



THE CITY OF WINNIPEG

TENDER

TENDER NO. 864-2022

METCALFE PUMPING STATION 2022 UPGRADES

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 METCALFE PUMPING STATION 2022 UPGRADES

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, April 13, 2023.

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 Contract Administrator or an authorized representative will be available at the Site on April 4, 2023 from 10:00 am to 11:00 am to provide Bidders access to the Site. The Site is located at 660 Lyndale Drive, at the most west end of the lane between Lyndale Drive and Metcalfe Avenue, Winnipeg, MB.

B3.2 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

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

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D5.1

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

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

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

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

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

B5. CONFIDENTIALITY

B5.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any

way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

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

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

B6. ADDENDA

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

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

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

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

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

B6.6 Notwithstanding D5 enquiries related to an Addendum may be directed to the Contract Administrator indicated in D5.1.

B7. SUBSTITUTES

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

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

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

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

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

(e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in their sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.

B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.

B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons they wish to inform.

B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base their Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B18.

B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B8. BID COMPONENTS

B8.1 The Bid shall consist of the following components:

- (a) Form A: Bid/Proposal;
- (b) Form B: Prices;
- (c) Form G1: Bid Bond and Agreement to Bond.

B8.2 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.

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

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

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

B9. BID

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

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

- (a) if the Bidder is a sole proprietor carrying on business in their own name, their name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;

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

B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

B9.3 In Paragraph 3 of Form A: Bid/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

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

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

B9.4.1 The name and official capacity of all individuals signing Form A: Bid/Proposal should be entered below such signatures.

B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B10. PRICES

B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B10.1.1 Notwithstanding C12.2.3(c), prices on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B10.1.2 Prices stated on Form B: Prices shall not include any costs which may be incurred by the Contractor with respect to any applicable funding agreement obligations as outlined in D36. Any such costs shall be determined in accordance with D36.

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) Tesseract Environmental Engineering Inc.

B11.3 Additional Material:

(a) Included and provided in Appendices A and B

B12. CONFLICT OF INTEREST AND GOOD FAITH

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

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

- (a) other commitments;
- (b) relationships;
- (c) financial interests; or
- (d) involvement in ongoing litigation; that could or would be seen to:
 - (i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or
 - (ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract.
- (e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of their participation in the Tender process or the Work; or
- (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

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

- (a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;
- (b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and
- (c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B12.4 Without limiting B12.3, the City may, in their sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in their sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in their sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

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

- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of their employees proposed for the Work;
- (b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in their sole discretion, determines cannot be avoided or mitigated;
- (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B12.4 to avoid or mitigate a Conflict of Interest; and
- (d) disqualify a Bidder if the Bidder, or one of their employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

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

B13. QUALIFICATION

B13.1 The Bidder shall:

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

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

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website <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);
- (e) upon request of the Contract Administrator, provide the Security Clearances in accordance with PART F - Security Clearance.

B13.4 Further to (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™) or
 - (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 their Bid Submission bid security in the form of a digital bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in Form G1: Bid Bond and Agreement to Bond, available on The City of Winnipeg, Corporate Finance, 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(b).
- B14.3 Bonds failing the verification process will not be considered to be valid and the bid shall be determined to be non-responsive in accordance with B18.1(a).
- B14.4 Bonds passing the verification process will be treated as original and authentic.
- B14.4.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.
- B14.5 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly formed with the successful Bidder and the contract securities are furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

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

B15. OPENING OF BIDS AND RELEASE OF INFORMATION

B15.1 Bids will not be opened publicly.

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

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

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

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

B16. IRREVOCABLE BID

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

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

B17. WITHDRAWAL OF BIDS

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

B18. EVALUATION OF BIDS

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

- (a) compliance by the Bidder with the requirements of the Tender or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to D13 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to D7.

B18.2 Further to (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 (b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in their Bid or in other information required to be submitted, that they are qualified.

B18.4 Further to (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 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.

B18.4.2 Bidders are advised that the calculation indicated in B18.4 will prevail over the Total Bid Price entered in MERX.

B19. AWARD OF CONTRACT

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

B19.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be qualified, and the Bids are determined to be responsive.

B19.2.1 Without limiting the generality of B19.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with their own forces;
- (d) only one Bid is received; or
- (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B19.3 The Work of this Contract is contingent upon Council approval of sufficient funding in the 2023 Capital Budget. If the Capital Budget approved by Council does not include sufficient funding for the Work, the City will have no obligation to award a Contract.

B19.4 If funding for the Work is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, Bidders are advised that the terms of D36 shall immediately take effect upon confirmation of such funding, regardless of when funding is confirmed.

B19.5 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.

B19.6 Following the award of contract, a Bidder will be provided with information related to the evaluation of their Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2020 01 31) are applicable to the Work of the Contract.
- C0.1.1 The General Conditions for Construction are available on the Information Connection page at The City of Winnipeg, Corporate Finance, 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 building and site improvements at the Metcalfe Lift Pumping Station.

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

- (a) Structural and architectural upgrades;
- (b) Mechanical process and building services upgrades;
- (c) Electrical and instrumentation upgrades;
- (d) Civil and municipal services (outside of the station) upgrades;
- (e) As per Drawings and Technical Specifications.

D3.3 The following shall apply to the Services:

- (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. SITE INVESTIGATION DUE DILIGENCE AND RISK

D4.1 Notwithstanding C3.1, the Contractor acknowledges that the site investigation reports and other site information included in this Tender have been provided to it and may be relied upon by the Contractor to the extent that the Contractor uses Good Industry Practice in interpreting such report(s) and site information and carries out the Work in accordance with Good Industry Practice based upon such report(s) and the information contained in them and such other site information. In the event that a site condition related to:

- (a) the location of any utility which can be determined from the records or other information available at the offices of any public authority or person, including a municipal corporation and any board or commission thereof, having jurisdiction or control over the utility;
- (b) the Site conditions, including but not limited to subsurface hazardous materials or other concealed physical conditions;
- (c) the location, nature, quality or quantity of the materials to be removed or to be employed in the performance of the Work;
- (d) the nature, quality or quantity of the Plant needed to perform the Work;
- (e) all matters concerning access to the Site, power supplies, location of existing services, utilities or materials necessary for the completion of the Work; and
- (f) all other matters which could in any way affect the performance of the Work;

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

D5. DEFINITIONS

D5.1 When used in this Tender:

- (a) **“Authority Having Jurisdiction”** or **“AHJ”** means an organization, office, or individual responsible for enforcing the requirements of a code, standard, or by-law, or for approving equipment, materials, and installation or a procedure, which is typically in reference to the local inspection authority;
- (b) **“As-Built”** means an accurate and complete record of the construction Work undertaken by the Contractor, resulting in adjustments and markups made to the construction set of documents;
- (c) **“Certificate of Final Inspection”** means the certificate of final inspections, obtained from the City of Winnipeg inspections department;
- (d) **“Code”** or “code” means the latest local code applicable at the project location;
- (e) **“C.P.M.”** means critical path method;
- (f) **“Conflict of Interest”** is as defined in B12;
- (g) **“CSA”** means Canadian Standards Association;
- (h) **“HVAC”** means Heating, Ventilation and Air Conditioning;
- (i) **“Licenced Electrical Contractor”** means an individual meeting the requirements of the Manitoba Electricians’ Licence Act (C.C.S.M. c E50) and the Manitoba Electricians’ Licensing Regulation (186-87 R);
- (j) **“Licenced Mechanical Contractor”** means a M-Prime contractor licensed by the City. M-Prime contractors may obtain permits for any work on HVAC systems, hazardous process systems, or fire protection systems where the work is to be performed by a M1 licenced contractor and/or a M2 licenced contractor;
- (k) **“PDF”** means Portable Document Format;
- (l) **“provide”** means to supply, install, and leave in working order all materials and necessary equipment, wiring, supports, access panels, etc., as necessary for item or system indicated;
- (m) **“Record Drawing”** means an accurate and complete record of the construction Work undertaken by the Contractor, and prepared by the reviewing professional after verifying in detail the actual conditions of the completed project as a result of adjustments and markups made to the construction set of documents. The drawings shall bear the seal of the responsible professional;
- (n) **“Standard”** or “standard” means the latest standard that is in effect at the project location;
- (o) **“Standardized Goods”** or **“Standardized Equipment”** means the respective goods that have been standardized by the City.
- (p) **“Standardized Vendors”** means a Contractor or Supplier of Standardized Goods.
- (q) **“Total Bid Price”** means the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices;

D6. CONTRACT ADMINISTRATOR

D6.1 The Contract Administrator is Kontzamanis Graumann Smith MacMillan Inc. dba KGS Group , represented by:

Lunide Milius-Alphonse, M.Sc., P.Eng.
Structural Engineer Project Manager

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

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

D7. CONTRACTOR'S SUPERVISOR

- D7.1 At the pre-construction meeting, the Contractor shall identify their designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D8. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

- D8.1 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.

- D8.1.1 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.

- D8.1.2 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. UNFAIR LABOUR PRACTICES

- D8.1 Further to C3.2, the Contractor declares that in bidding for the Work and in entering into this Contract, the Contractor and any proposed Subcontractor(s) conduct their respective business in accordance with established international codes embodied in United Nations Universal Declaration of Human Rights (UDHR) <https://www.un.org/en/about-us/universal-declaration-of-human-rights> International Labour Organization (ILO) [https://www.ilo.org/global/lang--en/index.htm](https://www.ilo.org/global/lang-en/index.htm) conventions as ratified by Canada.
- D8.2 The City of Winnipeg is committed and requires its Contractors and their Subcontractors, to be committed to upholding and promoting international human and labour rights, including fundamental principles and rights at work covered by ILO eight (8) fundamental conventions and the United Nations Universal Declaration of Human Rights which includes child and forced labour.
- D8.3 Upon request from the Contract Administrator, the Contractor shall provide disclosure of the sources (by company and country) of the raw materials used in the Work and a description of the manufacturing environment or processes (labour unions, minimum wages, safety, etc.).
- D8.4 Failure to provide the evidence required under D8.3, may be determined to be an event of default in accordance with C18.

- D8.5 In the event that the City, in its sole discretion, determines the Contractor to have violated the requirements of this section, it will be considered a fundamental breach of the Contract and the Contractor shall pay to the City a sum specified by the Contract Administrator in writing (“Unfair Labour Practice Penalty”). Such a violation shall also be considered an Event of Default, and shall entitle the City to pursue all other remedies it is entitled to in connection with same pursuant to the Contract.
- D8.5.1 The Unfair Labour Practice Penalty shall be such a sum as determined appropriate by the City, having due regard to the gravity of the Contractor’s violation of the above requirements, any cost of obtaining replacement goods/ services or rectification of the breach, and the impact upon the City’s reputation in the eyes of the public as a result of same.
- D8.5.2 The Contractor shall pay the Unfair Labour Practice Penalty to the City within thirty (30) Calendar Days of receiving a demand for same in accordance with clause D8.5. The City may also hold back the amount of the Unfair Labour Practice Penalty from payment for any amount it owes the Contractor.
- D8.5.3 The obligations and rights conveyed by this clause survive the expiry or termination of this Contract, and may be exercised by the City following the performance of the Work, should the City determine, that a violation by the Contractor of the above clauses has occurred following same. In no instance shall the Unfair Labour Practice Penalty exceed the total of twice the Contract value.

D9. FURNISHING OF DOCUMENTS

- D9.1 Upon award of the Contract, the Contractor will be provided with ‘issued for construction’ Contract Documents electronically, including Drawings in PDF format only.

SUBMISSIONS

D10. AUTHORITY TO CARRY ON BUSINESS

- D10.1 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.

D11. SAFE WORK PLAN

- D11.1 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.
- D11.2 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>
- D11.3 Notwithstanding B13.5 at any time during the term of the Contract, the City may, at their sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

D12. INSURANCE

- D12.1 The Contractor shall provide and maintain the following insurance coverage:

- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
- (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;
- (c) all risks installation floater, carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.
- (d) all risks course of construction insurance in the amount of one hundred percent (100%) of the total Contract Price, written in the name of the Contractor and The City of Winnipeg, at all times during the performance of the Work and until the date of Total Performance

D12.2 Deductibles shall be borne by the Contractor.

D12.3 The Contractor shall provide the Contract Administrator with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than seven (7) Calendar Days from notification of the award of Contract by Purchase Order.

D12.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D13. CONTRACT SECURITY

D13.1 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.

D13.1.1 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:

- (c) the version submitted by the Contractor must have valid digital signatures and seals;
- (d) 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.
- (e) 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.
- (f) 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.
- (g) the results of the verification must provide a clear, immediate and printable indication of pass or fail regarding D13.1(b).

- D13.1.2 Digital bonds failing the verification process will not be considered to be valid and may be determined to be an event of default in accordance with C18.1. If a digital bond fails the verification process, the Contractor may provide a replacement bond (in hard copy or digital format) within seven (7) Calendar Days of the City's request or within such greater period of time as the City in their discretion, exercised reasonably, allows.
- D13.1.3 Digital bonds passing the verification process will be treated as original and authentic.
- D13.2 The Contractor shall provide the Contract Administrator identified in D5 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.
- D13.3 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 D13.1(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.

D14. SUBCONTRACTOR LIST

- D14.1 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 seven (7) Calendar Days from notification of the award of Contract.

D15. EQUIPMENT LIST

- D15.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.

D16. DETAILED WORK SCHEDULE

- D16.1 The Contractor shall provide the Contract Administrator with a detailed work schedule (Form L: Detailed Work Schedule) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.
- D16.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.
- D16.2 The detailed work schedule shall consist of the following:
- (a) a critical path method (C.P.M.) schedule for the Work;
 - (b) a Gantt chart for the Work based on the C.P.M. schedule;
 - (c) a daily manpower schedule for the Work;
- all acceptable to the Contract Administrator.
- D16.3 Further to D16.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:
- (a) Mobilization and demobilization;
 - (b) Mechanical work;

- (c) Electrical and Instrumentation work;
- (d) Municipal/ civil site work, bypass pumping;
- (e) Wet well cleaning, inspection and rehabilitation;
- (f) Structural and architectural work;
- (g) Equipment start-up;
- (h) Commissioning;
- (i) Training;
- (j) Submission of operation and maintenance manuals and As-Built drawings;
- (k) Substantial Performance;
- (l) Total Performance.

D16.4 Further to D16.2(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.

D16.5 Further to D16.2(c), the daily manpower schedule shall list the daily number of individuals on the Site for each trade.

D17. REQUIREMENT FOR SITE ACCESSIBILITY PLAN

D17.1 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.

D17.2 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 access to pedestrian.
- (b) How the Contractor will maintain cycling facilities.
- (c) How the Contractor will maintain access to residents and businesses unless otherwise noted in the Contract.
- (d) Any required detour signage at adjacent crossings to facilitate sidewalk or active transportation pathway closures.

D17.3 The Accessibility Plan may also include figures, sketches, or drawings to demonstrate the proposed plan.

D17.4 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

D17.5 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.

D17.6 Any changes to the Accessibility Plan must be approved by the Contract Administrator.

- D17.7 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the site has been maintained.
- D17.8 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.
- D17.9 Third and subsequent Offences – A pay reduction will be issued in the amount of \$250.00 per instance and per day.

SCHEDULE OF WORK

D18. COMMENCEMENT

- D18.1 The Contractor shall not commence any Work until they are in receipt of a Purchase Order from the Award Authority authorizing the commencement of the Work.
- D18.2 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 D10;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D11;
 - (iv) evidence of the insurance specified in D12;
 - (v) the contract security specified in D13;
 - (vi) the Subcontractor list specified in D14;
 - (vii) the equipment list specified in D15;
 - (viii) the detailed work schedule specified in D16;
 - (ix) the Requirements for Site Accessibility Plan as specified in D17; and
 - (x) the direct deposit application form specified in D29.
 - (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.
- D18.3 The City intends to award this Contract by May 12, 2023.
- D18.3.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.
- D18.4 Once the temporary by-pass pumping system is in place, the wet well cleaning and inspection shall be the first items initiated as part of the Work.
- D18.5 Work on this project requiring the installation and use of temporary by-pass pumping is limited to the period between December 1 to February 29 of any given year, or as authorized by Contract Administrator.

D19. WORK BY OTHERS

- D19.1 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.

D19.2 Further to D19.1 the Contractor shall cooperate and coordinate all activities with all parties performing required Work by Others identified in D19.1 and accommodate the necessary area on Site required for the Work by Others to complete the Work

D20. WORKING DAYS

D20.1 Notwithstanding C1.1(jj), a Working Day includes a Saturday, Sunday, or a statutory or civic holiday when the Contractor chooses to undertake work requiring the presence of the Contract Administrator and/or City resources.

D20.2 In the event that incidental work is behind schedule which, in the opinion of the Contract Administrator, should have been or could have been carried out by the Contractor in conjunction with or immediately following work of a major type, the City hereby reserves the right to charge Working Days on the incidental work until such time as it is up to schedule.

D20.3 When the major type of work involves restoration of the site to the condition it was prior to rainfall, Working Days shall not be charged.

D20.4 The Contract Administrator will furnish the Contractor with a daily record for each major type of work showing various information concerning the equipment, the time it worked, could have worked and Working Days charged. This report is to be signed each day by an authorized representative of the Contractor.

D21. CRITICAL STAGES

D21.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

- (a) Wet well cleaning and inspection work shall be undertaken immediately following instatement of temporary by-pass pumping. Bypass manhole and temporary pumps will be required and must be provided to allow for the inspection of the chamber and to make any necessary repairs.
- (b) Critical Stage 1: The new lift pumps are required to be in service and operating on the new controls by February 29, 2024.
- (c) Substantial Performance as listed in D22.
- (d) Total Performance as listed in D23.
- (e) As-built Markups received no later than one (1) month after Total Performance has been achieved.

D22. SUBSTANTIAL PERFORMANCE

D22.1 The Contractor shall achieve Substantial Performance by **March 30, 2024**.

D22.2 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.

D22.3 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.

D23. TOTAL PERFORMANCE

- D23.1 The Contractor shall achieve Total Performance by **June 29, 2024**.
- D23.2 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.
- D23.3 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.

D24. LIQUIDATED DAMAGES

- D24.1 If the Contractor fails to achieve Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:
- (a) Critical Stage 1 (New Lift Pumps In-Service) - Two thousand dollars (\$2,000);
 - (b) Substantial Performance – One thousand dollars (\$1,000);
 - (c) Total Performance – One thousand dollars (\$1,000).
- D24.2 The amounts specified for liquidated damages in D24.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.
- D24.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D25. COVID-19 SCHEDULE DELAYS

- D25.1 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.
- D25.2 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.
- D25.3 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.
- D25.4 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 D25.3. Failure to provide this notice will result in no additional time delays being considered by the City.
- D25.5 The Work schedule, including the durations identified in D21 to D23 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.

- D25.6 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.
- D25.7 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

D26. JOB MEETINGS

- D26.1 Regular bi-weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D26.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever they deem it necessary.

D27. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

- D27.1 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).

D28. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

- D28.1 Further to B13.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at their sole discretion and acting reasonably, require updated proof of compliance, as set out in B13.4.

MEASUREMENT AND PAYMENT

D29. PAYMENT

- D29.1 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.
- D29.2 Further to E3, no payment will be made for Cash Allowances other than as set out in E3.4.

STANDARDIZATION

D30. STANDARDIZED EQUIPMENT

- D30.1 The following goods have been standardized by the City and will be supplied by the Contractor:
- (a) Standardized PLC Control System Equipment and Motor Control Equipment as per E7,
 - (b) Standardized Instrumentation as per E4.

D31. CONTRACTUAL ARRANGEMENT

- D31.1 Each Standardization Vendor shall be a Subcontractor of the Contractor.
- D31.2 The City's contract with each of the Standardization Vendors defines the prices and general terms of supply to the Contractor. Each Standardization Vendor is obligated to enter into a contract with the Contractor, based upon such prices and general terms of supply.
- D31.2.1 The City is not a party to any contract between a Standardization Vendor and the Contractor, or any Subcontractor.
- D31.3 In the event that a potential dispute arises between the Contractor and a Standardization Vendor, the Contract Administrator shall be notified.

D32. PAYMENT OF STANDARDIZATION VENDORS

- D32.1 The Contractor is obligated to pay the Standardization Vendors in accordance with general terms of supply applicable to such Standardization Vendor.
- D32.2 The Contractor's payment terms to the Standardization Vendor, in respect of Standardized Control System and Motor Control Equipment identified in E7, include the following:
- D32.2.1 Except as indicated in D32.2.2, payment shall be in Canadian funds net thirty (30) Calendar Days after shipment.
- D32.2.2 Payment for motor control centres shall be in Canadian funds net thirty (30) Calendar Days and initiated based upon the following schedule:
- (a) Upon approval of the shop drawings or forty (40) Calendar days after the last comprehensive submittal, in the event that a response is not made to the submittal: 25% of the total value.
 - (b) Upon delivery of the complete MCC along with all associated as-manufactured documentation: 60% of the total value; or
 - (c) In the event that the delivery is intentionally delayed, upon request by the Contractor, the following payment schedule would replace the 60% payment:
 - (i) Upon completion of the FAT and delivery of all as-manufactured documentation to the Contractor – 30% of the total value.
 - (ii) Forty (40) Calendar days after delivery of the as-manufactured documentation to the Contractor, or upon delivery, whichever comes sooner – 30% of the total value.
 - (d) Upon successful commissioning and delivery of documentation or six (6) months after delivery, whichever comes first: 15% of the total value.
- D32.3 The Contractor's payment terms to the Standardization Vendor, in respect of Standardized Instrumentation identified in E4, include the following:
- D32.3.1 Payment shall be in Canadian funds net thirty (30) Calendar Days after receipt and approval of the Standardization Vendor's invoice.

D33. FUEL PRICE ADJUSTMENT

- D33.1 The Contract is subject to a fuel price adjustment which will be calculated monthly based on eligible Work completed utilizing the following mathematical formulas;
- (a) where the price of fuel has increased - $((CFI/BFI)-1.15) \times Q \times FF$; and
 - (b) where the price of fuel has decreased - $((CFI/BFI)-0.85) \times Q \times FF$; where
 - (i) BFI = base fuel index
 - (ii) CFI = current fuel index
 - (iii) FF = fuel factor

- (iv) Q = monetary value of Work applied in the calculation.
- D33.1.1 Eligible Work will be determined in accordance with D33.5.
- D33.1.2 The base fuel index (BFI) will be the retail price of fuel identified on the Submission Deadline based on latest published "Monthly average retail prices for gasoline and fuel by geography" for Winnipeg, published by [Statistics Canada, Table 18-10-0001-01](#). The BFI is a blended rate based on 15% regular unleaded gasoline at self-service filling stations and 85% diesel fuel at self-service filling stations.
- D33.1.3 The current fuel index (CFI) based on the above blended rate will be determined for each monthly progress estimate and applied on the following progress estimate as a change order once rates are published by Statistics Canada.
- D33.1.4 A Fuel Factor (FF) rate of the monetary value of all eligible Work completed that month based on the Contract unit prices will be used to calculate the assumed apportioned cost of fuel.
- D33.2 Fuel cost adjustments may result in additional payment to the Contractor or credit to the City within the Contract by way of a monthly change order.
- D33.3 The fuel escalation or de-escalation adjustment will not be applied if the CFI is within $\pm 15\%$ of the BFI.
- D33.4 Fuel escalation adjustments will not be considered beyond the Substantial Performance/Critical Stages except where those dates/Working Days are adjusted by change order. Fuel de-escalation adjustments will apply for Work that extends beyond the dates/Working Days specified for Substantial Performance/Critical Stages.
- D33.5 The Fuel Factor (FF) rates will be set as follows:
- (a) The Fuel Factor rate shall be set at 2.7% of the monetary value of all Work based on unit prices except for the portions of the Contract identified below;

WARRANTY

D34. WARRANTY

- D34.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) year thereafter, except where longer warranty periods are specified in the respective Specification sections, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.
- D34.1.1 For the purpose of contract security, the warranty period shall be one (1) year.
- D34.2 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
- D34.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.
- D34.2.2 The Contractor will be required to attend a warranty inspection site visit approximately ten (10) months after the date of Total Performance. Any deficiencies found during the site visit along with prior to completion of the warranty period, the Contractor will be provided with a deficiency list and will be required to correct all deficiencies.

