized by the Contract Administrator.

(ix) Hammering that will damage or distort the members is not permitted.

(x) Surfaces that will be in permanent contact shall be cleaned immediately prior to assembly.

(c) Temporary Stresses

(i) The Contractor shall assume full responsibility for ensuring that all bridge member and component stresses are within permissible limits at all stages of the construction work. The Contractor shall provide all necessary additional steel reinforcement, bracing or other measures required to ensure that the erection procedures do not overstress any temporary or permanent member or component at any stage of the Work.

(d) Alignment and Camber

(i) The structural steel beams shall be erected to the proper alignment in plan and in elevation, taking into account dead load deflected profile of the girders following deck removal. Members shall be aligned to the dimensional tolerances specified in CAN/CSA W59- M, but in no case, shall it deviate by more than 50 mm from the theoretical location.

(ii) Alignment shall be measured from survey lines joining the ends of any test length of a member.

(e) Temporary Bracing

(i) The Contractor shall be responsible for the design, supply, installation and removal of all:

- erection bracing;
- temporary wind bracing;
- lateral stability bracing; and,
- longitudinal ties

(ii) As may be required during and immediately following the erection of structural steel girders.

(iii) The bracing shall be designed and installed so that it will not interfere with the installation jacking beam strengthening.

(f) Lifting Devices

(i) If required, after the Contract Administrator has approved the erection positions of the structural steel, all lifting devices shall be removed to the satisfaction of the Contract Administrator.

E23.7.3 Connections

(a) Holes made in the field shall be drilled or reamed. Shop reamed holes shall not be re-reamed in the field. Holes for cover plates and jacking beams shall only be field drilled following clamping of the cover plates in place.

(b) At the time of erection, all cover and splice plates shall be free of loose mill scale, burrs, and all contamination such as drilling shavings, oil, dirt, and paint.

(c) Surfaces to be in permanent contact shall be cleaned immediately prior to assembly. Existing girder surfaces shall be blast cleaned to remove the existing coating, and then washed to be free of contamination.

(d) Any error in shop fabrication or any deformation resulting from handling or transportation that prevents the proper assembly and fitting of parts, especially splices of main structural members, shall be reported and the proposed method of correction shall be submitted to the Contract Administrator. Corrective measures shall not commence until the submitted proposal is accepted by the Contract Administrator.

E23.7.4 Cantilever Erection

(a) When members or components to be erected will be cantilevered, splices that support the cantilevering member or component shall be fully bolted before extending.

E23.7.5 Attachments

(a) The use of tack welds for securing temporary or permanent attachments that are not shown on submitted Shop Drawings, erection drawings or fabrication drawings shall not be permitted on any portion of girders or any other structural members.

E23.7.6 Field Welding

(a) The company undertaking field-welding shall be certified to Division 1 of CAN/CSA W47.1. E20.10.2. The requirements of the Specifications for Supply and Delivery of Structural Steel, Clause E20.13.2 shall apply.

E23.7.7 Bolted Construction

(a) The requirements of the Specifications for Supply and Delivery of Structural Steel, Clause E20.13.4 shall apply.

(i) Bolt heads shall be located on the outside faces of exterior girder webs.

(ii) Bolt heads shall be located as shown on the Contract drawings.

E23.7.8 Removal of Falsework and Site Clean-up

(a) Upon completion of the erection and before final acceptance, the Contractor shall remove all temporary falsework. He shall remove all piling, excavated or surplus materials, rubbish and temporary supports, replace or renew any damaged fences, and restore in an acceptable manner all property damaged during the execution of the Work. Disposed of surplus materials shall be in a manner and at a location satisfactory to the Contract Administrator.

(b) The Contractor shall leave the platform site, roadway and adjacent property in a neat restored and presentable condition, satisfactory to the Contract Administrator. When requested by the Contract Administrator, the Contractor shall provide written evidence that affected property owners and/or regulatory agencies have been satisfied.

E23.7.9 Protection of Concrete Components

(a) During application of field applied coating system, the substructure shall be protected during construction against rust-staining by water runoff until the structural steel has been coated.

E23.8 Quality Control and Assurance

E23.8.1 Quality Control

(a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified Work.

(b) The Contractor shall be wholly responsible for the control of all operations incidental thereto, notwithstanding any inspection or acceptance that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works, which are not in accordance with the requirements of this Specification.

(c) Quality Assurance testing shall be undertaken by the Contract Administrator. Quality Control testing shall be undertaken by the Contractor.

E23.8.2 Quality Assurance

(a) All materials will be subject to physical inspection by the Contract Administrator and will be subject to rejection during the course of the Work and for the length of time as specified in the General Conditions, if, in the opinion of the Contract Administrator, the materials involved do not meet the requirements of the Drawings and this Specification.

(b) All materials shall be subject to testing by the Contract Administrator and will be approved only if the requirements of the Drawings, Standards and this Specification are met. The Contractor shall supply the specimens for testing in accordance with the requests of the Contract Administrator.

(c) The Contractor shall furnish facilities for the inspection of material and workmanship in the mill, shop and field, and the Contract Administrator shall be allowed free access to the necessary parts of the Works. The Contractor shall supply samples to the Contract Administrator or his inspector for testing purposes as required. There will be no charge to the City for samples taken.

E23.9 Measurement and Payment

(a) All work and materials will be considered incidental to construction of the new SLA access platform and will not be measured for payment. No separate payment will be made.

E24. HELICAL PILES

E24.1 Description

E24.1.1 This specification covers the design, supply, installation of helical pile, installation equipment, installation supervision, custom cap plate, and other construction requirements of the helical piles supporting the SLA access platform and footbridge.

E24.1.2 Company installing the helical piles to have a minimum of five (5) years experience installing helical piles and meet the qualifications in B14.

E24.1.3 Design the helical piles for a minimum service life of 100 years.

