



**THE CITY OF WINNIPEG**

# **REQUEST FOR PROPOSAL**

**RFP NO. 529-2020**

**PROFESSIONAL CONSULTING SERVICES FOR INVASIVE MUSSEL CONTROL  
SYSTEMS**

## TABLE OF CONTENTS

### PART A - PROPOSAL SUBMISSION

Form A: Bid/Proposal  
Form P: Person Hours

### PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	3
B5. Confidentiality	3
B6. Addenda	3
B7. Proposal Submission	4
B8. Proposal (Section A)	4
B9. Fees (Section B)	5
B10. Experience of Proponent and Subconsultants (Section C)	6
B11. Experience of Key Personnel Assigned to the Project (Section D)	7
B12. Project Understanding and Methodology (Section E)	7
B13. Project Schedule (Section F)	8
B14. Disclosure	8
B15. Conflict of Interest and Good Faith	9
B16. Qualification	10
B17. Opening of Proposals and Release of Information	11
B18. Irrevocable Offer	11
B19. Withdrawal of Offers	11
B20. Interviews	11
B21. Negotiations	12
B22. Evaluation of Proposals	12
B23. Award of Contract	14

### PART C - GENERAL CONDITIONS

C0. General Conditions	1
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### PART D - SUPPLEMENTAL CONDITIONS

#### General

D1. General Conditions	1
D2. Project Manager	1
D3. Background	1
D4. Definitions	2
D5. Relevant Documents and Historical Drawings	4
D6. General Requirements	4
D7. Scope of Services	6
D8. Project Management	7
D9. Historical Information Review and Stakeholder Engagement	9
D10. Deacon Reservoirs Invasive Mussel Control System Option Analysis	10
D11. Regulator and Authority Interfacing	11
D12. Deacon Reservoirs Invasive Mussel Control System Geotechnical Report	12
D13. Deacon Reservoirs Invasive Mussel Control System Preliminary Design Report	12
D14. SLAIF Invasive Mussel Control System Dosing Analysis	14
D15. SLAIF Invasive Mussel Control System Detail Design	15
D16. Additional Work Allowance	17

#### Submissions

D17. Authority to Carry on Business	17
D18. Safe Work Plan	17
D19. Insurance	18

**Schedule of Services**

D20. Commencement	19
D21. Critical Stages	19
D22. COVID-19 Schedule Delays	19

**PART E - SECURITY CLEARANCE**

E1. Security Clearance	1
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**Appendix A – Relevant Documents**

**Appendix B – Historical Drawings**

**Appendix C – Definition of Professional Consultant Services**

**Appendix D – Use of Greater Winnipeg Water District Railway**

**Appendix E –Shoal Lake Aqueduct Intake Orientation**

**Appendix F - Shoal Lake Aqueduct Intake Forms**

**Appendix G – Instrument Loop Diagram Requirements**

**Appendix H – Process and Instrumentation Diagram Requirements**

**Appendix I – City of Winnipeg Covid-19 Self-Screening Questionnaire**

## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 PROFESSIONAL CONSULTING SERVICES FOR INVASIVE MUSSEL CONTROL SYSTEMS

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, October 8, 2020.

B2.2 The Project Manager 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 City's Project Manager or an authorized representative will conduct a Site investigation tour of the Deacon Reservoirs at 9:00 a.m. on August 27, 2020.

B3.1.1 Proponents are required to register for the Site Investigation by contacting the City's Project Manager identified in D2 no later than 4:00 p.m. on August 25, 2020. Directions to the Winnipeg Drinking Water Treatment Plant and will be provided to the Proponent upon registration for the Site investigation.

B3.1.2 Transportation to the facility will be the responsibility of the Proponent.

B3.1.3 Proponents will not be permitted to join the Site investigation once it has commenced.

B3.1.4 Depending on the number of Proponents anticipated to take part in the Site investigation and the COVID-19 requirements at the time of the Site investigation, a second Site investigation date for the Deacon Reservoirs may be proposed.

B3.2 Further to C3.1, the City's Project Manager or an authorized representative will conduct a Site investigation tours of the Shoal Lake Aqueduct Intake Facility (SLAIF) on September 1, 2020 and September 2, 2020.

B3.2.1 Proponents are required to register for only one of the two the Site Investigation by contacting the City's Project Manager identified in D2 no later than 4:00 p.m. on August 25, 2020. Directions to the pick-up point for access to the GWWD Railway will be provided to the Proponent upon registration for the Site investigation.

B3.2.2 The SLAIF is only accessible by the GWWD Railway.

B3.2.3 Transportation to the pick-up point for access to the GWWD Railway will be the responsibility of the Proponent.

B3.2.4 Proponents will not be permitted to join the Site investigation once it has commenced.

B3.2.5 Depending on the number of Proponents anticipated to take part in the Site investigation and the COVID-19 requirements at the time of the Site investigation, additional Site investigation dates for the SLAIF may be proposed.

B3.2.6 Proponent's representatives will be required to sign and have witnessed the GWWD Railway Travel Waiver in Appendix F – Forms prior to travel on the GWWD Railway.

B3.2.7 It is anticipated the Site investigation will take approximately eight hours including transportation into SLAIF from the pickup location.

B3.2.8 Due to travel arrangements, Proponents are only allowed to attend one of the two Shoal Lake Aqueduct Site investigations.

B3.3 Proponents are not permitted to take photographs or videos at the Site investigations. The Proponent may request pictures of specific areas or equipment from the Project Manager. Subject to the City's approval, the requested photographs will be shared with the Proponents.

