



THE CITY OF WINNIPEG

TENDER

TENDER NO. 576-2022

ST. MARY'S ROAD RIVERBANK STABILITY IMPROVEMENT WORKS

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 ST. MARY'S ROAD RIVERBANK STABILITY IMPROVEMENT WORKS

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, August 30, 2022.

B2.2 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. SITE INVESTIGATION

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

B3.2 The Bidder/Proponent is responsible for inspecting the Site, the nature of the Work to be done and all conditions that might affect his/her Bid/Proposal or his/her performance of the Work, and shall assume all risk for conditions existing or arising in the course of the Work which have been or could have been determined through such inspection.

B4. ENQUIRIES

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

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

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

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

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

B4.6 Any enquiries concerning submitting through MERX should be addressed to:
MERX Customer Support
Phone: 1-800-964-6379
Email: merx@merx.com

B5. CONFIDENTIALITY

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

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

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

B6. ADDENDA

B6.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Tender, or clarifying the meaning or intent of any provision therein.

B6.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.

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

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

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

B6.6 Notwithstanding B4, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D4.

B7. SUBSTITUTES

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

B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B7.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.

B7.4 The Bidder shall ensure that any and all requests for approval of a substitute:

- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
- (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
- (c) identify any anticipated cost or time savings that may be associated with the substitute;
- (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
- (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B18.
- B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B8. BID COMPONENTS

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid/Proposal;
 - (b) Form B: Prices;
 - (c) Form G1: Bid Bond and Agreement to Bond.
- B8.2 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.
- B8.3 The Bid shall be submitted electronically through MERX at www.merx.com.
- B8.3.1 Bids will **only** be accepted electronically through MERX.
- B8.4 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B18.1(a).

B9. BID

- B9.1 The Bidder shall complete Form A: Bid/Proposal, making all required entries.
- B9.2 Paragraph 2 of Form A: Bid/Proposal shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
 - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
 - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
 - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

- B9.3 In Paragraph 3 of Form A: Bid/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B9.4 Paragraph 13 of Form A: Bid/Proposal shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
 - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
 - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers;
 - (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B9.4.1 The name and official capacity of all individuals signing Form A: Bid/Proposal should be entered below such signatures.
- B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.
- B10. PRICES**
- B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B10.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B10.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).
- B10.5 The Bidder shall enter the Total Bid Price from Form B: Prices into the Total Bid Price field in MERX.
- B10.5.1 Bidders are advised that the calculation indicated in B18.4 will prevail over the Total Bid Price entered in MERX.
- B11. DISCLOSURE**
- B11.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.
- B11.2 The Persons are:
- (a) N/A
- B12. CONFLICT OF INTEREST AND GOOD FAITH**
- B12.1 Further to C3.2, Bidders, by responding to this Tender, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

- B12.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:
- (a) other commitments;
 - (b) relationships;
 - (c) financial interests; or
 - (d) involvement in ongoing litigation;
- that could or would be seen to:
- (i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or
 - (ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;
- (e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of its participation in the Tender process or the Work; or
 - (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.
- B12.3 In connection with its Bid, each entity identified in B12.2 shall:
- (a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;
 - (b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and
 - (c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.
- B12.4 Without limiting B12.3, the City may, in its 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 its 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 its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.
- B12.5 Without limiting B12.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:
- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of its 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 its sole discretion, determines cannot be avoided or mitigated;
 - (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B12.4 to avoid or mitigate a Conflict of Interest; and
 - (d) disqualify a Bidder if the Bidder, or one of its employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

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

B13. QUALIFICATION

B13.1 The Bidder shall:

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

B13.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

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

B13.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
- (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);
- (d) have completed the Accessible Customer Service online training required by the Accessibility for Manitobans Act (AMA) (see B13.5 and D7).

B13.4 Further to B13.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) in the form of:
 - (i) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
 - (ii) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
- (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>).

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

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

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

B14. BID SECURITY

B14.1 The Bidder shall include in its Bid Submission bid security in the form of a digital bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in Form G1: Bid Bond and Agreement to Bond, available on The City of Winnipeg, Corporate Finance, Materials Management Division website at <https://www.winnipeg.ca/MatMgt/templates/files/eBidsecurity.pdf>.

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

- (a) The version submitted by the Bidder must have valid digital signatures and seals;
- (b) The version submitted by the Bidder must be verifiable by the City with respect to the totality and wholeness of the bond form, including: the content; all digital signatures and digital seals; with the surety company, or an approved verification service provider of the surety company.
- (c) The version submitted must be viewable, printable and storable in standard electronic file formats compatible with the City, and in a single file. Allowable formats include pdf.
- (d) The verification may be conducted by the City immediately or at any time during the life of the bond and at the discretion of the City with no requirement for passwords or fees.
- (e) The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding B14.2(a).

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

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

B14.4.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B14.5 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly formed with the successful Bidder and the contract securities are furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B14.6 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Tender.

B15. OPENING OF BIDS AND RELEASE OF INFORMATION

B15.1 Bids will not be opened publicly.

B15.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated and pending review and verification of conformance with requirements) will be available on the MERX website at www.merx.com.

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

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

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

B16. IRREVOCABLE BID

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

B16.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly formed and the contract securities have been furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B17. WITHDRAWAL OF BIDS

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

B18. EVALUATION OF BIDS

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

- (a) compliance by the Bidder with the requirements of the Tender, or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B13 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

B18.2 Further to B18.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B18.3 Further to B18.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is qualified.

B18.4 Further to B18.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

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

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

B19. AWARD OF CONTRACT

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

- B19.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be qualified, and the Bids are determined to be responsive.
- B19.2.1 Without limiting the generality of B19.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Work;
 - (b) the prices are materially in excess of the prices received for similar work in the past;
 - (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
 - (d) only one Bid is received; or
 - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.
- B19.3 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B18.
- B19.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 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, Materials Management 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 emergency repair of an approximately 20 m long failed section of the riverbank and the overlying sidewalk.

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

- (a) Riverbank Short-Term Remediation Works
 - (i) Construction Access and Slope Regrading
 - (ii) Lightweight Fill
- (b) St. Mary's Road Temporary Sidewalk Works
 - (i) Traffic Management
 - (ii) Temporary Gravel Sidewalk
 - (iii) Safety Railing

D3.3 The following shall apply to the Work:

- (a) City of Winnipeg Green Building Policy: New City-Owned Buildings and major additions;
<http://clkapps.winnipeg.ca/DMIS/DocExt/ViewDoc.asp?DocumentTypeId=2&DocId=5989>
- (b) Universal Design Policy
<http://clkapps.winnipeg.ca/DMIS/DocExt/ViewDoc.asp?DocumentTypeId=2&DocId=3604>

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is KGS Group, represented by:

Andrew Chan, P.Eng.
Geotechnical Engineer

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

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

D5. CONTRACTOR'S SUPERVISOR

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

D6. NOTICES

- D6.1 Except as provided for in C22.4, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid/Proposal.
- D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator identified in D4.
- D6.3 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:
- The City of Winnipeg
Legal Services Department
Attn: Director of Legal Services
Facsimile No.: 204 947-9155

D7. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

- D7.1 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.
- D7.1.1 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.
- D7.1.2 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.

D8. FURNISHING OF DOCUMENTS

- D8.1 Upon award of the Contract, the Contractor will be provided with 'issued for construction' Contract Documents electronically, including Drawings in PDF format only.

SUBMISSIONS

D9. AUTHORITY TO CARRY ON BUSINESS

- D9.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on

business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D10. SAFE WORK PLAN

- D10.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.
- D10.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Safety/default.stm>
- D10.3 Notwithstanding B13.4 at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

D11. INSURANCE

- D11.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg, Manitoba, its ministers, officers, employees and agent to be added as an additional insureds, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$5,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
 - (c) Property insurance for all machinery, equipment, tools, field office and portable toilets used by the Contractor in the performance of the Work on the project that may be owned, rented, leased or borrowed
 - (d) Contractors pollution liability in the amount of at least \$500,000 per occurrence insuring against claims covering third party injury, property damage and including clean up costs and transported cargo as a result of pollution conditions arising suddenly or gradually from the Contractor's operations and completed operations. Such policy to name the City as an additional insured and remain in place throughout the warranty period.
- D11.2 Contractor shall ensure that any sub-contractors hired in connection with the works provide evidence of insurances as outlined section D11.1(a) and (b).
- D11.3 Deductibles shall be borne by the Contractor.
- D11.4 All policies shall be taken out with insurers licensed to carry on business in the Province of Manitoba.
- D11.5 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.
- D11.6 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.

D12. CONTRACT SECURITY

- D12.1 The Contractor shall provide and maintain the performance bond and the labour and material payment bond until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; and
 - (b) a labour and material payment bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H2: Labour and Material Payment Bond), in an amount equal to fifty percent (50%) of the Contract Price.
- D12.1.1 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 D12.1(b).
- D12.1.2 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 its discretion, exercised reasonably, allows.
- D12.1.3 Digital bonds passing the verification process will be treated as original and authentic.
- D12.2 The Contractor shall provide the City Solicitor 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.
- D12.3 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 D12.1(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.

D13. SUBCONTRACTOR LIST

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

than the date specified in the General Conditions for the return of the executed Contract Documents, if applicable.

D14. EQUIPMENT LIST

D14.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at or prior to a pre-construction meeting, or 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 C4.1 for the return of the executed Contract Documents, if applicable.

D15. DETAILED WORK SCHEDULE

D15.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract Documents, as applicable.

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

- (a) a critical path method (C.P.M.) schedule for the Work;
 - (b) a Gantt chart for the Work based on the C.P.M. schedule; and
 - (c) a daily resources schedule for the Work
- all acceptable to the Contract Administrator.

D15.3 Further to D15.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

D15.4 Further to D15.2(b), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

D15.5 Further to D15.2(c), the daily resources schedule shall list the daily number of individuals on the Site for each trade and sub-contractor.

D16. REQUIREMENTS FOR SITE ACCESSIBILITY PLAN

D16.1 The Contractor shall provide the Contract Administrator with an Accessibility Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.

D16.2 The Accessibility Plan shall demonstrate how the Contractor will accommodate the safe passage of pedestrians and cyclists in accordance with the Manual of Temporary Traffic Control, the Contract Drawings, Staging Plans, and Streets By-Law No. 1481/77 at all times for the duration of the Construction. Unless noted in the Contract, the Accessibility Plan must include a written plan for the following:

- (a) How the Contractor will maintain at least one crossing in each direction for each intersection (one north/south crosswalk and one east/west crosswalk).
- (b) How the Contractor will maintain access to bus stops within the site.
- (c) How the Contractor will maintain access to pedestrian corridors and half signals.
- (d) How the Contractor will maintain cycling facilities.
- (e) How the Contractor will maintain access to residents and businesses unless otherwise noted in the Contract.
- (f) Any required detour signage at adjacent crossings to facilitate sidewalk or active transportation pathway closures.

- D16.3 The Accessibility Plan may also include figures, sketches, or drawings to demonstrate the proposed plan.
- D16.4 The Accessibility Plan shall include written details on how the Contractor intends to review, maintain, and document all items related to the Accessibility Plan on-site during Construction, including, but not limited to:
- (a) Signage
 - (b) Temporary Ramping
 - (c) Transit Stops
 - (d) Detour Signage
- D16.5 At minimum, the Contractor shall review the site conditions on a daily basis to ensure that all features related to the Accessibility Plan are in place. The site review is intended to correct deficiencies as a result of unforeseen events such as wind, traffic, or the general public. Deficiencies that are direct result of the Contractors actions must be corrected immediately.
- D16.6 Any changes to the Accessibility Plan must be approved by the Contract Administrator.
- D16.7 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the site has been maintained.
- D16.8 Deficiencies as a direct result of actions by the Contractor that are not immediately corrected and/or failure to produce records that demonstrate that the site was maintained in compliance with the Accessibility Plan may result in a pay adjustment via the monthly Progress Payment. The rate of pay adjustment will be as per the following schedule:
- (a) First Offence – A warning will be issued and documented in the weekly or bi-weekly site meeting.
 - (b) Second Offence – A field instruction to immediately correct the site will be issued by the Contract Administrator.
- D16.9 Third and subsequent Offences – A pay reduction will be issued in the amount of \$250.00 per instance and per day.

SCHEDULE OF WORK

D17. COMMENCEMENT

- D17.1 The Contractor shall not commence any Work until he/she is in receipt of an award letter from the Award Authority authorizing the commencement of the Work.
- D17.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D9;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D10;
 - (iv) evidence of the insurance specified in D11;
 - (v) the contract security specified in D12;
 - (vi) the Subcontractor list specified in D13;
 - (vii) the Equipment list specified in D14;
 - (viii) the detailed work schedule specified in D15;
 - (ix) the Requirements for Site Accessibility Plan specified in D16; and
 - (x) the direct deposit application form specified in D26.
 - (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.

D17.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the award letter.

D17.3 The City intends to award this Contract by September 9, 2022.

D17.3.1 If the actual date of award is later than the intended date, the dates specified for Substantial Performance and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D18. WORK BY OTHERS

D18.1 Further to C6.25, the Contractor's attention is directed to the fact that other Contractors, the personnel of Utilities and the staff of the City may be working within the project limit, approach roadway, adjacent roadways or right-of-way. The activities of these agencies may coincide with the Contractors execution of Work and it will be the Contractor's responsibility to cooperate to the fullest extent with other personnel working in the area, and such cooperation is an obligation of the Contractor under the terms of Contract.

D18.2 Work by others on or near the Site will include but not necessarily be limited to:

- (a) Geotechnical site investigations including drilling, instrumentation installation and instrumentation monitoring.
- (b) Manitoba Hydro:
 - (i) De-energizing existing underground electrical cables in the work area, inspection of excavation near light standards and placement of conduits, temporary overhead cable installation, and follow up underground cable connection and re-energizing.
 - (ii) Excavating, cutting, capping, and abandoning a section of gas line north of the work area.
- (c) BellMTS facilitation of excavation around trunk fibre conduit buried within the work area.
- (d) Old St. Vital Biz or its representatives facilitating work in proximity to Old St. Vital Biz light poles and buried conduits and cables.

D18.2.1 Further to D18.1 the Contractor shall cooperate and coordinate all activities with all parties performing required Work by Others identified in D18.1 and accommodate the necessary area on Site required for the Work by Others to complete the Work.

D19. SUBSTANTIAL PERFORMANCE

D19.1 The Contractor shall achieve Substantial Performance by October 14, 2022.

D19.2 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.

D19.3 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.

D20. TOTAL PERFORMANCE

D20.1 The Contractor shall achieve Total Performance by October 28, 2022.

D20.2 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.

D20.3 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.

D21. LIQUIDATED DAMAGES

D21.1 If the Contractor fails to achieve Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

- (a) Substantial Performance – two thousand dollars (\$2,250.00);
- (b) Total Performance – one thousand dollars (\$1,250.00).

D21.2 The amounts specified for liquidated damages in D21.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.

D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D22. COVID-19 SCHEDULE DELAYS

D22.1 The City acknowledges that the schedule for this Contract may be impacted by the COVID-19 pandemic. Commencement and progress of the Work shall be performed by the Contractor with due consideration to the health and safety of workers and the public, directives from health authorities and various levels of government and in close consultation with the Contract Administrator.

D22.2 If the Contractor is delayed in the performance of the Work by reason of the COVID-19 pandemic, 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.

D22.3 A minimum of seven (7) Calendar Days prior to the commencement of Work, the Contractor shall declare whether COVID-19 will affect the start date. The Contractor shall provide sufficient evidence that the delay is directly related to COVID-19, including but not limited to evidence related to availability of staff, availability of Material or work by others.

D22.4 For any delay related to COVID-19 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 D22.3. Failure to provide this notice will result in no additional time delays being considered by the City.

D22.5 The Work schedule, including the durations identified in D19 and D20 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.

D22.6 Where Work not previously identified is being carried over solely as a result of delays related to COVID-19, 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 COVID-19, a partial consideration of the cost of temporary works will be considered by the Contract Administrator.

D22.7 Any time or cost implications as a result of COVID-19 and in accordance with the above, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

CONTROL OF WORK

D23. JOB MEETINGS

- D23.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D23.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D24. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

- D24.1 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).

D25. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

- D25.1 Further to B13.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B13.4.

MEASUREMENT AND PAYMENT

D26. PAYMENT

- D26.1 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.

WARRANTY

D27. WARRANTY

- D27.1 Warranty is as stated in C13.

DISPUTE RESOLUTION

D28. DISPUTE RESOLUTION

- D28.1 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 D28.
- D28.2 The entire text of C21.4 is deleted, and amended to read: "Intentionally Deleted"
- D28.3 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 his written Appeal Form, in the manner and format set out on the City's Materials Management 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 his Appeal Form.

- D28.4 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.
- D28.5 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.
- D28.6 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.
- D28.7 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.
- D28.8 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 D28.7, 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.