E24.1.4 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, handling and storage, and all things necessary for and incidental to the satisfactory performance and completion of all Work as herein specified and as indicated on the Drawings.

E24.2 Reference

E24.2.1 Pile loading and size requirements are included on the contract Drawings.

E24.3 Submittals

E24.3.1 Submit Shop Drawings and layout plans as noted below to the Contract Administrator a minimum of twenty (20) Business Days prior to construction. Documentation for the helical pile type(s) shall be submitted under the seal and signature of the pile design engineer registered to practice in the Province of Manitoba, as follows:

(a) Drawings specifying connection details, pile depth, pipe diameter and thickness, number and spacing of helices, material grades, bracket details, pile capacities (axial compression and uplift, lateral and moment), and references to applicable codes and standards.

(b) Pile layout plan, indicating pile type and locations to support the loads provided on the contract drawings.

(c) Torque/capacity relationship for the pile type(s) and their maximum torque rating.

(d) The minimum embedment length shall be such that the lowest helical plate is embedded 10m in compact till, based on the sub-surface conditions at the site, and also such that the highest helical plate if multiple helices are required, is embedded below the depth of seasonal frost (2.4 m).

E24.3.2 Final pile Shop Drawings, layout plans, pile installation logs and pile certification under seal and signature of the pile design engineer and reviewed by the Engineer of Record for the project. (Final pile Shop Drawings and layout plans shall be resubmitted only if pile installation plans and/or pile types deviate from accepted plans due to practical site constraints).

E24.3.3 Pile installation plan signed and sealed by an engineer registered to practice in the Province of Manitoba outlining pile installation methods and equipment utilized. Plan shall avoid damaging the existing aqueduct structure and shall accommodate any and all restrictions on equipment placement noted in section E11.

E24.3.4 A letter of intent under seal and signature of the pile designer or geotechnical engineer registered to practice in the Province of Manitoba to confirm that:

(a) They are retained as the professional engineer certifying that the piles will be installed as per geotechnical requirements.

(b) A field review report will be submitted in accordance with the requirements of MBC Article 4.2.2.3, Field Review.

(c) A final installation report will be provided consisting of pile types, depth, torque and load capacity achieved.

E24.4 Materials

E24.4.1 All materials supplied under this Specification shall be of a type accepted by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator. The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E24.4.2 Pile shaft shall be pipe in accordance with ASTM A252, Grade 3 Steel Pipe seamless or straight welded.

E24.4.3 Helix shall be made from steel plate in accordance with CSA G40.21 300W.

E24.4.4 Helical pile shafts shall be hot-dip galvanized in accordance with the current version of ASTM A123/A124M.

E24.5 Construction Methods

(a) Follow Manufacturer’s recommendations regarding the torque and tensile/bearing capacity relationship for each pile type.

(b) The minimum embedment length shall be such that the lowest helical plate is embedded 10m in compact till, based on the sub-surface conditions at the site, and also such that the highest helical plate if multiple helices are required, is embedded below the depth of seasonal frost which is 2.4 m below final grade.

(c) The load bearing capacity of helical piles installed in accordance with the design shall be verified by one successful static load test at the Site, performed in accordance with ASTM D1143 Quick Load Test Method for Individual Piles. The test pile shall be subjected to axial compressive load up to twice the Service Limit State capacity shown on the Drawings. The test shall be deemed successful provided the helical pile head displacement is less than 20 mm under loading equal to the Service Limit State capacity. In the event of an unsatisfactory test, the helical pile shall be installed to additional length and torque until a successful proof load capacity test has been completed. Installation specifications outlined in E24.3 shall be resubmitted in the event additional length and torque is required.

(d) Notify the Contract Administrator and inspection and testing firm at least 48 hours prior to any pile installations at the Site.

(e) Ensure site conditions are adequate to support pile installation equipment and allow proper installation.

(f) Do not use any equipment or methods that could cause damage to the SLA.

(g) Install helical piles where indicated on the Drawings or in accordance with E24.3 Contractor Submittals. Contractor is responsible for survey and layout from designated control point and/or benchmark.

(h) Advance helical piles into the ground until the required torque and embedment is achieved to satisfy the ultimate tensile and compressive bearing capacity.

(i) Install helical piles without interruption until the embedment depths are achieved.

(j) Cut-off piles normal to the pile axis at the cutoff elevations shown on the Drawings.

(k) Constant normal pressure (crowd) shall be applied while screwing helical piles into the ground. The pressure applied shall be sufficient to ensure that during each revolution the helical anchor and helical pile embeds into the ground a distance of at least 80% of the blade pitch. Rate of helical pile rotation shall not exceed 20 revolutions per minute.

(l) Install helical piles to within 2% of plumb and within 15 mm of the location shown on the Drawings.

(m) Torque shall be measured at increments no greater than 0.5 m throughout installation.

E24.6 Non-Conforming Piles

(a) Piles that reach the maximum torque rating before reaching the minimum embedment depth shall be subject to the following:

(i) Terminate pile at the depth obtained with written approval by the Contract Administrator.

(ii) With the Contract Administrator's approval, replace pile with different pile type (e.g. smaller/fewer helices) installed to the minimum embedment depth.

(b) Notify the Contract Administrator immediately of any non-compliant pile.

(c) Discontinue the installation of piles and immediately notify the Contract Administrator should unexpected soil conditions or obstructions be encountered.

(d) Any piles not deemed acceptable to the Contract Administrator shall be removed and re-installed to the satisfaction of the Contract Administrator. Note that re-installed piles may require relocation and/or supplemental piles to satisfy the design loading conditions, as determined by the Contract Administrator.

E24.7 Installation Records

E24.8 Upon completion of pile installations, submit a helical pile installation report to the Contract Administrator for review and acceptance. The report shall include pile identification, actual pile location relative to planned location, final plumbness, installation torque profile including final

installation torque, final tip elevation, cutoff elevation, and notes regarding pile installation behaviour

E24.9 Certification

(a) Certification shall be made by the Contractor's professional engineer responsible for the work and issued to the Contract Adminstrator the following;

(i) Certify all piles are capable of developing the specified capacities.