- B3.4 Further to D22, the City acknowledges that COVID-19 may impact how the Site investigations are conducted and a number of protocols have been implemented for the safety of all participants.
- B3.4.1 A limit of one representative per Proponent will be permitted for the Proponent's assigned Site investigation to facilitate social distancing protocols.
- B3.4.2 The Site investigation will be carried out in accordance with the most stringent applicable Federal, Provincial, local government, City of Winnipeg guidelines and regulations for COVID-19 currently at the time of the Site investigation.
- B3.4.3 All travel to the SLAIF on GWWD equipment, SLAIF vehicles where social distancing cannot be maintained will require all personnel to wear a nonmedical mask. Nonmedical masks will not be provided by the City.
- B3.4.4 The Proponent's representative will be required to complete the self-assessment in Appendix I or on the Manitoba Shared Health website <https://sharedhealthmb.ca/covid19/screening-tool/> the day prior to and the day of the Site investigation. A Proponent with a representative that is recommended to have an additional COVID-19 assessment or is required to self-isolate will be required to assign a different representative to the Site investigation.
- B3.5 Notwithstanding B3.1 and B3.4, the City may cancel or reschedule the Site investigation due to health and safety concerns stemming from COVID-19 or to adhere to current COVID-19 regulations.
- B3.5.1 In the event that the Site investigations are unable to be held due to COVID-19, the City will consider providing virtual tours of the SLAIF. This may include photographs and/or videos. Proponents will be provided the opportunity to request specific photographs and videos, subject to approval by the City.
- B3.6 Public Safety Verification Check
- (a) Proponents wishing to register for the Site investigation must have a current Public Safety Verification Check at the time of registration. For the Public Safety Verification Check to be current it shall be obtained no earlier than one year prior to the Site investigation.
- (b) The Public Safety Verification Check may be obtained from Sterling Talent Solutions. Proponents will need to set up a Sterling Talent Solutions account prior to requesting individual background checks. This process should be done 72 hours prior to requesting the first check. The account can be setup using the following link:  
<https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>  
Note that the check will take up to 48 hours to complete. Refer to E1.1.1 of PART E - Security Clearance for information on obtaining the Public Safety Verification Check.
- (c) The results of the Public Safety Verification Check must be received by the City directly through Sterling Talent Solutions. Proponents must set up an account with Sterling Talent Solutions under their company name and grant Sterling Talent Solutions permission to share the results of the Public Safety Verification Check with the City.
- B3.7 Proponent's representatives are required to wear grade 1 safety shoes (CSA Green Triangle) for the Site investigation when on Site with the exception of the Staff House or the residences at SLAIF.
- B3.8 Access to view the Shoal Lake Aqueduct Intake Facilities and the Deacon Reservoirs can only be made under the supervision of an authorized City representative.
- B3.9 The City will not conduct Site investigations to the Hadashville Section Yard or the Ross Section Yards. Access by the Proponents to these facilities can be arranged through the Project Manager.
- B3.10 Although attendance at the Site Investigations is not mandatory, the City strongly suggests that Proponents attend.

- B3.11 The Proponent shall not be entitled to rely on any information or interpretation received at the site investigation unless that information or interpretation is the Proponent's direct observation, or is provided by the Project Manager in writing.

#### **B4. ENQUIRIES**

- B4.1 All enquiries shall be directed to the City's Project Manager identified in D2.
- B4.2 If the Proponent finds errors, discrepancies, or omissions in the Request for Proposal (RFP), or is unsure of the meaning or intent of any provision therein, the Proponent shall promptly notify the Project Manager of the error, discrepancy, or omission at least five (5) Business Days prior to the Submission Deadline.
- B4.3 Responses to enquiries which, in the sole judgment of the Project Manager, require a correction to or a clarification of the RFP will be provided by the Project Manager to all Proponents by issuing an addendum.
- B4.4 Responses to enquiries which, in the sole judgment of the Project Manager, do not require a correction to or a clarification of the RFP will be provided by the Project Manager only to the Proponent who made the enquiry.
- B4.5 All correspondence or contact by Proponents with the City in respect of this RFP must be directly and only with the City's Project Manager. Failure to restrict correspondence and contact to the Project Manager may result in the rejection of the Proponents Proposal Submission.
- B4.6 The Proponent shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Project Manager in writing.
- B4.7 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 Proponent by the City or acquired by a Proponent 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 Project Manager. The use and disclosure of the Confidential Information shall not apply to information which:
- (a) was known to the Proponent before receipt hereof; or
  - (b) becomes publicly known other than through the Proponent; or
  - (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.
- B5.2 The Proponent shall not make any statement of fact or opinion regarding any aspect of the RFP to the media or any member of the public without the prior written authorization of the Project Manager.

#### **B6. ADDENDA**

- B6.1 The Project Manager may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies, or omissions in the RFP, or clarifying the meaning or intent of any provision therein.
- B6.2 The Project Manager 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](http://www.merx.com).

- B6.4 The Proponent is responsible for ensuring that he/she has received all addenda and is advised to check the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.5 The Proponent shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid/Proposal. Failure to acknowledge receipt of an addendum may render a Proposal non-responsive.
- B6.6 Notwithstanding B4, enquiries related to an Addendum may be directed to the Project Manager indicated in D2.