THIRD PARTY AGREEMENTS

D29. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

- D29.1 Funding for the Work of the Contract is being provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada and accordingly, as required by the applicable funding agreements, the following terms and conditions shall apply.
- D29.2 For the purposes of D29:
- (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.
- D29.3 Indemnification By Contractor
- D29.3.1 In addition to the indemnity obligations outlined in C17 of the General Conditions for Construction, the Contractor agrees to indemnify and save harmless the Government of Canada and the Government of Manitoba and each of their respective Ministers, officers, servants, employees, and agents from and against all claims and demands, losses, costs,

damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from this Contract or the Work, or from the goods or services provided or required to be provided by the Contractor, except those resulting from the negligence of any of the Government of Canada's or the Government of Manitoba's Ministers, officers, servants, employees, or agents, as the case may be.

- D29.3.2 The Contractor agrees that in no event will Canada or Manitoba, their respective officers, servants, employees or agents be held liable for any damages in contract, tort (including negligence) or otherwise, for:
- (a) any injury to any person, including, but not limited to, death, economic loss or infringement of rights;
 - (b) any damage to or loss or destruction of property of any person; or
 - (c) any obligation of any person, including, but not limited to, any obligation arising from a loan, capital lease or other long term obligation;

in relation to this Contract or the Work.

D29.4 Records Retention and Audits

D29.4.1 The Contractor shall maintain and preserve accurate and complete records in respect of this Contract and the Work, including all accounting records, financial documents, copies of contracts with other parties and other records relating to this Contract and the Work during the term of the Contract and for at least six (6) years after Total Performance. Those records bearing original signatures or professional seals or stamps must be preserved in paper form; other records may be retained in electronic form.

D29.4.2 In addition to the record keeping and inspection obligations outlined in C6 of the General Conditions for Construction, the Contractor shall keep available for inspection and audit at all reasonable times while this Contract is in effect and until at least six (6) years after Total Performance, all records, documents, and contracts referred to in D29.4.1 for inspection, copying and audit by the City of Winnipeg, the Government of Manitoba and/or the Government of Canada and their respective representatives and auditors, and to produce them on demand; to provide reasonable facilities for such inspections, copying and audits, to provide copies of and extracts from such records, documents, or contracts upon request by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada and their respective representatives and auditors, and to promptly provide such other information and explanations as may be reasonably requested by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada from time-to-time.

D29.5 Other Obligations

D29.5.1 The Contractor consents to the City providing a copy of the Contract Documents to the Government of Manitoba and/or the Government of Canada upon request from either entity.

D29.5.2 If the Lobbyists Registration Act (Manitoba) applies to the Contractor, the Contractor represents and warrants that it has filed a return and is registered and in full compliance with the obligations of that Act, and covenants that it will continue to comply for the duration of this Contract.

D29.5.3 The Contractor shall comply with all applicable legislation and standards, whether federal, provincial, or municipal, including (without limitation) labour, environmental, and human rights laws, in the course of providing the Work.

D29.5.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.

- D29.5.5 The Contractor represents and warrants that no current or former public servant or public office holder, to whom the Value and Ethics Code for the Public Sector, the Policy on Conflict of Interest and Post Employment, or the Conflict of Interest Act applies, shall derive direct benefit from this Contract, including any employment, payments, or gifts, unless the provision or receipt of such benefits is in compliance with such codes and the legislation.
- D29.5.6 The Contractor represents and warrants that no member of the House of Commons or of the Senate of Canada or of the Legislative Assembly of Manitoba is a shareholder, director or officer of the Contractor or of a Subcontractor, and that no such member is entitled to any benefits arising from this Contract or from a contract with the Contractor or a Subcontractor concerning the Work.

FORM H1: PERFORMANCE BOND
(See D12)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

TENDER NO. 576-2022

ST. MARY'S ROAD RIVERBANK STABILITY IMPROVEMENT WORKS

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

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

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

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

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

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

_____ day of _____, 20____.

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

FORM H2: LABOUR AND MATERIAL PAYMENT BOND
(See D12)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

TENDER NO. 576-2022

ST. MARY'S ROAD RIVERBANK STABILITY IMPROVEMENT WORKS

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

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

- (a) A claimant is defined as one having a direct contract with the Principal for labour, service and material, or any of them, used or reasonably required for use in the performance of the contract, labour, service and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment (but excluding rent of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract;
- (b) The above-named Principal and Surety hereby jointly and severally agree with the Obligee that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work, labour or service was done or performed, or materials were furnished by such claimant, may sue on this bond, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon;
- (c) No suit or action shall be commenced hereunder by any claimant
 - (ii) unless claimant shall have given written notice to the Principal and the Surety above-named, within one hundred and twenty (120) days after such claimant did or performed the last of the work, labour or service, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work, labour or service was done or performed. Such notice shall be served by mailing the same by registered mail to the Principal, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the Province of Manitoba;

- (iii) after the expiration of one (1) year following the date on which Principal ceased work on said Contract; including work performed under the guarantees provided in the Contract;
 - (iv) other than in a court of competent jurisdiction in the Province of Manitoba.
- (d) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.
- (e) The Surety shall not be liable for a greater sum than the specified penalty of this bond.

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

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

_____ day of _____, 20____.

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

FORM K: EQUIPMENT
(See D14)

St. Mary's Road Riverbank Stability Improvement Works

<p>1. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>2. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>3. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

FORM K: EQUIPMENT
(See D14)

St. Mary's Road Riverbank Stability Improvement Works

<p>4. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>5. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>6. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

- E1.1 These Specifications shall apply to the Work.
- E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm>
- E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.3 Further to C2.4(d), Specifications included in the Tender shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B7. In every instance where a brand name or design specification is used, the City will also consider approved equals and/or approved alternatives in accordance with B7.
- E1.4 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
RW753-22-01	Cover Sheet
RW753-22-02	General Plan and Detailed Plan
RW753-22-03	Construction Sequence and Site Photos
RW753-22-04	Lightweight Fill Plan, Profile, Sections and Details
RW753-22-05	Erosion Control Measures

E2. SOILS INVESTIGATION REPORT

- E2.1 Further to C3.1, soil investigation information of the area adjacent to the project exist and is documented in the Report on the Geotechnical Aspects of the Old St. Vital Riverwalk Project prepared in 1998. Considerable variations in the soil conditions may exist between two sites, considering the natural variability of soil stratigraphy and groundwater conditions with geographic location and time. The report is included in Appendix 'A'.
- E2.2 Surficial conditions of the Site as observed on July 12, 2022, are shown in the photo log included in Appendix 'B'.
- E2.3 The Contractor is responsible for any interpretation they place on the supplied information and are expected to make such additional investigation of the soil as they feel necessary to satisfy themselves.
- E2.4 Any test borings or test excavations made by the Contractor shall be done in accordance with the requirements of the appropriate authority of the City of Winnipeg. The Contractor shall notify the Contract Administrator prior to starting any soil boring or test excavation.

E3. EXISTING SERVICES, UTILITIES AND STRUCTURES

- E3.1 The Contractor is responsible for identifying, notifying, locating, and working around all existing underground and overhead services, utilities, and structures within and adjacent to the Project Site in accordance with CW 1120.

- E3.2 The Contractor shall be responsible to not damage any existing services, utilities, or structures. Caution must be exercised around the utilities and work must be performed in accordance with instructions from the Contract Administrator or utility owners and their onsite inspectors. Hand excavation or soft dig methods shall be used for areas in close proximity to existing underground utilities, services, and structures, including but not limited to:
- (a) within 2.5 m of BellMTS trunk fibre conduits,
 - (b) within 1 m of Manitoba Hydro secondary voltage lines,
 - (c) within 1 m of Manitoba Hydro gas lines, and
 - (d) within 1 m of City of Winnipeg Traffic Signal cables.
 - (e) within close proximity of Old St. Vital Biz street lighting conduits and cables, as directed by the Contract Administrator, Old St. Vital Biz or its representatives.
- E3.3 The Contractor shall perform work around existing services, utilities, and structures in accordance with the drawings and instructions from the utility owners or Contract Administrator, including but not limited to:
- (a) Excavation to maintain a minimum separation of 1500 mm from Manitoba Hydro light standards.
 - (b) A minimum cover of 600 mm to be provided above Manitoba Hydro electrical conduits.
 - (c) BellMTS buried conduits and concrete duct shall not be undermined.
 - (d) Vibratory compaction shall not be used over or within 1.0 m of Manitoba Hydro gas pipelines.
- E3.4 Approximate locations of some public underground utilities in proximity of the Project Site are shown in the photo log in Appendix 'B'. However, the Contractor is responsible for obtaining updated utility locates prior to commencement of any subsurface works, and obtaining new locates if the nature of work or the work area changes during construction.

E4. SHOP DRAWINGS

E4.1 Description

- (a) This Specification shall revise, amend and supplement the requirements of CW 1110.
 - (i) The term 'shop drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, including Site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the Work.
 - (ii) The Contractor shall submit specified shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be shown on all submissions for Contract Administrator review.
 - (iii) Provision of Shop Drawings will be considered incidental to the price for supply and delivery of equipment and materials.
- (b) Shop Drawings
 - (i) Original drawings are to be prepared by Contractor, Subcontractor, Supplier, Distributor, or Manufacturer, which illustrate appropriate portion of Work; showing fabrication, layout, setting or erection details as specified in appropriate sections.
 - (ii) Shop drawings for the following structural components shall bear the seal of a registered Engineer in the Province of Manitoba.
 - ◆ Reinforcing steel.
 - ◆ Metal Fabrications.
- (c) Contractor's Responsibilities
 - (i) Review shop drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.

- (ii) Verify:
 - ◆ Field Measurements
 - ◆ Field Construction Criteria
 - ◆ Catalogue numbers and similar data
 - (iii) Coordinate each submission with requirements of Work and Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.
 - (iv) Notify Contract Administrator, in writing at time of submission, of deviations from requirements of Contract Documents.
 - (v) Responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review of submission, unless Contract Administrator gives written acceptance of specified deviations.
 - (vi) Responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
 - (vii) 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 previous submission.
 - (viii) After Contract Administrator's review and return of copies, distribute copies to subtrades as appropriate.
 - (ix) Maintain one (1) complete set of reviewed shop drawings, filed by Specification Section Number, at the Site of the Work for use and reference of the Contract Administrator and Subcontractors.
- (d) Submission Requirements
- (i) Schedule submissions at least 14 Calendar Days before dates reviewed submissions will be needed, and allow for a 10 Calendar Day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
 - (ii) Submit one original print and one digital PDF copy of shop drawings. The Contractor is advised that the Contract Administrator will retain the original copy and return one digital PDF copy to the Contractor.
 - (iii) Accompany submissions with transmittal letter, containing:
 - ◆ Date
 - ◆ Project title and Tender number
 - ◆ Contractor's name and address
 - ◆ Number of each shop drawing, product data and sample submitted.
 - ◆ Specification Section, Title, Number and Clause
 - ◆ Drawing Number and Detail/Section Number
 - ◆ Other pertinent data
- (e) Submission shall include.
- (i) Date and revision dates
 - (ii) Project title and Tender number
 - (iii) Name of:
 - ◆ Contractor
 - ◆ Subcontractor
 - ◆ Supplier
 - ◆ Manufacturer
 - ◆ Separate detailer when pertinent
 - (iv) Identification of product material
 - (v) Relation to adjacent structure or materials

- (i) Field dimensions clearly identified as such.
 - (ii) Specification section name, number and clause number or drawing number and detail/section number.
 - (iii) Applicable standards, such as CSA or CGSB numbers.
 - (iv) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents.
- (f) Other Considerations
- (i) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
 - (ii) Material and equipment delivered to the Site of the Works will not be paid for at least until pertinent shop drawings have been submitted and reviewed.
 - (iii) Incomplete shop drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.
 - (iv) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions and review of shop drawings.

E5. WATER OBTAINED FROM THE CITY

- E5.1 Further to clause 3.7 of CW 1120, the Contractor shall pay for all costs, including sewer charges, associated with obtaining water from the City in accordance with the Waterworks and Sewer By-laws.

E6. VERIFICATION OF WEIGHTS

- E6.1 All Material which is paid for on a weight basis shall be weighed on a scale certified by Consumer & Corporate Affairs, Canada.
- (a) All weight tickets shall have the gross weight and the time and date of weighing printed by an approved electro/mechanical printer coupled to the scale.
 - (b) The tare weight and net weight may either be hand written or machine printed. All weights, scales and procedures shall be subject to inspection and verification by the Contract Administrator. Such inspection and verification may include, but shall not be limited to:
 - (a) checking Contractor's scales for Consumer & Corporate Affairs certification seals;
 - (b) observing weighing procedures;
 - (c) random checking of either gross or tare weights by having such trucks or truck/trailer(s) combinations as the Contract Administrator shall select weighed at the nearest available certified scale; and
 - (d) checking tare weights shown on delivery tickets against a current tare.
- E6.2 The Contractor shall ensure that each truck or truck/trailer(s) combination delivering Material which is paid for on a weight basis displays a tare weight not more than one (1) month old.
- (a) The tare shall be obtained by weighing the truck or truck/trailer(s) combination on a certified scale and shall show:
 - (a) upon which scale the truck or truck/trailer(s) combination was weighed;
 - (b) the mechanically printed tare weight;
 - (c) the license number(s) of the truck and trailer(s); and
 - (d) the time and date of weighing.

E7. TRUCK WEIGHT LIMITS

- E7.1 The City shall not pay for any portion of Material which results in the vehicle exceeding the maximum gross vehicle weight allowed under *The City of Winnipeg Traffic By-Law*, unless such vehicle is operating under special permit.

GENERAL REQUIREMENTS

E8. OFFICE FACILITIES

- E8.1 Contractor shall supply one (1) office facility to be located at a Site specified by the Contract Administrator.
- E8.2 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 City staff and will be used for weekly site meetings.
 - (b) The building shall be conveniently located near the site of the Work.
 - (c) The building shall have a minimum floor area of 15 square metres, height of 2.4m with a window for cross-ventilation and a door entrance with a suitable lock.
 - (d) 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.
 - (e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.
 - (f) The building shall be furnished with one desk, one drafting table, table 3m x 1.2m, one stool, one four drawer legal size filing cabinet, and a minimum of 5 chairs.
 - (g) 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.
 - (h) 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 he/she deems it necessary.
- E8.3 The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the office facilities.
- E8.4 The office facilities will be provided from the date of the commencement of the Work to the date of Substantial Performance as defined in D19.

E9. TRAFFIC CONTROL

- E9.1 Further to clauses 3.6, 3.7 and 3.8 of CW 1130:
- (a) In accordance with the Manual of Temporary Traffic Control on City Streets (MTTC), the Contractor ("Construction Agency" in the manual) shall be responsible for placing, maintaining, and removing the appropriate temporary traffic control devices as specified by the MTTC or by the Traffic Management Branch of the City of Winnipeg Public Works Department. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by their own forces or subcontractor.
- E9.2 In accordance with the Manual of Temporary Traffic Control on City Streets (MTTC), the Contract Administrator shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place, maintain, and remove all regulatory signs and traffic control devices authorized and/or required by the Traffic Management Branch in the following situations:
- (a) Parking restrictions,

- (b) Stopping restrictions,
- (c) Turn restrictions,
- (d) Diamond lane removal,
- (e) Full or directional closures on a Regional Street,
- (f) Traffic routed across a median,
- (g) Full or directional closure of a non-regional street where there is a requirement for regulatory signs (turn restrictions, bus stop relocations, etc.) to implement the closure.
- (h) Approved Designated Construction Zones with a temporary posted speed limit reduction. Traffic Services will be responsible for placing all of the advance signs and 'Construction Ends' (TC-4) signs. The Contractor is still responsible for all other temporary traffic control including but not limited to barricades, barrels and tall cones.

- E9.3 Further to E9.2(c), the Contractor shall make arrangement with the Traffic Services Branch of the City of Winnipeg to supply regulatory signs as required.
- E9.4 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the Site has been maintained.
- E9.5 Further to E9.2(c) and E9.2(d) the Contractor shall make arrangements with the Traffic Services Branch of the City of Winnipeg to reinstall the permanent regulatory signs after the Contract Work is complete. At this time the Contractor shall make arrangements to drop off the stockpiled materials to Traffic Services at 495 Archibald Street.
- E9.6 Any changes to the approved traffic management plan must be submitted to the Contract Administrator a minimum of (five) 5 Working Days prior to the required change for approval.
- E9.7 If the Contract Administrator determines that the Contractor is not performing Traffic Control in accordance with this specification, Traffic Services Branch may be engaged to perform the Traffic Control. In this event the Contractor shall bear the costs associated charged to the project by the Traffic Services Branch of the City of Winnipeg in connection with the required Works undertaken by the Contractor.