(ii) Certify that all pile were installed in accordance with the contract docs and/or submitted Shop Drawings.

E24.10 Measurement and Payment

E24.10.1 Helical Piles

(a) All work and materials required for the helical piles will be considered incidental to the Mile 93.69 SLA Access Platform and will not be measured for payment. No additional payment will be made.

E25. CAST-IN-PLACE CONCRETE

E25.1 Description

(a) This Specification shall cover the construction of all cast-in-place concrete work and concrete patch repairs.

(b) All cast-in-place concrete shall be carried out in accordance with CW 2160 and CSA A23.1, except as amended or supplemented herein.

E25.2 Submittals

E25.2.1 Construction Method Submittal

(a) No Work shall commence until after the Contract Administrator's review of the Contractor's Construction Method submittal.

(b) The Contractor shall prepare for the Contract Administrator's review a Construction Method submittal detailing:

(i) Construction sequence to be followed including all methods to be employed to ensure no damage occurs to existing structures or adjacent properties within or adjacent to excavation.

(ii) Proposed method of construction.

(iii) Specialized equipment to be used.

(iv) Any design revisions proposed to accommodate the Contractor's proposed construction method.

(v) Flow control considerations including details on the Contractor's proposed method of flow control.

(vi) The Contractor shall respond to any concerns that may be raised by the Contract Administrator after review of the Construction Method submittal.

E25.3 Materials

(a) Structural Concrete Mix Design

(i) Provide concrete mixed in accordance with requirements of CW 2160 and CSA-A23.2. Concrete shall conform to requirements of Type A concrete in accordance with Table CW 2160.1.

(ii) Structural concrete design shall be in accordance with performance specification having the following properties:

- Class of Exposure: S-1
- Minimum Compressive Strength @ 28 days: 35 MPa

(b) Hydrophilic Waterstop

(i) One-part polyurethane, extrudable swelling waterstop (bentonite-free). Sikaswell S-2 or approved equal in accordance with B8.

E25.4 Construction Methods

E25.4.1 Forming

(a) The Contractor shall be responsible for the design and installation of all necessary shoring, bracing and formwork.

(b) All shoring shall conform to CW 2030 and E11.

E25.4.2 Cast-in-Place Concrete

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

E25.4.3 Refer to E28 for cold weather concrete requirements.

E25.4.4 Concrete Repairs

(a) General

(i) In no case will the Contractor be permitted to use removal equipment, or other equipment or methods which may cause damage to any remaining structural elements or to any new construction. In the event that any element is damaged, the Contractor shall repair such element at their own expense to the satisfaction of the Contract Administrator.

(ii) All removed material shall become the responsibility of the Contractor.

(iii) The Contractor shall provide all necessary access to facilitate concrete removals and subsequent inspection of all the Works by the Contract Administrator.

(iv) The Contractor shall only use methods of concrete removal that will not damage the existing structure to remain or new structures. Limits of demolition shall be straight and saw-cut to provide a clean edge at the extent of demolition.

(b) Preparation

(i) The Contract Administrator will mark out areas requiring concrete repair. Additional areas may be added as the Work proceeds.

(ii) The resulting surface from concrete removals is to be roughened using hand operated power tools.

(iii) Limits of the repair areas are to be saw-cut to provide a well-defined interface and bonding surface with the existing sound concrete.

(iv) All exposed reinforcing steel shall be sand blasted to remove all corrosion and fitted with a Galvashield XPT anode or equivalent in accordance with B8, installed in accordance with the manufacture’s specifications.

(v) Any reinforcing steel that is severed shall be replaced, with appropriate lap lengths, by the Contractor to the satisfaction of the Contract Administrator at no additional cost to the City.

(c) Partial depth patch repairs

(i) Provide a minimum 20 mm sawcut around the perimeter of the repair area.

(ii) Remove all fractured or deteriorated concrete to sound concrete, a minimum of 30 mm deep, and 20mm past more than half depth exposed reinforcing bars.

(iii) Clean concrete repair area to be free of debris.

(iv) Install Galvashield XPT

- In accordance with manufacturers guidelines
- Max 300mm on centre around perimeter of repair area
- Max 300mm on centre grid pattern for interior of repair area

(v) The Contractor is responsible to create a bond between the new mortar/concrete and the existing substrates.

E25.4.5 Repair areas shall be filled with Structural Concrete.

(i) The Contract Administrator shall inspect all repaired areas for bond using a hammer “sounding” method following cure.

(b) Full depth repairs

(i) Provide a minimum 20 mm sawcut around the perimeter of the repair area.

(ii) Remove all concrete within repair area.

(iii) Roughen perimeter around the repair area and install dowels as specified on the drawings.

(iv) Clean concrete repair area to be free of debris.

(v) Install Galvashield XPT anodes in accordance with manufacturers guidelines at a spacing of max 300mm on centre around perimeter of repair area

(vi) The Contractor is responsible to create a bond between the new mortar/concrete and the existing substrates.

(vii) Areas shall be filled with Structural Concrete as CW 2160.

E25.5 Measurement and Payment

E25.5.1 Supply and Placement of Cast-in-Place Concrete

(a) Supply and placement of cast-in-place concrete will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E25.5.2 Provisional – Concrete Patching

(a) Provisional concrete patching will be measured and paid for on a square meter basis at the Contract Unit Price for “Misc. Concrete Patching” as listed in Form B: Prices in locations where patching is required outside of the work specified on the drawings as identified by the Contract Administrator.

(b) Payment for “Misc. Concrete Patching” will include payment for all labour and materials to complete the work as specified.

E26. PRECAST CONCRETE

E26.1 Description

E26.1.1 This Specification shall cover all operations relating to the supply and installation of the access ramp precast concrete footing and step block up to the ramp as specified herein and as shown on the Drawings.