## **B7. PROPOSAL SUBMISSION**

- B7.1 The Proposal shall consist of the following components:
- (a) **Section A** - Form A: Bid/Proposal in accordance with B8; and
  - (b) **Section B** - Fees in accordance with B9.
- B7.2 The Proposal should also consist of the following components:
- (a) **Section C** - Experience of Proponent and Subconsultants in accordance with B10;
  - (b) **Section D** - Experience of Key Personnel Assigned to the Project in accordance with B11;
  - (c) **Section E** - Project Understanding and Methodology in accordance with B12; and
  - (d) **Section F** - Project Schedule in accordance with B13.
- B7.3 Further to B7.1 all components of the Proposal shall be fully completed, provided in the order indicated, and submitted by the Proponent no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Proposal.
- B7.4 Further to B7.2, all components of the Proposal should be fully completed, provided in the order indicated, and submitted by the Proponent no later than the Submission Deadline, with all required entries made clearly and completely.
- B7.5 Proposal format, including number of pages, size of pages, and font, etc., will not be regulated, except that the Proposal should contain a table of contents, page numbering, and should be arranged in the Sections identified above. Proponents are encouraged to use their creativity to submit a Proposal which provides the requested information for evaluation and other information which illustrates the strength of their proposed solution.
- B7.6 The Proposal shall be submitted electronically through MERX.
- B7.6.1 Proposals will **only** be accepted electronically through MERX.
- B7.7 Proponents are advised that inclusion of terms and conditions inconsistent with the RFP, will be evaluated in accordance with B22.1(a).
- B7.8 Any cost or expense incurred by the Proponent that is associated with the preparation of the Proposal shall be borne solely by the Proponent.

## **B8. PROPOSAL (SECTION A)**

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

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

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

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

B8.4 Paragraph 13 of Form A: Bid/Proposal shall be signed in accordance with the following requirements:

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

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

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

## **B9. FEES (SECTION B)**

B9.1 The Proponent shall include all fees on Form B: Fees.

B9.2 The Proposal shall include a Fixed Fee for the following phases identified in D7 Scope of Services.

B9.2.1 Project Management in accordance with D8.

B9.2.2 Historical Information Review and Stakeholder Engagement in accordance with D10.

B9.2.3 Deacon Reservoirs Invasive Mussel Control System Option Analysis in accordance with D10.

B9.2.4 Regulator and Authority Interfacing in accordance with D11.

B9.2.5 Deacon Reservoirs Invasive Mussel Control System Geotechnical Report in accordance with D12.

B9.2.6 Deacon Reservoirs Invasive Mussel Control System Preliminary Design Report in accordance with D13.

B9.2.7 SLAIF Invasive Mussel Control System Chlorine Dosing Evaluation in accordance with D14.

B9.2.8 SLAIF Invasive Mussel Control System Detail Design in accordance with D15.

B9.3 The Proposal shall include an Additional Work Allowance in accordance with D16.

B9.3.1 The Proponent shall include an additional work allowance of \$50,000.00 in their proposal.

B9.3.2 The Additional Work Allowance is to be used for design and project management in the event unforeseen conditions arise during the design stages of the project.



- B9.3.3 The Additional Work Allowance is to be included in the calculation of the total fees proposed by the Proponent.
- B9.3.4 The Additional Work Allowance shall only be used with the written permission of the Project Manager identified in D2.1 and formally documented in a Change in Scope of Services form.
- B9.4 There shall be no fee escalation allow for yearly adjustments or promotions throughout the Design phases of the Work and the associated Project Management Work.
- B9.5 Adjustments to Fees will only be considered based on increases to the Scope of Services.
- B9.5.1 The City will not consider an adjustment to the Fees based on changes in the Project budget or the Final Total Construction Cost.
- B9.6 Notwithstanding C1.1(b), Fees shall include costs for out of town travel, related meals and accommodations for the duration of the Project and shall not be considered an Allowable Disbursement.
- B9.7 The Fee Proposal shall also include an allowance for Allowable Disbursements as defined in C1.1(b), but shall exclude the costs of any materials testing, soils and hazardous materials investigation during construction.
- B9.8 Notwithstanding C11.1, Fees submitted shall not include the Goods and Services Tax (GST) or Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.
- B9.9 Payments to Non-Resident Consultants are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

**B10. EXPERIENCE OF PROPONENT AND SUBCONSULTANTS (SECTION C)**

- B10.1 Proposals should include:
- (a) details demonstrating the history and experience of the Proponent and Subconsultants in providing design services, specification writing, and cost engineering on two projects related to chemical feed systems for Critical Infrastructures of similar complexity, scope, and value.
- B10.2 For each project listed in B10.1(a), the Proponent should submit:
- (a) description of the project;
  - (b) role of the consultant;
  - (c) project's original contracted consulted cost and final consulting cost
    - (i) where the original contracted consulting cost and final cost differ by over 15 percent, the Proponent should submit an explanation;
  - (d) design schedule (anticipated Project schedule and actual project delivery schedule);
    - (i) where the anticipated project schedule and the actual project delivery schedule differ, the Proponent should submit an explanation;
  - (e) project owner; and
  - (f) reference information (two current names with telephone numbers per project).
    - (i) References should have worked directly on the projects described.
    - (ii) References may be used to confirm the information provided in the proposal.
    - (iii) Other sources not named in the references may be contacted to verify information provided.
- B10.2.1 Where applicable, information should be separated into Proponent and Subconsultant project listings.

- B10.3 The Proposal should include general firm profile information, including years in business, average yearly volume of work, number of employees and other pertinent information for the Proponent and all Subconsultants.