DISPUTE RESOLUTION

D35. DISPUTE RESOLUTION

- D35.1 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 D35.
- D35.2 The entire text of C21.4 is deleted, and amended to read: "Intentionally Deleted"
- D35.3 The entire text of C21.5 is deleted, and amended to read:
- (a) If Legal Services has determined that the Disputed Matter may proceed in the Appeal Process, the Contractor must, within ten (10) Business Days of the date of the Legal Services Response Letter, submit their written Appeal Form, in the manner and format set out on the City's 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 their Appeal Form.
- D35.4 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.
- D35.4.1 Names and positions of Contractor representatives equivalent to the above City position levels shall be determined by the Contractor and communicated to the City at the pre-commencement or kick off meeting.
- D35.4.2 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.
- D35.4.3 Both the City and the Contractor agree to make all reasonable efforts to conduct the above escalating negotiation process within twenty (20) Business Days, unless both parties agree, in writing, to extend that period of time.
- D35.4.4 If the Dispute is not resolved to the City and Contractor's mutual satisfaction after discussions have occurred at the final escalated level as described above, or the time period set out in D35.4.3, as extended if applicable, has elapsed, the Contract Administrator will issue a Final Determination as defined in C1.1(v), at which point the parties will be governed by the Dispute Resolution process set out in C21.

THIRD PARTY AGREEMENTS

D36. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

- D36.1 In the event that funding for the Work of the Contract is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, the following terms and conditions shall apply, as required by the applicable funding agreements.
- D36.2 Further to D36.1, in the event that the obligations in D36 apply, actual costs legitimately incurred by the Contractor as a direct result of these obligations ("Funding Costs") shall be determined by the actual cost to the Contractor and not by the valuation method(s) outlined in C7.4. In all other respects Funding Costs will be processed in accordance with Changes in Work under C7.
- D36.3 For the purposes of D36:
- (a) "**Government of Canada**" includes the authorized officials, auditors, and representatives of the Government of Canada; and
 - (b) "**Government of Manitoba**" includes the authorized officials, auditors, and representatives of the Government of Manitoba.
- D36.4 Modified Insurance Requirements
- D36.4.1 If not already required under the insurance requirements identified in D12, the Contractor will be required to provide wrap-up liability insurance in an amount of no less than two million dollars (\$2,000,000) inclusive per occurrence. Such policy will be written in the joint names of the City, Contractor, Consultants and all sub-contractors and sub-consultants and include twelve (12) months completed operations. The Government of Manitoba and their Ministers, officers, employees, and agents shall be added as additional insureds.
- D36.4.2 If not already required under the insurance requirements identified in D12, the Contractor will be required to provide builders' risk insurance (including boiler and machinery insurance, as applicable) providing all risks coverage at full replacement cost, or such lower level of insurance that the City may identify on a case-by-case basis, such as an installation floater.
- D36.4.3 The Contractor shall obtain and maintain third party liability insurance with minimum coverage of two million dollars (\$2,000,000.00) per occurrence on all licensed vehicles operated at the Site. In the event that this requirement conflicts with another licensed vehicle insurance requirement in this Contract, then the requirement that provides the higher level of insurance shall apply.
- D36.4.4 Further to D12.3, insurers shall provide satisfactory Certificates of Insurance to the Government of Manitoba prior to commencement of Work as written evidence of the insurance required. The Certificates of Insurance must provide for a minimum of thirty (30) days' prior written notice to the Government of Manitoba in case of insurance cancellation.
- D36.4.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.
- D36.5 Indemnification By Contractor
- D36.5.1 In addition to the indemnity obligations outlined in C17 of the General Conditions for Construction, the Contractor agrees to indemnify and save harmless the Government of Canada and the Government of Manitoba and each of their respective Ministers, officers, servants, employees, and agents from and against all claims and demands, losses, costs, damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from this Contract or the Work, or from the goods or services provided or required to be provided by the Contractor, except those resulting from the negligence of any of the Government of Canada's or the Government of Manitoba's Ministers, officers, servants, employees, or agents, as the case may be.

- D36.5.2 The Contractor agrees that in no event will Canada or Manitoba, their respective officers, servants, employees or agents be held liable for any damages in contract, tort (including negligence) or otherwise, for:
- (a) any injury to any person, including, but not limited to, death, economic loss or infringement of rights;
 - (b) any damage to or loss or destruction of property of any person; or
 - (c) any obligation of any person, including, but not limited to, any obligation arising from a loan, capital lease or other long term obligation; in relation to this Contract or the Work.
- D36.6 Records Retention and Audits
- D36.6.1 The Contractor shall maintain and preserve accurate and complete records in respect of this Contract and the Work, including all accounting records, financial documents, copies of contracts with other parties and other records relating to this Contract and the Work during the term of the Contract and for at least six (6) years after Total Performance. Those records bearing original signatures or professional seals or stamps must be preserved in paper form; other records may be retained in electronic form.
- D36.6.2 In addition to the record keeping and inspection obligations outlined in C6 of the General Conditions for Construction, the Contractor shall keep available for inspection and audit at all reasonable times while this Contract is in effect and until at least six (6) years after Total Performance, all records, documents, and contracts referred to in D36.6.1 for inspection, copying and audit by the City of Winnipeg, the Government of Manitoba and/or the Government of Canada and their respective representatives and auditors, and to produce them on demand; to provide reasonable facilities for such inspections, copying and audits, to provide copies of and extracts from such records, documents, or contracts upon request by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada and their respective representatives and auditors, and to promptly provide such other information and explanations as may be reasonably requested by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada from time-to-time.
- D36.7 Other Obligations
- D36.7.1 The Contractor consents to the City providing a copy of the Contract Documents to the Government of Manitoba and/or the Government of Canada upon request from either entity.
- D36.7.2 If the Lobbyists Registration Act (Manitoba) applies to the Contractor, the Contractor represents and warrants that it has filed a return and is registered and in full compliance with the obligations of that Act, and covenants that it will continue to comply for the duration of this Contract.
- D36.7.3 The Contractor shall comply with all applicable legislation and standards, whether federal, provincial, or municipal, including (without limitation) labour, environmental, and human rights laws, in the course of providing the Work.
- D36.7.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.
- D36.7.5 The Contractor represents and warrants that no current or former public servant or public office holder, to whom the Value and Ethics Code for the Public Sector, the Policy on Conflict of Interest and Post Employment, or the Conflict of Interest Act applies, shall derive direct benefit from this Contract, including any employment, payments, or gifts, unless the provision or receipt of such benefits is in compliance with such codes and the legislation.

D36.7.6 The Contractor represents and warrants that no member of the House of Commons or of the Senate of Canada or of the Legislative Assembly of Manitoba is a shareholder, director or officer of the Contractor or of a Subcontractor, and that no such member is entitled to any benefits arising from this Contract or from a contract with the Contractor or a Subcontractor concerning the Work.

FORM H1: PERFORMANCE BOND
(See D13)

KNOW EVERYONE BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____.)

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

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

TENDER NO. 864-2022

METCALFE PUMPING STATION 2022 UPGRADES

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 D13)

KNOW EVERYONE BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

TENDER NO. 864-2022

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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
 - (i) 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;

- (ii) 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;
 - (iii) 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 D15)

TENDER NO. 864-2022

<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 D15)

TENDER NO. 864-2022

<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 their entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 The City of Winnipeg Standard Construction Specifications is available on the Information Connection page at The City of Winnipeg, Corporate Finance, 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:

NMS SPECIFICATIONS

Specification No.

Specification Title

DIVISION 01 –

GENERAL REQUIREMENTS

013300	Submittal Procedures
013529.06	Health and Safety Requirements
014500	Quality Control
015200	Construction Facilities
015600	Temporary Barriers and Enclosures
017411	Cleaning
017800	Closeout Submittals
019113	General Commissioning Requirements
019113.13	Commissioning (Cx) Plan
019113.16	Commissioning Forms
019113.18	Commissioning Training

DIVISION 06

WOOD, PLASTICS AND COMPOSITES

066000	Plastic Fabrications
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DIVISION 04 –

MASONRY

040500	Common Work Results For Masonry
040513	Masonry Mortaring And Grouting
040519	Masonry Anchorage And Reinforcing

040523 Masonry Accessories
042200 Concrete Unit Masonry
042113 Brick Masonry

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

072113 Board Insulation
072700.01 Air Barriers
076200 Sheet Metal Flashing and Trim
079200 Joint Sealants

DIVISION 08 – OPENINGS

081100 Metal Doors and Frames
087110 Door Hardware

DIVISION 09 – FINISHES

096723 Resinous Epoxy Flooring
099123 Interior Painting

DIVISION 10 – SPECIALTIES

104400 Fire Protection Specialties

DIVISION 22 – PLUMBING

220515 Plumbing Specialties and Accessories
221010 Plumbing Pumps
221116 Domestic Water Piping
221316.16 Sanitary Waste and Vent Piping - Plastic

DIVISION 23 – HEATING, VENTILATION AND AIR-CONDITIONING (HVAC)

230500 Common Work Results for Mechanical
230554 Identification for HVAC Piping and Equipment
230593 Testing, Adjusting and Balancing of HVAC
230713 Duct Insulation
233113.01 Metal Ducts – Low Pressure to 500 Pa
233300 Air Duct Accessories
233314 Dampers – Balancing
233315 Dampers – Operating
233400 HVAC Fans
233713 Louvers
233714 Diffusers and Grilles
235501 Duct Heaters
238123 Air Conditioning
238240 Unit Heaters - Electric

DIVISION 26 – ELECTRICAL

260500 Common Work Results
260520 Wire and Box Connectors (0-1000V)
260521 Wires and Cables (0-1000V)
260528 Grounding – Secondary
260529 Hangers and Supports for Electrical Systems
260531 Splitters, Junction, Pull Boxes and Cabinets
260532 Outlet Boxes, Conduit Boxes and Fittings

260534	Conduits, Conduit Fastening and Conduit Fittings
261841	Interlock Systems
262419	Motor Control Centers
262716	Electrical Cabinets and Enclosures
262726	Wiring Devices
262823	Disconnect Switches – Fused and Non-Fused
262901	Contactors
262903	Control Devices
262910	Motor Starters
262923	Variable Frequency Drives
265000	Lighting
265201	Emergency Lighting
261216.01	Dry Type Transformers up to 600V Primary
262416.01	Panelboards Breaker Type
262816.02	Moulded Case Circuit Breakers

DIVISION 40 –

AUTOMATION

400501	Common Work Results - Automation
408008	Factory Acceptance Test
408011	Automation - Commissioning
409001	Automation – Field Pushbuttons, Switches and Indicators
409100	Automation – Process Measurement Devices
409200	Automation – Primary Control Devices
409443	Programmable Logic Controller
409513	Control Panels
409901	Training
409990	Maintenance and Support

GENERAL DRAWINGS

1-0162L-D0001	001	COVER SHEET
1-0162L-D0002	001	DRAWING INDEX
1-0162L-D0003	001	SITE PLAN

AUTOMATION DRAWINGS

1-0162L-A0001	001	AUTOMATION	PLAN LAYOUT - MAIN FLOOR	
1-0162L-A0002	001	AUTOMATION	PLAN LAYOUT - MOTOR ROOM	
1-0162L-A0003	001	AUTOMATION	PLAN LAYOUT - PUMP ROOM	
1-0162L-A0004	001	AUTOMATION	PANEL LAYOUT & BILL OF MATERIALS	PLC CONTROL PANEL CP-L81
1-0162L-A0004	002	AUTOMATION	PANEL LAYOUT & BILL OF MATERIALS	PLC CONTROL PANEL CP-L81
1-0162L-A0005	001	AUTOMATION	NETWORK BLOCK DIAGRAM	PLC CONTROL PANEL CP-L81
1-0162L-A0006	001	AUTOMATION	POWER DISTRIBUTION SCHEMATIC	PLC CONTROL PANEL CP-L81
1-0162L-A0006	002	AUTOMATION	POWER DISTRIBUTION SCHEMATIC	PLC CONTROL PANEL CP-L81
1-0162L-A0007	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	DISCRETE INPUT RACK 0, MODULE 4
1-0162L-A0008	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	DISCRETE INPUT RACK 0, MODULE 5
1-0162L-A0009	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	DISCRETE INPUT RACK 0, MODULE 6
1-0162L-A0010	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	DISCRETE OUTPUT RACK 0, MODULE 7
1-0162L-A0011	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	ANALOG INPUT RACK 0, MODULE 8
1-0162L-A0012	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	ANALOG INPUT RACK 0, MODULE 9
1-0162L-A0013	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	ANALOG INPUT RACK 0, MODULE 10
1-0162L-A0014	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	ANALOG INPUT RACK 0, MODULE 11
1-0162L-A0015	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	ANALOG INPUT RACK 1, MODULE 0
1-0162L-A0016	001	PLC I/O WIRING DIAGRAM	PLC CONTROL PANEL CP-L81	ANALOG OUTPUT RACK 1, MODULE 1
1-0162L-A0017	001	CONTROL SCHEMATIC	PLC CONTROL PANEL CP-L81	PLC MODE & LOCAL MODE PUMP CONTROLS
1-0162L-A0018	001	AUTOMATION	PANEL LAYOUT & BILL OF MATERIALS	HVAC VENTILATION PANEL JBA-L83
1-0162L-A0019	001	AUTOMATION	POWER DISTRIBUTION SCHEMATIC	HVAC VENTILATION PANEL JBA-L83
1-0162L-A0020	001	AUTOMATION	PANEL LAYOUT & BILL OF MATERIAL	INTRINSICALLY SAFE JUNCTION BOX JBA- L82

1-0162L-A0021	001	LOOP DIAGRAM	TVSS ALARM	XS-L711
1-0162L-A0022	001	LOOP DIAGRAM	MCC-L71 600V POWER STATUS	ESL-L712
1-0162L-A0023	001	LOOP DIAGRAM	MAIN FLOOR HVAC FILTER & AIR FLOW SWITCHES	PDSH-L660, FSL-L643 & FSL-L652
1-0162L-A0024	001	LOOP DIAGRAM	PUMP P-L01, P-L02 & P-L03 MOTOR HIGH	TEMPERATURE SWITCHES TSH-L011, TSH-L021 & TSH-L031
1-0162L-A0025	001	LOOP DIAGRAM	STATION TEMPERATURE TRANSMITTERS	TT-L691 & TT-L692
1-0162L-A0025	002	LOOP DIAGRAM	STATION TEMPERATURE TRANSMITTERS	TT-L671 & TT-L681
1-0162L-A0026	001	LOOP DIAGRAM	STATION OCCUPIED LIGHT SWITCH	HS-L600
1-0162L-A0027	001	LOOP DIAGRAM	DUCT TEMPERATURE SENSOR AND DUCT HEATER	TE-L600 & HCE-L61
1-0162L-A0028	001	LOOP DIAGRAM	STATION MAIN WATER LOW PRESSURE SWITCH	PSL-L526
1-0162L-A0029	001	LOOP DIAGRAM	WET WELL & COMMUNUTOR LEVEL SWITCH	LSHH-L101 & LSH-L502
1-0162L-A0030	001	LOOP DIAGRAM	HVAC DAMPERS AND SUPPLY FAN	FV-L641, FV-L642 & FV-L651
1-0162L-A0031	001	LOOP DIAGRAM	STATION FLOOD LEVEL SWITCH	LSH-L501
1-0162L-A0032	001	LOOP DIAGRAM	LIFT PUMP P-L01 BEARING VIBRATION SENSORS AND CONTROLLERS	VE-L010-1 & VIC-L010-1
1-0162L-A0032	002	LOOP DIAGRAM	LIFT PUMP P-L01 BEARING VIBRATION SENSORS AND CONTROLLERS	VE-L010-2 & VIC-L010-2
1-0162L-A0033	001	LOOP DIAGRAM	LIFT PUMP P-L02 BEARING VIBRATION SENSORS AND CONTROLLERS	VE-L020-1 & VIC-L020-1
1-0162L-A0033	002	LOOP DIAGRAM	LIFT PUMP P-L02 BEARING VIBRATION SENSORS AND CONTROLLERS	VE-L020-2 & VIC-L020-2
1-0162L-A0034	001	LOOP DIAGRAM	LIFT PUMP P-L03 BEARING VIBRATION SENSORS AND CONTROLLERS	VE-L030-1 & VIC-L030-1
1-0162L-A0034	002	LOOP DIAGRAM	LIFT PUMP P-L03 BEARING VIBRATION SENSORS AND CONTROLLERS	VE-L030-2 & VIC-L030-2
1-0162L-A0035	001	LOOP DIAGRAM	LIFT PUMP P-L01 BEARING TEMPERATURE SENSORS & TRANSMITTERS	TE-L010-1, TE-L010-2, TT-L010-1 & TT-L010-2
1-0162L-A0036	001	LOOP DIAGRAM	LIFT PUMP P-L02 BEARING TEMPERATURE SENSORS & TRANSMITTERS	TE-L020-1, TE-L020-2, TT-L020-1 & TT-L020-2
1-0162L-A0037	001	LOOP DIAGRAM	LIFT PUMP P-L03 BEARING TEMPERATURE SENSORS & TRANSMITTERS	TE-L030-1, TE-L030-2, TT-L030-1 & TT-L030-2
1-0162L-A0038	001	LOOP DIAGRAM	LIFT PUMP P-L01 DISCHARGE FLOW TRANSMITTER	FIT-L012
1-0162L-A0039	001	LOOP DIAGRAM	LIFT PUMP P-L02 DISCHARGE FLOW TRANSMITTER	FIT-L022
1-0162L-A0040	001	LOOP DIAGRAM	LIFT PUMP P-L03 DISCHARGE FLOW TRANSMITTER	FIT-L032
1-0162L-A0041	001	LOOP DIAGRAM	WET WELL LEVEL TRANSMITTER AND LEVEL CONTROLLER	LIT-L100-1, LIC-L100-1 & LSH-L100-1
1-0162L-A0041	002	LOOP DIAGRAM	WET WELL LEVEL TRANSMITTER AND LEVEL CONTROLLER	LIT-L100-2, LIC-L100-2 & LSH-L100-2
CIVIL DRAWINGS				
1-0162L-C0001	001	TEMPORARY BY-PASS PUMPING	PLAN AND DETAILS	S-MA70017062

**ELECTRICAL
DRAWINGS**

1-0162L-E0001	001	ELECTRICAL SITE PLAN	DEMOLITION	
1-0162L-E0003	001	ELECTRICAL	SINGLE LINE DIAGRAM	
1-0162L-E0004	001	ELECTRICAL AND LIGHTING	PLAN LAYOUT	MAIN FLOOR AND SUB-LEVEL 1
1-0162L-E0005	001	ELECTRICAL AND LIGHTING	PLAN LAYOUT	MOTOR ROOM
1-0162L-E0006	001	ELECTRICAL AND LIGHTING	PLAN LAYOUT	PUMP ROOM
1-0162L-E0007	001	HAZARDOUS AND WET LOCATION PLAN	MAIN FLOOR PUMP ROOM AND WETWELL	
1-0162L-E0008	001	HAZARDOUS AND WET LOCATION PLAN	DRY WELL (SUB-LEVELS 1, MOTOR ROOM & PUMP ROOM) AND WETWELL	
1-0162L-E0009	001	ELECTRICAL	GROUNDING INSTALLATION DETAILS	
1-0162L-E0010	001	ELECTRICAL	MCC ELEVATION AND DETAILS	MCC-L71
1-0162L-E0011	001	ELECTRICAL	SCHEDULES AND PHOTOCELL DETAILS	PNL-L73 & JBA-L74
1-0162L-E0012	001	ELECTRICAL	MOTOR STARTER SCHEMATIC	LIFT PUMP P-L01
1-0162L-E0013	001	ELECTRICAL	MOTOR STARTER CONNECTION DIAGRAM	LIFT PUMP P-L01
1-0162L-E0014	001	ELECTRICAL	MOTOR STARTER SCHEMATIC	LIFT PUMP P-L02
1-0162L-E0015	001	ELECTRICAL	MOTOR STARTER CONNECTION DIAGRAM	LIFT PUMP P-L02
1-0162L-E0016	001	ELECTRICAL	MOTOR STARTER SCHEMATIC	LIFT PUMP P-L03
1-0162L-E0017	001	ELECTRICAL	MOTOR STARTER CONNECTION DIAGRAM	LIFT PUMP P-L03
1-0162L-E0018	001	ELECTRICAL	MOTOR STARTER SCHEMATIC SUPPLY AND EXHAUST FAN	SF-L64 & EF-L65
1-0162L-E0019	001	ELECTRICAL	CONNECTION DIAGRAM SUPPLY AND EXHAUST FAN	SF-L64 & EF-L65
1-0162L-E0020	001	ELECTRICAL	SITE PLAN	

MECHANICAL DRAWINGS

1-0162L-M0001-001	001	MECHANICAL	PIPING DEMOLITION	PLAN
1-0162L-M0002-001	001	MECHANICAL	PIPING DEMOLITION	SECTION AND DETAIL
1-0162L-M0003-001	001	MECHANICAL	HVAC AND PLUMBING DEMOLITION	SECTION
1-0162L-M0004-001	001	MECHANICAL	HVAC AND PLUMBING DEMOLITION	PLANS
1-0162L-M0005-001	001	MECHANICAL	NEW PROCESS PIPING	PLANS
1-0162L-M0006-001	001	MECHANICAL	NEW PROCESS PIPING	SECTION
1-0162L-M0007-001	001	MECHANICAL	HVAC AND PLUMBING	SECTION
1-0162L-M0008-001	001	MECHANICAL	HVAC AND PLUMBING	PLANS
1-0162L-M0009-001	001	MECHANICAL	MECHANICAL EQUIPMENT	SCHEDULES
1-0162L-M0010-001	001	MECHANICAL	PIPING SUPPORT	STANDARD DETAILS
1-0162L-M0011-001	001	MECHANICAL	HVAC AND PLUMBING	STANDARD DETAILS
1-0162L-M0012-001	001	MECHANICAL	NEW PROCESS PIPING	SECTIONS AND DETAILS

PROCESS DRAWINGS

1-0162L-P0001	001	PROCESS	WASTEWATER PUMPING	PROCESS AND INSTRUMENTATION DIAGRAM
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1-0162L-P0001	002	PROCESS	WASTEWATER PUMPING	PROCESS AND INSTRUMENTATION DIAGRAM
1-0162L-P0001	003	PROCESS	WASTEWATER PUMPING	PROCESS AND INSTRUMENTATION DIAGRAM
1-0162L-P0002	001	PROCESS	HVAC AND PLUMBING SYSTEM	PROCESS AND INSTRUMENTATION DIAGRAM

**STRUCTURAL
DRAWINGS**

1-0162L-S0001	001	STRUCTURAL	SPECIFICATION NOTES	NEW
1-0162L-S0002	001	STRUCTURAL	FOUNDATION AND ROOF FRAMING PLAN	NEW
1-0162L-S0002	002	STRUCTURAL	SUB-LEVEL 1 & 2 FLOOR FRAMING PLANS	NEW
1-0162L-S0002	003	STRUCTURAL	SUB-LEVEL 3 FLOOR FRAMING PLAN	NEW
1-0162L-S0003	001	STRUCTURAL	WETWELL SECTION	DEMOLITION & RETROFIT
1-0162L-S0003	002	STRUCTURAL	WETWELL DETAILS	RETROFIT
1-0162L-S0004	001	STRUCTURAL	DETAILS	NEW
1-0162L-S0004	002	STRUCTURAL	DETAILS	NEW
1-0162L-S0004	003	STRUCTURAL	DETAILS	NEW
1-0162L-S0004	004	STRUCTURAL	AIR CONDITIONER CONNECTION DETAIL	
1-0162L-S0004	005	STRUCTURAL	SECTION & DETAILS	

BUILDING DRAWINGS

1-0162L-B0001	001	BUILDING	NOTES	
1-0162L-B0002	001	BUILDING	PLAN & SECTIONS	DEMOLITION
1-0162L-B0002	002	BUILDING	PLANS	DEMOLITION
1-0162L-B0002	003	BUILDING	PLAN	DEMOLITION
1-0162L-B0002	004	BUILDING	SECTION	DEMOLITION
1-0162L-B0003	001	BUILDING	MAIN FLOOR & ROOF PLAN	NEW
1-0162L-B0003	002	BUILDING	SUB-LEVEL 1, 2 & 3 FLOOR PLANS	NEW
1-0162L-B0004	001	BUILDING	ELEVATIONS	NEW
1-0162L-B0005	001	BUILDING	BUILDING SECTIONS	NEW
1-0162L-B0005	002	BUILDING	SUB-LEVEL SECTION	NEW
1-0162L-B0006	001	BUILDING	WALL SECTIONS & DETAILS	NEW
1-0162L-B0007	001	BUILDING	ROOM FINISH & DOOR SCHEDULE	NEW

GENERAL REQUIREMENTS

E2. MOBILIZATION AND DEMOBILIZATION PAYMENT

E2.1 Description

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

E2.2 Measurement and Payment

E2.2.1 Mobilization and Demobilization

- (a) Mobilization and demobilization will be measured on a lump sum basis and paid for at the Contract Lump Sum Price for "Mobilization and Demobilization". Payment for Mobilization and demobilization shall include all costs associated with mobilization and demobilization, site set up, and cleanup. Payment will be made on the following schedule:
- (b) 25% payment of the Mobilization and Demobilization lump sum price will be paid once sewer cleaning and preparation crews arrive on site and commence with cleaning and sewer preparation works.
- (c) 50% payment of the Mobilization and Demobilization lump sum price will be paid once lining crews arrive on site and commence CIPP liner installations.
- (d) 100% of the Mobilization and Demobilization lump sum price will be paid subsequent to completion of the liner installation, liner repairs (if necessary), and site cleanup.