E26.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory completion of all Work as hereinafter specified.

E26.2 References

(a) All reference standards and related specifications shall be current issue or latest revision at the date of tender advertisement.

(b) Specifications

(i) CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete

(ii) CAN/CSA A3001, Cementitious Materials for Use in Concrete

(iii) CAN/CSA G30.18, Billet-Steel Bars for Concrete Reinforcement

(iv) AASHTO T 176, Standard Method of Test for Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test Nineteenth Edition

(v) ASTM C 29, Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate

(vi) ASTM C 40, Standard Test Method for Organic Impurities in Fine Aggregates for Concrete

(vii) ASTM C 42, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

(viii) ASTM C 70, Standard Test Method for Surface Moisture in Fine Aggregate

(ix) ASTM C 88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate orb Magnesium Sulfate

(x) ASTM C 117, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing

(xi) ASTM C 127, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate

(xii) ASTM C 128, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate

(xiii) ASTM C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

(xiv) ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

(xv) ASTM C 138, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

(xvi) ASTM C 142, Standard Test Method for Clay Lumps and Friable Particles in Aggregates

(xvii) ASTM C 260, Standard Specification for Air-Entraining Admixtures for Concrete

(xviii) ASTM C 289, Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)

(xix) ASTM C 295, Standard Guide for Petrographic Examination of Aggregates for Concrete

(xx) ASTM C 457, Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete

(xxi) ASTM C 494, Standard Specification for Chemical Admixtures for Concrete

(xxii) ASTM C 535, Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

(xxiii) ASTM C 586, Standard Test Method for Potential Alkali Reactivity of Carbonate Rocks as Concrete Aggregates (Rock-Cylinder Method)

(xxiv) ASTM C 1017, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

(xxv) ASTM C 1064, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

(xxvi) ASTM C 1084, Standard Test Method for Portland-Cement Content of Hardened Hydraulic-Cement Concrete

(xxvii) ASTM C 1202, Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration

(xxviii) ASTM C 1567, Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)

(xxix) ASTM C 1583, Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)

(xxx) ASTM C 1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

(xxxi) ASTM D 75, Standard Practice for Sampling Aggregates

(xxxii) ASTM D 4791, Standard Test Method for Flat Particles, Elongated Particles or Flat and Elongated Particles in Coarse Aggregate

(xxxiii) ASTM D 5821, Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate

(xxxiv) ASTM D 6928, Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

(xxxv) ASTM D 7428, Standard Test Method for Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

E26.3 Scope of Work

E26.3.1 The Work under this Specification shall involve:

(a) Supplying and installing access ramp precast concrete footings and step block; and

(b) Supplying and installing all miscellaneous items and other items associated with the Work.

E26.4 Submittals

E26.4.1 The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (20) Business Days prior to the scheduled commencement of any fabrication, the proposed Shop Drawings showing all fabrication details of the precast concrete footing.

E26.4.2 The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (20) Business Days prior to the scheduled commencement of any fabrication, concrete mix design statement sealed by a Professional Engineer licensed in the Province of Manitoba that meets the minimum compressive strength of 35 MPa at 28 days. The mix design shall contain:

(a) Concrete mix design proportions.

(b) Type of cementitious materials used and source locations.

(c) Designated size of aggregates, and aggregate gradations.

(d) Aggregate source locations.

(e) Maximum water/cement ratio.

(f) The design slump.

(g) The limits for air content.

(h) Type and brand of admixtures.

(i) Certification that all concrete constituents are compatible.

E26.4.3 Copies of all reports, including but not limited to: “Record of Concrete Strength” form and material quality control test results.

E26.4.4 The contractor shall conduct and supply copies of all the following material quality control test results:

(a) Aggregate testing specified in CSA A23.1 Clauses 4.2.3.3, 4.2.3.4, 4.2.3.5.1, 4.2.3.6, 4.2.3.7, and Tables 10, 11, and the Standard requirements for concrete exposed to freezing and thawing listed in Table 12.

(b) Abrasion and impact testing results for coarse aggregate in accordance with CSA A23.2-16A.

(c) Report on alkali-aggregate reactivity testing, CSA A23.2-27A.

(d) Report on aggregate petrographic examination, CSA A23.2-15A. Petrographic examination of the aggregate shall be done by an experienced petrographer. The weighted petrographic number shall not exceed 125. The report from the petrographer shall confirm that the aggregate is suitable for the intended use and exposure class.

(e) Report on chloride ion penetrability test ASTM C 1202.

(f) Report on the water soluble chloride ion content by mass of cementing material in the concrete, CSA A23.2-4B.

(g) Report on Air Content of Hardened Concrete ASTM C 457.

E26.4.5 All testing of concrete and concrete constituents by the Contractor shall be done by an independent laboratory certified by the Canadian Standards Association except the plastic concrete testing (Slump, Air Content and Cylinders) and concrete cylinder compressive strength testing during casting can be done by the Contractor's Quality Control Technician (ACI Certified Concrete Testing Technician) as approved by the Contract Administrator.

E26.5 Materials

E26.5.1 General

(a) All materials supplied under this Specification shall be of a type acceptable to the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.

(b) The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator

E26.5.2 Material for the Precast Concrete

(a) Concrete: Concrete shall have a minimum compressive strength of 35 MPa at 28 days with a post-cracking residual strength index (Ri) of 0.15 using synthetic fibres and meet requirements of CSA A23.1, Exposure Class F-1 & S-1, Air Content Category 1 for hardened concrete.

(i) Coarse Aggregate

- The maximum nominal size of coarse aggregate shall be 20 mm and meet the grading requirements of CSA A23.1, Table 11, Group I. Coarse aggregate shall be uniformly graded and not more than 1% shall pass a 75 um sieve. Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter or other injurious substances.

(ii) Tests of the coarse aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12, for concrete exposed to freezing and thawing.