E10. TRAFFIC MANAGEMENT

- E10.1 Further to clause 3.7 of CW 1130:
- E10.1.1 The Contractor shall be responsible for Traffic Management of the Work in its entirety, including preparation of Traffic Management Plan prior to commencement of work for review and approval by the Contract Administrator.
- E10.1.2 All Traffic Management methods must be in accordance with the Manual of Temporary Traffic Control and are subject to review and approval by the Contract Administrator.
- E10.1.3 The Contractor shall schedule construction activities to meet the following:
- (a) St. Mary's Road: Maintain two southbound lanes and all northbound lanes along this street during construction.
 - (b) St. Mary's Road: Maintain local access and bus access at all times. The road shall be closed to traffic only with the approval of the Contract Administrator.
- E10.1.4 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.
- E10.1.5 The Southbound St Mary's at Vivian bus stop (#50280) will be temporarily relocated during the Work. Access to the temporary bus stop and bench must be maintained at all times unless determined otherwise by the Contract Administrator.

E11. PEDESTRIAN SAFETY

- E11.1 The Contractor shall be responsible for developing a Pedestrian Safety Plan approved by the Contract Administrator.
- E11.2 D3 Scope of Work Part (b) Works
- (a) Throughout the construction period, pedestrians shall be allowed to use the sidewalk East of St. Mary's Road. These construction works will require that the West pedestrian sidewalk be closed to all users. As a result, the Contractor shall be responsible for accommodating pedestrian crossing at the at the closest adjacent intersections, if possible.
 - (b) The Contractor shall provide signage, temporary curb ramps, and traffic control at all temporary pedestrian crossings that are consistent with the requirements of the City of Winnipeg Manual of Temporary Traffic Control on City Streets.
 - (c) The removal of temporary pathways and crossings is considered incidental to the Work.

E12. ENVIRONMENTAL PROTECTION PLAN

- E12.1 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the Environmental Protection Plan, as herein specified, and the Fisheries Act Authorization. The Contractor shall be responsible for all costs associated with the Environmental Protection Plan is incidental to the Work and no separate measurement or payment will be made.
- E12.2 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work and are available for viewing at the office of the Contract Administrator.
- (a) Federal
 - (i) Canadian Environmental Assessment Act (CEAA) c.37
 - (ii) Transportation of Dangerous Goods Act and Regulations c.34
 - (iii) The Fisheries Act
 - (iv) Canadian Navigable Waters Act
 - (b) Provincial
 - (i) The Dangerous Goods Handling and Transportation Act D12
 - (ii) The Endangered Species and Ecosystems Act E111
 - (iii) The Environment Act c.E125
 - (iv) The Fire Prevention Act F80
 - (v) The Manitoba Heritage Resources Act H39.1
 - (vi) The Manitoba Noxious Weeds Act N110
 - (vii) The Manitoba Nuisance Act N120
 - (viii) The Public Health Act c.P210
 - (ix) The Workplace Safety and Health Act W210
 - (x) And current applicable associated regulations.
 - (c) Municipal
 - (i) The City of Winnipeg By-law No. 1573/77 and all amendments
 - (ii) The City of Winnipeg By-law No. 1/2008
 - (iii) And any other applicable Acts, Regulations, and By-Laws.
- E12.3 The Contractor is advised that the following environmental protection measures apply to the Work.
- (a) Materials Handling and Storage
 - (i) Construction materials shall not be deposited or stored on riverbank slopes unless written acceptance from the Contract Administrator is received in advance.

- (ii) Construction materials and debris shall be prevented from entering any nearby watercourse. If materials and/or debris inadvertently enter the watercourse, the Contract shall be required to remove the material and restore the watercourse to its original condition.
- (b) Fuel Handling and Storage
- (i) The Contractor shall obtain all necessary permits from Manitoba Conservation and Climate for the handling and storage of fuel products and shall provide copies to the Contract Administrator.
 - (ii) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.
 - (iii) Fuels, lubricants, and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.
 - (iv) In accordance with Section 2.5 (Construction: General Guidelines) of the Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, (DFO and DNR, 1996), the Contractor shall ensure that any temporary fuel storage areas established for construction of the project are contained by an impermeable dike and are located a minimum distance of 100 metres away from the high-water line of the Red River. Dikes shall be designed, constructed, and maintained to retain not less than 100% of the capacity of the total number of containers or 110% of the largest container, whichever is greatest. The dikes shall be constructed of clay or similar impervious material. If this type of material is not available, the dike shall be constructed of locally available material and lined with high density polyethylene (HDPE). Furthermore, the fuel storage area(s) shall be secured by a barrier such as a high fence and gate to prevent vandalism.
 - (v) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
 - (vi) Products transferred from the fuel storage area(s) to specific Work Sites shall not exceed the daily usage requirement.
 - (vii) 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.
 - (viii) Refuelling of mobile equipment and vehicles shall take place at least 100 metres from a watercourse.
 - (ix) 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.
 - (x) 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.
- (c) Waste Handling and Disposal
- (i) The construction area shall be kept clean and orderly at all times during and at completion of construction.
 - (ii) At no time during construction shall personal or construction waste be permitted to accumulate for more than one day at any location on the construction Site, other than at a dedicated storage area as may be approved by the Contract Administrator.
 - (iii) All resulting debris shall be deposited at a Waste Disposal Ground operating under the authority of Manitoba Regulation #150/91.
 - (iv) Indiscriminate dumping, littering, or abandonment shall not take place.
 - (v) No on-site burning of waste is permitted.
 - (vi) Waste storage areas shall not be located so as to block natural drainage.
 - (vii) Run-off from a waste storage area shall not be allowed to cause siltation of a watercourse.

- (viii) Waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
 - (ix) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.
- (d) Dangerous Goods/Hazardous Waste Handling and Disposal
- (i) Dangerous goods/hazardous wastes are identified by, and shall be handled according to, The Dangerous Goods Handling and Transportation Act and Regulations.
 - (ii) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations.
 - (iii) The Contractor shall have on-site staff that is trained and certified in the handling of the dangerous/hazardous goods, when said dangerous/hazardous goods are being utilized on-site for the performance of the Work.
 - (iv) Different waste streams shall not be mixed.
 - (v) Disposal of dangerous goods/hazardous wastes shall be at approved hazardous waste facilities.
 - (vi) Liquid hydrocarbons shall not be stored or disposed of in earthen pits on-site.
 - (vii) Used oils shall be stored in appropriate drums, or tankage until shipment to waste oil recycling centres, incinerators, or secure disposal facilities approved for such wastes.
 - (viii) Used oil filters shall be drained, placed in suitable storage containers, and buried or incinerated at approved hazardous waste treatment and disposal facilities.
 - (ix) Dangerous goods/hazardous waste storage areas shall be located at least 100 metres away from the high-water line and be diked.
 - (x) Dangerous goods/hazardous waste storage areas shall not be located so as to block natural drainage.
 - (xi) Run-off from a dangerous goods/hazardous waste storage area shall not be allowed to cause siltation of a watercourse.
 - (xii) Dangerous goods/hazardous waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
- (e) Emergency Response
- (i) The Contractor shall ensure that due care and caution is taken to prevent spills.
 - (ii) The Contractor shall report all major spills of petroleum products or other hazardous substances with significant impact on the environment and threat to human health and safety (as defined in Table 1 below) to Manitoba Conservation and Climate, immediately after occurrence of the environmental accident, by calling the 24-hour emergency phone number (204) 945-4888. The Contract Administrator shall also be notified.
 - (iii) The Contractor shall designate a qualified supervisor as the on-site emergency response co-ordinator for the project. The emergency response co-ordinator shall have the authority to redirect resources in order to respond in the event of a spill.
 - (iv) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-site emergency response co-ordinator:
 - Notify emergency-response co-ordinator of the accident:
 - identify exact location and time of accident.
 - indicate injuries, if any
 - request assistance as required by magnitude of accident (Manitoba Conservation and Climate 24-hour Spill Response Line (204) 945-4888, Police, Fire Department, Ambulance, company backup)
 - Attend to public safety:
 - stop traffic, roadblock/cordon off the immediate danger area.
 - eliminate ignition sources.

- initiate evacuation procedures if necessary
 - Assess situation and gather information on the status of the situation, noting:
 - personnel on-site
 - cause and effect of spill
 - estimated extent of damage.
 - amount and type of material involved.
 - proximity to waterways, sewers, and manholes
 - If safe to do so, try to stop the dispersion or flow of spill material:
 - approach from upwind
 - stop or reduce leak if safe to do so.
 - dike spill material with dry, inert sorbet material or dry clay soil or sand
 - prevent spill material from entering waterways and utilities by diking.
 - prevent spill material from entering manholes and other openings by covering with rubber spill mats or diking.
 - Resume any effective action to contain, clean up, or stop the flow of the spilled product.
- (v) The emergency response co-ordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to Manitoba Conservation and Climate according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.
- (vi) When dangerous goods are used on-site, materials for containment and clean-up of spill material (e.g., absorbent materials, plastic oil booms, and oversized recovery drums) shall be available on-site.
- (vii) Minor spills of such substances that may be contained on land with no significant impact on the environment may be responded to with in-house resources without formal notification to Manitoba Conservation and Climate.
- (viii) City emergency response, 9-1-1, shall be used if other means are not available.
- (ix) The on-site emergency response coordinator shall contact The Canadian Coast Guard, Selkirk (204) 785-6030, if the spill material reaches and is on or in the Red or Assiniboine Rivers.

Table 1 Spills that must be reported to the Manitoba Conservation and Climate as Environmental Accidents

<u>Classification</u>	<u>Hazard</u>	<u>Reportable Quantity/Level</u>
1	Explosives	All
2.1	Compressed Gas (flammable)	100 L*
2.2	Compressed Gas	100 L*
2.3	Compressed Gas (toxic)	All
2.4	Compressed Gas (corrosive)	All
3	Flammable Liquids	100 L
4	Flammable Solids	1 kg
5.1	PG** I & II	1 kg or 1 L
	PG III	50 kg or 50 L
5.2	Organic Peroxide	1 kg or 1 L
6.1	PG I	1 kg or 1 L
	PG II & III	5 kg or 5 L
6.2	Infectious	All
7	Radioactive	Any discharge or radiation level exceeding 10 mSv/h at the package surface and 200 uSv/h at 1 m from the package surface
8	Corrosive	5 kg or 5 L
9.1	Miscellaneous	50 kg (except PCB mixtures)
9.1	PCB Mixtures	500 g
9.2	Aquatic Toxic	1 kg or 1 L

9.3

Wastes (Chronic Toxic)

5 kg or 5 L

* Container capacity (refers to container water capacity)

** PG = Packing Group(s)

(f) Vegetation

- (i) Vegetation shall not be disturbed without written permission of the Contract Administrator. The Contractor shall protect plants or trees which may be at risk of accidental damage. Such measures may include protective fencing or signage and shall be approved in advance by the Contract Administrator.
- (ii) The Contractor shall submit a Tree Preservation and Protection Plan to the Contract Administrator for approval prior to commencement of construction activities. The Tree Preservation and Protection Report shall be prepared by an arborist with International Society of Arboriculture (ISA) Certified Arborist designation, and the Report shall include the information listed below:
 - Details of any associated significant vegetation worthy of protection in accordance with the Ecologically Significant Land Strategy, including tree species, their location, size, and condition;
 - Recommendations for tree protection in accordance with tree protection specifications outlined herein;
 - Details of tree preservation and protection measures (before, during and after construction) for all trees that are to be preserved under the scope of this project;
 - Details of all trees proposed for removal;
 - Details of tree pruning (crown and roots), as applicable;
 - Schedule for site inspection and status reporting to the Contract Administrator via an ISA Certified Arborist throughout construction.
- (iii) Trees damaged as a result of this project shall be assessed by the City of Winnipeg Urban Forestry Branch to identify remedial pruning, if applicable. Remedial pruning shall be performed at the cost of the Contractor by an ISA Certified Arborist in accordance with the most current edition of the American National Standards Institute (ANSI) A300 and the most current edition of the companion publication "Best Management Practices – Tree Pruning".
- (iv) No pruning work is permitted on elm trees for the period April 1st to July 31st in accordance with the Manitoba Forest Health Protection Act and Regulations unless deemed a safety hazard by the Contract Administrator.
- (v) The Contractor shall provide compensation for damaged trees determined to be non-viable viable by the Urban Forestry Branch in accordance with the City of Winnipeg Tree Removal Guidelines.
- (vi) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400 millimetre wood planks, or suitably protected as directed by the Contract Administrator.
- (vii) A Tree Protection Zone (TPZ) shall be established for all trees to be preserved and protected and whose TPZ intersects with the Construction Area.
 - No activity is permitted inside the TPZ, including any traffic, construction excavation, change of grade, or disposal/storage of materials, chemicals.:
 - No accumulation of water or other substances as a result of activities associated with construction is permitted within the TPZ.
 - No parking of vehicles or equipment
 - TPZ Setback Distance:

<u>Trunk Diameter (DBH)</u>	<u>Minimum Protection Distances Required</u>
<10.1 cm	2.0m
10.1 – 40.0 cm	2.4m
40.1 – 50.0 cm	3.0m
50.1 – 60.0 cm	3.6m
60.1 – 70.0 cm	4.2m
70.1 – 80.0 cm	4.8m
80.1 – 90.0 cm	5.4m
90.1 – 100.0 cm	6.0m
>100.0 cm	6.0 cm for each 1.0 cm of trunk diameter

- (viii) A physical TPZ barrier shall be constructed prior to the commencement of any disturbance on the Site by erecting a barrier as described below:
- The Contractor shall obtain approval from the Contract Administrator for placement and installation of barriers prior to commencing any construction activities.
 - Barriers are to remain in place and be fully functional throughout the duration of the project until all work is completed to the satisfaction of the Contract Administrator.
 - Where the TPZ is interrupted by an impervious surface, the TPZ barrier will be installed at the edge of the hard surface area.
 - Materials for the TPZ Barrier shall meet the following specifications:
 - 6' (1.8 m) high metal construction fencing, or
 - Frame to consist of 50X100mm (2X4") wood posts set 450mm deep at each of the 4 corners of the TPZ. Max spacing of 2 m apart. 50X100mm rails (2X4") wood rails on top and bottom. Where surface is impervious, wood posts and frame shall be anchored or held in place by other means to prevent the barrier from being moved and to the satisfaction of the Contract Administrator.
 - Orange plastic web snow fence securely fastened to the outside of the frame to act as a barrier.
 - Where fill or excavation material must be stored within 1 m of the outside of the TPZ, a barrier of ¾" thick plywood must be securely installed along the outside of the orange plastic web snow fencing and must be long enough to accommodate the full extent of fill or excavated material to ensure that no material enters the TPZ.
 - The fence must be with a minimum of 1.2 m to a maximum height of 1.8 m. Adjustments may be made where height interferes with the normal branching habit of the tree and as accepted by the Contract Administrator.
 - A "Tree Protection Zone" sign must be mounted on any side facing foot and vehicular traffic, including construction traffic. The sign shall be produced in colour and be 45X60cm in size and made of white coroplast.
- (ix) Pruning of Tree Branches
- Branch pruning shall be performed to avoid anticipated conflicts between tree branches with construction activities or structures and is to be performed by an ISA Certified Arborist with the written consent of the Contract Administrator.
 - The Contractor shall be responsible for the cost of any precautionary branch pruning.
 - Branch pruning shall be done in accordance with the American National Standards Institute (ANSI) A300 current edition and the companion publication "Best Management Practices – Tree Pruning" current edition.
 - No Pruning work is permitted on elm trees for the period April 1st to July 31st as directed in the Manitoba Forest Health Protection Act and Regulations unless deemed a safety hazard by the Contract Administrator.
 - All elm debris, including branches and logs, shall be chipped on site or transported directly to Brady Road Resource Management Facility for

disposal in accordance with The Forest Health Protection Act and Regulations.