E3. CASH ALLOWANCE FOR ADDITIONAL WORK

E3.1 Additional Work may be necessitated due to unforeseen circumstances that may arise during the course of the project due to:

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

E3.2 A cash allowance has been included on Form B: Prices.

E3.3 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.

E3.4 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.

E3.5 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.

E3.6 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.

E3.7 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.

E3.8 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.

E4. TRAFFIC CONTROL

E4.1 In accordance with the Manual of Temporary Traffic Control on City Streets (MTTC), the Contract Administrator shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place, maintain, and remove all regulatory signs and traffic control devices authorized and/or required by the Traffic Management Branch in the following situations:

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

E4.2 Further to (c), the Contractor shall make arrangement with the Traffic Services Branch of the City of Winnipeg to supply regulatory signs as required.

E4.3 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the Site has been maintained.

E4.4 Further to E4(c) and E4(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.

E4.5 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.

E4.6 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.

E5. CONTRACTOR SUPPLIED STANDARDIZED EQUIPMENT

- E5.1 Comply with the general requirements of E5 for all Standardized Goods supplied by the Contractor.
- E5.2 Comply with the following Standardization Goods requirements:
 - E5.2.1 PLC Control System and Motor Control Equipment in accordance with E6.
 - E5.2.2 Instrumentation in accordance with E7.
- E5.3 Contact the Contract Administrator regarding any potential uncertainty as to whether a good is covered under a standardization agreement.
- E5.4 The Contractor may utilize a Standardization Vendor to provide other goods required under the Contract, in addition to Standardized Goods.
- E5.5 The Contractor shall separately track all goods supplied under each standardization agreement.
 - E5.5.1 In the event that one or more Standardization Vendors are utilized to procure goods not covered under a standardization agreement, the Contractor shall ensure such goods are quoted, ordered, tracked and accounted in a separate manner.
- E5.6 Pricing:
 - E5.6.1 The City has obtained discounted pricing for Standardized Goods. Each Standardization Vendor is obligated to sell Standardized Goods to all prospective Contractors at the discounted price, provided the goods are for the City of Winnipeg.
 - E5.6.2 The Standardization Vendors may at their option provide lump sum pricing for goods packages. The Standardization Vendor is not required to provide breakout pricing details to the Contractor.
 - E5.6.3 The Contractor and Subcontractors shall not utilize the City's agreements with the Standardization Vendors for any purpose other than City work.
 - E5.6.4 The City may audit the goods purchased from the Standardization Vendors under the standardization agreements and may identify to the Standardization Vendors any goods procured that are not associated with the Contract.
- E5.7 The Contractor is responsible for ensuring that the Material supplied by the Standardization Vendors meets the requirement of the Contract. The Contractor shall review and confirm quotations supplied by the Standardization Vendors to ensure that all required Material is supplied.
- E5.8 Without limiting or otherwise affecting any other term or condition of the Contract, including (non-exhaustive) D31.2.1:
 - E5.8.1 The supply of goods through a Standardization Vendor shall not relieve the Contractor of their obligations.
 - E5.8.2 Errors or omissions by a Standardization Vendor shall not be a cause for a Change in Work.
 - E5.8.3 Delays by a Standardization Vendor shall not be a cause for a Change in Work where the delay could have been avoided through reasonable planning, contingency allocation, or communication by the Contractor.
 - E5.8.4 The Contractor shall engage directly with the persons listed as the Standardized Vendor contact in sections E6.6 and E7.6 unless otherwise directed by the Contract Administrator.
- E5.9 Submittals
 - E5.9.1 Submittals shall be provided for Standardized Goods in accordance with the Specifications and typical industry practice. Submittals shall not be bypassed for Standardized Goods.

E6. STANDARDIZED PLC CONTROL SYSTEM AND MOTOR CONTROL EQUIPMENT

- E6.1 The City has standardized on a specific vendor for the supply and delivery of control system and motor control equipment. The Standardization Vendor was selected via RFP 756-2013 and was awarded to Schneider Electric Canada Inc. (Schneider).
- (a) Refer to E6.6 for contact information.
 - (b) Copies of the tender documents are available from City of Winnipeg Material Management's website.
- E6.2 Goods to be procured via this standardization agreement and applicable to this Tender includes but is not limited to:
- (a) Programmable Controllers (PLCs) including all associated components, hardware and software.
 - (b) Touchscreen HMI systems such as Magellis HMIs.
 - (c) Motor Control Centers (MCCs) including all components.
 - (d) Variable Frequency Drives (VFDs) including all components.
- E6.3 For clarity, this standardization agreement does not include:
- (a) Computer workstation hardware including operating systems;
 - (b) Computer server hardware, including operating systems and general terminal server / client software;
 - (c) Thin client terminals;
 - (d) Fused and un-fused disconnect switches not incorporated into a MCC or other motor starters;
 - (e) Control stations and pendants not incorporated into a MCC or other motor starters;
 - (f) Electrical Transformers not in a MCC or motor starter;
 - (g) Panelboards not integrated in a MCC;
 - (h) Switchboards / Switchgear not integrated in a MCC;
 - (i) System Integration Services (including programming and configuration);
 - (j) Control Panels to house PLCs;
 - (k) Instrumentation;
 - (l) Power supplies not integrated with the PLC / HMI systems; and
 - (m) Terminal blocks not integrated with the PLC / HMI systems
- E6.4 The following model series shall be utilized unless otherwise indicated in the Specifications, Drawings or otherwise approved by the Contract Administrator:
- (a) Schneider Electric M580 PLC;
 - (b) Schneider Electric X80 PLC I/O;
 - (c) Schneider Electric EcoStructure Control Expert programming software;
 - (d) Schneider Electric Local HMI – Harmony HMIGTO or HMIGTU series;
 - (e) Schneider Electric Model 6 MCC – NEMA rated starters;
 - (f) Schneider Electric Altivar 600 series VFD drives.
- E6.5 Commissioning and start-up:
- E6.5.1 Except as identified in E6.5.2, commissioning and start-up of all goods purchased under this standardization agreement shall be performed by the Contractor.
- E6.5.2 Schneider shall provide MCC start-up services, but not commissioning services. Coordinate with Schneider as required to understand the limitations of Schneider's MCC start-up

services and provide all remaining testing, commissioning and start-up services to provide a complete commissioning and start-up.

E6.6 The contact information for all quotations and purchases from Schneider is:

Derrick Cook
Omands Creek Blvd
Winnipeg, MB, R2R 2V2
Telephone: 204-218-1938
E-mail: Derrick.Cook@SE.com

E6.6.1 Goods to be procured via Choice Electric along with Eecol Electric, as Schneider's High Tech Automation Distributor (HTAD):

(a) Further to E3.2, goods to be procured via Eecol includes but is not limited to:

- (i) Programmable Controllers (PLCs) including all associated components hardware and software;
- (ii) Programmable Controller Programming Software;
- (iii) HMI System software;
- (iv) Touchscreen HMI systems such as Magellis HMIs;
- (v) Touchscreen HMI Programming Software;
- (vi) Motor Control Centers including all components;
- (vii) Loose VFDs, motor starters, soft starters, and associated components; and
- (viii) Industrial Ethernet Switches as per design. Note that some Ethernet switches may be specified to be from other vendors due to application requirements. Refer to drawings and specifications.

(b) The Eecol Electric contact:

Trevor Hambleton
1760 Wellington Avenue
Winnipeg, MB, R3H 0E9
Telephone: 204-774-2800
E-mail: hambletont@eecol.com

(c) The Choice Electric contact:

Ofer Margovski
2130 Notre Dame Ave.
Winnipeg, MB, R3H 0K1
Telephone: 204-783-233
E-mail: oferm@choicesupply.ca

(d) All correspondence related to requests-for-quotations to the Supplier for goods listed under (a) shall be copied to the Schneider contact listed under E6.6.

(e) For whatever reason, if the Supplier is unable to receive or respond to request-for-quotations for goods listed under (a) request-for-quotations may be issued directly to the Schneider contact listed under E6.6.

E6.7 Quotations and orders:

E6.7.1 Reference the following in all quotation requests and purchase orders:

- (a) This Bid Opportunity number; and
- (b) A statement indicating:
"This request / purchase order is subject to the Terms and Conditions of City of Winnipeg Request for Proposal RFP 756-2013."

E6.8 Measurement and Payment:

E6.8.1 Payment will be based on Form B, Item 36.

- (a) Indicate base costs for material supply under the standardization agreement. Any material mark-up or installation costs, as applicable, shall be included in other line items of Form B.

E7. STANDARDIZED INSTRUMENTATION

- E7.1 The City has standardized on a specific vendor for the supply and delivery of specific instrumentation. The Standardization Vendor was selected via RFP 449-2014 and was awarded to Trans-West Supply Company Inc. (Trans-West).
 - (a) Copies of the tender documents are available from City of Winnipeg Material Management's website.
- E7.2 Goods to be procured via this standardization agreement and applicable to this Tender include but are not limited to:
 - (a) Temperature Transmitters including temperature elements and thermowells;
 - (b) Electromagnetic Flowmeter Transmitters;
 - (c) Differential Pressure (Level) Transmitters; and
 - (d) Associated accessories.
- E7.3 For clarity, this standardization agreement does not include:
 - (a) Flowmeters - Coriolis;
 - (b) Flowmeters - Thermal Dispersion;
 - (c) Flowmeters - Ultrasonic;
 - (d) Flow switches (i.e. mechanical);
 - (e) Pressure switches;
 - (f) Temperature switches;
 - (g) Radar Level Transmitters; and
 - (h) Level Switches (non-ultrasonic based).
- E7.4 The following model series shall be utilized unless otherwise indicated in the Specifications, Drawings or otherwise approved by the Contract Administrator:
 - (a) Temperature Transmitters
 - (i) Siemens SITRANS TF (Process Applications)
 - (ii) Siemens SITRANS TH300 (HVAC applications)
 - (b) Electromagnetic Flowmeter Transmitters;
 - (i) Siemens SITRANS F M MAG 5100W series flow sensor (Process Applications)
 - (ii) Siemens SITRANS F M MAG 6000 series transmitter (Process Applications)
 - (iii) Siemens Remote Wall Mount Kit FDK:085U1053;
 - (iv) Siemens Cable Kit
 - (c) Differential Pressure (Level) Transmitters
 - (i) Siemens SITRANS P DS III (Process Applications)
- E7.5 Field setup and commissioning:
 - E7.5.1 Field setup and commissioning of the instrumentation may be performed by Trans-West under the Standardization Agreement. Coordinate with Trans-West as required to understand the capabilities and limitations of Trans-West's field setup and commissioning services and provide all remaining services to provide a complete commissioning and start-up.
 - E7.5.2 Field setup and commissioning of the standardized instrumentation shall be performed by Trans-West under the standardization agreement for the following:

- (a) The first instrument of each type installed on site; and
- (b) A minimum of five additional instruments of each type, or 10% of the actuators of that type, whichever is greater.

E7.5.3 The Contractor may provide field setup and commissioning services for the remaining instrumentation via alternate means, provided that this does not result in a reduction of the services or quality of work.

E7.5.4 The services provided are to include at all standard manufacturer recommended start-up and commissioning procedures, as well as the following:

- (a) Visual Inspection
 - (i) Inspect instrument for signs of damage,
 - (ii) Verify mechanical and piping installation per drawings and manufacturer requirements,
 - (iii) Verify wiring installation per drawings and manufacturer requirements, and
 - (iv) Inspect electrical terminal compartment for foreign objects.
- (b) Mechanical Inspection
 - (i) Check all connections and bolts for tightness and to the correct torque,
 - (ii) Check for alignment, and
 - (iii) Ensure appropriate clearances for all connecting bushings and connecting faces.
- (c) Electrical Inspection
 - (i) Check all power wiring connections for tightness,
 - (ii) Check all fuses in the instrument for continuity,
 - (iii) Confirm input voltage is correct, and
 - (iv) Confirm that the signal / fieldbus connections are correct.
- (d) Start-up Services
 - (i) Coordinate turning on power to the instrument,
 - (ii) Configure all applicable settings and parameters that could not be configured prior to installation,
 - (iii) Perform functional tests,
 - (iv) Coordinate with City personnel and designated representatives to confirm and finalize the application requirements,
 - (v) Configure and document all settings, as appropriate for the application,
 - (vi) Coordinate to perform test demonstrations to verify instrument performance,
 - (vii) Verify that all configuration values are in the correct state, and
 - (viii) Transfer the configuration settings to on-site personnel.
- (e) Documentation
 - (i) Provide a signed documented commissioning form for each instrument, in a format acceptable to the Contract Administrator.
- (f) Travel
 - (i) Provide all travel and accommodations at no additional cost.
- (g) Personnel:
 - (i) Personnel shall be factory trained in the maintenance, configuration, and service of the proposed instrumentation.

E7.5.5 Responsibility of the Contractor:

- (a) It is the responsibility of the Contractor to ensure that the installation of the instrumentation is complete and that the instrument is ready to commission prior to engaging Trans-West to commission any instrumentation.

E7.6 The contact for all quotations and purchases:

Amurthan (Amu) Abimanan Branch Manager
126 Bannister Road
Winnipeg, MB, R3R 0S3
Telephone:204-783-0100
Mobile: 204-782-1864
E-mail: amu@transwest-mb.com

E7.7 Quotations and orders:

E7.7.1 Reference the following in all quotation requests, quotations \ proposals, purchase orders, and invoices:

(a) This Bid Opportunity number; and

(b) A statement indicating:

“This request / purchase order is subject to the Terms and Conditions of City of Winnipeg Request for Proposal RFP 449-2014.”

E7.8 Measurement and Payment:

E7.8.1 Payment will be based on Form B, Item 37.

(a) Indicate base costs for material supply under the standardization agreement. Any material mark-up or installation costs, as applicable, shall be included in other line items of Form B.

E8. PRE-CONSTRUCTION PHOTOGRAPHS

E8.1 The Contractor is responsible for taking photographs and/or video of the surrounding structures, houses and landscaping in order to establish the condition of the area around the pumping station prior to commencement of the Work. The pictures and/or video must be submitted to and approved by the Contract Administrator prior to the commencement of the Work.

E9. WORK AND EQUIPMENT SUPPLIED BY OTHER

E9.1 Not applicable under this Contract.

E10. DEMOLITION OF STRUCTURES

E10.1 Description Work

The Work required under this section shall include, but is not limited to, the following:

(a) Partial depth demolition of the wetwell interior concrete surfaces, portion of concrete and brick masonry riser sections to specified limits shown on the contract drawings.

(b) Demolition of the existing superstructure.

(c) Partial selective concrete demolition in the sub-levels of the pump station.

(d) Removal and disposal of construction debris.

E10.1.1 The Work required under this section shall include, but is not limited to, the following:

E10.1.2 Removal of existing superstructure including all electrical, mechanical architectural and structural components as indicated in project drawings; concrete and brick masonry demolition; performing saw cutting; demolition and disposal of existing concrete and brick masonry; and clean-up of work site in anticipation of new work for those demolition areas indicated on the drawings.

E10.1.3 The work to be done by the Contractor under this section shall include the furnishing of all superintendence, overhead, labor, materials, equipment, tools, supplies, and all things

necessary for and incidental to the satisfactory performance and completion of all Works as described hereinafter.

E10.2 References

- E10.2.1 CSA S350-M1980, Code of Practice for Safety in Demolition of Structures.
- E10.2.2 Manitoba Workplace Safety and Health Act, and all applicable National, Provincial and Municipal regulations.
- E10.2.3 Pre-Renovation Hazardous Materials Assessment Report, Tesseract Environmental Consulting Inc.

E10.3 Protection

- E10.3.1 Prevent damage of existing structure to remain. Make good any damage caused by the demolition Work.
- E10.3.2 Take precautions to support adjacent and affected structures and, if safety of structure being demolished or adjacent structures appears to be endangered, cease operations and notify the Contract Administrator.
- E10.3.3 The Contractor shall take precautions during demolition works to prevent damage to existing structures and adjacent property. 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.

E10.4 Execution

E10.4.1 Commencement

- (a) Demolition shall commence after certification of the shoring system has been received and approved by the Contract Administrator.

E10.4.2 Inspection

- (a) Inspect Site with Contract Administrator and verify extent of items for removal, disposal, salvage and items to remain.
- (b) Notify and obtain approval of Contract Administrator before starting demolition.

E10.4.3 Safety Code and Requirements

- (a) Unless otherwise specified, carry out demolition in accordance with the City of Winnipeg Safety Directives and Guidelines.

E10.5 Demolition

- (a) Demolish structures to permit construction of new work as required.
- (b) The work shall be done in accordance with E11 – Hazardous Materials
- (c) Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces and replace as Work progresses.
- (d) At end of each day's Work, leave Work in safe condition so that no part is in danger of toppling or falling
- (e) Do not sell or burn materials on Site.
- (f) Damage to concrete that is to remain shall be minimized. Concrete shall be demolished by sawcutting and subsequent jackhammering using hand-held breakers or jack hammers (maximum 10 kgs/20 lbs unless noted otherwise on drawings). Other methods of performing concrete demolition may be submitted for review and approval to the Contract Administrator. The Contractor shall take measures to ensure that the concrete beyond the limits of demolition is not fractured or shattered. The Contractor shall remove concrete using acceptable methods and replace any concrete which is deemed to be fractured as a result of demolition methods employed by the Contractor. This repair Work shall be performed at no additional cost to the City of Winnipeg.

E10.5.2 Demolition Tolerances

- (a) All demolition shall be done using equipment and procedure to prevent over-breakage of the existing structure.
- (b) Final demolition surfaces must remain locally within (25 mm) of the demolition lines, alignments, or limits shown on the drawings. Demolition beyond the limits shown shall be reviewed by the Contract Administrator. The Contractor shall repair excess demolition to the satisfaction of the Contract Administrator, and at no cost to the City where required.
- (c) All protrusions into the defined limits of demolition shall be removed if they interfere with the placement and alignment of embedded components or reinforcing steel.

E10.5.3 Abrasive Wiresaw and Sawcutting

- (a) Areas of demolition shall be delineated from existing concrete that is to remain using either abrasive disc sawcutting, or abrasive wire sawing.
- (b) All sawcuts shall be performed straight and normal to the surface being cut, following the locations shown on the drawings, or as directed by the Contract Administrator.
- (c) Overruns at the junctions of sawcuts, and mis-starts shall be cleaned and filled with dry patching mortar of matching color, as directed by the Contract Administrator.
- (d) Minimum depths of sawcuts shall be 50 mm (2") unless otherwise shown on drawings.

E10.5.4 Disposal of Demolished Material

- (a) The Contractor shall be responsible for removal of debris and waste from the Work area to the location to an appropriate solid waste disposal area approved by the Contract Administrator.
- (b) Metal debris, which may include reinforcing steel, shall be removed from Site and disposed of by the Contractor.

E10.5.5 Special Provisions – None applicable under this Contract.

E10.6 Measurement and Payment

E10.6.1 Demolition

Demolition will be measured on a lump sum basis and paid for at the Contract Lump Sum Price for "Demolition."

No payment shall be made for demolition beyond the limits specified, or those otherwise approved by the Contract Administrator. The separation, as necessary of embedded and structural steel shall be considered incidental to the Work. The installation of temporary supports, shoring or hangers shall also be considered incidental to the Work. Saw cutting of concrete and removal of construction debris shall be considered incidental to the Work.

E11. HAZARDOUS MATERIALS

E11.1 KGS Group coordinated the completion of a Hazardous Materials Assessment to identify areas of hazardous materials within the Site. The Hazardous Materials Assessment is included in Appendix B of this tender.

E11.2 The Contractor shall note the presence of lead in paints used in existing construction and handle elements with lead containing paint in strict compliance with provincial regulations such as "Managing Demolition Debris Containing Hazardous Materials" by Environmental Compliance and Enforcement, The Dangerous Goods Handling and Transportation Act, Hazardous Waste Regulation etc.