**B11. EXPERIENCE OF KEY PERSONNEL ASSIGNED TO THE PROJECT (SECTION D)**

- B11.1 Describe your approach to overall team formation and coordination of team members.

- B11.1.1 Include an organizational chart for the Project.

- (a) Clearly identify Subconsultants to be engaged by the Proponent on the organizational chart.

- B11.2 Identify the following Key Personnel assigned to the Project:

- (a) The project manager;
- (b) lead process professional;
- (c) lead instrumentation professional;
- (d) lead structural professional; and
- (e) any other personnel with over 5% of the total project hours.

- B11.2.1 Include the following for each of the Key Personnel:

- (a) educational background and degrees;
- (b) professional recognition;
- (c) job title;
- (d) years of experience in current position;
- (e) years of experience in design and construction; and
- (f) years of experience with existing employer.

- B11.2.2 Roles of each of the Key Personnel in the Project should be identified in the organizational chart referred to in B11.1.1.

- B11.2.3 For each Key Personnel identified, list **two (2)** comparable projects in which they have played a primary role similar to that proposed for this Project. If a project selected for a Key Personnel is included in B10, provide only the project name and the role of the Key Personnel. For other projects provide the following:

- (a) a description of the project;
- (b) the role of the Key Personnel on the comparable project;
- (c) the project Owner; and
- (d) reference information (two current names with telephone numbers per project).

- B11.2.4 If a Key Personnel is assigned to multiple roles (as identified in the organizational chart referred to in B11.1.1), **two (2)** comparable projects as detailed in B11.2.3 are required for **each role** of the Key Personnel.

**B12. PROJECT UNDERSTANDING AND METHODOLOGY (SECTION E)**

- B12.1 Describe your firm's project management approach and team organization during the performance of Services, so that the evaluation committee has a clear understanding of the methods the Proponent will use in the delivery of this Project.

- B12.2 Methodology should be presented in accordance with the Scope of Services identified in D7.

- B12.3 Describe the collaborative process/method to be used by the Key Personnel of the team in the various phases of the Project.

**B12.4** Proposals should address:

- (a) the methodology that the Proponent intends to use to carry out the Scope of Services;
  - (i) the methodology should be presented in accordance with the Scope of Services identified in D7 – Scope of Services.
- (b) the team's understanding of the broad functional and technical requirements;
- (c) the team's understanding of system designs for Critical Infrastructure;
- (d) the team's understanding of construction processes for remote Sites;
- (e) the work activities related to the Scope of Services;
- (f) the deliverables associated with the Scope of Services;
- (g) all significant assumptions and interpretations related to the Scope of Services; and
- (h) any other insight, proposed usage of innovation, or identification of risks related to the Scope of Services that demonstrates the Proponent's suitability to the Project.

**B12.5** The Proposal should include Form P: Person Hours for all disciplines and or phases identified in D7 Scope of Services.

**B12.5.1** Proponents may use Form P: Person Hours or a table of their own design provided it includes all information requested in accordance with B12.5.

- (a) A sample of Form P: Person Hours can be found at <https://winnipeg.ca/matmgt/templates/information.stm>

**B12.5.2** The total Fees on Form P: Person Hours should match Fees submitted in response to B9.

**B12.6** For each person identified in B11.2, list the percent of the person's time per month to be dedicated to the Project in accordance with the Scope of Services identified in D7.

**B13. PROJECT SCHEDULE (SECTION F)**

**B13.1** Proponents should present a carefully considered critical path method schedule using Microsoft Project or similar project management software, complete with resource assignments (key designers), durations (weekly timescale) and milestone dates or events. The schedule should address each requirement of the Scope of Services identified in D7.

**B13.2** Further to B13.1, the Proponent's schedule should also include:

- (a) a work breakdown structure;
- (b) critical dates for review;
- (c) anticipated review and approval periods by the City;
  - (i) a minimum of two (2) weeks should be allowed for the City's review of Project Deliverables;
- (d) Project meetings; and
- (e) submission dates for required Deliverables.

**B13.3** The schedule should incorporate the critical stages listed in D21. The Proponent shall give justification in the event that the milestone dates listed in the schedule deviate.

**B14. DISCLOSURE**

**B14.1** Various Persons provided information or services with respect to this RFP. 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.

**B14.2** The Persons are:

- (a) AECOM Canada Ltd; and
- (b) Jacobs Engineering; and
- (c) TREK Geotechnical Inc.

B14.3 The following reports were prepared by the organizations identified in B14.2 and are also listed in Appendix A:

- (a) Drinking Water Quality Standard (CH2M Hill (now Jacobs Engineering) 2012)
- (b) Shoal Lake Aqueduct Intake Facility Assessment – Site Inspections and Assessment (AECOM Canada Ltd 2012)
- (c) Foundation Recommendations for Proposed Sodium Hypochlorite Building at Shoal Lake Aqueduct (TREK Geotechnical Inc. 2015)
- (d) Mussel Control at the Shoal Lake Intake Facility Assessment (AECOM Canada Ltd 2016)
- (e) The City of Winnipeg Preliminary Design of Mussel Control at the Shoal Lake Intake Facility (AECOM Canada Ltd 2017)

**B15. CONFLICT OF INTEREST AND GOOD FAITH**

B15.1 Proponents, by responding to this RFP, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B15.2 Conflict of Interest means any situation or circumstance where a Proponent or Key Personnel proposed for the Services 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 Proposals or award of the Contract; or
- (ii) compromise, impair, or be incompatible with the effective performance of a Proponent's obligations under the Contract;
- (e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of its participation in the RFP process or the Project; or
- (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the RFP process) of strategic and/or material relevance to the RFP process or to the Project that is not available to other Proponents and that could or would be seen to give that Proponent an unfair competitive advantage.