- The City of Winnipeg is an Emerald Ash Borer Regulated Area under the authority of the Canadian Food Inspection Agency. The movement of any ash materials, including logs, branches, woodchips, ash nursery stock/trees, and all species of wood out of Winnipeg is prohibited. Ash debris, including branches and logs, shall be chipped on site or transported directly to Brady Road Resource Management Facility for disposal.
- (x) Pruning of Tree Roots
- Root pruning shall be performed to avoid anticipated conflicts between tree roots and construction activities or structures and is to be performed by an ISA Certified Arborist and with the written consent of the Contract Administrator.
 - The Contractor shall be responsible for the cost of any precautionary root pruning.
 - All exposed or surface roots greater than 40mm diameter at risk of being damaged or damaged at the edge of the TPZ shall be cut cleanly with a pruning saw or chain saw. Severing or crushing roots by excavator or another mechanical device is not acceptable.
- (xi) Exceptions to the TPZ Barrier shall only be made as approved by the Contract Administrator and may include:
- TPZ Barrier may be temporarily modified upon approval of the Contract Administrator to allow for necessary access where no other access route is available or where the work extends inside the TPZ.
 - Where work must be performed inside the TPZ Barrier use best practices to minimize harm to existing trees and tree roots and shall be consistent with the American National Standards Institute (ANSI) A300 Standard for Management of Trees and Shrubs During Site Planning, Site Development, and Construction current edition and the companion publication “Best Management Practices – Managing Trees During Construction” current edition.
 - If excavation is the only means of completing the work, the Contractor shall use best practice to minimize harm to existing trees and tree roots. If deemed necessary by the Contract Administrator, the Contractor shall engage an ISA Certified Arborist to be on site to minimize risk to the public, workers, and tree(s).
- (xii) Herbicides and pesticides shall not be used adjacent to any surface watercourses.
- (xiii) All landowners adjacent to the area of application of herbicides or pesticides shall be notified at least 2 days prior to the Work.
- (xiv) Trees or shrubs shall not be felled into watercourses.
- (xv) Areas where vegetation is removed during clearing, construction, and decommissioning activities, shall be revegetated as soon as possible in accordance with the landscaping plans forming part of the contract, or as directed by the Contract Administrator.
- (g) Erosion and Sediment Control
- (i) Implementation of erosion and sediment control measures shall be in compliance with contract documents and regulatory approvals in order to prevent the entry of sediment in waterbodies. Suitable temporary erosion control measures (e.g., silt fences, straw wattles) shall be installed where required to ensure disturbed areas are not subject to erosion. These measures are to be inspected regularly to ensure that they are functioning properly until vegetation is re-established, and necessary repairs or adjustments will be made if damage is discovered or if these measures are not effective in controlling erosion and sedimentation.
 - (ii) Prior to mobilization to the site, the Contractor shall submit a detailed Erosion and Sediment Control Plan outlining the types and locations of all temporary erosion and sediment control measures during construction. The Erosion and Sediment Control Plan shall include any proposed alternatives to the erosion

control measures illustrated on the Construction Drawings. Any Alternatives shall be subject to the approval of the Contract Administrator.

(h) Heritage Resource Protection Plan

- (i) A Heritage Resources Protection Plan will be developed prior to construction, and it will specifically deal with potential effects to heritage resources. It will outline measures to mitigate effects to cultural and heritage resource. If heritage resources, or objects thought to be heritage resources, are discovered during site preparation and construction the Historic Resources Branch (of the Manitoba Sport, Culture and Heritage Department) will be informed immediately. The Contractor will cease construction activities in the immediate vicinity of the heritage resources, protective barriers will be placed around heritage resource sites and heritage resources discovered will be left in their original position until an Archaeologist is contacted and prescribes instruction.

E12.4 No separate measurement or payment will be made for the E12 Environmental Protection Plan and shall be considered incidental to the Work.

E13. SITE DEVELOPMENT AND RESTORATION

E13.1 Description

E13.1.1 This Specification shall cover all aspects of the Site Development and Restoration Work, including but not limited to mobilization and demobilization, erection, maintenance and removal of safety fencing, development and maintenance of access ramp, development, maintenance, and restoration of working bench, traffic management, traffic control and signage, temporary relocation of bus stop bench, sediment control Works, flow control, pedestrian safety and temporary pedestrian corridors, maintenance of site fencing, removal of protection and pruning as required of existing trees, removal of fallen trees and debris, office facilities, and general access development (including excavation and grade raising using clay backfill and traffic gravel, to be compacted to minimum 95% SPMDD), and site restoration. Existing fencing along the sidewalk will require removal and will be considered incidental to Site Development and Restoration and no separate payment will be made for the Work.

E13.1.2 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, and all things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

E13.1.3 All revegetation quantities required to restore areas adjacent to the footprint of the works as a function of the Contractor's chosen means and methods will be considered incidental to Site Development and Restoration. Areas disturbed by the Contractor must be restored. No additional payment will be made for revegetation of areas disturbed by the Contractor as a function of the Contractor's chosen means and methods.

E13.1.4 Access and subsequent construction works shall include the protection of all existing infrastructure and services at the Site throughout the period of construction.

E13.1.5 The inclusion of a payment item for the Work under this Specification shall not release or reduce the responsibilities of the Contractor under any other specification in this Contract.

E13.2 Materials

E13.2.1 Equipment

- (a) All equipment, implements, tools and facilities used shall be of a size and type as required to complete the work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

E13.3 Construction Methods

E13.3.1 Mobilization shall include, but not be limited to:

- (a) All activities and associated costs for transportation of the Contractor's personnel, equipment, and operating supplies to the site, and/or sites, and/or between sites;
- (b) Establishment of offices, buildings, other necessary general facilities and equipment parking/staging areas for the Contractor's operations at the site or sites;
- (c) Premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable;
- (d) General cleanup and housekeeping needed maintain a neat and orderly project site and/or sites;
- (e) Other job-related items.
- (f) Access to the site, equipment parking, and staging areas are limited to that shown on the drawings or as approved by the Contract Administrator.
- (g) Temporary relocating the bus stop bench to location of the temporary bus stop or as directed by the Contract Administrator.

E13.3.2 Demobilization shall include, but not be limited to:

- (a) All activities and costs for transportation of personnel, equipment, and supplies not used in the project from the site, and/or sites, and/or between sites;
- (b) Disassembly, removal, and site cleanup and restoration of offices, buildings, and other facilities assembled on the site and/or sites;
- (c) Repair of access roads, temporary haul roads, and equipment parking areas leaving the project site in the same or better condition than at the start of the project;
- (d) General cleanup and housekeeping needed to restore a neat and orderly project site.
- (e) Access to the site, equipment parking
- (f) Access to the site, equipment parking, and staging areas are limited to that shown on the drawings or as approved by the Contract Administrator.
- (g) Restoring the bus stop bench to its original conditions and location or as directed by the Contract Administrator.

E13.3.3 Site and Construction Access

- (a) The Contractor shall be responsible to plan and develop suitable site access that is limited to the footprints illustrated on construction drawings for temporary access ramp and work area. The development of site access includes but is not limited to, tree removal, temporary bridging over structures, and removal of existing fencing. Prior to commencing construction, the Contractor shall submit their site access plan to the Contract Administrator for approval.
- (b) Any alternative access points to those illustrated on the Construction Drawings will be subject to the approval of the Contract Administrator and must be proposed by the Contractor in their site access plan.
- (c) The construction access ramp shall be excavated from the upper bank area and working down to the working bench and the mid/lower bank. The ramp shall be constructed by excavating and regrading to the necessary ramp grade as shown in the Drawings.
- (d) The Contractor shall be responsible to not damage utilities within the Project Site. Caution must be exercised around any sinkholes and other anomalies and the Contractor must soft dig to confirm the locations of the utilities.

E13.3.4 Safety Fence

- (a) The Contractor shall erect and maintain safety fencing for the duration of the project to restrict access to any open and unsupervised excavation and open-water hazard.

- (b) Appropriate signs shall be erected to warn all recreational users of the river that an open water hazard may exist. Sufficient signage will be present to effectively provide warning from any potential angle of approach to an open water hazard.
- (c) Fence construction shall consist of Dupont Number L70 orange plastic safety fence or approved equal with a mesh spacing of 45 mm and a minimum height of 1.2 metres supported by steel posts driven into the ground. The steel posts shall be sized and capable of maintaining the snow fence material upright, regardless of conditions. Steel posts only in the ground, but wood posts required on ice. Upon completion of the work, all fence materials shall be removed and disposed off-site.

E13.4 General Requirements

E13.4.1 Existing Site Fencing

- (a) Existing fencing along the top of bank, adjacent to the sidewalk, will require removal and will be considered incidental to Site Development and Restoration and no separate measurement or payment will be made for the Work.

E13.4.2 Diversions of Flows

- (a) Flows such as rainfall, a water main break, or any other flow travelling through the outfalls or storm drains shall be diverted during construction. Riverbank grading for site development shall promote positive overland drainage down the slope and towards the river to prevent ponding and saturation of the riverbank. The cost of the flow diversion is considered incidental to Site Development and Restoration.

E13.4.3 Temporary Pedestrian Corridors

- (a) The Contractor shall provide and maintain passage of pedestrians throughout the project area consistent with the requirements of E11 Pedestrian Safety.

E13.4.4 Environmental Regulations

- (a) The Contractor shall adhere to all relevant Federal and Provincial environmental regulations.
- (b) The Contractor shall plan to Work in accordance with the current environmental regulations of "Manitoba Stream Crossing Guidelines for Protection of Fish and Fish Habitat", Fisheries and Oceans, and Manitoba Natural Resources.
- (c) The Contractor shall supply, in writing, prior to commencement of Work on-site, a detailed plan for sediment control on this project.
- (d) The Contractor shall ensure that sufficient supplies of suitable spill kits are on-site to cleanup minor spills, should they occur. The Contractor shall supply the name, address and phone number of a local supplier, where additional kits are available on short notice.

E13.4.5 Removal of Debris Deposited on Riverbank

- (a) Elevated water levels may result in debris being deposited on the riverbank slope. Debris that does not conflict with the Contractors operations may be left in place. Debris that conflicts with the Contractor's operations shall either be either relocated on site, or removed from site and disposed. Relocation of deposited debris shall be subject to approval by the Contract Administrator.

E13.4.6 General Site Clean Up and Restoration

- (a) The Site shall be restored to a condition at least equivalent to its original condition prior to initiation of the work as approved by the Contract Administrator. This may include, but is not necessarily limited to, landscape and grading repairs of any areas disturbed by the Contractor both within and outside of the approved work area. Site Restoration shall also include the removal of the Contract Administrator's trailer.

E13.4.7 Revegetation of Temporary Work Areas

- (a) Further to E13.1.3, laydown areas or similar temporary work areas shall be revegetated in a manner that is equal to or better than the original conditions prior to construction, as determined by the Contract Administrator. Revegetation of temporary work areas shall be considered incidental to Site Development and Restoration. No separate payment shall be made to revegetate these temporary work areas.

E13.5 Method of Measurement

E13.5.1 Site Development and Restoration will be paid for on a lump sum basis. The Work to be paid for shall be the total Work constructed in accordance with this Specification and accepted by the Contract Administrator. No measurement will be made for this Work.

E13.5.2 Basis of Payment

- (a) Site Development and Restoration will be paid for at the Contract Lump Sum Price for "Site Development and Restoration", which 20% of the Site Development and Restoration unit price will be paid on the first progress payment following commencement of the Work and to the satisfaction of the Contract Administrator.
- (b) Site Development and Restoration will be paid for at the Contract Lump Sum Price for "Site Development and Restoration", which 20% of the Site Development and Restoration unit price will be paid subsequent to the completion of the Work and restoration and clean-up of the Site including supplying all materials and for performing all operations herein described and all other items incidental to the work included in this Specification to the satisfaction of the Contract Administrator.
- (c) The remaining 60% of the Site Development and Restoration unit price will be paid for interim progress payments, prorated to the value of work completed and approved by the Contract Administrator.

E14. TREE REMOVAL

E14.1 Description

E14.1.1 This specification shall cover the removal of existing trees, stumps, roots, logs, brush, rubbish, and all other surface litter within the full limits of the works that may be required, and disposal of the same in a manner hereinafter specified.

E14.1.2 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E14.2 Materials

E14.2.1 Existing Trees to be Removed.

E14.2.2 The existing trees to be removed may include, but not limited to ash, elm, cottonwood, basswood, oak, pine, maple, spruce, etc., all of which may be cut with standard chain saw equipment.

- (a) all elm debris, including branches and logs, shall be chipped on site or transported directly to Brady Road Resource Management Facility for disposal in accordance with The Forest Health Protection Act and Regulations.
- (b) The City of Winnipeg is an Emerald Ash Borer Regulated Area under the authority of the Canadian Food Inspection Agency. The movement of any ash materials, including logs, branches, woodchips, ash nursery stock/trees, and all species of wood out of Winnipeg is prohibited. Ash debris, including branches and logs, shall be chipped on site or transported directly to Brady Road Resource Management Facility for disposal.

E14.3 Construction Methods

- E14.3.1 Prior to commencement of the Work the Contract Administrator shall identify on site all trees for removal as identified in the contract documents or as required in order to facilitate construction, for the review and approval by the Contract Administrator.
- E14.3.2 The Contractor shall remove only trees designated to be removed, and grub out all stumps and roots greater than 100 mm diameter. Trees are to be felled so as to land within the limits of the Works. The Contractor shall load and haul all trees, stumps, roots, logs, brush, rubbish and all other surface litter from the Site and dispose of these materials at an approved disposal Site, acceptable to the Contract Administrator.
- E14.3.3 The Contractor shall take all precautions to prevent damage to structures, adjacent property and to trees and shrubs. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.
- E14.3.4 Any trees damaged during construction activities shall be examined by a bonded tree care professional and pruned as required. Damaged trees which are not viable shall be replaced by the Contractor at the Contractor's own cost.
- E14.4 Measurement and Payment
- E14.4.1 The removal of existing trees shrubs and brush within the excavation footprint of the Works shall be considered incidental to Site Development and Restoration and no separate measurement or payment will be made.

E15. PROTECTION OF EXISTING TREES

- E15.1 Further to E12, the Contractor shall take the following precautionary steps to prevent damage from construction activities to existing trees within the limits of the construction area:
- (a) All trees shall have a 3 m radius protective zone calculated from the circumference at the base of the trunk which will remain free of digging, trenching, grade changes, stock piling of materials and soil compaction, unless otherwise agreed to by the City and Contract Administrator throughout the duration of the Contract. Protective fencing around these areas is required.
 - (b) Trees within and immediately adjacent to proposed construction and those identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400mm wood planks, or suitably protected as approved by the Contract Administrator. Do not use nails or other fasteners that penetrate the tree trunk. The width and length of strapping may be reduced to suit the tree being protected as approved by the Contract Administrator.
 - (c) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches) where 1 inch diameter equals 1 foot measured from the outside edge of the trunk of the tree at 6 inches above grade. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation. They must be properly trimmed with sharp tools to prevent crushing or being pulled by construction equipment. No paint is required. All exposed roots must be mulched until the excavated area is filled with clean earth to avoid exposure to sunlight and desiccation.
 - (d) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
 - (e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E15.2 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his/her designate.

E15.3 No separate measurement or payment will be made for the protection of trees.

E15.4 Elm trees shall not be pruned at any time between April 1 and July 31.

E16. SILT FENCE

E16.1 Description

E16.1.1 This specification covers the erection of temporary silt fencing, which shall be installed and maintained at the locations shown on the drawings or as directed by the Contract Administrator, to control runoff and minimize the release of detrimental silt loading to watercourses.

E16.1.2 The scope of Work included in this specification is as follows:

- (a) Supply and install temporary silt fencing as indicated on the Drawings or as directed by the Contract Administrator prior to undertaking any other activities on the Site where silt fencing is required.
- (b) Maintain the silt fencing in serviceable condition throughout the entire duration of activities at the Site where silt fencing is required, including final restoration and cleanup of the construction Site.
- (c) Remove the silt fencing and restore the area where the fencing was installed, without further disturbing the area and without releasing any deleterious substances to the adjacent watercourse.

E16.2 Materials

E16.2.1 Fence Posts

- (a) Fence posts shall be 100 mm diameter untreated wood posts or 50 mm diameter steel.

E16.2.2 Filter Fabric

- (a) Filter Fabric Shall be a woven geotextile material specifically designed for a silt fence application, meeting the following minimum requirements:

Property	Test Method	Value
Grab Tensile Strength	ASTM D 4632	0.55 kN
Grab Tensile Elongation	ASTM D 4632	15%
Mullen Burst	ASTM D 4786	2060 kPa
Puncture	ASTM D 4833	0.285 kN
Trapezoid Tear	ASTM D 4533	0.285 kN
UV Resistance	ASTM D 435	5 80 % @ 500 hrs
Apparent Opening Size (AOS)	ASTM D 4751	0.60 mm
Flow Rate	ASTM D 4491	405 l/min/m ²

Acceptable Product: "Amoco 2130 Silt Fence Fabric" or approved equal in accordance with B7.

E16.2.3 Wire Mesh

- (a) Wire mesh shall be galvanized or plain metal with wire gauge = 3.0 mm, wire spacing @ 150 mm o/c.

E16.2.4 Fencing Material Fasteners

- (a) Staples or wire ties of sufficient strength and spacing to withstand 500 N (100 lbf) pull test at any point on the wire mesh.

E16.3 Construction Methods

E16.3.1 Ensure that no deleterious substances are discharged into the adjacent watercourse at any time during construction activities.