- a) Existing ladders which are to be demolished are coated with lead-containing paint. If these ladders or any other metal components coated with lead-based paint are carefully removed and sent to metal processing or recycling facilities, handling of these components as containing hazardous materials is not required. If such disposal is not

possible, these metallic components would be subjected to hazardous waste handling procedures.

The Hazardous Materials Assessment does not include construction materials which are hidden from view such as superstructure roof base layers, wall finishes hidden from view or any other materials that were not assessed and which are to be demolished. The Contractor shall treat such materials as containing asbestos and shall handle these materials in strict compliance with any provincial regulations such as "Managing Demolition Debris Containing Hazardous Materials" by Environmental Compliance and Enforcement, The Dangerous Goods Handling and Transportation Act, Hazardous Waste Regulation etc.

- b) As an alternative to handling unassessed materials as hazardous, the Contractor may test them, and in the event that laboratory testing reveals no hazardous contents, the tested materials can be handled as non-hazardous. Cost for such testing shall be responsibility of the Contractor. Provide testing results to Contract Administrator as soon as they become available.

E12. DANGEROUS WORK CONDITIONS

- E12.1 The Contractor shall be aware that the following locations are considered confined spaces:
 - a) Wet well within the Lift Station.
 - b) Any other areas labelled as 'confined space' at the Site.
- E12.2 The Contractor shall follow the "Guidelines for Confined Entry Work" as published by the Manitoba Workplace Safety and Health Division for all work involving a confined space.
- E12.3 The Contractor shall be aware of the potential hazards that can be encountered in confined spaces such as toxic gases and oxygen deficiency. The Contractor's Safe Work Plan should address these issues.
- E12.4 The air in a confined space must be tested before entry and continuously during the time that personnel are inside the space. Equipment for continuous monitoring of gases must be explosion-proof and equipped with a visible and audible alarm. The principal tests are for oxygen deficiency and toxic gases. Testing equipment must be calibrated in accordance with manufacturer's specifications.
 - a) The Contractor is responsible for all testing requirements.
- E12.5 The Contractor shall ventilate all confined spaces including underground chambers, tunnels, and shafts as required and approved by the Manitoba Workplace Safety and Health Act (the "Act"). If no ventilation is supplied, a worker must wear a respirator or supplied air to enter the confined space.
- E12.6 The Contract Administrator may issue a stop work order to the Contractor if the above guidelines are not being followed. The Contractor shall not resume operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to the stop work order for not following these safety guidelines.

E13. SALVAGE

- E13.1 All salvaged equipment and materials as determined by the Contract Administrator shall remain property of the City unless specifically noted otherwise. The Contractor shall deliver salvaged equipment and materials to the City of Winnipeg's "Y Yard" outdoor storage compound located at the Northeast corner of the intersection of Dugald Road and Van Bellegham Avenue, Winnipeg, Manitoba.

E13.2 The Contractor shall notify the Contract Administrator at least 48 hours prior to delivery of salvaged equipment to allow for arrangements to be made to receive the salvaged equipment. All deliveries shall be made between 8:00 am and 3:30 pm on Business days.

E13.3 The Contractor shall remove and haul all rejected salvage from the site and legally dispose of it.

E13.4 Removal and delivery of salvageable and non-salvageable equipment and material shall be considered incidental to the Contract Work and no additional payment will be made for such Work.

E14. MOBILIZATION AND DEMOBILIZATION

E14.1 Description

E14.1.1 This Specification shall cover all operations relating to the mobilization and demobilization of the Contractor to the Site, as specified herein.

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 Works hereinafter specified.

E14.2 Scope of Work

E14.2.1 The Work under this Specification shall include but not be limited to:

- (a) Pre-construction meeting in accordance with D5.2, D6.1, and D18.2.
- (b) Mobilizing and demobilizing construction trailers.
- (c) Supply and installation of protection measures for sensitive infrastructure at the Site.
- (d) Utility locates.
- (e) Restoration of existing facilities and other miscellaneous Site works.

E14.3 References

E14.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) City of Winnipeg's Specification CW-1120 (latest edition) – Existing Services, Utilities and Structures.
- (b) City of Winnipeg's Specification CW-1130 (latest edition) – Site Requirements.

E14.4 Materials

E14.4.1 The Contractor shall be responsible for the supply, safe storage, and handling of all Materials as set forth in this Specification. All Materials are to be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E14.4.2 All Materials supplied under this Specification shall be of a type approved by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.

E14.4.3 The Contractor shall provide suitable portable toilet facilities on-Site for his/her use.

E14.4.4 This section also includes travel and accommodation, set-up, and demobilization of storage conveniences and other temporary facilities, construction plant, and other items not required to form part of the permanent Works and not covered by other prices.

E14.5 Equipment

E14.5.1 All equipment shall be of a type acceptable to the Contract Administrator, shall conform to any requirements listed in these Specifications or on the Drawings for the type of Work being performed, and shall be kept in good working order.

E14.6 Protection Measures for Sensitive Infrastructure

E14.6.1 The Contractor shall protect the sensitive components in strict accordance with the Drawings. Generally, the components requiring protection include, but are not limited to:

- (a) Discharge piping;
- (b) Feeder mains;
- (c) Drainage sewer;
- (d) Valve chambers;
- (e) Fire water supply line;
- (f) Gas supply line;
- (g) Any other components indicated on the Drawings or as directed by the Contract Administrator.

E14.6.2 The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing sensitive infrastructure as a result of the Contractor's operations, as determined by the Contract Administrator.

E14.6.3 All materials and protection systems installed shall be removed as part of the final clean-up unless they are to form a part of the permanent Work.

E14.7 Utility Locates

E14.7.1 The Contractor shall be responsible for contacting the appropriate utility authorities to locate all utilities prior to commencing any excavation works or any other works that may potentially damage buried utilities.

E14.7.2 The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations, as determined by the Contract Administrator.

E14.8 Restoration of Existing Facilities

E14.8.1 Upon completion of the Work and demobilization, the Contractor shall restore the Site.

E14.8.2 The Contractor shall be fully responsible to restore the project Site to the original, documented conditions prior to construction, unless as approved by the Contract Administrator. This may include but is not necessarily limited to the Contractor's lay down area and removal of all temporary fencing.

E14.8.3 Topsoil and Sod

- (a) Where topsoil and sodding are required to restore laydown areas, or similar temporary work areas, it shall be considered incidental to mobilization and demobilization. No separate payment shall be made for topsoil and sod in these areas.

E14.9 Quality Control

E14.9.1 Inspection

- (a) All workmanship and all Materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of Materials through to final acceptance of the specified Work.
- (b) The Contractor shall be wholly responsible for the control of all operations incidental thereto, notwithstanding any inspection or acceptance that may have been previously given.
- (c) The Contract Administrator reserves the right to reject any materials or Works which are not in accordance with the requirements of this Specification.

E14.10 Access

- (a) The Contractor shall always allow the Contract Administrator free access to all parts of the Work. The Contractor shall supply samples to the Contract Administrator or his inspector for testing purposes as required. There will be no charge to the City for samples taken.

E14.11 Measurement and Payment

- E14.11.1 Mobilization and demobilization will not be measured and will be paid for at the Contract lump sum price for Item No. 1 "Mobilization/Demobilization, of Form B: Prices which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.
- E14.11.2 Mobilization and demobilization will be paid for as a percentage of the Contract lump sum price for Item No. 1 – "Mobilization/Demobilization" of Form B: Prices measured as specified herein. These percentages shall be as follows:
 - (a) 40% when the Contract Administrator is satisfied that construction has commenced.
 - (b) 40% at Substantial Performance.
 - (c) 20% at Total Performance.

E15. TEMPORARY USE OF CITY EQUIPMENT

- E15.1 City facilities, systems, and equipment shall not be used during construction without the Contract Administrator's written permission. The Contract Administrator reserves the right to withdraw said permission if, in their opinion, proper care and maintenance are not provided.

E16. CONSTRUCTION WORK PLAN

- E16.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
- E16.2 Submit a detailed work plan document for review and approval by the Contract Administrator on each Thursday, indicating the following:
 - (a) Detailed description of all work planned for the next week. Where required or requested by the Contract Administrator, provide:
 - (i) The proposed construction sequence to be followed including all methods to be employed to ensure that no damage or unintended service outages occur.
 - (ii) A description of all proposed methods of construction to be implemented.
 - (iii) Specialized equipment that may be used.
 - (iv) A detailed description, methods, and procedures for all testing (both factory-based testing and field testing).
 - (b) Any design revisions proposed to accommodate the Contractor's proposed method of construction.
 - (c) The Contractor shall respond to any concerns that may be raised by the Contract Administrator's review of the Contractor's construction methods submission.
- E16.3 The Contractor must keep life safety systems, such as fire alarm systems, emergency lighting, gas detection systems operational at all times except for planned and approved outages. Include costs and provide a 24 hours per day / 7 day per week watch person and/or monitoring equipment where systems are made inoperable during the approved outage periods.
- E16.4 No Work shall proceed without the inclusion of the Work on a detailed work plan and corresponding approval of the Work by the Contract Administrator.

E17. ENVIRONMENTAL PLAN

E17.1 Fuels, chemicals, or any other hazardous substances which may compromise the safety of the potable water supply shall not be stored outside of the area designated by the Contract Administrator.

E17.2 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the environmental protection measures as herein specified.

E17.3 Submittals

- (a) Submit an Environmental Protection Plan two (2) weeks prior to start of Work in accordance with Section 01 33 00 – Submittals.
- (b) Environmental Protection Plan to include:
 - (i) Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - (ii) Names and qualifications of persons responsible for hazardous waste removal from Site.
 - (iii) Names and qualifications of persons responsible for training Site personnel.
 - (iv) Descriptions of environmental protection personnel training program.
 - (v) Fuel Handling and Storage Plan describing the Contractor's proposed procedure for refuelling of equipment. The plan shall include the location of the designated refuelling area, the provision of containment membranes underneath all equipment being refuelled, the provision of containment membranes underneath all stationary working equipment (e.g., membranes underneath all cranes to contain any leaks), the proposed procedure for refuelling large stationary equipment away from the designated refuelling area (e.g., refuelling of set-up cranes), proposed locations, types, and volumes of stored fuel, and any other details pertinent to refuelling on Site.
 - (vi) Storm Water Pollution Prevention Plan, if applicable, describing water quality protection measures including erosion and sediment controls, inspections, monitoring, and staff training. The plan shall also provide a schematic drawing indicating location and type of sediment protection measures.
 - (vii) Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on-Site.
 - (viii) Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
 - (ix) Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
 - (x) Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - (xi) Construction Waste Management Plan describing on-site waste management, disposal, reuse of materials, recycling, and staff training.
 - (xii) Hazardous Material Spill Management Plan describing management, reporting, emergency response and contact numbers, as well as staff training.

E17.4 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

- (a) Workplace Hazardous Material Information System (Hazardous Product Act and Canada Labour Code);
- (b) Canadian Environmental Protection Act;

- (c) Canadian Environmental Assessment Act;
- (d) Transportation of Dangerous Goods Act;
- (e) Manitoba Environmental Act;
- (f) The Manitoba Nuisance Act N120;
- (g) The Public Health Act c.P210;
- (h) Manitoba Dangerous Goods, Handling, and Transportation Act;
- (i) The Workplace Safety and Health Act W210; and
- (j) Current applicable associated regulations.

E17.5 The Contractor is advised that the following environmental protection measures apply to the Work.

E17.5.1 Material Handling and Storage

- (a) Construction materials shall not be stored within 5 m of existing pipe centerlines.

E17.5.2 Fuel Handling

- (a) The Contractor shall abide by the regulations of Manitoba Environment for handling and storage of fuel products.
- (b) 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.
- (c) 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.
- (d) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
- (e) Products transferred from fuel storage area(s) to specific work sites shall not exceed the daily usage requirement.
- (f) 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.
- (g) 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.
- (h) A sufficient supply of materials such as absorbent material and plastic oil brooms, 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.
- (i) Fuelling of stationary equipment shall be completed with portable tanks containing only enough fuel to fill equipment.

E17.5.3 Waste Handling and Disposal

- (a) The construction area shall be kept clean and orderly at all times during and at completion of construction.
- (b) At no time during construction shall personal or construction waste be permitted to accumulate for more than one (1) day at any location on the Site, other than at a dedicated storage area as may be approved by the Contract Administrator.
- (c) Indiscriminate dumping, littering, or abandonment shall not take place.
- (d) Equipment shall not be cleaned on Site unless at areas designated by the Contract Administrator.

E17.5.4 Dangerous Goods/Hazardous Waste Handling and Disposal

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

E17.5.5 Fires

- (a) Fires and burning of rubbish on-Site shall not be permitted.

E17.5.6 Emergency Spill Response

- (a) The Contractor shall ensure that due care and caution is taken to prevent spills.
- (b) The Contractor shall report all major spills of petroleum products or other hazardous substances with the potential for impacting the environment and threat to human health and safety, including contamination of potable water, to the Contract Administrator and Manitoba Environment, immediately after occurrence of the environmental accident, by calling the twenty-four (24)-hour emergency telephone number 204-945-4888.
- (c) The Contractor shall designate a qualified supervisor as the on-site emergency response coordinator for the project. The emergency response coordinator shall have the authority to redirect manpower in order to respond in the event of a spill.
- (d) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-Site emergency response coordinator:
 - (i) Notify emergency-response coordinator of the accident:
 - ◆ Identify exact location and time of accident
 - ◆ Indicate injuries if any
 - ◆ Request assistance as required by magnitude of accident (Manitoba Environment twenty-four (24)-hour Spill Response Line 204-945-4888, Winnipeg Police Service, Winnipeg Fire Paramedic Service, company backup)
 - (ii) 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 critical Reservoir infrastructure and other waterlines
 - (iii) If safe to do so, try to stop the dispersion or flow of spill materials:
 - ◆ Approach from upwind
 - ◆ Stop or reduce leak if safe to do so
 - ◆ Dike spill material with dry, inert absorbent material or dry clay soil or sand
 - ◆ Prevent spill material from entering Site infrastructure and utilities by diking
 - ◆ Prevent spill material from entering drainage manholes and other openings by covering with rubber spill mats or diking
 - (iv) Resume any effective action to contain, clean-up, or stop the flow of the spilled product.
- (e) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to the Manitoba Environment according to The Dangerous Goods and Transportation Act Environmental Accident Report Regulation 439/87.

E17.5.7 Controlled Products

- (a) Materials classified as “Controlled Products” under Regulation 52/88, “Workplace Hazardous Materials Information System”, including amendments, are prohibited inside the Site, unless the material will be directly employed in the Work.

E18. 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) Additions to the scope of Work by the Contract Administrator, beyond that defined herein.
- E18.2 A cash allowance has been included as “Extra Work Allowance” 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:
 - (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 a 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%), including the Contractor and all Subcontractors’ mark-ups.
 - (e) Where the Contractor’s immediate Subcontractor is supplying the material:
 - (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%).
 - (f) 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.
- E18.8 Measurement and Payment
 - (a) Additional material will be reimbursed by the actual base cost of the material, multiplied by the approved mark-up factors

E19. METAL FABRICATIONS

E19.1 Description

E19.1.1 General

- (a) This Specification shall cover the supply, fabrication, transportation, handling, delivery and placement of metal fabrications.

E19.2 Materials

E19.2.1 All material shall be of a type acceptable to the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.

E19.3 Material intended for use in the various assemblies shall be new, straight, and clean with sharply defined profiles.

E19.3.1 Steel Sections and Plates: to CAN/CSA G40.20/G40.21, Grade 300 W, except W, HP AND HSS sections, which shall be Grade 350 W.

E19.4 Steel Pipe: to ASTM A53/A53M Grade B, seamless, galvanized, as specified by item.

E19.4.1 Welding materials: to CSA W59.

E19.4.2 Hot dipped galvanized steel repair material: Galvalloy and Gal-Viz.

E19.4.3 Stud Anchors: to ASTM A108, Grade 1020.

E19.4.4 Aluminum: to CAN/CSA S157 and the Aluminum Association 'Specifications for Aluminum Structures'. Aluminum for plates shall be Type 6061-T651. Aluminum plate shall have an approved raised oval or multi-grip pattern.

E19.4.5 Isolation sleeves shall be "Nyltite" – headed sleeves as manufactured by Spaenaur of Kitchener, Ontario, or approved equal.

E19.4.6 Anchor bolts and fasteners: ASTM F1554 Grade 36 (galvanized); ASTM F3125 A325 (galvanized); ASTM A276, Type 316 stainless steel, of ample section to safely withstand the forces created by operation of the equipment or the load to which they may be subjected. Existing concrete shall be scanned for rebar location prior to anchor installation in order to avoid interfering and damaging the rebar.

E19.4.7 Paint: Crane Beams - epoxy paint system as indicated on structural drawings and in this specification section or approved equivalent in accordance with B7; Color: safety yellow , black (crane beams capacity wording).

E19.4.8 Monorail crane beam trolley: Main floor crane beam and sub-level 2 crane beam: OZ1PBT by OZ Lifting Products (1 per each crane beam, 1 tonne capacity); sub-level 3 crane beam: SHB010 hand chain hoist by KITO (1 tonne capacity)

E19.5 Construction Methods

E19.5.1 Submittals

- (a) The Contractor shall submit the qualifications of the fabricator and welders to the Contract Administrator for acceptance. Submit shop drawings in accordance with the shop drawings submission requirements of Section 01 33 00, clearly indicating material, core thickness, finishes, connections, joints, methods of anchorage, number of anchors, supports, reinforcement, details and accessories. Indicate field measurements on shop drawings. Where a specific connection detail is not shown on construction drawings, it needs to be designed by a third-party engineer licensed in Province of Manitoba. Shop drawings showing such connections shall be sealed.

E19.5.2 Fabrications

- (a) Fabricate Work square, true, straight and accurate to required size, with joints close fitted and properly secured. Assemble Work in such a way that no disfigurements show in the finished Work or impair the strength.
- (b) Confirm measurements for all fabrications before fabricating.
- (c) Cut aluminum plate with edges straight and true, as far as practical; maintain the continuity of the pattern at abutting edges.
- (d) Pieces shall be of the sizes indicated on the drawings and shall not be built up from scrap pieces. Confirm sizes with field measurements.
- (e) Where possible, fit Work and shop assemble, ready for erection.
- (f) Remove and grind smooth burrs, filings, sharp protrusions, and projections from metal fabrications to prevent possible injury. Correct any dangerous or potential harmful installations as directed by the Contract Administrator.
- (g) Angle frames shall be of the same material as the cover plate (except for existing frames designated on the drawings for re-use), and cover plates shall be hinged and be supplied with lifting handles, as shown on the drawings. Exterior covers shall be supplied with a hasp for a padlock.
- (h) All steel welding shall conform to CSA Standard W59. Fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with CSA Standard W47.1. Welding shall be done by currently licensed welders only.
- (i) All aluminum welding shall be in accordance with the requirements of CSA W59.2. The fabricator shall be fully certified in conformance with CSA Standard W47.2. All welding shall be done in a licensed welding shop, and no field welding will be permitted unless approved in writing, in advance, by the Contract Administrator.
- (j) Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- (k) Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1.
- (l) Use self-tapping shake-proof flat-headed screws on items requiring assembly by screws.

E19.5.3 Coatings

- (a) Galvanized Steel (monorail crane beams)
 - (i) Remove oil or soap film with detergent or emulsion cleaner.
 - (ii) Lightly abrasive blast with a fine abrasive in accordance with SSPC SP-16 guidelines to achieve a profile of 40 - 75 μm (1.5 - 3.0 mils). When light abrasive blasting is not possible, galvanizing can be treated with a suitable zinc phosphate conversion coating.
 - (iii) Apply one base coat of Amerlock 2 Epoxy paint, 75-125 μm (3.0 - 5.0 mils). Colour: Safety Yellow.
 - (iv) Apply one finish coat of Durethane, 75-125 μm (3.0 - 5.0 mils). Colour: Safety Yellow.
 - (v) For crane capacity wording, apply two coats of Amerlock 2 Epoxy paint, 100 μm per coat dry film thickness. Colour: black. Select font size and location to be in conspicuous space.

E19.5.4 Erection

- (a) Do steel welding Work in accordance with CSA W59 and aluminum welding Work in accordance with CSA W59.2
- (b) Erect metal Work in accordance with reviewed shop drawings, square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

- (c) Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles where not specifically indicated on the drawings.
- (d) Provide components for building in accordance with shop drawings and schedule.
- (e) Make field connections with bolts to CAN/CSA-S16, or weld.
- (f) Touch-up rivets, bolts and burnt or scratched surfaces that are to receive paint finish, with zinc primer after completion of erection.
- (g) Repair damaged galvanized surfaces and field welds with self-fluxing, low temperature, zinc-based alloy rods in accordance with ASTM A780, Repair of Damaged Hot Dip Galvanizing Coatings. The general procedure shall be to allow a small amount of the repair alloy to flow then spread by brushing briskly with a wire brush. Brushing shall be sufficient to obtain a bright finish. Repeat process three (3) times to ensure a proper thickness is achieved. Temperatures shall be kept below 177°C (350°F) at all times. All heating of structural steel Work shall be done in the presence of the Contract Administrator.
- (h) Install access hatch frames square and level at the locations show on the drawings. Embed anchors in concrete as shown on the drawings. Install covers and adjust hardware to proper function.
- (i) All aluminum surfaces in contact with concrete shall be isolated using alkali resistant bituminous paint meeting the requirements of CGSB 31-GP-3M.
- (j) Install electrochemical isolation gaskets and sleeves to electrically isolate dissimilar metals.
- (k) Install trolleys on all monorail crane beams and ensure their proper and safe operation.

E19.6 Measurement and Payment

- E19.6.1 Supply, fabrication, transportation, handling, delivery and placement of metal fabrications will be paid for at the Contract Lump Sum Price for supply and installation of "Miscellaneous Metals."

E20. PUMPS COMPLETE WITH MOTORS, DRIVE SHAFTS, GUARDS AND ACCESSORIES

E20.1 Description:

- E20.1.1 This Specification shall cover the supply of pumping equipment, spare parts and initial on-site start-up inspection of the Goods after installation in the Metcalfe wastewater pumping station.
- E20.1.2 Pumps will be used to pump raw sewage having a temperature range of 0°C to 30°C and will operate under conditions of flooded suction.
- E20.1.3 Each pump shall be a single stage, non-clogging, centrifugal flow, vertical mounted, pump coupled with a drive shaft to an electric motor suitable for dry pit installation.
- E20.1.4 Durable metal nameplates shall be securely attached to each pumping unit supplied. Pump nameplates shall indicate the serial number, capacity, head, rpm, and other pertinent data. Motor nameplates shall indicate the serial number, voltage, phase, hertz, rpm, horsepower, service factor, NEMA Design, insulation class and any other pertinent data.
- E20.1.5 Pumps will be operated at fixed speed on variable frequency drives. Pump performance shall be based on the manufacturer's full size impeller operating at reduced speed as required to meet the specified duty point(s).