(iii) Fine Aggregate

- Fine aggregate shall meet the grading requirements of CSA A23.1, Table 10, FA1, be graded uniformly and not more than 3% shall pass a 75 um sieve. Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam or other deleterious substances.
- Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12.

(iv) Admixtures

- Air-entraining admixtures shall conform to the requirements of ASTM C 260.
- Chemical admixtures shall conform to the requirements of ASTM C 494 or C 1017 for flowing concrete.

(v) Cementitious Materials

- Cementitious materials shall conform to the requirements of CSA A3001.
- Should the Contractor choose to include a silica fume admixture in the concrete mix design, the substitution of silica fume shall not exceed 8% by mass of cement.

- Should the Contractor choose to include fly ash in the concrete mix design, the fly ash substitution shall not exceed 20% by mass of cement. The fly ash shall meet the following requirements:

Chemical and Physical Parameters Specification	Specification
CaO Content	10 - 20%
Loss of Ignition	< 1%
Fineness Retained on the 45 µm Sieve	< 15%
Blaine	300 – 400 m2/kg
Strength Activity Index	
% Control at 7 Days	≥ 85%
% Control at 28 Days	≥ 95%

(vi) Synthetic Fibres

- The synthetic fibres for the precast concrete footing shall consist of 100% virgin polypropylene. The dosage shall be designed by the Contractor to meet the requirements for post-cracking residual strength as specified in E26.5.2(a).

(b) Reinforcement: Plain deformed steel bars conforming to CSA Standard CAN/CSA G30.18, Grade 400W, in accordance with E27.

(c) Sand: “Sand” in accordance with Table CW 2030.1, Specification CW 2030-R9.

(d) Miscellaneous Materials: Shall be of the type specified on the Drawings or approved by the Contract Administrator.

(e) Embedded Materials: Embedded materials shall conform to the requirements shown on the Drawings.

(f) Precast Concrete Footing will be supplied to the Contractor f.o.b. on the Contractor’s truck at the precast Fabricator’s yard. The precast Fabricator will load the footing onto the Contractor’s hauling equipment. Pick up of footing shall be during the Fabricator’s normal working hours unless other mutually satisfactory arrangements are made between the Contractor and the Fabricator. The Contractor will be responsible for any premium charged for items picked up outside of the Fabricator’s normal working hours.

(g) The Contractor shall be responsible for the security and integrity of the footing during transportation to site, and during unloading, storage and installation on site. items damaged during any of these operations shall be replaced or repaired to the satisfaction of the Contract Administrator before final approval is granted. The decision to repair or replace the damaged footing will be entirely at the discretion of the Department.

E26.6 Equipment

E26.6.1 General

(a) All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

E26.7 Construction Methods

E26.7.1 Fabrication of Precast Concrete Footing

(a) Dimension Tolerances

(i) Cross-sectional dimensions throughout the entire length of the footing shall not vary from those shown on the Drawings by more than 5 mm.

(ii) The locations of the reinforcing steel shall not vary from those shown on the Drawings by more than 5 mm.

(iii) For the horizontal alignment, the maximum deviation from a straight line parallel to the centreline of a footing shall be 5 mm.

(b) Placing Reinforcement:

(i) Reinforcement shall be:

- Placed in accordance with the details shown on the Drawings.
- Rigidly fastened together.
- Lowered into the forms before concrete is placed.

(ii) Spacers shall be used to properly locate the reinforcing steel cage in the excavation.

(c) Forms

(i) Steel forms shall be used. The faces of the forms shall be smooth so as to impart a good finish to the concrete. Forms shall produce precast concrete footing that conforms to the shape, lines and dimensions as shown on the Drawings and within the tolerances described in E26.7.1.

(ii) The faces of the forms shall be treated with a release agent to ensure that stripping may be carried out without damage to the concrete. Care shall be taken to prevent the release agent from coming in contact with any reinforcing steel or embedded materials.

(iii) All foreign substances shall be removed from the forms prior to placing the concrete.

(d) Placing Concrete

(i) Concrete shall be placed to the dimensions shown on the Drawings. Hand finished surfaces shall be finished smooth with a hand float.

(ii) The form shall be free of water prior to placing of concrete. Concrete shall not be placed in or through water unless authorized by the Contract Administrator.

(iii) Interruption in placing concrete shall not exceed 30 minutes.

(e) Concrete Finish

(i) The top surface of the step block shall be given a coarse broomed finish following initial troweling and floating.

(ii) Immediately after the removal of the forms, all defects in the concrete shall be repaired as directed by the Contract Administrator, provided the defects are not extensive enough to cause rejection of the footing. Should the top surface exhibit excessive laitance or “frothing” or any other deleterious effects, the Contractor shall repair the concrete to the satisfaction of the Contract Administrator.

(iii) Honeycombs, if any, shall be repaired as soon as the forms are taken off. When approved by the Contract Administrator, repairs shall be accomplished by: removing all aggregate that is loose or that is not bonded thoroughly to the surrounding concrete, washing the sound concrete with clean water, using a wire brush to remove any loose particles, applying an approved epoxy resin to the dried areas, and applying a cementitious mortar.

(iv) The cementitious mortar shall have the same quality and mix as that used for the concrete. Patched areas shall be rubbed flush with the surrounding surface after the cementitious mortar has hardened.

(v) All objectionable fins, projections, offsets, streaks, and other surface imperfections shall be removed totally to the Contract Administrator 's satisfaction by approved means.

(vi) Finally, the concrete surface shall be wetted down thoroughly and all air pockets larger than 6 mm in diameter and other surface cavities shall be filled carefully with the approved cementitious mortar. When sufficiently dry, the surface shall be rubbed down to leave a smooth and uniform finish. Cement washes of any kind will not be allowed.

(vii) If, in the Contract Administrator 's opinion, repairs to the concrete are not satisfactory or will be detrimental to the strength or long-term durability of the footing, the Contractor shall, at his own expense and as directed by the Contract Administrator replace the footing.