E16.3.2 Silt Fence Installation

- (a) Excavate 150 x 150 anchor trench along alignment of silt fence.
- (b) Install fence posts as indicated. Ensure that fence posts are firmly driven into undisturbed soil, or are completely and firmly backfilled if installed via auger methods. Attach wire mesh as support backing for silt fence filter fabric. Attach silt fence filter fabric on top of wire mesh in similar fashion. Overlap any fence seams (wire mesh or filter fabric) by 450 mm minimum. Ensure that wire mesh and filter fabric are installed on the upslope side of the post and are fully laid in anchor trench.
- (c) Install and compact impermeable excavated materials into anchor trench and slope. Compact to 95% of maximum dry density (ASTM D-698).

E16.3.3 Silt Fence Maintenance

- (a) Inspect silt fence daily, prior to starting any other construction activities. If fence posts are found loose or not upright, repair in accordance with the installation procedure. If silt fence is found to be loose or torn, repair or replace as necessary to comply with the installation procedure.
- (b) If silt deposition at the fence is 300 mm or more in depth, carefully remove and dispose of silt offsite without disturbing silt fence.

E16.3.4 Silt Fence Removal

- (a) The silt fence shall remain in place until new vegetation growth has established on the bank or as determined by the Contract Administrator.
- (b) Upon authorization of the Contract Administrator, remove all fence posts, wire mesh, fabric, and fasteners from Site.
- (c) Restore areas disturbed in accordance with E13 without releasing any deleterious substances to the adjacent watercourse.

E16.4 Measurement and Payment

E16.4.1 The supply, placement, and removal of silt fence shall be measured on a length basis and paid for at the Contract Unit Price per lineal metre for "Silt Fence". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification, accepted and measured by the Contract Administrator. Payment of silt fence shall be in accordance with the following payment schedule:

- (a) Sixty percent (60%) of the Contract Unit Price per lineal metre for "Silt Fence" shall be paid following supply and installation.
- (b) Forty percent (40%) of the Contract Unit Price per lineal metre for "Silt Fence" shall be paid following final removal.

E16.5 Scheduled maintenance and removal of accumulated sediment from the silt fence is considered incidental to the Work and no separate measurement or payment will be made.

E17. STRAW WATTLES

E17.1 Description

E17.1.1 This Specification covers the erection of temporary straw wattles, which shall be installed and maintained as shown on the Drawings or as directed by the Contract Administrator to control runoff and minimize the release of detrimental silt loading to the watercourse.

E17.1.2 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 things

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

E17.2 Materials

E17.2.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials as shown on the Drawings.

E17.2.2 Straw Wattles shall be 300 mm (12") biodegradable Straw Wattles.

E17.3 Equipment

E17.3.1 All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

E17.4 Construction Methods

E17.4.1 Installation

- (a) Install the straw wattles at the locations as directed by the Contract Administrator.
- (b) Straw wattles are to be installed in accordance with the details on the Construction Drawings and manufacturer's installation instructions.

E17.4.2 Maintenance

- (a) The Contractor shall ensure that the integrity of the straw wattle is maintained until natural vegetation is re-established at the site or as determined by the Contract Administrator. Any section of straw wattle that is found to be damaged or otherwise no longer be providing effective erosion and sediment control, as determined by the Contract Administrator, shall immediately be restored to the satisfaction of the Contract Administrator at no additional cost to the City.
- (b) If sediment deposition at the base of the log is 150 mm or more in depth, the Contractor shall carefully remove and dispose of the sediment build up off-site without disturbing the straw wattle system.

E17.4.3 Removal

- (a) The straw wattle erosion control shall remain in place until new vegetation growth has established on the riverbank slope or as determined by the Contract Administrator.
- (b) Upon authorization of the Contract Administrator, the Contractor shall remove all straw wattles, posts and netting from the site.
- (c) The Contractor shall take care not to release sediment or deleterious substances into the adjacent watercourse as part of straw wattle removal, as determined by the Contract Administrator.

E17.5 Measurement and Payment

E17.5.1 The supply, placement, and removal of straw wattles shall be measured on a length basis and paid for at the Contract Unit Price per lineal metre for "Straw Wattle". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification, accepted and measured by the Contract Administrator. Payment of Straw Wattle shall be in accordance with the following payment schedule:

- (a) Sixty percent (60%) of the Contract Unit Price per lineal metre for "Straw Wattle" shall be paid following supply and installation.
- (b) Forty percent (40%) of the Contract Unit Price per lineal metre for "Straw Wattle" shall be paid following final removal.

E17.6 Removal of accumulated sediment from the straw wattle is considered incidental to the Work and no separate measurement or payment will be made for removal of accumulated sediment.

E18. CASH ALLOWANCE FOR ADDITIONAL WORK

- E18.1 Additional Work may be necessitated due to unforeseen circumstances that may arise during the course of the project due to:
- (a) Utility protection measures, including but not limited to soft digging and hand excavation required around existing underground utilities and protection of all underground utilities.
 - (b) Additions to the scope of Work by the Contract Administrator, beyond that defined herein.
- E18.2 A cash allowance has been included on Form B: Prices.
- E18.3 The City reserves the right to delete any or all of the Cash Allowance from the Contract if the Work intended to be covered by the Cash Allowance is not required, or if the Works intended are found to be more extensive than the provisional Cash Allowance.
- E18.4 Cost of additional work shall be evaluated by the methods outlined in C7.4, and a Change Order prepared by the Contract Administrator. Cost of the Change Order will be paid on the Progress Estimate and deducted from the Cash Allowance. If the valuation of the authorized work exceeds the Value of the Cash Allowance, the Contract Value will be adjusted by the shortfall.
- E18.5 Additional services and/or Work will not be initiated for:
- (a) Reasons of lack of performance or errors in execution.
 - (b) Scheduling changes initiated by the City, where at least 24 hours' notice is given prior to the Contractors schedule time to be on Site.
- E18.6 Should it be determined that additional material or services are required, the Contract Administrator shall approve the Work, prior to commencement of the additional Work.
- E18.7 Material Mark-Up Factors in accordance with C7:
- (a) The base cost is to be the wholesale cost of the material, regardless of the Contractor or Subcontractor supplying the material.
 - (b) In general, the party (Contractor or Subcontractor) supplying the material is the party that purchases the material from a supplier who does not perform any work on Site, unless otherwise determined by the Contract Administrator.
 - (c) Where the Contractor is supplying the material, the mark-up on the material is limited to fifteen percent (15%).
 - (d) Where the Contractor's immediate Subcontractor is supplying the material the total mark-up on the material including all Subcontractors and the Contractor is limited to twenty-five percent (25%)
 - (i) The Subcontractor's mark-up on the material is limited to fifteen percent (15%);
 - (ii) The Contractor's mark-up on the material is limited to ten percent (10%).
 - (e) A Third-Level Subcontractor is a Subcontractor of a Subcontractor of the Contractor.
 - (i) No Third-Level Subcontractors on this project are approved for additional mark-up.
 - (ii) In the event that a Third-Level Subcontractor is utilized, that is not approved for additional mark-up, the Contractor is responsible for coordinating the split of the maximum approved mark-up between the Contractor and Subcontractors.

GEOTECHNICAL

E19. LIGHTWEIGHT FILL

E19.1 Description

- E19.1.1 This Specification shall cover the installation of lightweight fill, including the excavation of in-situ materials, supply and placement of geotextile, drainage pipe, free draining rockfill material, light weight cellular concrete, and electrical conduit.

E19.1.2 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E19.2 References

- (a) ACI 523.1, Guide for Cast-in-Place Low Density Cellular Concrete
- (b) ASTM C495, Standard Test Method for Compressive Strength of Lightweight Insulating Concrete
- (c) ASTM C869, Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete
- (d) ASTM C796, Standard Test Method for Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam
- (e) CAN/CSA A30001, Cementitious Materials for Use in Concrete
- (f) CSA A23.1, Concrete Materials and Methods of Concrete Construction

E19.3 Qualifications

E19.3.1 The Contractor is to submit the qualifications of the Subcontractor that is to produce and place the cellular concrete for review and approval by the Contract Administrator.

E19.3.2 The approved Subcontractor producing and placing cellular concrete shall have a record of experience and quality of work in Manitoba that is satisfactory to the Contract Administrator and can be verified through engineered stamped compressive strength reports that prove quality of work has been achieved. The Subcontractor must be capable of developing a mix design, batching, mixing, handling and placing cellular concrete. The Subcontractor shall be certified by the manufacturer of the foaming agent and regularly engaged in the production and placement of cellular concrete. The Subcontractor shall have fully qualified workers who are thoroughly trained and experienced in the production, placement and quality control of cellular concrete. Certifications verifying their qualifications and training will be required as part of the submittal for approval.

E19.4 Conformance

E19.4.1 Cellular Concrete supplier must provide independent, third-party testing that confirms the proposed cellular concrete meets:

- (a) ASTM C495, Standard Test Method for Compressive Strength of Lightweight Insulating Concrete - Minimum compressive strength of 0.4 MPa to 0.5 MPa (foaming agent dependent) at 28 days.
- (b) ASTM C666, modified procedure B as per ACI 523.1 – Standard for freeze thaw cycles with relative dynamic modulus of elasticity (E) not less than 70% of its original value after 120 cycles.
- (c) ASTM D5084, Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter – Maximum hydraulic conductivity

E19.5 Equipment

E19.5.1 All equipment, implements, tools and facilities used shall be of a size and type as required to complete the work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

E19.5.2 Light Weight Cellular Concrete

- (a) The specialized batching, mixing and placing equipment shall be automated and certified for the purpose by the manufacturer of the cellular concrete material.

- (b) Dry-mix equipment must be able to receive bulk cement installed with a dust suppression system to conform to OSHA 29 CFR 1926 and 1910. Dry-mix equipment must be capable of producing over 100 cubic metres per hour on-site, continuously, from one piece of equipment, and pump through hoses or pipes up to a flat lineal distance of 1000 metres. Bulk cement weight measurements shall be determined by onboard instrumentation that operates within a tolerance of one and one-half percent (1.5%) per batch.
- (c) Wet-mix equipment must be able to receive slurry on-site into equipment and process it continuously during ready-mix supply, and pump through hoses or pipes up to a flat lineal distance of 200 metres. Each unit must be capable of producing 75 cubic metres per hour.
- (d) Cellular concrete must be pumped by a positive displacement pump (peristaltic or similar). A foam generator shall be used to continuously produce pre-formed foam, which shall be injected and mixed with the cementitious slurry downstream of the positive displacement slurry pump. The equipment shall be calibrated to produce a precise and predictable volumetric rate of foam with stable uniform microbubbles.

E19.6 Materials and Testing

E19.6.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.

E19.6.2 All materials set forth in this Specification shall be subject to inspection and testing by the Contract Administrator or by the testing laboratory designated by the Contract Administrator. There shall be no charge for any materials taken by the Contract Administrator for testing purposes.

E19.6.3 Geotextile

- (a) Geotextile shall be non-woven "Separation/Filtration Geotextile Fabric" as specified in Table CW 3130.2 of City of Winnipeg Specification CW 3130.

E19.6.4 Drainage Pipe

- (a) The drainage pipe system installed within the drainage layer shall include 100 mm diameter High Density Polyethylene (HDPE) pipes with Class 2 perforations, 100 mm diameter non-perforated HDPE pipes, and HDPE T-connections.

E19.6.5 Rockfill

- (a) The rockfill material used to as a drainage layer below the light weight cellular concrete shall consist of a clean free draining, sound, dense, durable, crushed rock. The material shall be free from organics, roots, silts, sand, clay, snow, ice or any other material that would detract from the strength and drainage characteristics of clean rockfill.
- (b) Individual particles shall be shaped such that no dimension is greater than two times the smallest dimension. Flat, elongated, or platy particle shapes will not be accepted.
- (c) Should the Contractor choose to use limestone, it shall be durable white crystalline limestone. Softer buff to yellow dolomite or dolostone will not be accepted.
- (d) The rockfill material shall meet the following requirements:

Parameter	Test Method	Specified Limit
Bulk Specific Gravity	ASTM C127	2.6 minimum
Absorption	ASTM C127	2.5% maximum
LA Abrasion Loss	ASTM C131	32% maximum
Soundness	ASTM C88	13% maximum
Gradation	ASTM D5519	See below

- (e) The rockfill shall be well graded having a full range and even distribution of sizes and shall conform to the following gradation:

Canadian Metric Sieve Size (millimeters)	Percent of Total Dry Weight Passing Each Sieve
150	100%
75	40-70%
25	0-5%

E19.6.6 Light Weight Cellular Concrete

- (a) The light weight cellular concrete to be used as embankment fill material shall be CEMATRIX CMEF-475 and CMEF-1200 Lightweight Engineered Fill or approved equivalent.

- (b) The light weight cellular concrete material shall meet the following requirements:

Parameter	Specified Limit	
	CMEF-475	CMEF-1200
Unconfined Compressive Strength at 28 days	0.4 MPa minimum	5.5 MPa minimum
Wet Cast Density	475 kg/m ³ (+/- 10%)	1200 kg/m ³ (+/- 10%)

- (c) Portland cement shall conform to the requirements of CSA Standard CAN/CSA A3001, Type GU or HE. Supplementary cementing materials shall conform to the requirements of CSA Standard CAN/CSA A30001.
- (d) Mixing water shall conform to the requirements of CSA Standard A23.1. Water of questionable quality shall not be used unless proven to produce specimens whose 28-day compressive strength is at least 90% of those made with known acceptable water and an identical material mix.
- (e) Foaming agents shall conform to the requirements of ASTM C 869 when tested in accordance with the provisions of ASTM C 796. CEMATRIX CF-1 or PROVOTON foaming agents shall be used, or equal as accepted by the Consultant. The Subcontractor shall be pre-qualified and approved in writing by the foaming agent manufacturer, referencing this Project.
- (f) The fresh cellular concrete density shall be measured and recorded once per production run, or once for every 50 cubic metres, or once per 30 minutes, whichever is more frequent. The density shall be maintained within +/- 10% of the design density.
- (g) Cellular Concrete samples must be captured, cured and tested to verify the compressive strength requirement is satisfied. One sample is comprised of one set of six cellular concrete cylinders. One sample should be taken for each placement, or every 100 cubic metres, whichever is more frequent. Cylinders are cast in 75 mm by 150 mm cylindrical plastic molds. The sample mold must be lined with "freezer paper" with the plastic side against the cellular concrete. Cellular concrete cylinders shall be cured and tested as per ASTM C495, modified to represent the field curing conditions for geotechnical applications.

E19.6.7 Electrical Conduit

- (a) Conduit for existing underground electrical cable will be supplied by Manitoba Hydro. Material damaged or lost after it has been delivered shall be replaced with new material from Manitoba Hydro and shall be paid for by the Contractor.

E19.7 Quality Control and Reporting

E19.7.1 Light weight cellular concrete

- (b) The cellular concrete supplier must have documented quality control (QC) procedures that include processes for training and certification of QC personnel. The cellular concrete supplier must provide a dedicated onsite QC representative that is certified according to the above-noted process.

- (c) A turnover package must be provided within 60 days of project completion. The information in the turnover package must include, at a minimum, the measured cast densities of the cylinders, cast dates, location of samples, cylinder dimensions and mass, and compressive strength at 28 days. The turnover package must be stamped by a Professional Engineer.

E19.8 Subgrade Conditions and Site Preparation

- (a) The subgrade shall be cleared of vegetation, soft, wet, muddy, loose soil and other deleterious material, and graded and compacted to the lines and grades shown on the relevant Drawings. The prepared subgrade shall be good competent level ground with compaction to provide a firm base equivalent to or greater than 95% SPMDD. The placement area shall be free of standing water during placement of cellular concrete and until backfill is placed on top of the cellular concrete. Snow and ice must be removed from the area prior to placement.
- (b) Hand excavation or soft digging shall be used for areas in close proximity to existing underground utilities and services. The Contractor shall protect any existing utilities and services within the work area.

E19.9 Construction Methods

E19.9.1 Excavation

- (a) The excavation shall be supervised at all times, and open excavations shall be adequately guarded or covered for safety, and shall be the sole responsibility of the Contractor.
- (b) Excavation and backfilling shall achieve the depth as illustrated on the Drawings.
- (c) Excavation shall not commence until sufficient rockfill and light weight cellular concrete are on Site to backfill the excavation.
- (d) Any deleterious or sloughed material shall be removed from the excavation prior to backfilling.
- (e) Discharge of water contained within the excavation will be acceptable. The Contractor shall be responsible to contain and direct any displaced water such that it will not affect other construction work or cause excessive erosion or saturation of the existing riverbank slope soils. The control of the water shall be considered incidental to the work.
- (f) The installation of drainage layer and light weight cellular concrete shall be a continuous operation with backfilling immediately following excavation.
- (g) Excess excavated material shall be disposed of offsite immediately after excavation. Stockpiling of excavated material on the riverbank slope area will not be permitted.
- (h) The Contractor shall take all precautions necessary to maintain the excavation geometry to the neat lines shown on the Drawings. If necessary, the Contractor shall undertake measures to prevent sloughing of the sidewalls and top surface of the excavation, and to protect existing utilities above and below ground surface. Such precautions, including coordination with utility owners during the work will be considered incidental to the excavation and will not be paid for separately.