E20.2 Products:

E20.2.1 Pumps:

- (a) General Requirements:

- (i) Duty Point A* (Design): 31 l/s @ 19.6 m TDH, NPSHa = 8.84 m
* two pumps operating in parallel, maximum station flow 62 l/sec, point must fall within pump Allowable Operating Range (AOR).
- (ii) Duty Point B** (Runout): 56 l/s @ 15.0 m TDH, NPSHa = 8.52 m
** single pump operating at same speed as Duty Point A, pump vendor to confirm flow at TDH shown, flow must be within pump Preferred Operating Range (POR) between 70% to 120% of Best Efficiency Point (BEP).
- (iii) Type and Size of impeller: Non-clog, full size (do not trim).
- (iv) Size of sphere impeller shall pass: 76 mm diameter (minimum).
- (v) Diameter of pump suction: DN150 (6") or DN200 (8").
- (vi) Diameter of suction Elbow Connection: DN200 (8").
- (vii) Diameter of pump discharge: DN100 (4") or DN150 (6").
- (viii) Pump efficiency at BEP: 70% minimum.
- (b) Unspecified Materials: All unspecified materials shall be selected specifically for their suitability considering their duty.
- (c) Casing: Pump casing: cast iron conforming to ASTM Specification A48 or A278, for Gray Iron Castings, Class 30 or approved equal in accordance with B7.
- (d) Backhead and Stuffing Box:
 - (i) Backhead: cast iron conforming to ASTM Specification A48 or A278, for Gray Iron Castings, Class 30 or approved equal in accordance with B7.
- (e) Bearing Frame:
 - (i) Cast iron conforming to ASTM Specification A48 or A278, for Gray Iron Castings, Class 30.
- (f) Non-Clog Impeller:
 - (i) Impeller: cast iron conforming to ASTM Specification A48 or A278, for Gray Iron Castings, Class 30 or approved equal in accordance with B7. The cast iron shall contain not less than 3 percent nickel.
 - (ii) The impeller to be of the non-clog enclosed channel type.
 - (iii) The impeller shall be keyed to the shaft to permit reverse operation.
- (g) Wear Rings:
 - (i) Wear Rings: fabricated from stainless steel conforming to ASTM Standard A296, for Corrosion-Resistant Iron Chromium, Iron-Chromium-Nickel, and Nickel-Base Alloy Castings for General Application, Grade CA-15 or approved equal in accordance with B7.
 - (ii) Impeller ring hardness to be at least 300 Brinell (RC 32.1).
 - (iii) Casing wear ring to exceed impeller wear ring by at least 50 Brinell.
- (h) Impeller Shaft Assembly:
 - (i) Shaft Assembly: fabricated from steel conforming to ASTM A108, Grade 1045 or approved equal in accordance with B7.
- (i) Shaft Sleeve:
 - (i) Shaft sleeve where shaft passes through stuffing box: fabricated from 316L stainless steel conforming to ASTM A240 or approved equal in accordance with B7.
- (j) Bearings:
 - (i) Bearings: shall be of the heavy-duty anti-friction type suitable for oil or grease lubrication. Radial bearings shall be of the self-aligning plain roller or ball type and thrust bearings shall be of the tapered roller or angular contact type.
 - (ii) Design bearings for a B-10 life of not less than 100,000 hours in accordance with AFBMA.

- (iii) Equipped with IMI model 641B61 vibration sensor (4-20 mA) on pump drive-end bearing only. Vibration sensor wired to junction box with terminal blocks mounted to the pump stand. Refer to Electrical drawings for further details.
- (iv) Equipped with 100Ω RTD temperature sensor on pump drive-end bearing only. RTDs to be wired to a junction box with terminal blocks mounted to the pump stand. Refer to Electrical drawings for further details.
- (k) Mechanical Seals:
 - (i) Mechanical Seals: Cartridge type, single mechanical seals,
 - (ii) Metal Parts: 316 Stainless Steel
 - (iii) Elastomers: Buna-N
 - (iv) Primary sealing mating faces to be silicon carbide to silicon carbide and secondary sealing mating faces to be carbon to silicon carbide or silicon carbide to silicon carbide.
 - (v) As manufactured by Flowserve, John Crane, Durametallic, Burgmann, or approved equal in accordance with B7.
- (l) Paint:
 - (i) One prime coat of a rust inhibitive primer, a second adhesive prime coat and one finish coat of manufacturer's standard enamel.
- (m) Shop Drawing Submittals:
 - (i) Submit shop drawings of the pumps in accordance with Section 01 33 00.
- (n) Approved Products:
 - (i) Flowserve 4MF13C FR4T,
 - (ii) Or approved equal in accordance with B7.

E20.2.2

Motors:

- (a) General Requirements:
 - (i) Power supply: 600V / 3 phase / 60 Hz.
 - (ii) Power Rating: 14.9 kW (20 hp), sized for maximum pump bhp at nominal speed.
 - (iii) Nominal Speed: 1175 to 1200 rpm.
 - (iv) Motor Service Factor: 1.15.
 - (v) Motor Efficiency: NEMA premium motor efficiency.
 - (vi) Full load amps at operating point: 90% of max.
 - (vii) Motor Speed Torque Characteristics: NEMA Design B.
 - (viii) Starts Per Hour Capability: 10.
 - (ix) CSA Specification Conformance: C22.2 No. 100.
 - (x) Inverter duty rated for VFD compatibility.
- (b) Vertical shaft, squirrel cage, totally enclosed fan cooled, NEMA premium efficiency induction motor conforming to CSA Specification C22.2 No. 100 and all other CSA Specifications referenced therein.
- (c) Equipped with motor winding high temperature switch, to be wired to a junction box with terminal blocks mounted to the motor.
- (d) Suitable for inverter duty.
- (e) Suitable for full voltage or reduced voltage starting.
- (f) Suitable for reverse rotation capability.
- (g) Able to operate, without damage, at full load with voltages from 10% below to 10% above rated volts. Motor horsepower shall not be less than 5% in excess of the maximum power requirement of the pump at any point on the pump characteristic curve. This rating shall be exclusive of the motor service factor.

- (h) Motors will be subject to a maximum of ten (10) start/stop cycles per hour and the stator winding insulation suitable for such operation. In no case shall stator winding insulation be less than Class F.
- (i) Equipped with heavy duty grease-lubricated and anti-friction bearings with an AFBMA B10 rating of 100,000 hours.
- (j) Equipped with electrically insulated non-drive end bearing or housing, suitable for VFD (inverter) application.
- (k) Equipped with IMI model 641B61 XY vibration sensor (4-20 mA) on motor non-drive-end bearing only. Vibration sensor wired to junction box with terminal blocks mounted to the motor. Refer to Electrical drawings for further details.
- (l) Equipped with 100Ω RTD temperature sensor on motor non-drive-end bearing only. RTDs to be wired to a junction box with terminal blocks mounted to the motor. Refer to Electrical drawings for further details.
- (m) Equipped with motor shaft grounding ring, suitable for VFD (inverter) application.
 - (i) Approved Product:
 - ◆ AEGIS SGR Bearing Protection Ring,
 - ◆ Or approved equal in accordance with B7.
- (n) Maximum noise level of 85 dBa at 1.2 meter distance.
- (o) Motors to be suitable for vertical mounting either to the concrete floor or base stand.
- (p) Paint:
 - (i) Primer and manufacturer's standard enamel.
- (q) Shop Drawings Submittals:
 - (i) Submit shop drawings of the motors in accordance with Section 01 33 00.
- (r) Approved motor manufacturers:
 - (i) Westinghouse,
 - (ii) General Electric,
 - (iii) Toshiba,
 - (iv) Baldor,(v)
 - (v) U.S. Electric,
 - (vi) TECO,
 - (vii) WEG,
 - (viii) Or approved equal in accordance with B7.

E20.2.3 Drive Shaft Assembly:

- (a) Vertical hollow steel drive shaft with flexible coupling(s) to transmit power from the motor to the pump.
- (b) Drive shaft and coupling(s) shall have a service factor of 2.5 to ensure ample capacity to transmit power continuously for all operating conditions with up to 3 degrees of misalignment which may occur during or develop after installation and should accommodate any thermal expansion based on a temperature differential of 100 degrees Fahrenheit.
- (c) Shop drawing submittals:
 - (i) Submit shop drawings of the drive shaft assembly in accordance with Section 01 33 00.

E20.2.4 Drive Shaft Guard:

- (a) Removable (with tools), minimum 1.6 mm thick galvanized expanded metal steel mesh constructed to CSA standards.
- (b) Finish: CSA Safety Yellow.

- (c) Fasteners: ASTM A276 Type 316 stainless steel.
- (d) Shop Drawing Submittals:
 - (i) Submit shop drawings of the drive shaft guard in accordance with Section 01 33 00.

E20.2.5 Pump Support:

- (a) Provide one rigid four-legged stand or a cast suction elbow/cast stand combination for each pump. Pump support shall firmly support the entire weight of the pump and withstand the full motor torque.
 - (i) The pump support shall provide clear access to the cleanout ports on the suction elbow and the pump volute.
- (b) The pump support should be suitable for mounting onto the new concrete house keeping base using anchor bolts.
 - (i) The installation contractor will have the capability to modify the existing concrete base to suite the pump and pump support.
- (c) Shop Drawing Submittals:
 - (i) Submit shop drawings of the pump support in accordance with Section 01 33 00.

E20.3 Construction Methods:

E20.3.1 General:

- (a) Castings to be free from flaws and imperfections and machined surfaces finished true.
- (b) Round off inside and outside corners and edges of all castings. Provide means to prevent nuts and bolts from becoming loose (pins, spring or friction washered fasteners). Obtain written permission from the Contract Administrator to patch, plug, shim or employ equipment.
- (c) Other means of overcoming defects, discrepancies or errors in manufacturing.
- (d) Statically and dynamically balance all rotating components as an assembled unit in accordance with ISO 1940 G6.3.

E20.3.2 Casing:

- (a) Centrifugal volute type design of ample thickness and rigidity to withstand stresses due to hydraulic forces, weight of piping, erection loads, operating and testing.
- (b) Inside water passages shall be smooth and free from any significant projections that would hinder the flow of any solid waste.
- (c) Proportion casings so change in energy of the sewage from the kinetic form, as it leaves the impeller, to the pressure form as it leaves the casing will take place gradually with minimum eddy formation or shock.
- (d) Front head to permit equal distribution of sewage to all parts of the impeller without the use of stationary guides or vanes on the suction side of the impeller.
- (e) Design to permit the removal of the rotating assembly without disturbing the suction and discharge piping.
- (f) Provide a hand hole with bolted cover on the volute to permit access to the inside for cleaning and unclogging of the volute.
- (g) Provide a tapped 10 millimetre (3/8") NPT hole on the top of the volute with a suitable length of stainless pipe and a shut off ball valve to allow trapped air within the volute to be bled off.
- (h) Shop test and provide certification that the fully assembled casing is successfully able withstand a hydrostatic test pressure of not less than 1.5 times the shut-off head of the largest impeller size as shown by the characteristic curve.

E20.3.3 Suction and Discharge:

- (a) Suction and discharge shall be flanged, faced and drilled to conform to ASME Specification B 16.1 Class 125.
- (b) Provide a cast 90° suction elbow with hand hole and cover plate fastened with bolts, to permit access to the suction side of the impeller for cleaning and inspection.
- (c) Provide gauge connections tapped for 10 mm (3/8") NPT threaded pipe on each suction and discharge nozzle. Locate tapped connection close to flange ends. Provide pipe plugs in tapped holes.
- (d) Orient the suction and discharge horizontally opposite each other on the centreline of the pump.
- (e) Suction elbow is to connect directly to the suction gate valve with a flanged connection.

E20.3.4 Backhead and Stuffing Box:

- (a) Backhead shall be a separate piece from the volute casing.
- (b) Backhead shall be designed to rigidly support the bearing frame and be a self-centering and self-indexing fit with the volute casing to ensure proper alignment.
- (c) Provide a minimum of two large openings opposite each other adjacent to the stuffing box to allow access for maintenance.
- (d) Provide for external axial adjustment of the rotating element to maintain proper clearance between the impeller and front head wearing rings.
- (e) Stuffing box shall be integral with the backhead and suitable for the use of a double mechanical seal.
- (f) Provide tapped 10 mm NPT inlet and vent holes complete with suitable lengths of brass pipe and shut-off ball valves on opposite sides of the stuffing box for seal water inlet and outlet.
- (g) Provide a tapped drain hole on the stuffing box complete with pipe plug.

E20.3.5 Bearing Frame:

- (a) Bearing frame shall rigidly support the motor adapter frame with a self-centering and self-indexing fit with the backhead to ensure proper alignment.
- (b) Machine bearing frame for accurate and permanent bearing alignment.
- (c) Completely enclose the shaft between the bearings.
- (d) Provide lip type seals in contact with the shaft.
- (e) Include grease fittings in the bearing frame for bearing lubrication.

E20.3.6 Impeller:

- (a) Design impeller to ensure smooth operation without cavitation in the operating range and with minimum vibration.
- (b) Cast impeller in one piece and balance both statically and dynamically to ISO 1940 G6.3.
- (c) Trim impeller over its full height if the impeller supplied has been trimmed from a larger impeller leaving no lip or protrusion around the bottom edge.
- (d) Balance trimmed impeller after trimming.
- (e) Machined and polish impeller to Ra12 µ inches.
- (f) Securely key the impeller to the tapered shaft and hold in place with an impeller nut.
- (g) The impeller nut shall be dome shaped with a smooth face and blend into the hub so as not to allow any stringy material to accumulate around the nut. Hex shaped nuts shall not be used.
- (h) Design the impeller and retaining nut so that the impeller cannot loosen on the shaft due to torque resulting from rotation.

- E20.3.7 **Wear Rings:**
- (a) Provide removable wear rings of the axial or radial type for the front head and impeller.
 - (b) Machine the rings for a close fit to minimize the leakage of sewage from the discharge to the suction.
 - (c) Attach the rings in such a way as to allow for ready adjustment or replacement and to prevent loosening under normal operation or under reverse pump rotation.
- E20.3.8 **Impeller Shaft Assembly:**
- (a) Shaft assembly to be of sufficient diameter to assure rigid support of the impeller and to transmit loads without slip, vibration or undue deflection at all operating speeds and loads.
 - (b) Accurately machine the shaft along its entire length and provide keyways at both ends.
- E20.3.9 **Shaft Sleeve:**
- (a) Fit and securely fasten the shaft sleeve in place after shaft grinding.
 - (b) Seal shaft sleeve to prevent leakage between the sleeve and shaft.
 - (c) Extend shaft sleeve at least 2 millimetres above the top of the gland cover.
- E20.3.10 **Bearings:**
- (a) Rigidly support bearings to counteract any possible tendency towards vibration.
 - (b) Grind and match duplex bearings, if used.
 - (c) Adapt lubrication of the bearings to the operation of the units without full-time attendance.
- E20.3.11 **Mechanical Seals:**
- (a) Seals to be process lubricated.
- E20.3.12 **Drive Shaft Assembly:**
- (a) The drive shaft assembly coupling arrangement shall permit easy removal of either the pump or motor without disturbing the other. Only one length of shaft shall be used between the pump and motor.
 - (b) Statically and dynamically balance the drive shaft to obtain vibration free operation. Design shaft to ensure a separation of 50% between the operating speed and the first harmonic frequency of the system (motor, couplings, shaft and pump).
 - (c) The approximate floor elevations for the pumping station are shown in E25.1, Table 1. The Bidder shall use this to approximate the drive shaft length for bidding purposes. Bidder shall confirm distances prior to manufacture.
 - (d) After award of this Contract, the Supplier shall be responsible to take exact measurements for final sizing of the drive shaft lengths.
- E20.3.13 **Drive Shaft Guard:**
- (a) Drive shaft guards, as supplied, shall be meet OSHA standards upon installation without requiring any modification. Installation by others.
- E20.3.14 **Paint:**
- (a) Apply one prime coat of a rust inhibitive primer, a second adhesive prime coat and one finish coat of manufacturer's standard enamel to all exterior metal surfaces, except machined surfaces.
 - (b) Do not paint over nameplates.

E21. GATE VALVES

- E21.1 Application: Pump suction and discharge isolation gate valves.
- E21.2 Sizes: DN200 (8") pump suction, DN150 (6") pump discharge.
- E21.3 Metal seated solid wedge gate valve conforming to AWWA C500, ductile iron body with flanged ends; bronze trimmed, ductile iron wedge; 316 stainless steel stem, double O-ring stem seals, 316 stainless steel fasteners, internal and external fusion-bonded epoxy coating on body and wedge.
- E21.4 Gate valves to be equipped with outside rising stems, screws and yokes and complete with handwheels.
- E21.5 Flanges shall conform in dimension and drilling to ANSI/ASME B16.1, Class 125 with holes straddling centreline.
- E21.6 Direction of opening shall be counter clockwise and shall be clearly stamped or indicated with raised letters and arrow.
- E21.7 Manufacturer's nameplate shall be attached to the valve body with stainless steel fasteners.
- E21.8 Knife gate valves are not acceptable.
- E21.9 Submit shop drawings of gate valves in accordance with Section 01 33 00.
- E21.10 Approved gate valve manufacturers:
 - (a) Mueller Canada,
 - (b) Or approved equal in accordance with B7.

E22. CHECK VALVES

- E22.1 Application: Pump discharge check valves.
- E22.2 Size: DN150 (6")
- E22.3 The valves shall be designed, manufactured, tested and certified to American Water Works Association Standard ANSI/AWWA C508.
- E22.4 The valves shall have flanges with drilling to ANSI B16.1, Class 125 with holes straddling centreline.
- E22.5 Check valve to be rapid closure lever and weight type valve designed for vertical installation.
- E22.6 The valve body shall be full flow equal to nominal pipe diameter at all points through the valve. The top access port shall be full size, allowing removal of the disc without removing the valve from the line. The access cover shall be domed in shape to provide flushing action over the disc for operating in lines containing high solids content. A threaded port with pipe plug shall be provided in the access cover to allow for field installation of a mechanical disc position indicator.
- E22.7 The disc shall be of one-piece construction, precision molded with an integral O-ring type sealing surface and reinforced with alloy steel.
- E22.8 The valve body and cover shall be constructed of ASTM A536 Grade 65-45-12 ductile iron.
- E22.9 The disc shall be precision molded Buna-N (NBR), ASTM D2000-BG. Optional disc material includes Viton, EPDM, Hypalon.
- E22.10 Hinge pin to be stainless steel (303/316).

E22.11 All valves shall be hydrostatically tested and seat tested to demonstrate zero leakage. The manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.

E22.12 Submit shop drawings of check valves in accordance with Section 01 33 00.

E22.13 Approved check valve manufacturers:

- (a) American Valve Company,
- (b) Clow Canada,
- (c) Dezurik,
- (d) Mueller Canada,
- (e) Or approved equal in accordance with B7.

E23. TOOLS, ACCESSORIES AND SPARE PARTS

E23.1 Tools and Accessories:

- (a) Provide special tools or accessories required for maintenance, adjustment, assembly or disassembly of the pumping equipment supplied.

E23.2 Spare Parts:

- (a) Provide the following spare parts:
 - (i) Qty 3 sets of wear rings;
 - (ii) Qty 3 sets of mechanical seals;
 - (iii) Qty 3 sets of bearings;
 - (iv) Qty 3 pump shafts;
 - (v) Qty 3 impellers;
 - (vi) Qty 3 sets of volute and casing gaskets.
- (b) Properly package spare parts to resist damage.
- (c) Clearly identify package as to its contents.
- (d) Spare parts shall be identical to those supplied in the pumps.

E24. TESTING AND INITIAL START-UP INSPECTION FOR THE PUMPING EQUIPMENT

E24.1 Pump and Motor Testing:

- (a) In general, testing and initial start-up in accordance with section 01 91 13 – General Commissioning Requirements.
- (b) Conduct pump tests in accordance with Hydraulic Institute Standards - Centrifugal Pumps Test Code. All definitions for the purpose of testing shall be as set forth by Hydraulic Institute Standards - Centrifugal Pumps Ratings. Each pump shall be tested to include:
 - (i) Hydraulic Performance at Full Speed with varying Head Levels.
 - (ii) Hydraulic Performance at Reduced Speed with Fixed Head Ranges of 15.0 – 19.0 Head Levels
 - (iii) Verification of Vibration and Temperature Readings at various Flow setpoints.
- (c) Pump test to be non-witnessed performance tested as per Hydraulic Institute Standards 14.6 Grade 1B.
- (d) Conduct motor tests in accordance with CSA C22.2 No. 100, EEMAC, MG-2. each motor shall be tested for:
 - (i) Running current,
 - (ii) Hi-pot test
 - (iii) Winding resistance

- (iv) Power factor test
 - (v) Surge test
 - (vi) Partial discharge test
 - (vii) Insulation resistance test
- (e) Conduct instrument tests to vary operation and monitoring. Each instrument shall be tested in the energized and de-energized states.

E24.2 Shop Tests:

- (a) Test each pump in the manufacturer's shops over the range of operation from shut-off to run-out.
- (b) Provide a certified test curve in duplicate showing the head, capacity, pump efficiency and power for each pump to the Contract Administrator for review prior to shipping Goods.
- (c) Test curves to be signed by the pump manufacturer's official responsible for the test.
- (d) Final payment for the Goods will be made only after the Contract Administrator has received the certified test curve for each pump supplied.

E24.3 Field Tests:

- (a) Field tests will be performed on each pumping unit as soon as possible after the Contractor has inspected the installation. Field tests will be to determine and check for the following:
 - (i) Capacity,
 - (ii) Noise (bearing, mechanical seal, cavitation, other),
 - (iii) Vibration,
 - (iv) Electrical energy supplied to the motors from motor control centre, and
 - (v) The liquid pumped during the field test will be raw sewage with a density taken to be 1.00 kilogram per litre.
- (b) If the field pump tests indicates the Goods supplied does not meet the specified requirements, the Contractor shall promptly correct the problem at his expense to the Contract Administrator's satisfaction.
- (c) If the Contractor is not satisfied with the procedure of the tests or the City's interpretation of the results thereof, the Contractor may have the tests repeated, or their interpretation referred to a referee acceptable to both the City and themselves. The cost of the services of such referee shall be borne by the City if the referee rules that the tests as reported by the City were to the detriment of the Contractor but if otherwise, the Contractor shall pay the cost of the services of the referee and of repeating the tests. The decision of the referee shall be final and binding both on the City and the Contractor.

E24.4 Initial Start-Up Inspection:

- (a) Goods supplied under this Contract will be installed under a separate Contract. The pumping equipment supplier will not be responsible for the installation work.
- (b) The Contract Administrator will provide seven (7) Calendar Days notice of requirement for an initial pump start-up inspection.
- (c) Provide the services of a qualified technical representative to be present at the initial start-up of each pumping unit supplied under this Contract to perform the following:
 - (i) Inspect the pumping equipment to ensure they have been properly installed in accordance with the manufacturer's instructions.
 - (ii) Conduct and document amp draw, rotation and speed tests.
 - (iii) Check for unusual vibration or noises.
 - (iv) Instruct City personnel in the operation and maintenance of the Goods.
- (d) Promptly correct any deficiencies with the pumping equipment at own expense to the Contract Administrator's satisfaction.

- (e) The price provided for "Initial Start-up Inspection" shall cover all costs associated with this item of Work including travel expenses, accommodations, meals, and wages.