B15.3 In connection with its Proposal, each entity identified in B15.2 shall:

- (a) avoid any perceived, potential, or actual Conflict of Interest in relation to the procurement process and the Project;
- (b) upon discovering any perceived, potential, or actual Conflict of Interest at any time during the RFP process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Project Manager; 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.

- B15.4 Without limiting B15.3, the City may, in its sole discretion, waive any and all perceived, potential, or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Proponent to put into place such policies, procedures, measures, and other safeguards as may be required by and be acceptable to the City, in its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.
- B15.5 Without limiting B15.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:
- (a) disqualify a Proponent that fails to disclose a perceived, potential, or actual Conflict of Interest of the Proponent or any of its Key Personnel;
  - (b) require the removal or replacement of any Key Personnel proposed for the Services that has a perceived, actual, or potential Conflict of Interest that the City, in its sole discretion, determines cannot be avoided or mitigated;
  - (c) disqualify a Proponent or Key Personnel proposed for the Services that fails to comply with any requirements prescribed by the City pursuant to B15.4 to avoid or mitigate a Conflict of Interest; and
  - (d) disqualify a Proponent if the Proponent, or one of its Key Personnel proposed for the Project, has a perceived, potential, or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.
- B15.6 The final determination of whether a perceived, potential, or actual Conflict of Interest exists shall be made by the City, in its sole discretion.

## **B16. QUALIFICATION**

- B16.1 The Proponent shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed, or permitted by law to carry on business in Manitoba, or if the Proponent does not carry on business in Manitoba, in the jurisdiction where the Proponent does carry on business; and
  - (b) be financially capable of carrying out the terms of the Contract;
  - (c) have all the necessary experience, capital, organization, and equipment to perform the Services in strict accordance with the terms and provisions of the Contract;
  - (d) have or establish and staff an office in Winnipeg for the duration of the Project.
- B16.2 The Proponent and any proposed Subconsultant (for the portion of the Services proposed to be subcontracted to them) shall:
- (a) be responsible and not be suspended, debarred, or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <https://winnipeg.ca/finance/findata/matmgt/listing/debar.pdf>
- B16.3 The Proponent and/or any proposed Subconsultant (for the portion of the Services proposed to be subcontracted to them) shall:
- (a) have successfully carried out design services, process system shutdown planning, construction staging planning, and specification writing for engineering of municipal and/or industrial water intake structures and/or water treatment projects of similar complexity, scope, and value; and to those required for this Project;
  - (b) have experience in the design of chemical treatment systems for Critical Infrastructure;

- (c) be fully capable of performing the Services required to be in strict accordance with the terms and provisions of the Contract;
- (d) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba);
- (e) undertake to meet all licensing and regulatory requirements of the appropriate governing authorities and associations in the Province of Manitoba; and
- (f) provide the Security Clearances as identified in PART E - Security Clearances.

B16.4 The Proponent shall submit, within three (3) Business Days of a request by the Project Manager, further proof satisfactory to the Project Manager of the qualifications of the Proponent and of any proposed Subconsultant.

B16.5 The Proponent shall provide, on the request of the Project Manager, full access to any of the Proponent's equipment and facilities to confirm, to the Project Manager's satisfaction, that the Proponent's equipment and facilities are adequate to perform the Services.

#### **B17. OPENING OF PROPOSALS AND RELEASE OF INFORMATION**

B17.1 Proposals will not be opened publicly.

B17.2 After award of Contract, the Contract amount and the name of the successful Proponent and their address will be available on the MERX website at [www.merx.com](http://www.merx.com).

B17.3 The Proponent is advised any information contained in any Proposal Submission 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).

B17.3.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Proposal Submission identified by the Proponent as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

B17.4 Following the award of Contract, a Proponent will be provided with information related to the evaluation of his/her submission upon written request to the Project Manager.

#### **B18. IRREVOCABLE OFFER**

B18.1 The Proposal(s) submitted by the Proponent shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B18.2 The acceptance by the City of any Proposal shall not release the Proposals of the other responsive Proponents and these Proponents shall be bound by their offers on such Services for the time period specified in Paragraph 11 of Form A: Bid/Proposal.

#### **B19. WITHDRAWAL OF OFFERS**

B19.1 A Proponent may withdraw his/her Proposal without penalty prior to the Submission Deadline.

#### **B20. INTERVIEWS**

B20.1 The Project Manager may, in his/her sole discretion, interview Proponents during the evaluation process.

## **B21. NEGOTIATIONS**

- B21.1 The City reserves the right to negotiate details of the Contract with any Proponent. Proponents are advised to present their best offer, not a starting point for negotiations in their Proposal Submission.
- B21.2 The City may negotiate with the Proponents submitting, in the City's opinion, the most advantageous Proposals. The City may enter into negotiations with one or more Proponents without being obligated to offer the same opportunity to any other Proponents. Negotiations may be concurrent and will involve each Proponent individually. The City shall incur no liability to any Proponent as a result of such negotiations.
- B21.3 If, in the course of negotiations pursuant to B21.2, the Proponent amends or modifies a Proposal after the Submission Deadline, the City may consider the amended Proposal as an alternative to the Proposal already submitted without releasing the Proponent from the Proposal as originally submitted.