E19.9.2 Geotextile

- (a) Non-woven geotextile shall be placed as a separator between rockfill and in situ soil, and between rockfill and light weight cellular concrete, as shown on the drawings.
- (b) Handle, store and install non-woven geotextile in accordance with the manufacturer's recommended procedures and this specification.
- (c) Commence installation of geotextile after material has been approved and the preparation of the sub-grade has been inspected by the Contract Administrator.
- (d) Sub-grade shall be clean and smooth and free of sharp edges, fines, loose or foreign materials, oil, grease, and other materials that may damage the geotextile.

- (e) All roughened surfaces that can damage the geotextile shall be repaired as specified to offer a smooth sub-grade.
- (f) Unroll geotextile fabric as smooth as possible on the installed prepared surface.
- (g) Install geotextile fabric in the longest continuous practical length, free from tension, stress, wrinkles and creases.
- (h) Cut or fold geotextile fabric to conform to curves.
- (i) Overlap joints a minimum of 600 millimetres. Install pins as required to hold geotextile fabric in place.
- (j) Install geotextile fabric in accordance with this specification and procedures recommended by the manufacturer.
- (k) Construction equipment shall not drive on the geotextile fabric.
- (l) Remove and replace geotextile fabric that is improperly installed or damaged as directed by the Contract Administrator.

E19.9.3 Drainage Pipe

- (a) The drainage pipe shall be installed at locations as indicated in the Drawings or as directed by the Contract Administrator. T-connections shall be used to connect perforated and non-perforated drainage pipes. Non-perforated pipes shall extend to the toe of the upper bank slope or as directed by the contract Administrator.
- (b) The drainage pipe shall be installed in accordance with manufacturer's instructions so when complete the drainage pipe will have a smooth and uniform invert.

E19.9.4 Rockfill

- (a) The rockfill shall be gently placed onto the geotextile and drainage pipe, and in such a manner that the larger stones are uniformly distributed, the smaller rocks serve to fill the spaces between the larger stones, and that excessive segregation of the various stone sizes does not occur.
- (b) The rockfill stone shall not be dropped onto the geotextile fabric or drainage pipe or otherwise placed that will tear or damage the underlying geotextile and pipe.
- (c) Sufficient placing and levelling shall be done to produce a firmly bedded neat and uniform surface conforming to the thickness, shape, and dimensions shown on the Drawings.
- (d) Compacting of rockfill shall be by way of a plate compactor capable of increasing the rockfill density a minimum of 10% versus the uncompacted material. Compaction shall be completed over the entire length of the drainage layer as shown on the Drawings. Rockfill compaction will be considered incidental to the supply and placement of Rockfill and no separate measurement or payment for compaction will be made.
- (e) The Contractor shall monitor the supply rate of the rockfill material to ensure that the backfilling operations are not delayed.
- (f) Stockpiling of rockfill material will not be permitted on the riverbank slope.
- (g) Where crushed limestone has become contaminated with silt, clay, snow, ice or other deleterious material due to the Contractor's method of operation, negligence, failure to backfill in a timely manner, etc. the material shall be classified as rejected backfill and shall be weighed prior to disposal for deduction from the total weight of crushed limestone measured for payment.

E19.9.5 Light Weight Cellular Concrete

- (a) Any items, such as sonotubes, posts, geogrid, and helical anchors to be fully or partially encased in the cellular concrete shall be properly set and stable prior to the installation of the cellular concrete.
- (b) The cellular concrete shall be cast in lifts no greater than 1.0 m in height.

- (c) The formwork shall be designed and installed to securely withhold cellular concrete and will require an impermeable lining such as poly sheeting or similar to prevent leakage through formwork joints.
- (d) Cellular concrete may be placed during freezing conditions, provided measures are taken to prevent damage to the cellular concrete until sufficient strength has been attained. Care should be taken to avoid freezing before initial set. Cellular concrete shall not be placed during heavy or prolonged precipitation.
- (e) Once mixed, the cellular concrete shall be conveyed promptly to the location of placement without excessive handling.
- (f) The CMEF-1200 material shall be placed to the design elevation as indicated in the Drawings. The CMEF-475 material shall not be placed above the CMEF-1200 until the latter has attained sufficient strength to withstand the weight of the CMEF-475.
- (g) The Contractor shall determine the maximum lift thickness based on density and any other considerations that may impact the placement. Cellular concrete shall be cast in a formed area within 1 to 2 hours, to permit an undisturbed setting.
- (h) Finished surface elevation shall be within 25 mm± of the design grades shown in the Drawings. Slopes greater than 1% will require profiling by creating steps for the Cellular Concrete with formwork or can be mechanically graded to slopes in excess of 1% by means of grader, bulldozer or milling machine.
- (i) The Contractor shall monitor the supply rate of the light weight cellular concrete to ensure that the backfilling operations are not delayed.
- (j) Loading of, or traffic on cellular concrete shall be prevented until the material has attained sufficient strength to withstand the loads with no damage.

E19.9.6 Electrical Conduit

- (a) The Contractor shall install electrical conduit within the light weight cellular concrete, at locations shown on the Drawings or as directed by the Contract Administrator. The Contractor shall coordinate with Manitoba Hydro during the work.
- (b) The Contractor shall furnish all labour and supplies necessary for the completion and maintenance of grade and line of the conduit, including water control if found to be necessary.
- (c) The Contractor shall handle, store, and install the conduit in a manner that will not damage the conduit. The Contractor shall remove and replace conduit that is improperly installed or damaged as directed by the Contract Administrator.
- (d) The Contractor shall use diligent care and proper equipment in handling of all cables, so as not to injure the jacket and avoid gouging, kinking, scratching or abrading the cables. If any material is damaged to any extent, the Contractor shall repair the damages at its own expense, in a manner approved by Manitoba Hydro or will be charged the full cost of the damaged items.

E19.10 Measurement and Payment

E19.10.1 Excavation

- (a) The excavation will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for "Excavation". The volume to be paid for shall be the total number of cubic metres of excavation completed, measured from the original ground geometry prior to construction as carried out in accordance with this Specification, acceptable to the Contract Administrator, and as computed from measurements made by the Contract Administrator.

E19.10.2 Geotextile

- (a) Supply and installation of the non-woven geotextile will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Geotextile". The area to be paid for shall be the total number of square metres of geotextile supplied and installed in accordance with this Specification, acceptable to the Contract

Administrator, and as computed from measurements made by the Contract Administrator. Only material placed within the designated sub-grade limits will be included in the payment for "Lightweight Fill Geotextile". No measurement or payment will be made for geotextile fabric removed and replaced due to improper installation or damaged materials.

E19.10.3 Drainage Pipe

- (a) The supply and placement of drainage pipe shall be measured on a length basis and paid for at the Contract Unit Price per lineal metre for "Drainage Pipe". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification, accepted and measured by the Contract Administrator. Supply and installation of T-connections is considered incidental to supply and installation of non-perforated pipes and no separate measurement or payment for T-connections will be made.

E19.10.4 Rockfill

- (a) The supply, placement and compaction of the Rockfill will be measured on a weight basis and paid for at the Contract Unit Price per metric tonne for "Rockfill". The weight to be paid for shall be the total number of metric tonnes of rockfill supplied and placed in accordance with this Specification, acceptable to the Contract Administrator, as measured on a certified weigh scale. The Contractor shall provide the weigh tickets to the Contract Administrator for the material supplied to the Site at the time of delivery. No payment will be made for any weigh tickets that are not supplied at the time of delivery.

E19.10.5 Light Weight Cellular Concrete

- (a) Supply and installation of the cellular concrete will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for "Light Weight Cellular Concrete". The volume to be paid for shall be the total number of cubic metres of light weight cellular concrete, completed in accordance with this Specification, as measured in the field and accepted by the Contract Administrator.

E19.10.6 Electrical Conduit

- (a) Manitoba Hydro shall be responsible to supply the Contractor with the electrical conduits required. Installation of the electrical conduit will be measured on a length basis and paid for at the Contract Unit Price per linear metre for "Electrical Conduit". The length to be paid for shall be the total number of linear metres of conduits installed in accordance with this Specification, as measured in the field and accepted by the Contract Administrator.

SIDEWALK WORKS

E20. TEMPORARY SIDEWALK

E20.1 Description

- (a) This Specification shall cover the installation of temporary sidewalk, including removal of the existing sidewalk, supply and installation of gravel sidewalk.
- (b) The Work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E20.2 Materials

- (a) The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.
- (b) All materials set forth in this Specification shall be subject to inspection and testing by the Contract Administrator or by the testing laboratory designated by the Contract

Administrator. There shall be no charge for any materials taken by the Contract Administrator for testing purposes.

- (c) Granular Base Course
 - (i) Granular base course material for construction of the temporary gravel sidewalk shall be free draining Granular A material, in accordance with CW 3110 and approved by the Contract Administrator.
- (d) Granular Surface Course
 - (i) Granular surface course material for the pathway shall consist of 50mm of crusher fines/ toppings crushed limestone.

E20.3 Equipment

- (a) All equipment, implements, tools and facilities used shall be of a size and type as required to complete the work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

E20.4 Construction Methods

E20.4.1 Removal of Existing Sidewalk

- (a) The existing sidewalk concrete slab and paving stones shall be removed in accordance with CW 3235 Section 3.1.
- (b) Any existing sub-grade, sub-base and base material in deteriorated conditions or are unsuitable for its purpose shall be removed.
- (c) Removal of existing sub-grade, sub-base and base materials in close proximity to buried utilities shall be performed by soft digging. The existing trunk fibre conduit shall be exposed at grade and protected for the duration of the project, as indicated in the Drawings or as directed by the Contract Administrator. Coordination with utility owners during the removal will be considered incidental to removal of existing sidewalk and will not be paid for separately.
- (d) The removed material shall be immediately disposed of at a legal disposal site. Stockpiling of removed material on the roadway or the riverbank slope area will not be permitted.

E20.4.2 Gravel Sidewalk

- (a) Preparation of the existing surface and placement of any new sub-grade, sub-base, base, and granular surfacing materials shall be undertaken in accordance with CW 3150 and CW 3110.
- (b) Existing and suitable sub-grade, sub-base, or base material at the surface shall be regraded and compact to a minimum of 95% Standard Proctor Density.
- (c) New granular base course material shall be placed, compacted to a minimum of 95% Standard Proctor Density, and levelled to finished elevation as shown in Drawings.
- (d) New granular surface course material shall be placed, compacted to a minimum of 100% Standard Proctor Density, and levelled to finished elevation as shown in Drawings.
- (e) Backfilling around any buried utilities shall be performed with caution to not damage the utilities. Coordination with utility owners during installation of the sidewalk will be considered incidental to the work and will not be paid for separately.
- (f) Stockpiling of the granular materials on the roadway or the riverbank slope area will not be permitted.

E20.5 Measurement and Payment

E20.5.1 Removal of Existing Sidewalk

- (a) Removal of the existing sidewalk will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Removal of Existing Sidewalk". The area to be paid for will be the total number of square metres of removal completed in accordance with this specification, accepted and measured by the Contract Administrator.

E20.5.2 Gravel Sidewalk

- (a) The supply, placement and compaction of the sub-grade, sub-base, base, and granular surfacing materials will be measured on a weight basis and paid for at the Contract Unit Price per metric tonne for "Gravel Sidewalk". The weight to be paid for shall be the total number of metric tonnes of granular material supplied and placed in accordance with this Specification, acceptable to the Contract Administrator, as measured on a certified weigh scale. The Contractor shall provide the weigh tickets to the Contract Administrator for the material supplied to the Site at the time of delivery. No payment will be made for any weigh tickets that are not supplied at the time of delivery.

E21. SAFETY RAILING

E21.1 Description

- (a) This Specification shall cover the installation of safety railings along the edge of the sidewalk, including supply and installation of safety railings and design of the foundation system for safety railing posts.
- (b) The safety railings shall be permanent in nature.
- (c) The Work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E21.2 Materials

E21.2.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.

E21.2.2 All materials set forth in this Specification shall be subject to inspection and testing by the Contract Administrator or by the testing laboratory designated by the Contract Administrator. There shall be no charge for any materials taken by the Contract Administrator for testing purposes.

E21.2.3 Guardrails

- (a) The guardrails shall be in accordance with the Manitoba Building Code (MBC), National Building Code of Canada (NBC), and approved by the Contract Administrator.
- (b) Guardrail load resistance shall conform to the requirement of the MBC 2011 in providing lateral factored load resistance at the height of the guardrail of:
 - (i) 1.0 kN, inward or outward horizontally, at any point along the rail,
 - (ii) 0.75 kN/m inward or outward horizontally, along the guardrail, and
 - (iii) 1.5 kN/m vertically, along the guardrail.
- (c) The guardrails shall be at least 1070 mm in height, as per the NBC. The guardrail shall not be climbable and shall have no pickets having spaces larger than 100 mm, as per the MBC.
- (d) The Contractor shall provide shop drawings, sealed by engineer licensed to practice in Manitoba, for review by the Contract Administrator. Anchorage of guardrail to sub-structure designed by a guardrail designer and reaction loads shall be provided in the shop drawings.

E21.3 Equipment

- (a) All equipment, implements, tools and facilities used shall be of a size and type as required to complete the work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

E21.4 Construction Methods

E21.4.1 Installation

- (a) Install the guardrails at the locations illustrated on the Construction Drawings or as directed by the Contract Administrator.
- (b) Guardrails including anchorage to sub-structure are to be installed in accordance with the details on Shop Drawings approved by the Contract Administrator, and the manufacturer's installation instructions.

E21.4.2 Maintenance

- (a) The Contractor shall ensure that the integrity of the guardrails is maintained for the duration of the project or as determined by the Contract Administrator. Any section of guardrails that is found to be damaged or otherwise no longer be providing effective protection for pedestrians and other users of the sidewalk, as determined by the Contract Administrator, shall immediately be restored to the satisfaction of the Contract Administrator at no additional cost to the City.

E21.5 Measurement and Payment

- E21.5.1 The supply, installation, and maintenance of safety railings including design of anchorage to sub-structure shall be measured on a length basis and paid for at the Contract Unit Price per lineal metre for "Safety Railing". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification, accepted and measured by the Contract Administrator.

APPENDIX 'A'

Report on the Geotechnical Aspects of the Old St. Vital Riverwalk Project

APPENDIX 'A' – REPORT ON THE GEOTECHNICAL ASPECTS OF THE OLD ST. VITAL RIVERWALK PROJECT

Filed under: St. Mary's Rd. Cbtwn
REPORT ON THE GEOTECHNICAL ASPECTS
(Mar. 23/1998)
OF THE OLD ST. VITAL RIVERWALK PROJECT
(WA#111/97)

A. Dean Gould, P. Eng. & Associates
Geotechnical Consultant

18 BRENTLAWN BLVD., WINNIPEG, MANITOBA R3T 4X8 (204) 269-2829



HILDERMAN THOMAS, FRANK, CRAM

Filed under: St. Mary Is Rd (btwn Vivian & Harrowby)
REPORT ON THE GEOTECHNICAL ASPECTS
(Mar. 23/1998)
OF THE OLD ST. VITAL RIVERWALK PROJECT
(WA#111/97)

W/A: 111/97
THE CITY OF WINNIPEG
WATERWAYS SECTION
MAR 27 1998
RECEIVED

FILE NO. 7016

DATE; MARCH 23, 1998

PREPARED BY; A. DEAN GOULD P.ENG

GEOTECHNICAL CONSULTANT



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APPENDIX

- o Location Plan of Project
- o Soil Logs
- o Riverbank Profile

1. Terms of Reference

In accordance with the May 12, 1997 offer of service proposal to Hilderman, Crosby, Thomas, Cram the writer, a Geotechnical Consultant was authorized to address the Geotechnical issues of the Old St. Vital Riverwalk project and assist Dillon Consulting in the structural design. The work was to include;

- o Review of historical Geotechnical Studies and Reports
- o Assistance with the structural design of the project elements including the walkway, interpretive outlook and pathways
- o Preparation of a report to the Waterways Section of the Department of Planning addressing the Geotechnical issues.