E25. APPROXIMATE ELEVATIONS AND DIMENSIONS

E25.1 Table 1 – Approximate Elevations

Detail	Elevation
Lift Station Superstructure	232.211 m
Sub-Level 1	229.157 m
Sub-Level 2	223.663 m
Sub-Level 3	221.174 m

E26. PROCESS MECHANICAL WORK

E26.1 Description

- E26.1.1 This Specification covers the process piping, equipment, and materials for the Metcalfe Lift Station Project.
- E26.1.2 The Contractor shall remove the existing pumping units, motors, piping, equipment and materials as required and install new pumping units, piping, equipment and materials as shown on the drawings or as indicated by the Contract Administrator.
- E26.1.3 Mechanical drawings indicate general layout only. The Contractor is responsible for confirming all dimensions prior to manufacture of piping.
- E26.1.4 All equipment and material shall be supplied by the Contractor.

E26.2 Materials:

E26.2.1 Pumping Units:

- (a) Three (3) pumps shall be supplied by the Contractor.

E26.2.2 Pump Motors:

- (a) Three (3) pump motors complete with driveshaft assemblies shall be supplied by the Contractor.

E26.2.3 Process Gate Valves:

- (a) Gate valves shall be supplied by the Contractor.

E26.2.4 Process Check Valves

- (a) Process check valves shall be supplied by the Contractor.

E26.2.5 Carbon Steel Piping and Fittings:

- (a) All piping shall be ASTM A106/A106M Grade B Carbon steel extra heavy wall thickness.
- (b) Fabricated fittings shall conform to ASTM A53/A53M Carbon Steel Grade B, extra heavy wall thickness.
- (c) Steel fittings shall be ASTM A234 Grade B Carbon Steel, extra heavy wall thickness. Dimensions shall be to ANSI B16.9.
- (d) All welded steel flanges shall be in conformance with AWWA C207, Class B. Internal pipe coatings are not required.
- (e) Submit shop drawings in accordance with Section 01 33 00.

E26.2.6 Stainless Steel Pipe and Fittings

- (a) Schedule 40 Stainless steel pipe and fittings to ASTM A312 for stainless steel pipe; Joints: NPT threaded joints; Pressure rating: 10 bar (150 psi)
- (b) Stainless Steel ball valves, (8 – 80 mm): 2 piece; full port; all 304/316 stainless body, follower and ball; Adjustable stem packing, Buna-N seal and seat; hand operating lever. Pressure rating: 10 bar (150 psi). Temperature range: -20°C – 200°C

E26.2.7 Large Diameter Flanges and Adaptor Flanges:

- (a) Thread-on flanges for Ductile Iron Pipe: AWWA C115 or ASME B16.1.
- (b) Adaptor flanges: Ductile Iron, Grade 65-45-12, conforming to the current ASTM Standard A536 for Ductile Iron Castings. Bolt holes shall be drilled in accordance with AWWA C115 or ASME B16.1.
- (c) Clamping screws on adaptor flanges shall be zinc-plated, heat-treated steel with a minimum tensile strength of 28 MPa.
- (d) Submit shop drawings in accordance with Section 01 33 00.

E26.2.8 Dismantling Joints:

- (a) Use Dresser style 131 or Robar dismantling joint with tie rods or equivalent in accordance with B7.
- (b) Materials:
 - (i) Spool Piece: Steel – AISI C1010-C1015
 - (ii) Flange Adapter: Steel – AISI C1010-C1015
 - (iii) Tie Rods: Steel – ASTM A193 Grade B7
 - (iv) Nuts: ASTM A194 Grade 2H
 - (v) Gasket: Grade 27 BUNA S
 - (vi) Coatings: Fusion Bonded Epoxy

E26.2.9 Link Seal

- (a) EPDM rubber modular wall penetration seal designed for permanent sealing with all stainless hardware.
- (b) Pressure rating: Up to 12 m head (1.3 bar)
- (c) Sizing: Match manufacturer's recommendations for pipe size / penetration size ratio
- (d) Approved Product: Link Seal by GPT or approved equal in accordance with B7.

E26.2.10 Miscellaneous Metal Fabrications:

- (a) As per E19 of this specification.

E26.2.11 Pipe Supports and Hangers:

- (a) Pipe supports and hangers to be as shown on the Drawings and in accordance with E19 of this specification.

E26.2.12 PVC Water and Drain Piping:

- (a) As per Section 22 13 16.16.

E26.2.13 Domestic water valves:

- (a) As per Section 22 11 16.

E26.2.14 Plumbing Specialties and Accessories:

- (a) As per Section 22 05 15.

E26.2.15 Sump Pump:

- (a) As per Section 22 10 10.

E26.2.16 Fasteners:

- (a) Flange nuts and bolts shall be ASTM A276, Type 316 stainless steel sized to requirements of flange. Thread-on bolts to extend past nut a minimum of 6 millimetres.
- (b) Anchors shall be Kwik-bolt or Rawl Stud ASTM A276, Type 316 stainless steel. Embedment depth and size, where not shown on the Drawings, to be as required for load being carried or resisted.

E26.2.17 Gaskets:

- (a) Flange gaskets shall be full faced rubberized cloth gaskets, 3mm in thickness.
- (b) Rubber gaskets for adaptor flanges shall conform to AWWA C111, Standard for Rubber-gasket Joints for Cast Iron and Ductile Iron Pressure Pipe and Fittings.

E26.2.18 Paint:

- (a) As per Section 09 91 23.

E26.3 Construction Methods:

E26.3.1 General:

- (a) Install the new station piping and pumping equipment as indicated in this specification and shown on the Drawings. Make no changes, revisions or substitutions to the layout without obtaining written approval from the Contractor Administrator.
- (b) Be aware of and contend with the wastewater in the existing force main when preparing to make the required piping modifications.
- (c) Prior to pumping unit installation, provide a portable sewage pump and discharge hose to remove remaining wastewater in the wet well. The wastewater shall be directed to the upstream manhole or to a sewage hauler for disposal.

E26.3.2 Flow Control and Temporary By-Pass Pumping:

- (a) Provide flow control measures and temporary by-pass pumping in accordance with E26 of this Specification.

E26.3.3 Locating Ground Services:

- (a) The contractor shall be responsible for locating all services.
- (b) Costs for locating the services shall be considered to incidental to the Contract Work.

E26.3.4 Existing Pump Level Controls and Alarms:

- (a) Maintain and protect existing pump controls and float type alarms, located in the wet well or in the other areas of the Station, during the execution of the work until all the new equipment is ready for installation.

E26.3.5 Pumping Units and Piping Installation:

- (a) The existing pumping station contains two (2) pumps complete with motors and related piping. These pumps will be replaced with three (3) new pumps complete with new motors and new drive shafts and related piping.
- (b) Remove all existing piping as indicated in the Specifications and on the Drawings and replace with new piping.
- (c) The Contractor will provide the installation plan to the Contract Administrator at least seven (7) days prior to commencement for approval.
- (d) After new pumps and piping have been installed; all pipes and pipe welds shall be cleaned and prepared for application of primer and paint in accordance with Section 09 91 23.

E26.3.6 Miscellaneous Metal Fabrications:

- (a) As per E19 of this specification.

E26.3.7 Paint:

- (a) As per Section 09 91 23.

E26.3.8 Cleanup:

- (a) Cleanup construction debris and materials inside the Station at the end of each day and before pumping station operation is restored.

E26.3.9 Replacement of Water Service:

- (a) The existing water service piping shall be replaced starting from the water service entrance on Sub-Level 1 to the control room above ground. The City will provide a new water meter to be installed by the Contractor. The Contractor is responsible to supply and install a reduced pressure backflow preventer to Section 224201 and as shown on the drawings.

E26.4 Measurement and Payment:

E26.4.1 Payment will be based on Form B, "Process Mechanical Work", as accepted and measured by the Contract Administrator.

- (a) A maximum of 95% may be submitted for progress payments prior to the total completion of the associated services, including the provision of as-built drawing mark-ups and O&M manuals.

E27. MECHANICAL BUILDING SERVICES WORK

E27.1 Scope of Work:

Provide new ventilation, cooling and heating system in accordance with the drawings and specifications, including but not limited to the following:

- (a) Demolition of the existing supply fan, associated ductwork, control wiring and unit heaters.
- (b) Supply and installation of new supply and exhaust fans, duct heater and appurtenances. See Sections 23 34 00 and 23 55 01.
- (c) Supply and installation of new wall mounted air conditioner for the main floor. See Section 23 81 23.
- (d) Supply and installation of mixing section with dampers and controls. See Section 23 33 15, Division 40 and drawings.
- (e) Supply and installation of new, insulated ductwork. See Section 23 07 13 and Section 23 31 13.01, Section 23 33 00 and Section 23 37 14.
- (f) Supply and installation of new outdoor air and exhaust openings complete with new louvers. See Section 23 31 13.01.
- (g) Supply and installation a new electric unit heaters. See Section 23 82 40.
- (h) Supply and installation fire extinguishers as shown on plan drawings and Section 10 44 20.
- (i) Complete testing, adjusting and air balancing for HVAC equipment. See Section 23 05 93.
- (j) Start-up commissioning and testing in accordance with section 01 91 13 – General Commissioning Requirements.

E27.2 Measurement and Payment:

E27.2.1 Payment will be based on Form B, "Mechanical Building Services Work", as accepted and measured by the Contract Administrator.

- (a) A maximum of 95% may be submitted for progress payments prior to the total completion of the associated services, including the provision of as-built drawing mark-ups and O&M manuals Site Development and Restoration

E28. SITE DEVELOPMENT AND RESTORATION

E28.1 Description

- (a) This Specification shall supplement the requirements of CW1130.
- (b) This Specification shall cover all aspects of the Site Development and Restoration Work, including:
 - (i) Erection, maintenance and removal of safety fencing;
 - (ii) Snow clearing;
 - (iii) Water/flow control;
 - (iv) General access development;
 - (v) Start-up costs;
 - (vi) Equipment setup and removal;
 - (vii) Office facilities;
 - (viii) Access maintenance; and
 - (ix) Site restoration.

E28.1.1 All topsoil, and seeding beyond the quantities listed on Form B: Prices will be considered incidental to Site Development and Restoration, and no additional payment will be made for the additional quantities.

E28.1.2 Additional Site-specific Works included within this Specification are the temporary removal, relocating, and replacing existing site furniture, fencing, and other obstructions within easement right-of-ways and/or as required for site access.

- (a) Works and permits associated with raising and/or relocating overhead power lines and/or light standards as required to facilitate the Works. Contact the local Manitoba Hydro Office to arrange for Manitoba Hydro Staff to lift power lines, temporarily support utilities, and/or relocate utilities as required. Only Manitoba Hydro staff will be permitted to lift power lines.

E28.1.3 This Specification shall amend and supplement Standard Specification CW3510 and CW3520.

E28.2 Materials

E28.2.1 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.

E28.3 Construction Methods

E28.3.1 Site and Construction Access

- (a) The Contractor shall be responsible to develop suitable Site access. This includes but is not limited to, temporary bridging over structures, temporary removal and reinstallation of safety fencing, any landscaping and grading repairs, restoration of vegetation, etc. necessary to restore any Site and construction access area to their pre-existing condition.

E28.3.2 Vegetation Removal

- (a) Some vegetation (living trees smaller than 50 mm, fallen larger trees and sod) removal may be permitted in order to facilitate Site access. Existing vegetation shall not be removed without prior approval from the Contract Administrator. The Contractor shall load and haul any removed vegetation, and dispose of the material off Site immediately upon collection. Stockpiling shall not be permitted unless written approval has been obtained from the Contract Administrator.

E28.3.3 Site Security

- (a) At the end of each work day, all excavations and underground structure openings shall be secured to prevent access. Safety fence shall also be closed and secured to prevent public access.

E28.3.4 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 the commencement of Work 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.

E28.4 Staging Areas

- (a) During the Site Investigation outlined in B3.1, the Contract Administrator will identify staging areas that are acceptable to the City for staging materials and placement of a site trailer.

E28.5 General Site Cleanup and Restoration

- (a) All areas of the construction Site shall be restored to a condition at least equivalent to its original condition prior to initiation of Work. This may include but is not necessarily limited to the Contractor’s lay down area, and removal of all temporary fencing.

E28.6 Permanent Surface Restorations

- (a) If required, permanently restore all existing surface areas disturbed by construction activities including but not limited to areas disturbed by; construction equipment, placement of equipment trailers and where construction materials were stockpiled, shall be restored as follows:
 - (i) Boulevards, ditches and grassed areas – sodding using imported topsoil in accordance with CW3510.
 - (ii) Asphalt surfaces – match existing base course and asphalt thickness or a minimum of 150 mil of base course and 75 mil of Type 1A Asphaltic Concrete, whichever is greater, in accordance with CW3410.
 - (iii) Miscellaneous concrete slabs, including sidewalk – in accordance with CW3235
 - (iv) Interlocking stones – in accordance with CW3330.
 - (v) Concrete curb and gutter – in accordance with CW3240.

E28.6.1 Topsoil and Seed

- (a) The primary means of restoration for existing grassy areas will be sod. A fraction of restoration not exceeding 25% of the total restoration area may be undertaken using topsoil and seed at these locations, or as directed by the Contract Administrator.

E28.7 Method of Measurement and Payment

E28.7.1 Site Development and Restoration

- (a) The site development and restoration shall be measured on a lump sum basis and paid for at the Contract Lump Sum Price for “Site Development and Restoration,” which prices shall be payment in fill for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.
- (b) 50% of the Site Development and Restoration unit price will be paid for on the first progress payment following commencement of the work on the specific Site being developed.

- (c) The remaining 50% of the Site Development and Restoration unit price will be paid subsequent to the completion of the Work and restoration and cleanup of the Site.

E28.7.2 Topsoil and Seed

- (a) Where topsoil and seeding are required to restore laydown areas, or similar temporary Work areas, it shall be considered incidental to Site Development and Restoration. No separate payment shall be made for topsoil and sod in these areas.

E29. EXISTING PUMPING STATION OPERATION DURING CONSTRUCTION

E29.1 The facility related to the Work is critical to the transport of wastewater for the City of Winnipeg. Under no condition shall the station pumping be shut down without prior written permission from the Contract Administrator.

E29.2 The Contractor is advised that the pumping station will be allowed to be taken out of operation only after the Contractor's schedule of activities to complete the Work is approved by the Contract Administrator. The Contractor shall plan his/her construction activities to allow for the minimum amount of disruption time to normal operating status of the station. Temporary by-pass pumping is required when the station is not in operation (reference E32).

E29.3 The Contractor shall cooperate with and provide full access at all times for City personnel to carry out maintenance and operational duties.

- (a) No additional payments will be made for providing access to City forces on the Site or any potential affect City crews might have on the Contractor's Work.

E30. TEMPORARY SHUTDOWN OF THE LIFT STATION

E30.1 Temporary shutdown of the wastewater lift station will be allowed for the following work activities.

- (a) Switch-over between station pumps and temporary by pass pumps and while temporary by-pass pumping is in operation during the lift station upgrades Work.

E30.2 The Contractor is advised that there is a short time window for temporary shutdown of the station at night prior to flow levels reaching the overflow weir elevation of 223.33 m. Based on the City's models, this time window is estimated at being between 2 to 5 hours. Prior to temporary shutdown of the station, the Contractor shall complete a test shutdown of the station to verify the Contractor's time window to install their initial temporary by-pass pumping.

E30.3 All shutdowns must be reviewed and approved by the Contract Administrator prior to the shutdown. Prepare and submit shutdown plans to Contract Administrator a minimum of fifteen (15) Working Days prior to proposed shutdown, with the estimated date included in the Contractor's by-pass pumping plan. The by-pass pumping plan and OSS submittals shall be issued ten (10) Working Days prior to the planned shutdown and commencement of Work (see E32). Shutdown plans must a minimum include:

- (a) Location and duration of shutdown
- (b) Purpose/description of the planned shutdown
- (c) List of all relevant stakeholders
- (d) Risks and contingency planning
- (e) Outline of shutdown plan
- (f) Monitoring requirements
- (g) Key data and elevations

- E30.4 All gate operation and other control relating to the wastewater process will be by the City.
- E30.5 The Contractor shall monitor the upstream system at all times to ensure the stored level of wastewater will not exceed the critical basement elevation.
- E30.6 Schedule work activities requiring shutdown of pumping operations to be done at night, unless otherwise authorized by the City and Contract Administrator in writing.
- E30.7 Water and Waste Department, Collection System personnel will be available to aid the Contractor for shutdown of the wastewater pumping station to facilitate transition of station pumping to the Contractor's temporary pumping system.
- E30.8 Coordination of the lift station shutdown and any associated Work described herein is incidental to Temporary By-Pass Pumping.

E31. BY-PASS MANHOLE AND VALVE ASSEMBLY

E31.1 Description

- E31.1.1 The Work to be done by the Contractor under this Specification shall include the supply and construction of the By-Pass Manhole and Valve Assembly, excavation, bedding, and backfill. Furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for an incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E31.2 Materials

E31.2.1 Fittings and Appurtenances

- (a) Acceptable Manufacturers
 - (i) Robar
 - (ii) Smith Blair OMNI 441
 - (iii) Approved equal in accordance with B7

E31.2.2 Bedding and Backfill

- (a) Bedding and initial backfill material to be sand in accordance with CW 2030.
- (b) Backfill excavations in boulevard and pavement areas to be Class 2 in accordance with clause 3.8.2 of CW 2030.
- (c) Sand bedding and Modified Class 2 backfill material as indicated on the drawings and per CW 2030, modified to have 0.6 m of compacted excavated Site select material as opposed to the detailed 0.3 m of compacted excavated material.
- (d) Backfill under the force main connections shall extend past the flexible couplings to the base of the manhole with cement stabilized fill and bear against undisturbed soil.
- (e) The Contractor shall provide heating and hoarding of backfill material when the temperature is at or below 5° C or if the temperature will fall below 5° C within 24 hours after placing material.

E31.2.3 By-Pass Manhole and Valve Assembly

- (a) A by-pass manhole and valve assembly shall be installed at the station shown on the drawings to allow by-pass pumping operation to take place when required. This by-pass manhole assembly shall be installed as per SD-010 and shall include the installation of a gate valve on the force main upstream of the by-pass tee in the manhole.
- (b) A 200 mm x 200 mm x 200 mm ductile iron tee fitting with a 200 mm gate valve shall be installed on the force main as shown on the Drawings and is to be used for discharging wastewater flows during the by-pass pumping operations.
- (c) The following items shall be procured and installed by the Contractor:

- (i) Two (2) 200 mm gate valves with non-rising stem. Gate valve to conform to current AWWA C590 Standard for Resilient Seated Gate Valves. To be epoxy coated cast iron with a counter clockwise opening rising spindle.
- (ii) Two (2) ductile iron spool pieces for connecting the gate valve and by-pass tee to the Polyvinyl Chloride (PVC) force main on the up and downstream ends using an approved flexible Robar coupling or equivalent.
- (iii) Standard 1500 mm Precast Concrete Manhole as per City of Winnipeg SD-010.

E31.3 Measurement and Payment

E31.3.1 The construction of the By-Pass Manhole and Valve Assembly will be paid for at the Contract Lump Sum Price for "Installation of By-Pass Manhole" with valve assembly. Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification, accepted by the Contract Administrator.

E32. WASTEWATER TEMPORARY BY-PASS PUMPING

E32.1 Description

E32.1.1 This section specifies the requirements for the temporary by-pass pumping of wastewater flows during the Work.

E32.1.2 The expected minimum peak dry weather flow (PDWF) to the station is 18.3 L/s.

- (a) Contractor to review and verify the critical basement elevation in the catchment area.
- (b) Sewers can receive flow of an undetermined amount from watermain breaks, snow melt, rain, and other unforeseen sources. The Contractor will be responsible to monitor the flow in the sewer and adjust work activities accordingly, such as putting the spare standby by-pass pump into operation to handle any excessive flows due to unforeseen flow above the amount identified for PDWF.

E32.2 Materials

E32.2.1 Provide a complete fully automatic pumping system that includes a minimum of two submersible pumps, each with a capacity equal to or greater than the listed PDWF for that station. Expected PDWF is 18.3 L/s. Both pumps are to be installed, always connected to power and discharge piping and be available for operation. A replacement pump of equal capacity shall be immediately provided if one of the two original pumps must be removed from the site for repairs.

E32.2.2 Temporary By-Pass Pumping Equipment

- (a) Non-clog, submersible pumping units, each sized to meet or exceed the required capacity. Complete with all required piping, fittings, floats, alarms, back-up generator, pump controls and related appurtenances suitable for temporary installation in a Lift Station.
- (b) Duty Pump to provide 18.3 L/s.
- (c) Stand-by pump(s) to provide 18.3 L/s.
- (d) Pump head and discharge hose to be sized appropriately to maintain pressure in the existing force main from connection point to the downstream gravity connection (Fifth Avenue/St. Mary's Road intersection, approximately +/- 0.4 km).
- (e) Provide model and capacity curves to the Contract Administrator for review and approval.
- (f) Power supply to be suitably sized for pumping equipment complete with all required controls. Fuel to be in lockable, tamperproof container, approved by the Contract Administrator.
- (g) Contractor shall take special precautions and supply noise abatement measures as required to reduce the public exposure to noise to ensure all work is conducted in

accordance with the City of Winnipeg Neighbourhood Liveability By-Law, Part 5 – Noise Control. Such measures may include but are not limited to:

- (i) Enclosures for noise producing equipment (pumps, generators, etc.)

E32.2.3 Manhole A (New)

- (a) Manhole A may be installed with an additional 1.0 vertical meter sump. Following completion of the project, the sump shall be filled in with concrete to match the sewer invert elevation.

E32.2.4 Fittings and Appurtenances

- (a) Fittings, coupling and appurtenances to be used for repairs to existing force mains and sewers to be approved products for underground use in the City of Winnipeg.

E32.2.5 A combination of smaller sized pumps may be used concurrently if the total discharge flow of the pumps meets the PDWF volumes identified providing replacement pumps are available on-site to maintain the PDWF volume.

E32.2.6 Surface mount, vertical lift suction pumps are not acceptable.

E32.2.7 Inflatable Rubber Sewer Plugs

- (a) Made of rubber, capable of remaining in place when inflated to the pressure required to withstand the expected sewer levels.
- (b) Provided with an inflation/deflation hose, monitoring pressure valve, removal rope or cable and safety chain, all of sufficient length to reach ground elevations for monitoring and removal.

E32.3 Construction Methods

E32.3.1 General

- (a) Provide a plan for monitoring the temporary by-pass pumping to ensure proper operation at all times. The Contractor shall provide 24 hour personnel to address any issues with the temporary by-pass pumping. A 24 hour contact person shall be specified for the project.
- (b) Contractor shall pump flows via the new manhole (MH-A) east of the station. Discharge overflow to the street or river is not allowed, and shall be controlled to show no overflows during by-pass pumping.
- (c) Due to the short available shut down time of the station, initial temporary by-pass pumping will be required to facilitate installation of the by-pass manhole. Contractor shall include plans for their initial temporary by-pass pumping to facilitate installation of the by-pass manhole in their overall temporary by-pass pumping flow control plan.
- (d) All instrumentation in lift station and manholes shall be protected and avoided at all times. Any damage to the lift station instrumentation by the Contractor will be repaired or replaced to the satisfaction of the Contract Administrator.
- (e) Critical Basement Elevation is 223.940 m.
- (f) Overflow Weir Elevation is 223.33 m.
- (g) A single temporary by-pass pump shall maintain level of flows to 300mm below the overflow weir elevation of 223.33 m. As such, the Contractor shall maintain the level of sewage in existing sewers below 223.03 m. A clear marker shall be installed within MH-A to facilitate on-site monitoring.
- (h) The downstream flows of the temporary pumping system can be installed directly into the force main through the gate valve in the new By-Pass Manhole.
- (i) Temporary pumping equipment and materials shall remain on-site until station construction is completed as described in these Specifications and to the satisfaction of the Contract Administrator.
- (j) Provide a temporary by-pass flow control plan to the Contract Administrator for review and approval prior to starting construction. It shall provide detailed information for

pumping equipment to be used including pump capacity and dimensions, depth of submergence, pump controls and installation details. Also include discharge piping details, arrangements to protect manhole openings required to run piping and power to the pumps and power supply details.