## **B22. EVALUATION OF PROPOSALS**

- B22.1 Award of the Contract shall be based on the following evaluation criteria:
- (a) compliance by the Proponent with the requirements of the RFP or acceptable deviation therefrom: (pass/fail)
  - (b) qualifications of the Proponent and the Subconsultants, if any, pursuant to B16: (pass/fail)
  - (c) **Section B - Fees;** 40%
  - (d) **Section C - Experience of Proponent and Subconsultant;** 15%
  - (e) **Section D - Experience of Key Personnel Assigned to the Project;** 20%
  - (f) **Section E - Project Understanding and Methodology** 20%
  - (g) **Section F - Project Schedule.** 5%
- B22.2 Further to B22.1(a), the Award Authority may reject a Proposal as being non-responsive if the Proposal Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations, or other irregularities. The Award Authority may reject all or any part of any Proposal, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.
- B22.3 Further to B22.1(b), the Award Authority shall reject any Proposal submitted by a Proponent who does not demonstrate, in its Proposal or in other information required to be submitted, that it is qualified.
- B22.4 If, in the sole opinion of the City, a Proposal does not achieve a pass rating for B22.1(a) and B22.1(b), the Proposal will be determined to be non-responsive and will not be further evaluated.
- B22.5 Where references are requested, the reference checks to confirm information provided may not be restricted to only those submitted by the Proponent, and may include organizations representing Persons, known to have done business with the Proponent.
- B22.6 Further to B22.1(c), Fees will be evaluated based on Fees submitted in accordance with B9.
- B22.7 Further to B22.1(d), Experience of Proponent and Subconsultants (Section C) will be evaluated considering the information provided in response to B10, including but not limited to the following criteria:
- (a) Similarity of the Proponent's past Projects to this Scope of Services;
  - (b) Performance of the Proponent on past referenced projects and any City of Winnipeg projects including to but not limited to:

- (i) adherence to project budget;
- (ii) adherence to project schedule;
- (iii) quality of work; and
- (iv) overall satisfaction with the Proponent.

B22.8 Further to B22.1(e), Experience of Key Personnel Assigned to the Project (Section D) will be evaluated considering the experience and qualifications of the Consultants and Subconsultant personnel on Projects of comparable size and complexity, considering the information provided in B11, including but not limited to the following criteria:

- (a) Similarity of Key Personnel past projects, with an emphasis on past experience related to chemical handling systems for Critical Infrastructure;
- (b) Appropriateness of related years of experience of the Key Personnel;
- (c) Relevancy of experience of the Key Personnel;
- (d) Appropriateness of approach to overall team formation and coordination of team members; and
- (e) Overall satisfaction of the Project Owner towards the Personnel on past Projects, including but not limited to:
  - (i) quality of work; and
  - (ii) technical proficiency.

B22.8.1 Proposals that receive less than half the available evaluation points for Experience of Key Personnel Assigned to the Project will be rejected in accordance with B22.3.

B22.9 Further to B22.1(f), Project Understanding and Methodology (Section E) will be evaluated considering the information provided in response to B12 including, but not limited to the following criteria:

- (a) appropriateness of the Project Management Approach;
- (b) consistency and completeness of the Methodology;
- (c) appropriateness of hours assigned to individual tasks per person;
- (d) proponent's understanding of the Project, including the deliverables and constraints; and
- (e) demonstration of insight beyond the information that was presented in this RFP.

B22.9.1 Proposals that receive less than half the available evaluation points for Project Understanding and Methodology will be rejected in accordance with B22.3.

B22.10 Further to B22.1(g), Project Schedule (Section F) will be evaluated considering the information provided in response to B13 including, but not limited to the following criteria:

- (a) completeness and consistency of the Project schedule;
- (b) logic and sequencing of the tasks;
- (c) any narrative that will describe how slippage in the proposed schedule will be managed and how the schedule will be re-evaluated to determine the impacts to the critical paths; and
- (d) appropriateness of the timelines provided.

B22.11 Notwithstanding B22.1(d) to B22.1(g), where Proponents fail to provide a response to B7.2(a) to B7.2(d), the score of zero may be assigned to the incomplete part of the response.

B22.12 The City reserves the right to conduct an independent verification of information in the Proposal Submission received and generally pertaining to the qualifications and experience of the Proponent and any proposed members of the Proponent's team.

B22.13 Proposals will be evaluated considering the information in the Proposal Submission and any interviews held in accordance with B20.



**B23. AWARD OF CONTRACT**

- B23.1 The City will give notice of the award of the Contract, or will give notice that no award will be made.
- B23.2 The City will have no obligation to award a Contract to a Proponent, even though one or all of the Proponents are determined to be qualified, and the Proposals are determined to be responsive.
- B23.2.1 Without limiting the generality of B23.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Services;
  - (b) the prices are materially in excess of the prices received for similar services in the past;
  - (c) the prices are materially in excess of the City's cost to perform the Services, or a significant portion thereof, with its own forces;
  - (d) only one Proposal 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.
- B23.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Proponent submitting the most advantageous offer.
- B23.4 The City may, at its discretion, award the Contract in phases.
- B23.5 Further to Paragraph 7 of Form A: Bid/Proposal and C4, the City may issue an award letter to the successful Proponent in lieu of execution of Contract Documents.
- B23.5.1 The Contract documents as defined in C1.1(o)(ii) in their entirety shall be deemed to be incorporated in and to form a part of the award letter notwithstanding that they are not necessarily attached to or accompany said award letter.
- B23.6 The form of Contract with the City of Winnipeg will be based on the Contract as defined in C1.1(o).
- B23.7 Following the award of Contract, a Proponent will be provided with information related to the evaluation of its Proposal upon written request to the Project Manager.
- B23.8 If, after the award of Contract, the Project is cancelled, the City reserves the right to terminate the Contract. The Proponent will be paid for all Services rendered up to time of termination.