2. Background

The St. Vital Site is well known for riverbank instability and has been the subject of many academic, City of Winnipeg and Geotechnical community studies. These studies have involved extensive drilling, sampling, movement monitoring and more recently ground water impact studies on these same movements. A partial listing of the studies are as follows;

- | | |
|------|---|
| 1960 | Baracos; "The stability of riverbanks in the metropolitan Winnipeg Area" Proc. 14th Canadian Soil Mechanics Conf. |
| 1967 | Winnipeg Geotechnical Group; "Report on Activities of Case History Subgroup" |

1972	City of Winnipeg Transportation Division Ripley Klohn and Leonoff; "Report on Riverbank Stability St. Mary's Road"
1978	Baracos; "Effects of River Levels, Ground water and Other Seasonal Changes on Riverbanks in Winnipeg" 31st Canadian Geotechnical Conference
1994	City of Winnipeg - Rivers and Streams Authority KGS, UofM, R&S; "Role of Ground water in Riverbank Stability"

These studies have provided a wealth of information on soil profile, riverbank movement, insitu and laboratory soil strength parameters, piezometric pressures, river levels and ground water impacts. All have resulted in the conclusion that the St. Vital riverbank is currently in a marginally stable condition (Factor of Safety against Sliding 1.0) and that movement occurs along a non circular surface parallel to the glacial till strata at or about elevation 215.4. The movement plane as determined through slope indicator installations (1969) extends from the Red River channel to a surface scarp which is located 40 metres from the Normal Summer waters edge (Ripley, Klohn and Leonoff 1972). The riverbank movement rates can be during periods of the year as high as 0.7 mm /day on a riverbank slope which is currently at approximately 9H:1V. Movement is normally concentrated within the summer - winter period coinciding with Red River drawdown periods. Stabilization measures to limit movement have been undertaken in the Mager Drive area (1997) and earlier in the Lyndal Drive riverbank. These stabilization measures both include the construction of shear keys which extend from winter water level some 6 metres to the glacial till surface. These have been installed into

the lower riverbank and have proven very costly. Stabilization of the riverbank at the Old St Vital Riverwalk project area is considered at this time uneconomical, consequently design approaches to the proposed Riverwalk structural units are to take a "passive" approach where movement can be accepted rather than the "active" approach where movement must be resisted.

3. Proposed Works

The proposed works as shown on the Hilderman, Crosby, Thomas, Cram drawings are to consist of the widening of the sidewalk along the west side of St Mary's Road and the construction of a projected outlook equipped with a steel arch, lighting standards and railings. The proposed elevation of the outlook is 230. The 160 year Flood Level at this location is 230.64 or top of riverbank at street level. Currently a timber pile wall exists along the west edge of the sidewalk which was constructed in 1973. The timber piles are 40 feet (12.2 metres) in length and are spaced at 1'-6" (0.46m) c-c. The tips of the piles terminate at elevation 219 some 3 metres above the glacial till surface, consequently are not considered as end bearing.

4. Impact on Riverbank Stability

The attached riverbank cross section has been developed from a survey performed by Bastin and Shepherd, Manitoba Land Surveyors on June 30, 1997. It reflects

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current topography and the position of the Retaining wall throughout the entire riverbank area.

Analysis of the riverbank stability using the following soil strength parameters has been performed by the writer. The non circular failure surface shown, reflects the soil profile and slope indicator data by Ripley Klohn and Leonoff of 1972.

Effective Soil Strength Parameters re; Janzen 1971 and based upon Direct Shear testing are;

Brown Clay Angle of Internal friction (res) = 13.0 degrees

Cohesion = 3.4 kPa

Grey Clay Angle of Internal Friction (res) = 8.0

Cohesion = 3.4 kPa

Applying piezometric pressures in the analysis from the 1994 City of Winnipeg Rivers and Streams Report on "Role of Ground water in Riverbank Stability" the Computed Factors of Safety against sliding are;

At NWWL = 1. 01

From these calculations and those of previous investigators it is evident that current conditions are similar to those analysed earlier and a marginal state of stability exists. The retaining wall serves to support the St. Mary's road grade and sidewalk but does little to offer stabilization. The proposed project will not influence either negatively or positively the present condition of stability.

Inspection of the wall on March 23, 1998 indicated lateral movement had occurred

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through the winter of 1997/98 resulting a 50mm displacement between the sidewalk and the road pavement.

5. Geotechnical Design Approach

To accept riverbank movement in the design of structural works, we propose to utilize the St. Mary's pavement as an anchor and support the sidewalk and observation area on existing and new cast in place concrete pilings which have an allowance for movement of up to 700 mm. We propose;

- A. New cast in place concrete pile foundations are proposed for the structural concrete observation deck. Cast in place pilings are recommended over prebored driven pilings since driving vibration may cause further destabilization of the riverbank. The piles should be end bearing on the dense glacial till at or near Elevation 214.5. The allowable end bearing capacity of the glacial till should be 574 kPa. It is recognized that the deck loading will have a high component of live loading produced by snow clearing equipment. Since this loading will occur infrequently during frozen soil conditions, the allowable end bearing capacity which includes a Factor of Safety of 3 against punching failure, may be exceeded for short duration at the discretion of the designer.

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- B. A slip joint between the deck and the top of pile should be provided to allow pile movement with respect to the deck structural components. The end bearing piles will arrest vertical movement, however lateral movement can be anticipated consequently a slip joint of Teflon or other materials will allow movement equal to 75% of the pile diameter. Since riverbanks are known to creep at a rate of approximately 15-20 mm/year, a 400mm diameter pile would provide sufficient lateral movement for approximately 15-20 years before additional corbal would be required.
- C. The deck will be tied into the St. Mary's pavement slab such that the pavement slab will provide anchorage to lateral movement. The strength and durability of the slab/deck connection must be carefully considered. Vertical movement that may occur of the pavement resulting from continued riverbank creep should be repaired through concrete underslab grouting rather than asphalt overlays. During construction of the deck close examination of the west edge of the St. Mary's pavement should be made and any void, grouted or filled with concrete.
- E. During construction, no fill, or material storage should be permitted on the riverbank.
- F. The proposed walkway leading to and along the lower slope involve

9

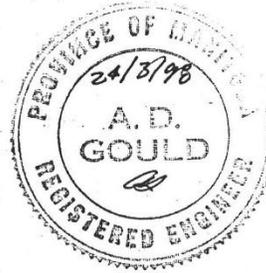
neither cut nor fill and the surfacing will be granular materials such that movement can occur without causing damage.

Yours Truly,



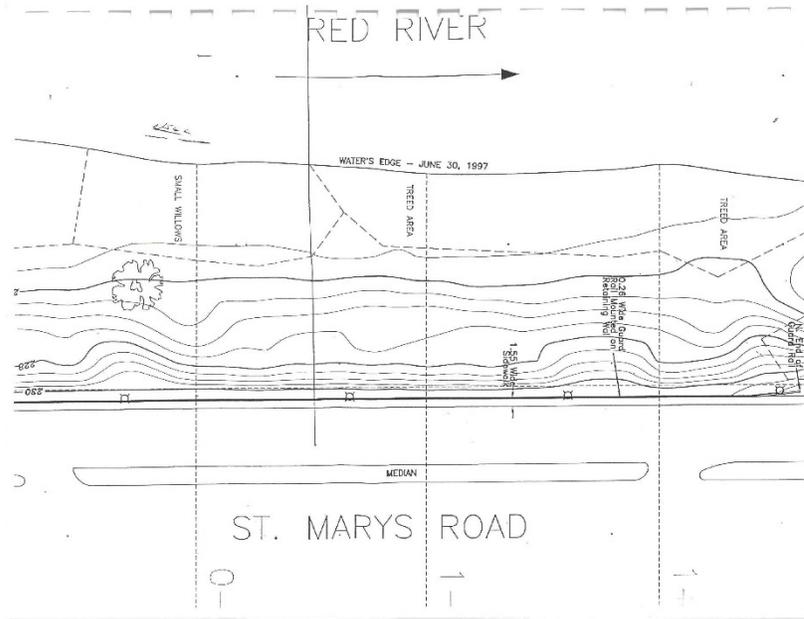
A. Dean Gould P.Eng.

Geotechnical Consultant



APPENDIX

- o Location Plan of Project**
- o Soil Logs**
- o Riverbank Profile**

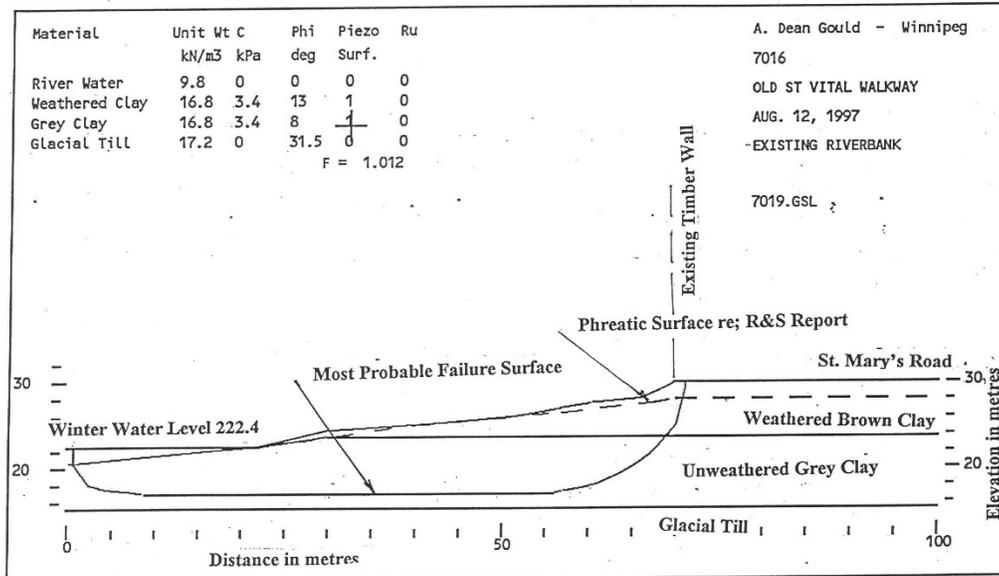


KGS GROUP		SUMMARY LOG		HOLE NO. SV-1	SHEET 1 of 2		
CLIENT CITY OF WINNIPEG		JOB NO. 91-107-02		GROUND ELEV. 226.41			
PROJECT GROUNDWATER RESEARCH		SITE 604 ST. MARY'S ROAD		WATER ELEV. DATE DRILLED 92/3/3			
LOCATION 15 m downslope from TH-1		DRILLING METHOD 125 mm Solid Stem Auger					
ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER RECOVERY	P.L. MC LL Cu TORVANE (kPa) ◇ % - kPa 20 40 60 80
225.8	0.5		TOPSOIL -Brown to dark brown, organics.				
225.3	1.0		SILT -Tan, dry to moist.			1	
	1.5		SILTY CLAY -Brown, high plasticity, soft to firm.				
223.8	2.5		LIMIT OF WEATHERING -Grey, high plasticity, soft to firm			2	
	3.0						
	4.0					3	
	4.5						
	5.0						
	5.5						
	6.0						
	6.5						
	7.0						
	7.5						
	8.0						
	8.5						
	9.0						
	9.5						
	10.0						
SAMPLE TYPE		<input checked="" type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> SHELBY	<input type="checkbox"/> SPLIT BARREL SAMPLER	<input type="checkbox"/> AUGER GRAB		
CONTRACTOR Paddock Drilling Ltd.		INSPECTOR Rob Kenyon		APPROVED	<i>M.J.</i>	DATE	92/9/4

KGS GROUP		SUMMARY LOG		HOLE NO. SV-1		SHEET 2 of 2	
ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER RECOVERY	P.L. MC LL Cu TORVANE (kPa) ◊ (%) - kPa 20 40 60 80
214.5	10.5		<u>SILT TILL</u> -Tan, gravelly, soft, moist.			4	
212.7	12.0						
	14.0		END OF HOLE				

SAMPLE TYPE SPLIT SPOON SHELBY SPLIT BARREL SAMPLER AUGER GRAB

CONTRACTOR Paddock Drilling Ltd. INSPECTOR Rob Kenyon APPROVED M.S. DATE 92/9/4



Note: Add 200 to elevations shown for Geodetic Datum

TABLE 1 - RESIDUAL STRENGTH PARAMETERS FOR WINNIP
(in terms of effective stress)

PARAMETERS		DESCRIPTION OF SAMPLE, (Reference)
ϕ'_R	c'_R	Liquid Plastic Moisture limit w_L , limit w_p , $w\%$
Degrees	$\frac{kN}{m^2}$	Type of test
<u>ST. VITAL SITE RIVER BANK, Janzen (1971)</u>		
<u>Brown Clay</u>		
9.0	5.5	Direct shear on pre-cut horizontal plane
13.0	3.4	Direct shear on horizontal plane
<u>Grey Clay</u>		
11.5	10.3	Direct shear on horizontal plane
8.0	3.4	Direct shear on horizontal plane
9.0	5.5	Direct shear on pre-cut horizontal plane
<u>GLACIAL TILL (soft)</u>		
31.5	0.0	Direct shear on horizontal plane
<u>ST. BONIFACE SITE 1 RIVER BANK, Janzen (1971)</u>		
<u>Brown Clay</u>		
8.3	4.1	$w_L = 98, w_p = 37.7, w\% = 48.0, \gamma = 17.1$ Direct shear on pre-cut horizontal plane
<u>Grey-Brown Clay</u>		
9.5	0.0	$w_L = 111, w_p = 33.1, w\% = 77.4, \gamma = 17.2$ Direct shear on pre-cut horizontal plane
<u>UNIVERSITY OF MANITOBA CAMPUS, (Muir 1971)</u>		
<u>Brown Clay</u>		
13.0	6.7	$w_L = 112, w_p = 38, w\% = 58.9, \gamma = 16.1$ Triaxial test, pre-cut at 52° to 54° to horizontal
13.0	0.0	Direct shear on horizontal plane
13.0	0.0	Direct shear on vertical plane
<u>WINNIPEG FLOODWAY, Sutherland (1969)</u>		
<u>Brown Clay</u>		
8	-	$w_L = 120, w_p = 34, w\% = 34, \gamma = 16.5$ Direct shear
<u>Grey Clay</u>		
10°	-	$w_L = 72, w_p = 25, w\% = 45.9, \gamma = 17.4$ Direct shear
<u>Grey Clay (Plastic)</u>		
11°	-	$w_L = 101, w_p = 34, w\% = 62.7, \gamma = 16.2$ Direct shear

7.2.12

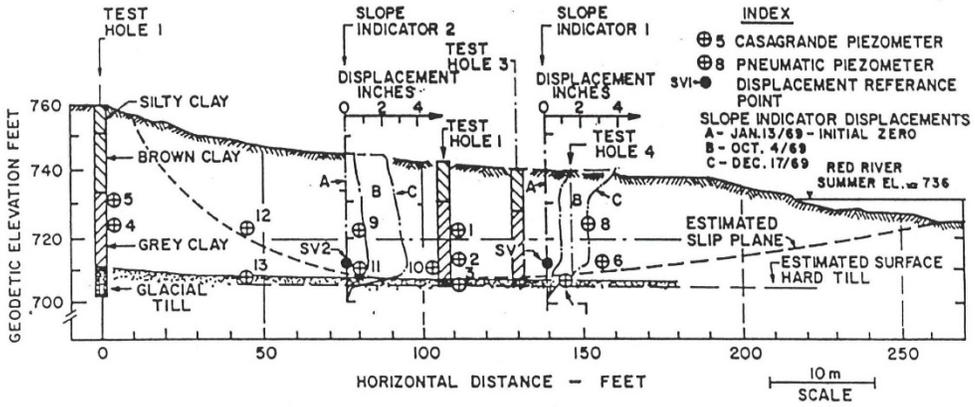


FIGURE 1 - ST. VITAL SITE, RIVER BANK CROSS-SECTION, LOCATIONS OF PIEZOMETERS, SLOPE INDICATORS, TEST HOLES AND REFERENCE POINTS. TYPICAL SLOPE INDICATOR HORIZONTAL DISPLACEMENTS, ESTIMATED SLIP PLANE