- (k) Power supply connection to the existing site power supply shall be approved by the Contract Administrator before set-up.
- (l) Provide suitable traffic ramps approved by the Contract Administrator if the by-pass pumping discharge pipe and power supply cables are laid across vehicle or pedestrian traffic areas on the force main site.
- (m) Cooperation and coordination will always be required with the City to allow full access to the lift station to carry out maintenance and operational duties on the site.
- (n) If wastewater gate operations are required, they shall only be operated by the City.

E32.3.2 Inflatable Sewer Plugs or Weirs

- (a) Only inflatable rubber sewer plugs or weir structures shall be used to plug sewers.
- (b) Clean sewer pipe as required to properly install inflatable sewer plug(s) in accordance with the manufacturer's instructions.
- (c) Secure inflatable sewer plugs at or near the ground surface.
- (d) Continuously monitor air pressure while sewer plug is in place and have proper inflation equipment available at all times.

E32.3.3 Temporary By-Pass Pumping

- (a) Provide a check valve on the by-pass pumping discharge pipe to prevent cycling.
- (b) Power supply for the pumps is the responsibility of the Contractor and must be suitably sized for pumping equipment complete with all required automatic controls. Should one pump not perform, an alarm shall be raised to the contractor's representative and the standby pump shall be used.
- (c) If the first pump cannot maintain level, the second pump shall be used. That is the temporary pumping system shall have the capability to run both pumps at the same time.
- (d) Monitor the upstream system at all times to ensure the stored level of wastewater does not exceed the Maximum Permissible Liquid Level elevation of 223.03 m. (300mm below the Overflow Weir Elevation).
- (e) Provide an alarm when the water level rises to 150 mm above pump start elevation. Send this alarm via cell phone to the contractor's office and at the same time to the Contract Administrator.
- (f) The Contractor shall ensure temporary by-pass pumping equipment and materials will be properly insulated and heated, as required, to be protected from freezing and to maintain proper functioning during cold weather and snow.
- (g) Under no circumstances shall wastewater levels in the sewer rise above the critical basement elevation indicated.

E32.4 Measurement and Payment

E32.4.1 Wastewater Temporary By-Pass Pumping will be paid for at the Contract Lump Sum Price for "Wastewater Temporary By-Pass Pumping". Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification, accepted by the Contract Administrator.

E32.4.2 There shall be no claim for additional costs or time due to increased standby pumping operations from high wet weather flows.

E32.4.3 Should the Contractor install MH-A with an additional 1.0 vertical meter sump to facilitate their Wastewater Temporary By-Pass Pumping, the sump shall be filled in with concrete

once construction is completed. Costs for the additional 1.0 vertical meter sump and filling in with concrete shall be considered incidental to "Wastewater Temporary By-Pass Pumping". No separate measurement or payment will be made.

E33. WET WELL CLEANING

E33.1 Description

- (a) Work under this section shall include cleaning and dewatering of the existing wet well located next to the pumping station.
- (b) This Specification shall amend and supplement Standard Specifications CW 2140.

E33.1.1 Construction Methods

- (a) Cleaning to start only after the inflow and outflow wet well outlets are fully blocked and the temporary by-pass pumping system is in place.
- (b) Cleaning shall include washing the surfaces with high pressurized water. Ceiling and walls shall be cleaned first and then finish with cleaning the floor. Surfaces shall be cleaned to a point where there is no residue covering the concrete surfaces of the wet well or as accepted by the Contract Administrator.
- (c) Cleaning shall also include cleaning of the existing wet well riser manhole including riser rungs.
- (d) Remove all residue from the wet well including any solids, debris, grit etc. Remove any standing water – wet well floor shall be dry.
- (e) Provide photos of cleaned wet well to Contract Administrator for review and approval.
- (f) Maintain the wetwell clean until the completion of the inspection by the Contract Administrator.
- (g) Advise the Contract Administrator immediately when backfill material or large cracks are observed during the cleaning of a sewer and/or chamber. The Contract Administrator will direct one of the following operations be performed:
- (h) Complete or attempt to complete cleaning of the sewer.
 - (i) Suspend cleaning operations and inspect the sewer.
 - (ii) Simultaneously clean and inspect the sewer.

E33.2 Measurement and Payment

E33.2.1 Amend Section 4.1 of Specification CW 2140 to read:

- (a) Wet Well Cleaning will be measured on a time basis and paid for at the Contract Unit Price for "Sewer/Chamber Cleaning". The time to be paid will be the total number of hours of sewer cleaning in accordance with this specification, accepted and measured by the Contract Administrator.
- (b) Sewer Cleaning shall include all water supply costs, permits (access or otherwise), cleaning, reverse set-up cleaning, dumping, travel time, tipping fees, units, flow control and whatever may be required for the cleaning of the wet well chamber and surge tank.

E33.2.2 Delete sections 4.3, 4.7 and 4.8 of specification CW 2140.

E34. WET WELL INSPECTION

E34.1 Description

- E34.1.1 This Specification covers the scope of work associated with the inspection of the wet well chamber for the purposes of assessing thoroughness of cleaning, observing and recording structural and service defects and construction features and to verify new concrete repair construction prior to acceptance.

E34.1.2 Further to E34.1.1, this Specification covers supply of Confined Space Entry equipment, standby rescue team, supplied air, lighting and services required for the purposes of accessing and inspection of the wet well structural condition by the Contract Administrator.

E34.2 Construction Methods

E34.2.1 Wet Well Chamber Inspection

- (a) The Contractor shall provide Confined Space Entry Equipment and Emergency Rescue Services in accordance with current Manitoba Safety Laws & Regulations to allow the Contract Administrator to complete a one (1) day visual inspection of the wet well chamber following completion of cleaning works, quality control inspections during construction, and one (1) inspection at completion of internal concrete repairs (if any) prior to project acceptance. Confined Space Entry Equipment and Services shall at a minimum include but not be limited to the following:
- (i) Air Supply
 - (ii) Ventilation
 - (iii) Calibrated Air Monitor
 - (iv) Fall Arrest Equipment (Uni-Hoist w/ Winch)
 - (v) Lighting (as required)
 - (vi) Ladder (inside the wet well)
 - (vii) Emergency Rescue Services and Equipment

E34.3 Measurement and Payment

E34.3.1 Amend Section 4.4 of specification 2145 to read

E34.3.2 Wet Well Inspection will be measured and paid for at the Contract Lump Sum Price for "Sewer/Chamber Inspection" which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E35. INSTALLATION OF SILT FENCE

E35.1 Description

E35.1.1 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.

E35.1.2 The scope of Work included in this specification is as follows:

- (a) Supply and Install temporary silt fencing at the locations as indicated on the Drawings or as directed by the Contract Administrator, in accordance with the detailed drawing provided, immediately upon completion of the riprap placement and 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.

E35.2 Materials

E35.2.1 Fence Posts

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

E35.2.2 Filter Fabric

- (a) Filter Fabric Shall be a woven geotextile material specifically designed for a silt fence applications, 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

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

E35.2.3 Wire Mesh

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

E35.2.4 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.

E35.3 Construction Methods

- E35.3.1 Ensure that no deleterious substances are discharged into the adjacent watercourse at any time during construction activities.

E35.3.2 Silt Fence Installation

- (a) Excavate 150 x 150 anchor trench along alignment of silt fence as indicated.
- (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 with fasteners as specified in E35.2.3. 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 as shown.
- (c) Install and compact impermeable excavated materials into anchor trench and slope as indicated. Compact to 95% of maximum dry density (ASTM D-698).

E35.3.3 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 installation procedure as specified in E35.2.4. If silt fence is found to be loose or torn, repair or replace as necessary to comply with E32.3.2.
- (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.

E35.3.4 Silt Fence Removal

- (a) The silt fence shall remain in place until new vegetation growth has established on the bank, 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 without releasing any deleterious substances to the adjacent watercourse.

E35.3.5 Measurement and Payment

E35.3.6 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.
- (c) Removal of accumulated sediment from the silt fence is considered incidental to the Work and no separate measurement or payment will be made

E36. TREE REMOVAL

E36.1 Description

E36.1.1 This specification shall cover the removal of existing trees.

E36.1.2 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.

E36.2 Materials

E36.2.1 Existing Trees to be Removed

- (a) The existing trees to be removed include, but not limited to ash, elm, cottonwood, basswood, oak, pine, maple, spruce, etc., all of which may be cut with standard chain saw equipment. The existing trees range from 50 mm to 1,000 mm diameter.

E36.3 Construction Methods

E36.3.1 Prior to commencement of the Work the Contract Administrator shall identify all trees for removal. The Contractor shall cut down only trees designated to be removed, and grub out all stumps and roots greater than 100 mm diameter. In general, the Contractor shall start at the top of the tree and remove branches or trunks not longer than 2 m. Trees are to be felled so as to land within the limits of the Works. The Contractor shall load and haul all trees, stumps, roots, logs, brush, rubbish and all other surface litter from the Site and dispose of these materials at an approved disposal Site, acceptable to the Contract Administrator.

E36.3.2 The Contractor shall take all precautions to prevent damage to structures, adjacent property and to trees and shrubs. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.

E36.3.3 Any trees damaged during construction activities shall be examined by a bonded tree care professional and pruned as required. Damaged trees which are not viable shall be replaced by the Contractor at his own cost.

E36.4 Measurement and Payment

E36.4.1 The removal of existing trees shall be measured on a per tree basis and paid for at the Contract Unit Price per unit for the "Items of Work" listed below. The amount to be paid shall be the total number of trees removed in accordance with this specification, accepted and measured by the Contract Administrator.

Items of Work: Tree Removal

i. 50 mm to 249 mm Diameter

ii. 250 mm to 500 mm Diameter

iii. Greater than 500 mm Diameter

E36.4.2 The removal of trees and brush less than 50 mm diameter is considered incidental to the Work and no separate measurement or payment will be made.

E37. PROTECTION OF EXISTING TREES

E37.1 Removal of some trees will be required. The Contract Administrator will identify which trees will be removed. The Contractor shall take the following precautionary steps to avoid damage from construction activities to any existing trees not marked for removal within the limits of the construction area.

E37.1.1 Do not stockpile materials and soil or park vehicles and equipment within 2 metres of trees.

E37.1.2 Strap mature tree trunks with 25 x 150 x 2400 wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.

E37.1.3 Excavations shall be carried out in a manner to minimize damage to existing root systems. Where roots must be cut to facilitate an excavation, they shall be neatly pruned at the face of the excavation and coated with an appropriate wound dressing to prevent infection.

E37.1.4 Work on Site shall be carried out in a manner to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch.

E37.1.5 American elm trees shall not be pruned between April 1st and August 1st and Siberian elm trees between April 1st and July 1st of any year under provisions of The Dutch Elm Disease Act.

E37.2 All damage to existing trees due to construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Public Works Department, Forestry Branch at the Contractor's expense.

E37.3 Costs for protection of trees shall be considered incidental to Site Development and Restoration. No separate measurement or payment will be made.

E38. NATIVE GRASSES

E38.1 Not applicable under this Contract.

E39. TREE PLANTING

E39.1 Description

E39.1.1 Trees will be planted as directed by the Contract Administrator. Plantings will consist of trees in various container sizes.

E39.1.2 The Work to be undertaken by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as shown on the Drawings and as herein specified.

- E39.1.3 Work shall include, but not necessarily confined to, the relocation, supply and installation of trees and shrubs.
- E39.1.4 Reference
- (a) All plants shall be supplied and installed as per the Canadian Standards for Nursery Stock Current Edition, published by the Canadian Nursery Trades Association, except where specified otherwise.
- E39.1.5 Source Quality Control
- (a) All plant material shall be randomly inspected at the source upon request of the Contract Administrator.
 - (b) Trees are to be grown in nurseries under proper cultural practices as recommended by the Canadian Nursery Trades Association.
 - (c) Only those trees that have been grown for at least the four (4) previous years in local Manitoba nurseries located in an Agriculture Canada Plant Hardiness Zone designation of 2(a or b) or 3(a or b) and within a 250 km radius of Winnipeg, will be accepted. Trees that have grown in plant hardiness zones 1 and 4 or greater will be rejected.
- E39.2 Maintenance
- (a) The Contractor shall be responsible for the maintenance of the trees for a period of one (1) year from the date of Total Performance. Any areas planted after September 15th, the maintenance period will commence on May 15th of the following year or such date as mutually agreed upon by all parties.
 - (b) Water to ensure soil moisture conditions for optimum growth and health of plant material. Ensure watering techniques do not cause erosion.
 - (c) Reform damaged watering saucers.
 - (d) Remove weeds as per overall weed control strategy.
 - (e) Replace or re-spread damaged, missing or disturbed mulch.
 - (f) For non-mulched areas, cultivate monthly to keep top layer of soil friable.
 - (g) If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Contract Administrator prior to application.
 - (h) Apply fertilizer as directed by manufacturer's specifications.
 - (i) Remove dead, broken or hazardous branches from plant material.
 - (j) Keep trunk protection and tree supports in proper repair and adjustment.
 - (k) Remove trunk protection, tree supports and level watering saucers at end of warranty period.
 - (l) Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.
 - (m) Submit weekly written reports to Contract Administrator identifying:
 - (i) Maintenance work carried out.
 - (ii) Development and condition of plant material.
 - (iii) Preventative or corrective measures required which are outside Contractor's responsibility.
- E39.2.1 Warranty
- (a) The Contractor shall, at his/her expense, warrant the Work against any and all defects or deficiencies resulting from insect infestation, disease and mechanical damage due to improper handling, installation or maintenance, for a period of one (1) year from the date of the Total Performance. Nursery stock damaged by vandalism or reasons beyond the control of the Contractor shall be replaced by the client.

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

E39.2.2 Replacements

- (a) During the Warranty Period, the Contractor shall remove from Site any plant material that has died or failed to grow satisfactorily as determined by the Contract Administrator and replace as per Specifications within a maximum ten (10) day period from notification.
- (b) Defective trees shall be replaced within three (3) days of notification to the Contractor, unless otherwise agreed to by the Contract Administrator.
- (c) The Contractor shall extend Maintenance and Warranty on replacement tree for a period equal to the original Maintenance and Warranty Periods.
- (d) The Contractor shall continue such replacement, Maintenance and Warranty until tree is acceptable.

E39.3 Materials

E39.3.1 Planting Soil and Mulch

- (a) As per Planting Preparation.
- (b) Imported soils shall be used to backfill tree and shrub plantings.

E39.3.2 Miscellaneous Materials

- (a) Water shall be potable and free of minerals which may be detrimental to plant growth.
- (b) Stakes shall be metal T-Bar, steel, 40x40x5x2440 mm.
- (c) ARBORTILE® by Deep Root Canada Corp., or equivalent approved by the Contract Administrator.
- (d) Guying Collar shall be plastic tube, 13mm diameter, nylon reinforced.
- (e) Trunk Protection shall be plastic perforated spiralled strip.
- (f) Fertilizer shall be a slow release formulation of low nitrogen and high phosphorus e.g., 10-50-12. Apply quantities at rates stated by product manufacturer.
- (g) Root Ball Burlap shall be 150 g Hessian burlap, biodegradable.
- (h) Wire Baskets shall be horticultural accepted product designed to carry the weight and to contain a burlap-covered root ball. Minimum diameter basket size is to conform to the same minimum diameter of the tree root ball for the respective minimum tree caliper sizes.

E39.3.3 Plant Material

- (a) All nursery stock supplied shall be Canadian Prairie nursery grown, and of species and sizes indicated in the plant list on the Drawings. Its quality shall be in accordance with the "Guide Specification for Nursery Stock of the Canadian Nursery Trades Association".
- (b) Any nursery stock dug from native stands, wood lots, orchards, or neglected nurseries and which have not received proper cultural maintenance as advocated by the Canadian Nursery Trades Association shall be designated as "collected plants". The use of "collected plants" will not be permitted unless specified below.
- (c) Nomenclature of specified nursery stock shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the names accepted in the nursery trade.

- (d) Plants larger than specified may be used if approved by the Contract Administrator. The use of such plants shall not increase the Contract price.
- (e) Plants shall be free of disease, insect infestation, rodent damage, or environmental stress.
- (f) Trees:
 - (i) To be characteristically developed for their species and structurally sound, well branched, healthy and vigorous and densely foliated when in leaf. The tree is to have a healthy, well developed, fibrous root system which may be verified through a testing procedure that destructively samples one or more randomly selected root balls;
 - (ii) To have been root pruned regularly, but not later than one growing season prior to arrival on-site. The Contractor may be required to furnish documentation to the client on their root-pruning program. Trees in excess of 75 mm caliper are to have been half root pruned during each of two successive growing seasons, the latter at least, one growing season prior to arrival on-site;
 - (iii) To have all parts, especially lower branches, moist and show live, green cambium tissue when cut;
 - (iv) Single stem trees to have only one, sturdy, reasonably straight and vertical trunk, and a well-balanced crown with fully developed leader.
 - (v) To be free of disease, insect infestation, rodent damage, sun scald, frost cracks, abrasions, unhealed scars, scars exceeding 5cm in diameter, major forks or crooks in the trunk, broken branches, or angled leaders. Trees having the above defects will not be accepted by the Contract Administrator;
 - (vi) Trees having a leader which has developed at a sharp angle to the trunk as a result of pruning or trunk damage will not be accepted;
 - (vii) Trees exhibiting suppressed, weakly developed branches due to competition from other closely spaced trees in the nursery will not be accepted. Trees exhibiting dead branches will not be accepted.
 - (viii) Any tree that has come out of dormant stage and is too far advanced will not be accepted unless prior approval obtained. Approval is required for any tree which has been held in cold storage.
 - (ix) Balled and burlapped trees in excess of a 3 m height must have been dug with large firm ball. Roots in root balls must be comprised of 75% fibrous and feeder root systems. Secure root balls with burlap, heavy twine and rope. For trees 75 mm or more in caliper, wrap ball in double layer of burlap and drum lace with minimum 10 mm diameter rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.
 - (x) Tree spade dug trees are to be dug with mechanized digging equipment with hydraulic spade. Lift root ball from hole, place in wire basket designed for purpose and lined with burlap. Tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.
 - (xi) Use of collected or native trees is not permitted.

E39.3.4 Tree Quantity and Size

- (a) Trees are to be planted at the quantities and caliper listed in Form B and broken down in detail below. Any variations to size, caliper or species of specified trees will require a request for approval from the Contract Administrator.
 - (i) Large trees shall be a minimum 75 mm caliper, 2.5 m in height, with a minimum of eight (8) major branches 2 m above grade, have balled and burlapped root balls, and be double stake. Tree species specific to the site shall consist of:
 - ◆ American Elm
 - ◆ Bur Oak

- ◆ Manitoba Maple
- ◆ Basswood
- ◆ Cottonwood

- (b) Planting locations will be determined on-site by the Contract Administrator.
- (c) Trees are to conform to the measurements specified in Form B, except that trees larger than specified may be used if approved by the Contract Administrator.
- (d) Trees are to be measured when the branches are in their normal position. Height dimensions specified are to refer to the main body of the tree and not from branch tip to root base. Where trees have been measured by caliper or diameter, reference is to be made to the diameter of the trunk measured 15 cm above the ground as the tree stands in the nursery prior to lifting. Caliper of tree shall be appropriately designed on a permanently fixed tag on one of the branches.

E39.3.5 Shipment and Pre-Planting Care

- (a) Coordinate shipping of trees and excavation of holes to ensure minimum time lapse between digging and planting.
- (b) Tie branches of trees securely, and protect trees against abrasion, exposure and extreme temperature change during transit. Avoid binding of trees with rope or wire which would damage bark, break branches or destroy natural shape of tree. Give full support to root ball of trees during lifting.
- (c) Cover tree foliage with tarpaulin, and protect bare roots by means of dampened straw, peat moss, saw dust or other acceptable material to prevent loss of moisture during transit and storage.
- (d) Remove broken and damaged roots with sharp pruning shears. Make clean cuts, and cover cuts over 10 mm diameter with a tree wound dressing.
- (e) Keep roots moist and protected from sun and wind. Heel-in trees which cannot be planted immediately in shaded areas and water well.

E39.4 Construction Methods

E39.4.1 Workmanship

- (a) All areas and locations provided for planting will be staked out or painted on-Site by the Contract Administrator. Excavation shall not proceed until the layout has been inspected and approved by the Contract Administrator. Excavation shall not be undertaken until all underground utilities have been located and protected.
- (b) Coordinate operations. Keep Site clean and planting holes drained. Immediately remove soil or debris spilled onto street pavement, grass or sidewalk.
- (c) Work to be coordinated with installation of fencing and planting of shrub.

E39.4.2 Planting Time

- (a) Plant trees as early as May 15 but no later than June 30 depending on when Topsoil are placed and prepared.
- (b) Plant only under conditions that are conducive to health and physical conditions of trees.
- (c) Provide planting schedule to Contract Administrator. Extending planting operations over long period using limited crew will not be accepted.
- (d) The Contractor must obtain all above and below ground clearances from all the utilities as well as the appropriate District Operations Branch in a timely manner so as not to jeopardize the schedule of the complete tree planting Contract.

E39.4.3 Excavation

- (a) Tree pit to be dug with back hoe.
- (b) Excavate tree pits as indicated by stakes or paint marks.

- (c) Protect bottom of excavations against freezing.
- (d) Remove water which enters excavations prior to planting. Ensure source of water is not ground water and notify Contract Administrator.
- (e) Upon excavation of the planting, the excavation shall be backfilled with a Topsoil mixture to a depth to permit adequate installation and stabilization of the plant material. Topsoil shall be placed in accordance with City of Winnipeg Standard Construction Specification CW 3540 to a 300 mm depth.