## PART C - GENERAL CONDITIONS

### C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Consultant Services* (Revision 2017-03-24) are applicable to the Services of the Contract.
- C0.1.1 The *General Conditions for Consultant Services* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](http://www.winnipeg.ca/matmgt/gen_cond.stm).
- C0.2 A reference in the RFP to a section, clause or subclause with the prefix “C” designates a section, clause or subclause in the *General Conditions for Consultant Services*.

## PART D - SUPPLEMENTAL CONDITIONS

### GENERAL

#### D1. GENERAL CONDITIONS

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

#### D2. PROJECT MANAGER

- D2.1 The Project Manager is:  
Jeff Brooks, C.E.T.  
Telephone No. 204 986-2521  
Email Address: jeffb Brooks@winnipeg.ca
- D2.2 At the pre-commencement meeting, the Project Manager will identify additional personnel representing the Project Manager and their respective roles and responsibilities for the Services.

#### D3. BACKGROUND

- D3.1 Zebra and quagga mussels have been introduced into North American waterways and are invasive mussels known for their biofouling capabilities. Zebra mussels were detected in the Red River in North Dakota in 2010 and in Lake Winnipeg in 2013, and quagga mussels have become a dominant species in the Great Lakes. As such, the likelihood of their introduction into Shoal Lake has increased. Should they be detected, the SLAIF currently has the option to dose sodium hypochlorite using an existing chlorination system for invasive mussel control. However, this is not a long-term solution due to concerns with the anticipated dosing requirements.
- D3.2 The existing chlorination system at the SLAIF includes a dechlorination facility for dechlorination of chlorinated process water requiring discharge to Falcon Bay. Individual chlorinated process flows include screen backwash water, pump cooling water, and genset cooling water and their individual flows range from approximately 20 to 350 litres per minute during discharge to Falcon Bay. The dechlorination facility was installed in 1994 and is designed to use sulfur dioxide gas for dechlorination.
- D3.3 The City of Winnipeg Preliminary Design of Mussel Control at the Shoal Lake Intake Facility (AECOM 2017) provides the direction for an invasive mussel control approach to address the concerns at SLAIF and the Deacon Reservoirs. The recommendations of the report are:
- (a) upgrade the existing chlorination system at the SLAIF for the dosing of sodium hypochlorite to serve ~~for~~ as a control process for invasive mussel species and biofilm at the SLAIF and in the Shoal Lake Aqueduct;
  - (b) upgrade the process and support systems in the Gatehouse at the SLAIF to accommodate the effects of dosing chlorine at the headwall of the SLAIF;
  - (c) replace the existing sulfur dioxide gas system used for dechlorination of process water with an ascorbic acid system;
  - (d) construct a new invasive mussel control system to protect the Deacon Reservoirs. Two options to investigate further include:
    - (i) construction of new chemical dosing control structure(s) to protect the Deacon Reservoirs. The new structures to be capable of suppressing the pH of the raw water during the summer months to 6.9 using sulphuric acid; and
    - (ii) upgrading the four Deacon Reservoirs cells to accommodate an end-of-season treatment system utilizing sodium hypochlorite.

#### D4. DEFINITIONS

##### D4.1 When used in this RFP:

- (a) **“Authority Having Jurisdiction”** 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;
- (b) **“ACGIH”** means American Conference of Governmental Industrial Hygienists;
- (c) **“ANSI”** means American National Standards Institute;
- (d) **“ASME”** means American Society of Mechanical Engineers;
- (e) **“AWWA”** means American Water Works Association;
- (f) **“Additional Work Allowance”** means a cash allowance that is to be used for engineering and project management in the event pre-existing unforeseen Site conditions or City instigated changes that arise during the various stages of the Project;
- (g) **“As-Built Drawings”** means drawings prepared by a third party, or by the professional using information furnished by the Contractor or other field staff;
- (h) **“CAD”** means AutoCAD drawings;
- (i) **“CCOHS”** means Canadian Centre for Occupational Health and Safety;
- (j) **“Class 1 Estimate”** means an estimate used to check tenders. The maturity level of the final overall design deliverables shall range from 65 percent to 100 percent. The typical costing methodology shall be detailed unit costs with detailed take-off items. The expected low to high variation in the accuracy range based on the complexity and remoteness of this Work shall be minus 10 percent to plus 15 percent with an 80 percent confidence interval;
- (k) **“Class 3 Estimate”** means an estimate used to for budget authorization. The maturity level of the final overall design deliverables shall range from 10 percent to 40 percent. The typical costing methodology shall be semi-detailed unit costs with assembly level line items. The expected low to high variation in the accuracy range based on the complexity and remoteness of this Work shall be minus 20 percent to plus 30 percent with an 80 percent confidence interval;
- (l) **“Class 5 Estimate”** means an estimate used to for concept screening assessment of different systems. The maturity level of the final overall design deliverables shall range from up to two percent. The typical costing methodology shall be factored for capacity, parametric models, analogy or judgement. The expected low to high variation in the accuracy range based on the complexity and remoteness of this Work shall be minus 50 percent to plus 100 percent with an 80 percent confidence interval;
- (m) **“CPM”** means critical path method used to determine the longest stretch of dependent activities and measuring the time required to complete activities from start to finish;
- (n) **“CSA”** means Canadian Standards Association;
- (o) **“Competent Person”** means a worker, who in relation to specific work:
  - (i) is qualified because of education, knowledge, training, and experience to perform the Work; and
  - (ii) is familiar with the codes, standards, by-laws, regulations, and other legislation that are applicable to the Work.
- (p) **“Critical Infrastructure”** means components system that cannot typically be taken out of service for extended periods to facilitate construction and inadvertent damage caused to the component would likely have catastrophic consequences;
- (q) **“Deacon Reservoirs”** means the four raw water balancing storage reservoirs which are upstream of the City of Winnipeg Drinking Water Treatment Plant. The cells were constructed from the 1970’s to the 1990’s and have a raw water holding capacity of 8.8 million cubic metres;
- (r) **“DFO”** means the Canadian Government Department of Oceans and Fisheries;