(f) Protection of Newly Placed Concrete

(i) Newly cast concrete threatened with damage by rain, snow, fog, or mist shall be protected with a tarpaulin or other approved means.

(g) Curing Concrete

(i) The footing shall be cured until the concrete has reached a minimum compressive strength of 35 MPa. Concrete can either be moist-cured or steam cured.

(ii) If steam-curing is used, steam shall not be applied until after the initial set has taken place. Initial set will be considered to have taken place 4 hours after the completion of concrete placing.

(iii) During steam curing, the rise in the ambient air temperature shall not exceed 15 ^{o} C per hour to a maximum temperature of 60^{o} C.

(iv) Once curing has been completed, the temperature of the concrete shall not be allowed to fall at a rate exceeding 20^{o} C per hour.

(v) The footing shall not be subjected to freezing temperatures before reaching a compressive strength of 35 MPa. The footing, including any patched areas, shall be properly cured within the plant a minimum of three (3) days before being subjected to freezing conditions. The Contractor shall monitor the rate of cooling and avoid thermal shock from prematurely subjecting the footing to freezing temperatures.

E26.7.2 Handling and Storage

(a) The Contractor shall be responsible for storage of the footing from the completion of it’s fabrication until required. The Contractor may have to store, free of charge, all or portions of the fabricated material past the delivery date specified in the contract documents, for a period of up to one year.

(b) During storage, the footing shall be maintained in a horizontal position and shall be, as a minimum, supported at the corners. Care shall be exercised during the handling and storage of the precast concrete footing to avoid twisting, cracking or other distortion that may result in damage to the footing.

(c) The Contractor will give the Precast Supplier 48 hours notice of his intention to pick up the footing. The Contractor shall load the footing onto the Contractor's hauling equipment and shall co-operate with the Contractor as to the loading procedures.

(d) The precast concrete footing shall be picked up only by the lifting devices provided by the Fabricator. The lifting devices shall be cut off flush with the bottom of the recesses after installation.

E26.7.3 Placement of Precast Concrete Footing

(a) Excavation required for the placement of the footing shall be completed prior to footing placement.

(b) Concrete footing shall be placed level and at the location as indicated on the Drawings.

E26.8 Quality Control and Assurance

E26.8.1 Quality Control

(a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work.

(b) The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or acceptance that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.

(c) General

(i) Batches of concrete that do not meet the requirements of this Specification will be rejected by the Contract Administrator. The Contract Administrator reserves the right to require immediate removal of any concrete from the rejected batches that may have already been placed in the forms.

(ii) The Contractor shall be responsible for all concrete testing, including but not limited to making test cylinders, transporting cylinders to an independent certified testing laboratory of his choice, storage, curing, breaking, and providing written reports of the concrete test results to the Contract Administrator.

(iii) All testing shall be completed by qualified personnel who are certified at the time of testing as ACI CSA-based Concrete Field Testing Technicians - Grade 1, and shall be conducted at the point of discharge into the forms.

(d) Compressive Strength tests

(i) A “Strength Test” shall consist of the compression test of four standard test specimens, sampled, cast, cured, and tested in accordance with CSA Standard Specifications as referenced with modifications as indicated. One cylinder shall be tested at seven (7) days. One cylinder shall be tested at fourteen (14) days. Two cylinders shall be tested at twenty eight (28) days. The 28 day test result shall be the average of the strengths of the remaining two specimens.

(ii) Additional cylinders may be cast, at the discretion of the Contract Administrator or Contractor.

(iii) Compressive strength tests shall be completed by the Contractor for every 10 m3 of concrete placed in the forms. As a minimum, one compressive strength test shall be completed each day that concrete is placed.

(iv) Additional test cylinders shall be made, cured and tested as required by the Contractor to verify that the concrete has reached the minimum strength of 35 MPa identified in Section 5.9 of the Special Provisions.

(v) The compressive strength of the concrete shall be determined from standard 100 mm diameter x 200 mm test cylinders or 150 mm x 300 mm test cylinders that have been molded, cured and tested in accordance with CSA A23.2.

(e) Additional Testing Requirements

(i) In addition to the compressive strength tests, the Contractor shall perform and record the results of the following tests for each concrete batch:

- Slump tests completed in accordance with CSA A23.2 – 5C.
- Air content tests completed in accordance with CSA A23.2 – 4C.
- Temperature tests completed in accordance with ASTM C 1064.

(ii) The Contractor shall be responsible for maintaining an up-to-date record of all test results on a "Record of Concrete Strength" form approved by the Contract Administrator. A separate "Record of Concrete Strength" form shall be prepared for the footing and the strengths of the test cylinders as well as the pertinent data shall be listed in the same order as the batches of concrete were placed in the forms. A complete set of test results shall be submitted to the Contract Administrator within 7 days after the date that the final cylinder from the last item was tested.

E26.8.2 Quality Assurance

(a) The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

(b) Visual inspection and sampling will be done in the fabrication plant by the Contract Administrator to confirm the material supplied and the fabrication has been done as specified on the Drawings, in this Specification and in the Special Provisions. The Contractor shall supply material specimens for concrete testing when requested by the Contract Administrator.

(c) The Contract Administrator, at their discretion and City's expense, may complete other tests deemed necessary on: a) the concrete, b) the concrete constituent materials or c) any finished or partially finished item. The Contractor shall allow the Contract Administrator unhindered access to the concrete, concrete constituent materials and the footing and shall assist the Contract Administrator in carrying out any test.

(d) During fabrication of the precast concrete footing, the Contractor shall weigh completed component to verify the mass when requested by the Contract Administrator.

(e) After the precast concrete footing has been installed, the Contractor and the Contract Administrator shall conduct a final inspection to locate any damage or deficiencies. All visible damage or deficiencies shall be repaired by the Contractor to the satisfaction of the Contract Administrator and acceptable to the Department before final approval is granted.