E39.4.4 Installation

- (a) Plantings of trees shall be undertaken as approved by the Contract Administrator. Configuration of planting shall be subject to input and final approval by the Contract Administrator.
- (b) Planting shall be done during periods of suitable weather conditions and in accordance with locally accepted practice.
- (c) Trees are to be planted within forty-eight (48) hours of excavation from the nursery.
- (d) No tree pit is to be left open at the end of the Contractor's Work Day. Planting program is to be planned to ensure that all approved trees delivered to the Site at designated planting locations are installed and thoroughly watered the same day as delivery.
- (e) With balled and burlapped root balls and root balls in wire baskets, burlap shall be loosened and cut away from the top 1/3 without disturbing root ball. Wire shall be cut away and removed from the top 1/3 of the root ball. Burlap or rope shall not be pulled from under root ball. Non-biodegradable wrapping shall be removed.
- (f) To avoid future root girdling, The Contractor shall ensure that roots are not coiled around the root ball. After removal from the container, if it is seen that roots are coiled around the root ball, roots must be loosened and spread out in a more natural form before planting in order to establish healthy root development and root direction after planting.
- (g) After inserting the tree and tamping the root system with Topsoil in layer of 150mm, water shall be poured in until the pit is thoroughly soaked. Filling of the hole shall then be completed and the fill-in soil shall be packed firmly around the roots, leaving a concave surface for convenient watering. After filling, the planting shall be watered at frequent intervals.
- (h) Each tree is to have an earth saucer at its base having a diameter as large as the excavation with a 10 cm lip formed at the perimeter of the saucer to retain water.
- (i) All nursery stock shall be set plumb in the centre of pits and at levels as shown on the planting details after settlement has taken place.
- (j) Nursery stock shall be faced to give the best appearance or relationship to adjacent structure and to the approval of the contract administrator. Trees shall be placed equal to depth they were originally growing in nursery.
- (k) Tree pit depth shall be such that the top of the root ball is even with the existing grade, considering that proper planting depth requires the root flare to be at or slightly above the finished grade. It is important to determine how deep the root flare is in the ball before it is placed in the planting hole. Sometimes the top of the ball may need to be raised until the root flare is at the proper planting depth and/or soil must be removed from the top of the ball.
- (l) Each tree must be planted such that the trunk flare is visible at the top of the root ball. Trees where the trunk flare is not visible shall be considered a deficiency and payment for the planting will not be received until the deficiency is addressed. Do not cover the top of the root ball with soil.

E39.4.5 Supply and Installation of Mulch

- (a) Contractor to supply and install mulch in tree pit, planters and in areas as indicated in the Drawings. Mulch supplied shall cover entire planting area to a consistent depth of 100 mm.
- (b) Mulch must not be placed within 8 cm (3 in) of tree trunks.

E39.4.6 Fertilizing

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

E39.4.7 Trunk / Beaver Protection

- (a) Install trunk protection on trees.
- (b) Install trunk protection prior to installation of tree supports when used.

E39.4.8 Pruning

- (a) The Contractor shall provide a licensed Manitoba Certified Arborist for each Work crew or Work Site.
- (b) Employ clean sharp tools and make cuts flush with branch collars. Remove dead and injured branches.

E39.4.9 Watering

- (a) Trees are to be watered during the planting procedure as described previously, and once a week thereafter, or more frequently as required, during the growing season.
- (b) Apply 40 litres of water per 25 mm caliper per application using deep root feeder or low/pressure nozzle and hose. The water stream must not gouge out a hole in the soil and mulch.
- (c) A complete record is to be kept of each series of waterings for all planted trees noting: 1) location, and 2) date of watering. This record shall be sent bi-weekly to the Contract Administrator.

E39.5 Measurement and Payment

E39.5.1 Installation and maintenance of trees shall be measured on a per unit basis. The amount to be paid for shall be the total number of trees supplied and installed in accordance with this Specification, and as acceptable to the Contract Administrator.

E39.5.2 Payment for Installation and maintenance of trees shall be paid for at the Contract Unit Prices for "Tree Revegetation". This price shall be payment in full for supplying all labour, equipment and materials, and performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E40. EROSION CONTROL BLANKETS

E40.1 Description

E40.1.1 This Specification shall cover the supply and placement of erosion control blankets to provide temporary erosion control in localized areas (as directed by the Contract Administrator)

E40.2 Materials

- (a) The blanket material shall consist of wheat or barley straw, coconut fibres, or other plants approved by the Contract Administrator. Acceptable products will be S32 BD Double Net Straw Blankets with biodegradable netting or approved alternative in accordance with B7. The blanket material shall be air dried, reasonably light in colour, and shall not be musty, mouldy, caked or otherwise of low quality. The blanket material shall be free of coarse

- (b) (chaff) material and free of noxious weeds and/or seeds to prevent the introduction of weeds into previously seeded and planted areas.

E40.3 Construction Methods

E40.3.1 General

- (a) The Contractor shall supply and place erosion control blankets immediately after final grading is completed and prior to **March 15**.
- (b) Erosion control blankets shall be placed as directed, measured and accepted by the Contract Administrator.
- (c) Covered areas shall be inspected periodically and after runoff producing storm events. Damaged areas shall be repaired immediately as determined by the Contract Administrator. Areas requiring recovering as directed by the Contract Administrator will be re-measured and additionally paid for at the Contract Unit Price for the Work item.

E40.3.2 Installation

- (a) The erosion control blankets shall be installed as per the manufacturer's recommended procedures. Blankets shall be rolled out on smoothed out soils starting from the top of the slope. The Contractor is to start by stapling the blanket at the top of the slope in a 150 mm deep by 150mm wide trench. The trench will be backfilled and compacted so that water will flow evenly onto the blanket.
- (b) The Contractor shall roll the blankets down the slope insuring soil blanket contact. Edges are to be overlapped a minimum 50 mm with parallel blankets.
- (c) If more than one blanket is need for the run down the slope then adjoining ends must be overlapped a minimum 100 mm shingle style. Overlapped areas are to be stapled with a staggered pattern of staples.

E40.3.3 Removal

- (a) Immediately prior to placement of topsoil and sod and/or topsoil and seed all erosion control blankets shall be removed and disposed of off-Site.

E40.4 Measurement and Payment

- E40.4.1 Supply, placement and removal of erosion control blankets will be measured on an area basis and paid for at the Contract Unit Price for "Erosion Control Blankets". The area to be paid for shall be the total number of square metres of ground covered by blankets, supplied and placed in accordance with this Specification, accepted and measured by the Contract Administrator.

E41. EXCAVATION & SHORING

E41.1 Description

- E41.1.1 This Specification shall cover shoring requirements for the Works where required under Manitoba Acts, Regulations, and Guidelines, or as indicated on the Drawings.

E41.2 Construction Methods

E41.2.1 Excavation

- (a) Remove excavated material from the Site immediately. Excavated material shall not be stockpiled on-Site or along riverbank.
- (b) All Working areas below grade shall be kept adequately and securely supported during and after excavation until the shoring and bracing is in place to prevent loss of ground or injury to any person from falling material.

E41.2.2 Excavation Safety Fence

Further to Clause 3.1 of CW 1130, completely cover the excavation and provide a security fence to completely surround the excavation when unattended generally in accordance with the following. Safety fence installed shall be as per E25..

E41.2.3 Shoring

- (a) The type, strength, and amount of shoring and bracing shall be such as the nature of the ground and attendance conditions may require, considering property lines, existing slopes, utilities and roadways.
- (b) Shoring and bracing shall be so spaced and dimensioned as to prevent caving, loss of ground, surface settlement, or squeezing of the soil beyond the neat lines of excavation. It shall be free from defects that might impair its strength or suitability for the Work. Sheeting/shoring and bracing shall conform to the latest revisions of the "Construction Safety Act" of the Department of Labour of the Government of Manitoba and in accordance with Province of Manitoba "W210 The Workplace Safety and Health Act" and "Guidelines for Excavation Work".
- (c) Supporting design information, including soil log information and stratigraphy, and design calculations as required to facilitate review of the submission for conformance with the Contract Documents.
- (d) Submit AutoCAD Shop Drawings and design calculations for the shoring/excavation system designed as well as the shop drawings sealed by a Professional Engineer registered and licensed to practice in the Province of Manitoba and experienced in the structural design of shoring systems. The designer of the shoring system shall inspect the system during construction and certify, in writing to the Contract Administrator, that construction is in conformance with the approved design.
- (e) Shoring and bracing shall be installed such that the structure size and wall thickness shown on the shop drawings can be obtained subsequent to installation of the shoring system.
- (f) Shoring and bracing shall be designed and installed to prevent settlement and damage to existing structures. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his/her cost, to the satisfaction of the Contract Administrator.
- (g) Shoring and bracing shall be designed and installed to ensure that there is adequate space to achieve compaction of bedding and backfill and such that it does not impact compaction of bedding and backfill and/or cause settlement when shoring is removed.
- (h) Shoring and bracing shall remain in place until concrete has attained 75% of the design strength.

E41.2.4 Monitoring Movement of Shoring

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

E41.3 Measurement and Payment

- E41.3.1 All costs associated with temporary shoring to meet Manitoba Safety Laws and Regulations shall be measured on a lump sum basis and paid for at the Contract Unit Price for "Excavation and Shoring".

E42. CAST-IN-PLACE CONCRETE CONSTRUCTION

E42.1 Description

- E42.1.1 This specification shall cover construction of cast-in-place concrete and shall supplement, revise and amend CW 2160.

E42.2 Materials

(a) Concrete Mix Design

(i) Grade Beam, Corbels and Slab

Class of Exposure	S-2
Maximum Size of Aggregate	20 mm
Cement Type	HS
Maximum Water/Cementing Materials Ratio	0.45
Compressive Strength at 56 Days	32 MPa
Slump/Flow	80 mm +/- 20 mm
Air Content	6.5% +/- 1.5%

(ii) Wetwell Riser

Class of Exposure	S-1
Maximum Size of Aggregate	20 mm
Cement Type	HS
Maximum Water/Cementing Materials Ratio	0.4
Compressive Strength at 56 Days	35 MPa
Slump/Flow	80 mm +/- 20 mm
Air Content	6.5% +/- 1.5%

(iii) Concrete Apron (Approach) At Entrance

Class of Exposure	C-1
Maximum Size of Aggregate	20 mm
Cement Type	GU
Maximum Water/Cementing Materials Ratio	0.40
Compressive Strength at 28 Days	35 MPa
Slump/Flow	80 mm +/- 20 mm
Air Content	6.5% +/- 1.5%

(iv) All admixtures must be compatible and meet the following standards:

- ◆ Air entraining agents to ASTM C260
- ◆ Chemical admixtures (water reducing) to ASTM C494
- ◆ Type F high-range water reducing (super-plasticizing) admixture shall be used when a slump of more than 110 mm is desired.

(b) Grout

- (i) Grout shall be Sika Grout 212 or approved equal in accordance with B7.
- (ii) Hydraulic cement for form hole patching shall be Xypex Patch-n-Plug or approved equivalent in accordance with B7.

(c) Reinforcing Steel

- (i) Bar accessories:
 - To be made of a non-corroding material
 - Shall not stain, blemish or spall the concrete surface for the life of the concrete

- Shall be approved by the Contract Administrator
- Bar chairs shall be PVC
- (ii) Bonding Agent shall be Sika Latex R or approved equivalent.
- (iii) Reinforcement is new deformed billet steel bar conforming to CSA G30.18 (Latest). Grade 400.
- (iv) Refer to structural drawings for concrete cover requirements.
- (v) Reinforcing steel shall be clean, free of rust, dirt, loose scale, oil, grease or any material that could reduce bond with the concrete.

E42.3 Construction Methods

E42.3.1 Construction Method Submission

- (a) No Work shall commence on construction of cast-in-place concrete until after the Contract Administrator's review of the Contractor's Construction Method submission.
- (b) The Contractor shall prepare for the Contract Administrators review a Construction Method submission detailing:
 - (ii) Construction sequence to be followed including all methods to be employed.
 - (iii) Specialized equipment to be used.
 - (iv) Any design revisions proposed to accommodate the Contractor's proposed construction method.
- (c) The Contractor shall respond to any concerns that may be raised by the Contract Administrator after review of Construction Method submission.

E42.3.2 Pump Station Upgrades

- (a) Construct cast in place concrete in accordance with CW 2160, CSA A23.1, except as supplemented, revised or amended in this specification and as indicated in the construction notes on the drawings.
- (b) Adjust the location of reinforcing steel adjacent to openings to frame those openings in accordance with good practice, and maintain the bar spacing intent.
- (c) Do not use welded splices for reinforcing steel.
- (d) Remove all form tie plastic cones and patch with hydraulic cement compound.

E42.4 Measurement and Payment

Construction of the cast-in-place concrete will be paid for at the Contract Lump Sum Price for "Cast-in-Place Concrete." Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification.

E43. WET WELL SURFACE REFINISHING, CRACK REPAIRS & CONCRETE SPALL REPAIRS

E43.1 Description

- (a) This specification shall cover the demolition and repair work related to refinishing of Wet Well interior surfaces, concrete crack repairs and concrete spot repairs.
- (b) The locations and extent of repairs shall be as determined by the Contract Administrator upon completion of wetwell inspection.

E43.2 Materials

- (a) Materials shall be as indicated in the Construction Methods section E40.3 and in project drawings. Equivalent products and/or alternative construction methods shall be approved by the Contract Administrator prior to repairs. The Contractor shall supply to the Contract Administrator, Material Data Sheets and Product Information for approval prior to commencing repairs for review and approval.

E43.3 Construction Methods

(a) Wet well surface refinishing:

- (i) Wetwell surface preparation and refinishing shall be completed as per instructions shown on the project structural drawings;

(b) Concrete crack repairs:

- (i) Identify all cracks scheduled for repair as identified by the Contract Administrator after the completion of wet well inspection.
- (ii) Remove any loose material from the concrete surface adjacent to cracks by wire brushing a 50 to 75 mm wide strip along the cracks, and vacuuming all dust from the surface.
- (iii) Install surface ports for injection along the cracks at spacing ranging from 100 to 300 mm depending on the width of the crack. The base plate of each entry port shall be adhered onto the concrete surface using Kemko 022 or Sikadur 33. The ports shall be coated with the same material over the top of the base plate to assure a good seal and stability of the port during the injection process.
- (iv) Surface seal material with paste adhesive Kemko 022 or Sikadur 33. Paste shall be applied to the face of the crack between injection ports to build a confinement area for the liquid epoxy resin.
- (v) After curing of the surface seal, a two-component epoxy resin/hardener suitable for the structural repair of cracks and delaminations in concrete; Kemko 038 or Sikadur 52 shall be injected into the crack starting at the lowest injection port. The injection will continue at the same port until there is an appearance of epoxy resin at the next port adjacent to the entry port being pumped. The injection epoxy resin shall be selected based on the thickness of the crack (for hairline cracks Kemko 068 or Sikadur 55 will be used).
- (vi) When epoxy adhesive travel is indicated by appearance at the next adjacent port, injection can be discontinued on the entry port being pumped and epoxy injection shall be transferred to the next adjacent port where epoxy adhesive has appeared. The first entry port must be plugged. The epoxy injection on any intermediate entry port being pumped shall not be discontinued unless the injection pressure reaches 150-160 psi or directed by the Contract Administrator. The above steps will be repeated until cracks are completely filled along their length.
- (vii) As soon as the crack is full and all injection ports are blocked, the pump shall be run for several seconds to create a pressure of 100 psi in the crack that will be maintained for one (1) minute. Once the epoxy adhesive in the crack is pressurized and no leaks are observed, the pump shall be disconnected from the port and the injection port shall be plugged.
- (viii) The above steps shall be repeated for all cracks or set of cracks that are connected, until all cracks are injected.
- (ix) For every day that injection work is performed, an Injection Report shall be completed to document type of injection equipment, location, quantity of materials, and amount of crack length injected each day.
- (x) After all injection work is completed and cured, the crack seal shall be removed (after 12 hours) by grinding to obtain a smooth concrete surface.
- (xi) Cleanup work area and demobilize.

(c) Concrete Spall Repairs:

- (i) Identify all spalled areas scheduled for repair as identified by the Contract Administrator after the completion of wet well inspection.

- (ii) Saw cut the perimeter of the patch to a minimum of 13 mm outside the limits of the spalled/deteriorated area designated for repair.
- (iii) Chip and remove the delaminated concrete until sound concrete is encountered to provide a solid bond.
- (iv) Remove any coatings that may reduce bond between the existing concrete and repair mortar/grout.
- (v) Remove a minimum of 25 mm of concrete from around all encountered rebar to provide a solid bonding area.
- (vi) Prepare demolished concrete surface to CSP-3 profile.
- (vii) Surface prepare reinforcement to SSPC-SP3 (power tool cleaning).
- (viii) Repair overhead and sidewall patches using a Sikatop 123 Plus repair mortar. The product shall be prepared and installed according to the manufacturer's instructions.

E43.4 Measurement and Payment

- (a) Wet Well Surface Refinishing will be measured on area basis and will be paid for at the Contract Unit Price for "Wet Well Surface Refinishing". Area to be paid for will be the total area of refinishing inspected, accepted and measured by the Contract Administrator.
- (b) Concrete Crack Repairs will be measured on a length basis and will be paid for at the Contract Unit Price for "Concrete Crack Repairs". Length to be paid for will be the total length of repaired concrete cracks inspected, accepted and measured by the Contract Administrator.
- (c) Concrete Spall Repairs will be measured on area basis and will be paid for at the Contract Unit Price for "Concrete Spot Repairs". Area to be paid for will be the total area of refinishing inspected, accepted and measured by the Contract Administrator.

E44. COLD WEATHER REQUIREMENTS

- E44.1 Should any concrete Work be required to be carried out when the daily mean temperature is below 5°C or anticipated to be below 5°C within the next 24 hours, cold weather requirements will be specified herein.
- E44.2 All freshly placed concrete shall be protected from the elements and from defacements due to construction operations.
- E44.3 The following are minimum requirements for protecting concrete during and after placement during freezing weather, but mere adherence to these requirements will not relieve the Contractor of the necessity for producing concrete which has not been weakened or injured by frost or freezing, or replacing such damaged Work at no additional cost to the City;
 - (a) Before any concrete is placed, all ice, snow, and frost shall be completely removed from all formwork, and other surfaces against which concrete temperatures of such surfaces raised above 7°C for twenty-four (24) hours minimum prior to concreting. Where concrete Work is to come in contact with the earth, the surface of the earth shall be completely free of frost when concrete is placed thereon.
 - (b) Concrete aggregates and water shall be heated to not over 80°C. Concrete shall be not less than 20°C or more than 30°C in temperature when deposited. Concrete when placed during freezing weather, or if freezing is anticipated during curing period, shall be fully enclosed and the temperature of same maintained at not less than 20°C for five (5) days nor less than 5°C for an additional five (5) days.
 - (c) Heating enclosures shall be strong and wind-proof, well ventilated with heating units so located as to prevent local overheating or drying of the concrete or damage from combustion gases. Only indirect fired heaters will be accepted. Units must be vented outside the enclosure. No direct fired units will be accepted.

- (d) The Contractor shall inform the Contract Administrator well in advance as to the methods of enclosure and frost protection he proposes to employ.

E44.4 Measurement and Payment

- E44.5 Cold weather requirements shall be considered incidental to the construction of Cast-in-Place concrete and no payment will be made for this item.

E45. TEMPORARY SURFACE RESTORATION

- E45.1 Further to clause 3.3 of CW 1130, where permanent surface restorations cannot be made due to cold weather, the Contractor shall temporarily restore surfaces as follows:

- (a) backfill and level boulevards and grassed areas to match existing surface elevations,
- (b) cap excavations in concrete pavement with a 100 millimetre thick layer of concrete for "Temporary Restoration of Utility Pavement Cuts" as specified in CW 3310,
- (c) cap excavations in sidewalk pavement with a 50 millimetre thick layer of concrete for "Temporary Restoration of Utility Pavement Cuts" as specified in CW 3310,
- (d) insulate temporary concrete where required during 48hr curing period,
- (e) where curb has been removed as part of the pavement cut pour temporary curb using "Concrete for Temporary Restoration of Utility Pavement Cuts" as specified in CW 3310.
- (f) remove all temporary pavements prior to permanent restorations.

- E45.2 The Contractor shall monitor and maintain temporarily restored surfaces as required until permanent restoration is complete.

- E45.3 If, in the opinion of the Contract Administrator, temporarily restored surfaces are not being adequately maintained or were not properly constructed and pose a danger to the public, maintenance or reconstruction will be done by the City forces with no advance notification the Contractor.

- E45.4 All costs associated with the maintenance or reconstruction of temporary pavement incurred by the City shall be deducted from future payments to the Contractor.

- E45.5 Temporary surface restorations shall be measured and paid as follows:

- (a) Temporary restoration will be measured by area and paid at the Contract Unit Price for "Temporary Surface Restoration". Area to be paid for will be total area temporarily restored inspected in accordance with this Specification, accepted and measured by the Contract Administrator.

- E45.6 No measurement or payment will be made for the temporary restoration of barrier or lip curb.

- E45.7 No measurement or payment will be made for the temporary restorations of boulevards and grassed areas.

- E45.8 No measurement or payment will be made for the removal of temporary pavement prior to permanent restoration.

E46. SUPPLY AND INSTALLATION OF STEEL BOLLARD

E46.1 Description

- E46.1.1 This Specification shall cover the supply and installation of the new steel bollard to be installed outside of the new building superstructure (north west corner).

E46.2 Materials and Construction Methods

- E46.2.1 Contractor to supply and install the new steel bollard in accordance with the detail shown on the Drawings.

E46.3 Measurement and Payment

E46.3.1 The Supply and Installation of Steel Bollard shall be measured and paid for at the Contract Lump Sum price for "Supply and Installation of Steel Bollard", which shall be payment in full for supplying all materials and for performing all operations as described herein and all other items incidental to the Work.

E47. SUPPLY AND INSTALLATION OF TIMBER PARKING FENCE

E47.1 Description

E47.1.1 This Specification shall cover the supply and installation of the timber parking fence to be installed at the Site.

E47.2 Materials and Construction Methods

E47.2.1 Contractor to supply and install the new timber parking fence in accordance with the details shown on the Drawings.

E47.3 Measurement and Payment

E47.3.1 The Supply and Installation of Timber Parking Fence shall be measured on a linear meter basis. The length to be paid for shall be the total number of linear meters of timber parking fence installed as acceptable to the Contract Administrator.

E47.3.2 The Supply and Installation of Timber Parking Fence shall be paid for at the Contract Unit Price for "Supply and Installation of Timber Parking Fence", which price shall be payment in full for supplying all materials and for performing all operations as described herein and all other items incidental to the Work.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

- F1.1 Each individual proposed to perform the following portions of the Work:
- (a) any Work on private property;
 - (b) communicating with residents and homeowners in person or by telephone;
- F1.1.1 Each Individual shall be required to obtain a Police Information Check from the police service having jurisdiction at their place of residence. Or
- (a) Sterling BackCheck – for existing account holders, log into your account to send individual invitations to employees requiring security clearance. For those that do not have an account, click on the following link to open an account:
<https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>; or
 - (b) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: <https://www.commissionaires.ca/en/manitoba/home>; or
 - (c) FASTCHECK Criminal Record & Fingerprint Specialists, forms to be completed can be found on the website at: <https://myfastcheck.com>
- F1.2 Prior to the award of Contact, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Police Information Check obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform such Work.
- F1.3 Any individual for whom a Police Information Check is not provided, or for whom a Police Information Check indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work specified in F1.1.
- F1.4 Any Police Information Check obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.
- F1.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at their sole discretion and acting reasonably, require an updated Police Information Check. Any individual who fails to provide a satisfactory Police Information Check as a result of a repeated Police Information Check will not be permitted to continue to perform any Work specified in F1.1.

APPENDIX A

METCALFE WASTEWATER PUMPING STATION HISTORICAL RECORD DRAWING

APPENDIX B
HAZARDOUS MATERIALS ASSESSMENT REPORT

APPENDIX C
CONTROL NARRATIVE

APPENDIX D

FORM N

APPENDIX E
ELECTRICAL I/O && INSTRUMENT LISTS

APPENDIX F
VFD SETTING LETTERS