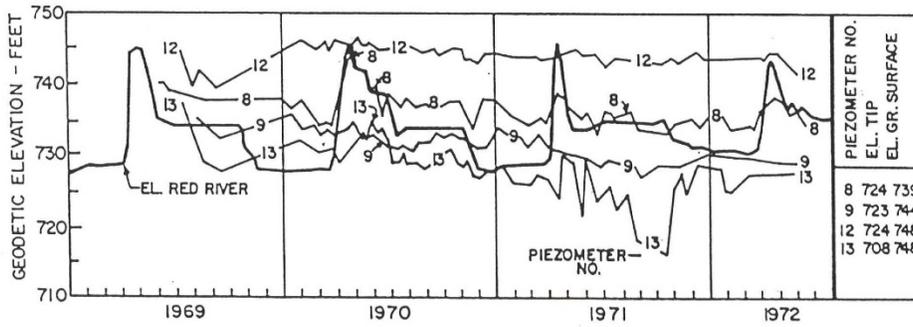
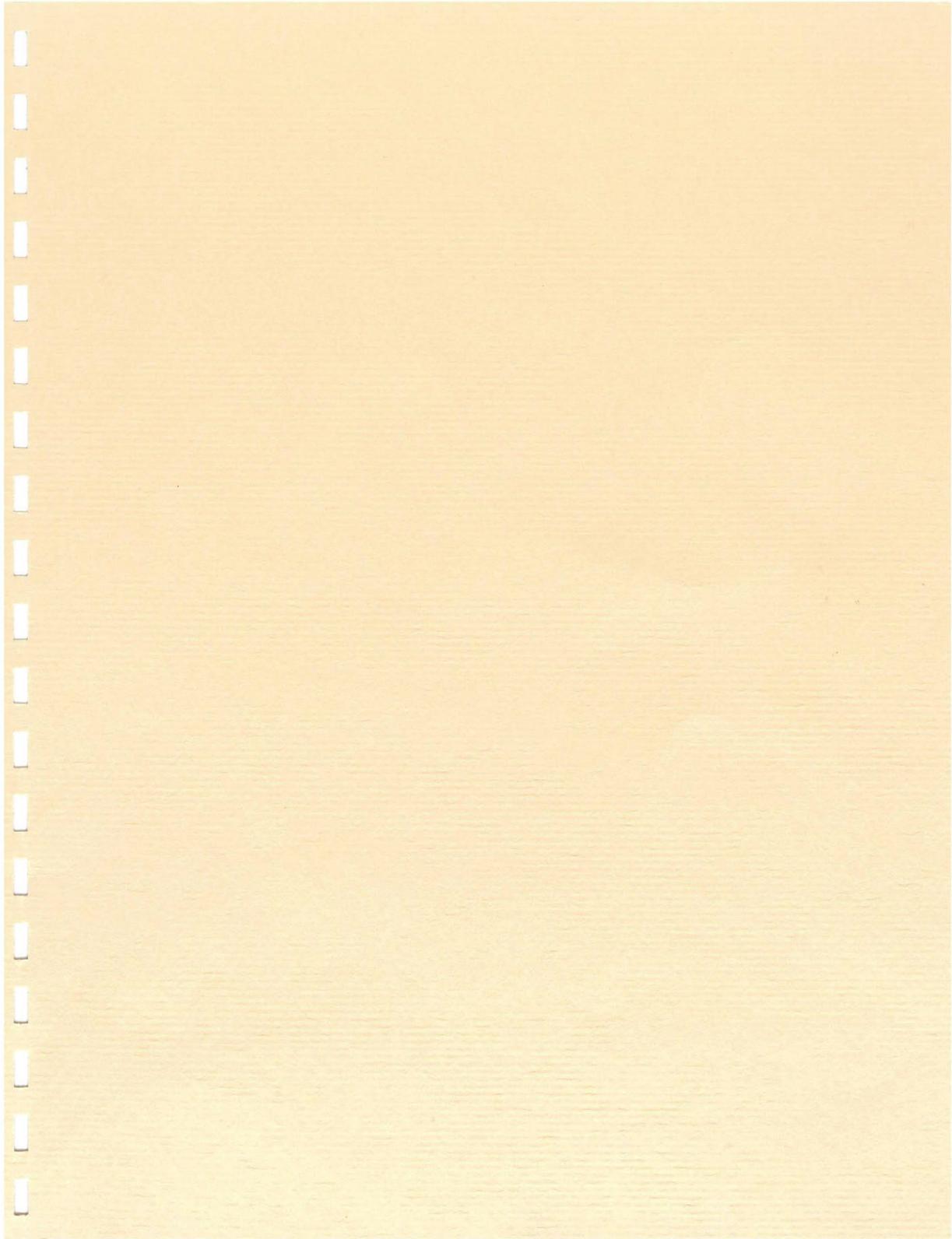


FIGURE 2 - ST. VITAL SITE - RIVER BANK SLIDE
PIEZOMETRIC ELEVATIONS FOR SELECTED PIEZOMETERS.
ELEVATION RED RIVER

7.2.14



APPENDIX 'B'

Photo Log

APPENDIX 'B' – PHOTO LOG

General Site Conditions (Photos taken July 12, 2022)



Photo 1: Southbound St. Mary's Road and west sidewalk (looking south from St. Mary's Road at Vivian Avenue)



Photo 2: Upper Riverbank Slope (looking south)



Photo 3: Section of undermined sidewalk foundation (looking southeast)



Photo 4: Undermined sidewalk foundation with exposed underground cables (looking southeast)



Photo 5: Exposed underground cables

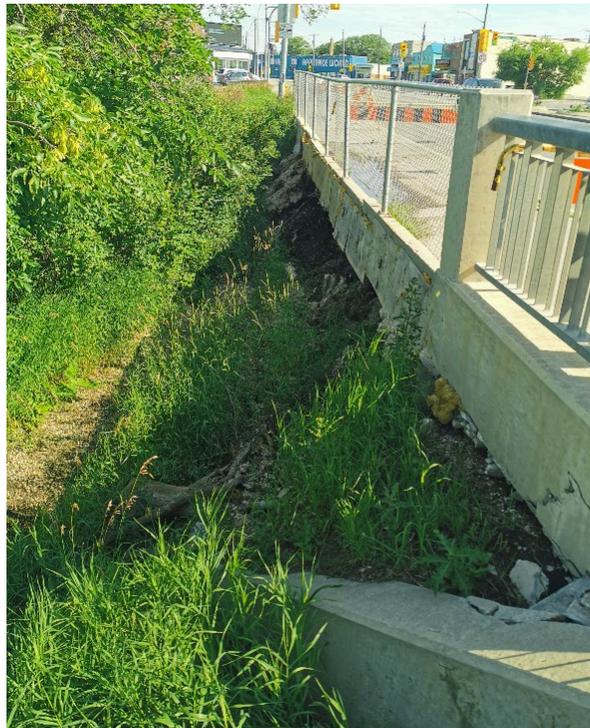


Photo 6: Undermined section of sidewalk foundation (looking north from north limit of the Old St. Vital Riverwalk)



Photo 7: Terraced upper bank with considerable vegetation and tree debris (looking southeast from mid/lower bank)



Photo 8: Upper bank geometry and evidence of desire line between upper and mid banks (looking northwest from Old St. Vital Riverwalk)



Photo 9: Scarp evident between upper and mid banks (looking northeast from mid bank)



Photo 10: Mid/lower bank (looking south from mid bank)



Photo 11: Lower bank (looking south)



Photo 12: Red River Shoreline (looking south)



Photo 13: Surface of undermined section of sidewalk (looking south)



Photo 14: Water collecting at a settled slab (looking south)

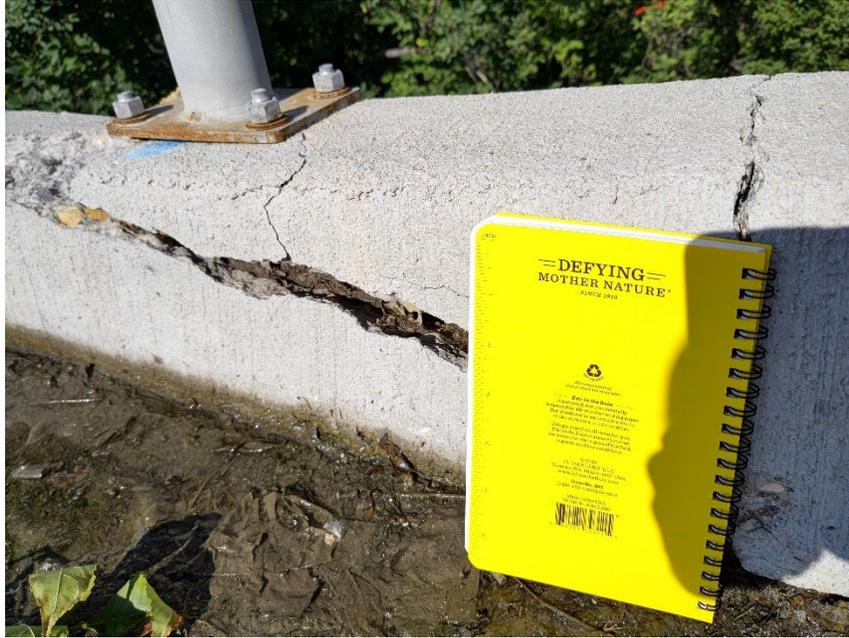


Photo 15: Crack in west curb of the settled sidewalk slab

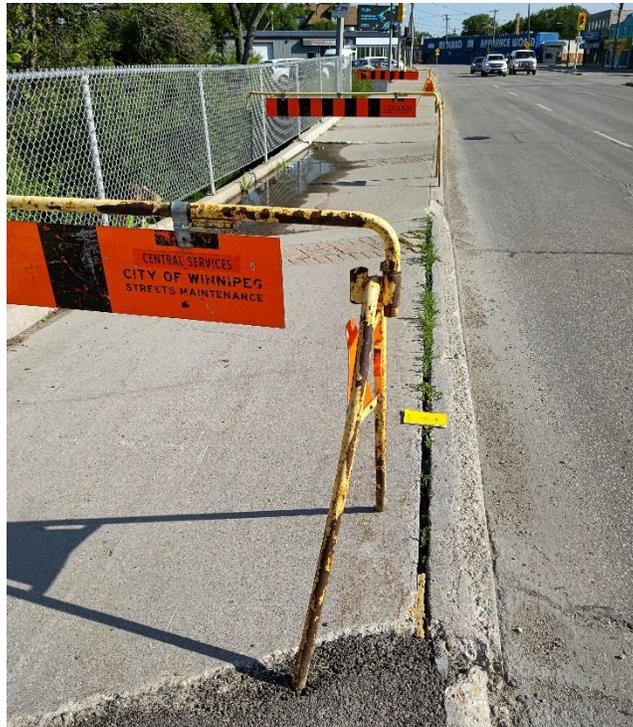


Photo 16: Curb separated from sidewalk slab (looking north)



Photo 17: Old St. Vital Riverwalk near Essex Avenue (looking south)



Photo 18: Old St. Vital Riverwalk sub-structure

Underground Utility Markings (Photos taken July 27, 2022)



Photo 19: North of St. Mary's / Vivian Intersection (looking south)



Photo 20: South of St. Mary's / Vivian Intersection (looking south)

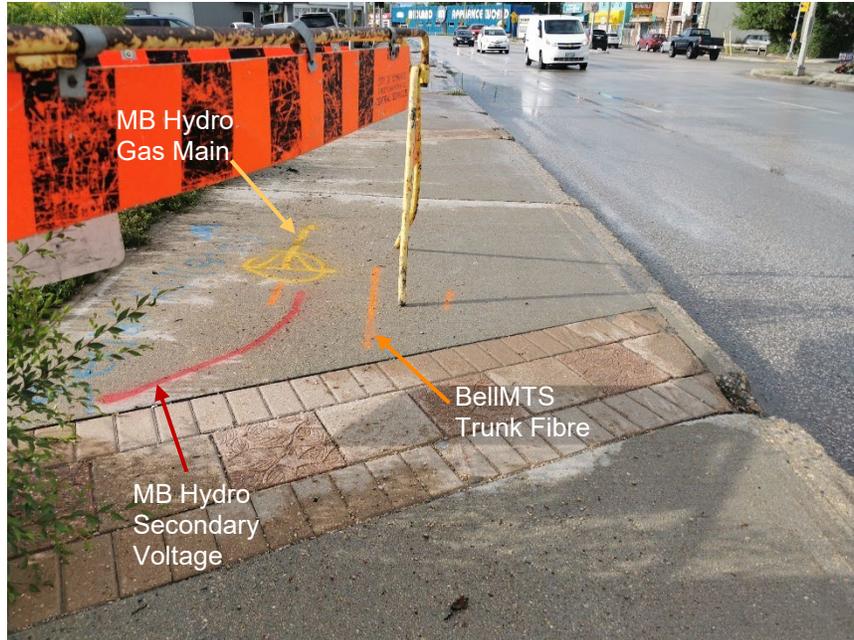


Photo 21: Adjacent to north end of existing chain link fence (looking north)



Photo 22: Adjacent to existing chain link fence (looking southeast)

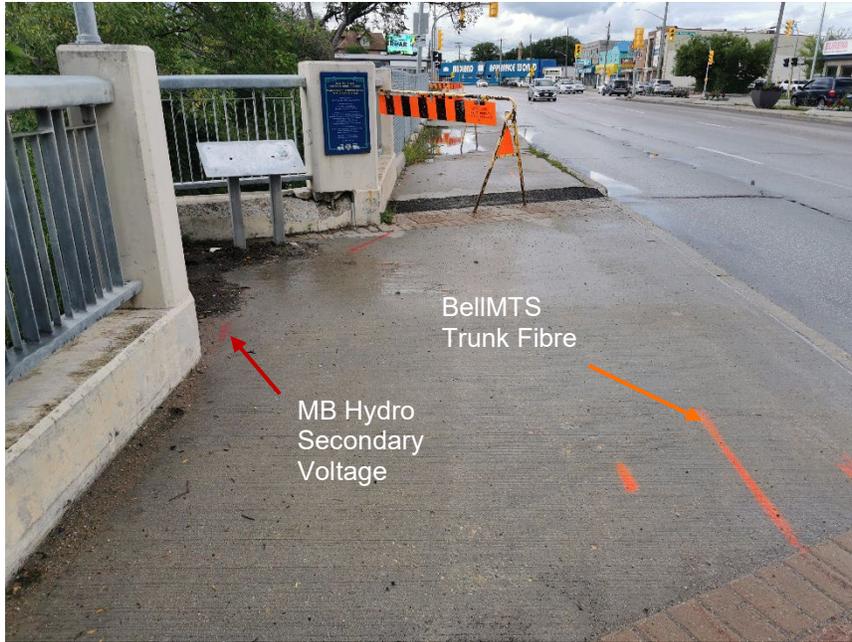


Photo 23: North end of Old St. Vital Riverwalk (looking north)



Photo 24: Near St. Mary's / Essex Intersection (looking north)

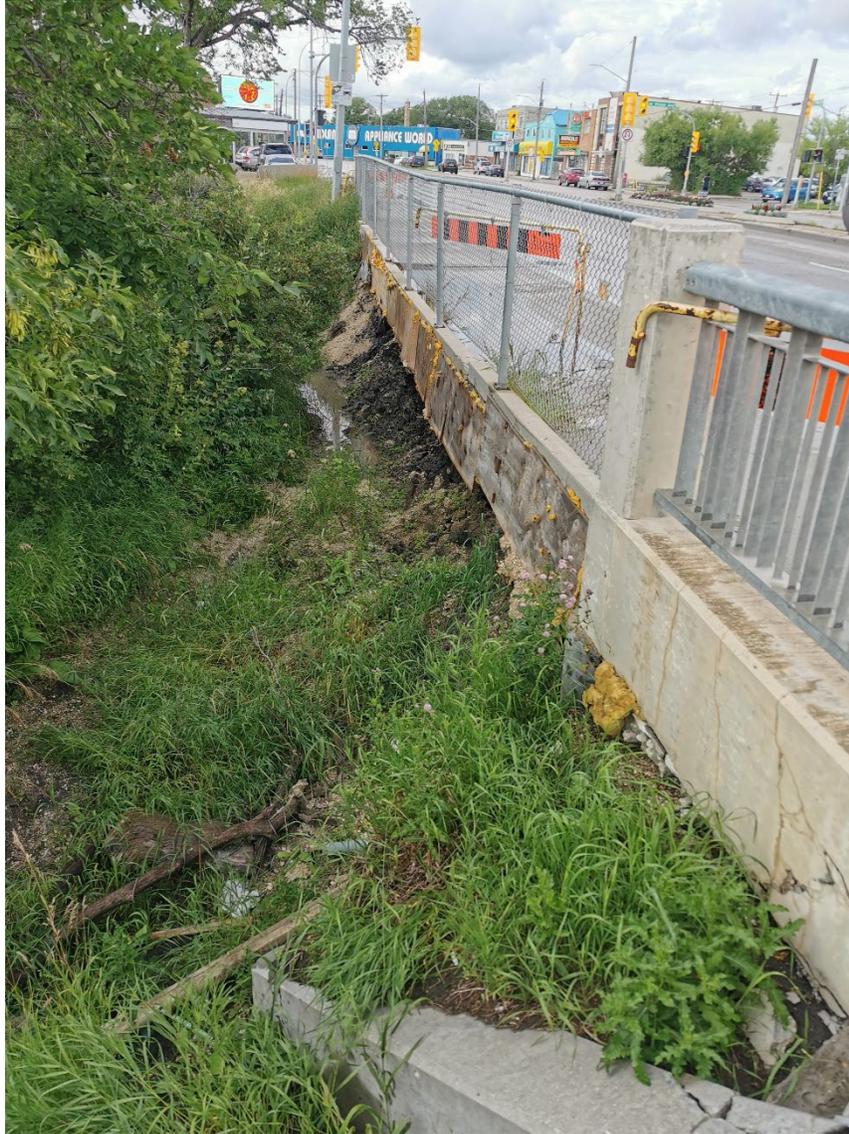


Photo 25: Undermined section of sidewalk after rain on July 27, 2022
(looking northeast)