E26.9 Measurement and Payment

E26.9.1 Precast Concrete

(a) Supply and placement of precast concrete will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E27. REINFORCING STEEL

E27.1 Description

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

E27.2 Submittals

(a) The Contractor shall submit reinforcing steel Shop Drawings in accordance with E3 a minimum of ten (10) Business Days prior to the fabrication of any reinforcing steel.

E27.3 Materials

E27.3.1 Reinforcing Steel

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

E27.3.2 Bar Accessories

(a) Bar accessories shall be of type approved by the Contract Administrator. They shall be made from a non-corroding material, and they shall not stain, blemish, or spall the concrete surface for the life of the concrete. Bar chairs are to be PVC; galvanized bar chairs are not acceptable.

(b) Bar accessories shall include bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices that may be approved by the Contract Administrator. Bar accessories are not shown on the Contract Drawings. The supply and installation of bar accessories shall be considered incidental to the supply and placing of reinforcing steel.

E27.4 Construction Methods

E27.4.1 Placing of Reinforcing Steel

(a) Placement of reinforcing steel shall be completed in accordance with CW 2160, CSA A23.1, and CSA A23.3.

(b) Lap splices in accordance with CSA A23.3

(c) Reinforcing steel shall be placed accurately in the positions shown on the Contract Drawings. Carefully adjust the location of reinforcing steel adjacent to openings to frame those openings in accordance with good practice, and maintain the bar spacing intent.

(d) Splices in reinforcing steel shall be made only where indicated on the Contract Drawings. Prior approval of the Contract Administrator shall be obtained where, in the opinion of the Contractor, other splices must be made. All splices shall have laps of at least 40 bar diameters. Welded splices shall not be used.

(e) A minimum of twenty-four (24) hours notice shall be given to the Contract Administrator prior to the pouring of any concrete to allow for inspection of reinforcing steel.

E27.4.2 Quality Control

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

E27.5 Measurement and Payment

(a) Supply and placement of reinforcing steel will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E28. COLD WEATHER CONCRETE WORK

E28.1 Submittals

(a) The Contractor shall submit a cold weather concrete plan in accordance with E3.

E28.2 Construction Methods

E28.2.1 Should any concrete work be required to be caried out when the daily mean temperature is below 5°C or anticipated to be below 5°C within the next 24 hours, cold weather requirements as specified herein shall be followed.

E28.2.2 All freshly placed concrete shall be protected from the elements and from defacements due to construction operations.

E28.2.3 The following are minimum requirements for protecting concrete during and after placement during freezing weather, but mere adherence to these requirements does not relieve the Contractor of the necessity for producing concrete which as not been weakened or injured by frost or freezing, or replacement such damaged work at their own expense:

(a) Before any concrete is placed, all ice, snow, and frost shall be completely removed from all formwork and brought up above 7°C for twenty-four (24) hours minimum prior to placement of concrete. Where concrete is placed against the earth, the underlying soils shall be free of frost when the concrete is placed.

(b) Prior to mixing, concrete aggregates shall be thawed but heated to a temperature not exceeding 80°C.

(c) Concrete shall be placed at a temperature between 20°C and 30°C.

(d) Placed concrete shall be horded and kept at a temperature of not less than 20°C for five (5) Calendar Days or at a temperature of not less than 5°C for ten (10) Calendar Days. Hording enclosures shall be strong, wind-proof, and well ventilated. Heating units shall be placed to prevent local overheating or drying of the concrete and/or damage from combustion gases. Only indirect fired heaters may be utilized.

E28.3 Measurement and Payment

(a) Cold weather concrete requirements will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

E29. SHEET METAL CLADDING

E29.1 Description

(a) Aluminum (sheet metal) cladding.

E29.2 Submittals

(a) Submit Shop Drawings for review in accordance with E3.

(b) Clearly indicate material type, profiles, sizes, spacing and locations of components, connections, attachments, anchorage, profiles of drip edges, caps, and size and type of fasteners.

E29.3 Materials

E29.3.1 Sheet Metals

(a) Aluminum Cladding: Mill Finish aluminum, non-painted, minimum 1.0 mm base aluminum thickness.

(b) Drip edge, caps, inside and outside corners: Mill Finish aluminum, non-painted, minimum 1.0 mm base aluminum thickness.

(c) Aluminum material: Alloy 3003-H14 in accordance with ASTM B209/ASTM B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

E29.3.2 Sheet Metal Fastening Systems

(a) Self-drilling 410 Stainless Steel screws suitable for concrete substrate.

(b) Utilize pan head stainless steel screws for securing of other aluminum materials.

E29.3.3 Sealants

(a) As recommended by the cladding manufacturer for exterior applications and adhesion to aluminum and concrete substrates.

(b) Approved Products: Skiaflex-1A or approved equal in accordance with B8.

E29.4 Construction Methods

(a) Install materials in accordance with the Manufacturer’s written instructions.

(b) Field measure site conditions prior to fabricating Work.

(c) Fabricate all components in the factory, ready for field installation.

(d) Provide Aluminum Cladding and all accessories in longest practicable length to minimize field lapping of joints.

(e) Aluminum Cladding is to be installed tight to the face of the Rigid Insulation.

(f) Segment drip edging, caps, inside and outside corners as required to secure to curved substate where applicable. Ensure segmented components lap adjoining segmented components in the same nominal plane.

(g) Form sections square, true and accurate to size, free from distortion, and other defects detrimental to appearance or performance.

(h) Fasten liner sheet to substrate utilizing stainless steel fasteners. Ensure all fasteners are driven normal to the plane of the liner panel.

E29.5 Measurement and Payment

(a) Supply and installation of aluminum cladding components and related appurtenances shall be considered incidental to construction of the Mile 93.69 manhole and will not be measured for payment. No additional payment will be made.

E30. RESTORATION

E30.1 Description

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

E30.2 Construction Methods

E30.2.1 All sites shall be cleaned up upon completion of the work.

(a) All excavations shall be backfilled to match existing grade, or as shown on the Drawings.

(b) Areas outside of the granular working pads shall be leveled and left in a condition consistent with existing conditions. All existing drainage paths shall be restored, except as shown on the Drawings.

(c) Granular working pads shall be regraded as required to match the grades shown on the Drawings and remove any damage caused during the course of construction.

E30.3 Measurement and Payment

E30.3.1 Site Restoration

(a) Site restoration will be considered incidental to the Work and will not be measured for payment. No additional payment will be made.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

F1.1 Each individual proposed to perform Work under this Contract within facilities associated with the water supply, treatment and distribution system including the Shoal Lake Intake Facility, Shoal Lake Aqueduct, Deacon Reservoir, Water Treatment Plant, Regional Pumping Stations, and Booster Pumping Stations shall be required to obtain a Global Sanctions & PEP Check **and** a Police Information Check as detailed below.

F1.1.1 The Global Sanctions & PEP Check must be obtained through Sterling BackCheck.

(a) A Sterling BackCheck account must be setup 72 hours prior to individual security clearances to allow sufficient time for activation of the contracting company's account. If the contracting company has an existing City of Winnipeg Sterling Backcheck vendor account, they may skip to (d) below.

(b) An authorized individual of the contracting company must complete the Sterling Backcheck Setup Form. There is no cost to the organization to set up the account. Click on the link below, complete the form, and hit submit. **(This form is to be completed by the company, not by the employee requiring the security clearances). https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity

(c) Within 48 hours of completing the Sterling Backcheck Setup Form, the authorized individual of the contracting company will receive a Username and Password for Sterling Backcheck. It will appear in their inbox as a "Welcome to Sterling Backcheck" email. Upon receipt, the authorized individual of the contracting company will be asked to login to the Sterling Backcheck website to set their security questions and password. Once completed, individual security clearance requests can be submitted.

(d) In order to run a Global Sanctions & PEP Check and/or a Police Information Check, follow the steps below:

(i) Click on the sub-tab labelled "Order eConsent".

(ii) Fill out the required information about the employee proposed to perform Work under this Contract within City facilities (the person that requires the security clearances).

(iii) Select your location under the "Order Information" section and enter the organization's phone number, if required.

(iv) Select the required individual service(s) in the dropdown menu under the "Select Services" section. If both the Global Sanctions & PEP Check and the Police Information Check are required, select the Sterling Backcheck Package One (with electronic identity verification). Once selected, both the Global Sanctions & PEP Check and the Police Information Check should have a grey check mark beside them.

(v) Scroll down to the bottom and click the blue "Submit" button. The employee proposed to perform Work under this Contract within City facilities will be invited to complete their security clearance.

(vi) The employee will receive the invitation and must click on the link and complete their Global Sanctions & PEP Check and/or Police Information Check.

(vii) The results of the Global Sanctions & PEP Check and/or Police Information Check will go directly to the City of Winnipeg and to the authorized individual of the contracting company within 24 hours.

(e) Any questions related to the Sterling BackCheck process can be directed to Linda Ferens at 204-999-0912 or by email at: linda.ferens@sterlingcheck.com OR managedsupport@sterlingcheck.com

F1.1.2 The Police Information Check must be obtained from one of the following:

(a) Sterling BackCheck;

(i) See F1.1.1(a) thru (e) for instructions on how to set up an account and submit individuals for security checks; or

(b) A police service having jurisdiction at their place of residence;

(i) 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.

(ii) The applicant shall provide the original Police Information Check (Form P–612) to the Contract Administrator; or

(c) Commissionaires (Manitoba Division);

(i) Forms to be completed can be found on the website at: https://www.commissionaires.ca/en/manitoba/home

(ii) The applicant shall provide the original Police Information Check to the Contract Administrator; or

(d) FASTCHECK Criminal Record & Fingerprint Specialists;

(i) Forms to be completed can be found on the website at: https://myfastcheck.com

(ii) The applicant shall provide the original Police Information Check to the Contract Administrator.

F1.2 Any individual for whom a Global Sanctions & PEP Check and/or a Police Information Check is not provided will not be permitted to perform any Work.

F1.3 Individuals for whom a Global Sanctions & PEP Check indicates “CLEAR” and a Police Information Check demonstrates no previous convictions or pending charges will be permitted to perform Work as specified in F1.1.

F1.4 Individuals for whom a Global Sanctions & PEP Check does not indicate “CLEAR” and/or a Police Information Check demonstrates previous convictions or pending charges may not be permitted to perform any Work as specified in F1.1.

(a) Previous convictions or pending charges may be investigated and a determination will be made by the City as to whether the individual will be permitted to perform any Work.

(b) Convictions or pending charges that may preclude an individual from performing any Work include but are not limited to:

(i) convictions or pending charges related to property offences; and/or

(ii) convictions or pending charges related to crimes against another person.

(c) Where additional investigation related to a Global Sanctions & PEP Check or a Police Information Check is required by the City, no extension to critical stages, Substantial Performance, or Total Performance, as applicable, will be provided.

(d) Additional investigation by the City may take upwards of six weeks.

F1.5 Prior to the award of Contract, and during the term of the Contract, if additional or replacement individuals are proposed to perform Work within City facilities, the Bidder/Contractor shall supply the Contract Administrator with a Global Sanctions & PEP Check and a Police Information Check satisfactory to the City 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.

F1.6 Any Global Sanctions & PEP Check and Police Information Check determined to be satisfactory to the City 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 Global Sanctions & PEP Check and/or a Police Information Check. Any individual F1.1 who fails to provide a Global Sanctions & PEP Check and/or a Police Information Check satisfactory to the City as a result of a

repeated records search will not be permitted to continue to perform any Work as specified in F1.1.