- (s) **“FTP”** means the City of Winnipeg’s file transfer protocol site;
- (t) **“GWWD”** means the Greater Winnipeg Water District;
- (u) **“HVAC”** means the heating, ventilation, and air conditioning systems of a building;
- (v) **“Hypo”** means sodium hypochlorite;
- (w) **“ILD”** means Instrument Loop Diagram: An engineering drawing which symbolically represents a single control loop identifying control components and interconnections. Special situations may necessitate a combination of loops on one drawing. A loop diagram may document electrical or pneumatic instruments or a combination of both.
- (x) **“I/O”** means an input or output from an instrumentation device or panel, which is either an analog signal, a digital signal, or an interlock;
- (y) **“Key Personnel”** means an individual designated in a Proponent’s Proposal Submission to perform a lead role in one or more of the proposed key organizational positions indicated in this RFP for the Proponent or its team members;
- (z) **“LS”** means lump sum when used in reference to the Form B: Prices;
- (aa) **“MCC”** means a Motor Control Centre;
- (bb) **“MLD”** means a flow rate of a fluid measured in millions of litres per day;
- (cc) **“NMS”** means National Master Specification;
- (dd) **“ODW”** means Government of Manitoba Conservation and Water Stewardship’s Office of Drinking Water;
- (ee) **“Operating Licence”** means licence number PWS-09-412-01, issued by the ODW;
- (ff) **“PDF”** means a Portable Document Format electronic file;
- (gg) **“P&ID”** means process and instrumentation diagram which is a detailed diagram in that shows the piping and process equipment together with the instrumentation and control devices;
- (hh) **“PLC”** means programmable logic controller;
- (ii) **“PLC Panel”** means a rated electrical/instrumentation enclosure that houses PLCs, cable management systems, UPS power sources, relays, field terminations, etc used in the control of processes;
- (jj) **“SCADA”** means Supervisory Control and Data Acquisition which is a control system architecture that uses computers, networked data communications, and graphical user interfaces for high-level process supervisory management, but uses other peripheral devices such as programmable logic controllers and discrete controllers to interface to the process plant or machinery;
- (kk) **“Scope of Service”** means all Services executed under this Contract;
- (ll) **“Shoal Lake Aqueduct”** means the aqueduct structure constructed between 1915 and 1919 which conveys raw water from Shoal Lake to the Deacon Reservoirs. The approximate length of this portion of the Shoal Lake Aqueduct is 135 kilometres and has a maximum water flow rate of 385 MLD;
- (mm) **“SLAIF”** means Shoal Lake Aqueduct Intake Facility;
- (nn) **“TM”** means technical memorandum.
- (oo) **“Three-Point Estimate”** means a weighted average of the optimistic, likely, and pessimistic time lines or costs for a task and shown as the anticipated task’s time or cost using the following formula:

$$\text{Anticipated} = \frac{\text{Optimistic} + 4 \times \text{Likely} + \text{Pessimistic}}{6}$$

- (pp) **“UPS”** means an uninterrupted power supply;
- (qq) **“WBS”** means work breakdown structure or a deliverable oriented hierarchical decomposition of the work packages to be executed by the Project team. The work

package expresses the work, duration and costs for the tasks required to produce the sub-deliverable; and

(rr) “**W&W**” means the City of Winnipeg Water and Waste Department.

## **D5. RELEVANT DOCUMENTS AND HISTORICAL DRAWINGS**

D5.1 Relevant documents and drawings are available by request to the City's Project Manager after completion of a Non-Disclosure Agreement. These documents and drawings will be released at the sole discretion of the City. A list of the available documents is included in Appendix A – Relevant Documents and Appendix B – Historical Drawings.

## **D6. GENERAL REQUIREMENTS**

### **D6.1 Consultant**

D6.1.1 The Consultant shall ensure that the Scope of Services is performed under direct supervision of a Professional Engineer.

- (a) All drawings, reports, recommendations, and other documents involving the practice of professional engineering shall bear the stamp or seal and signature of a qualified engineer as required by the Engineering and Geoscientific Professions Act of the Province of Manitoba and By-laws of the Engineers Geoscientists Manitoba.
- (b) Other reports and documents not involving the practice of professional engineering, such as letters of information and minutes of meetings, may be originated and signed by the Consultant's Project Manager or their designate as accepted by the City.
- (c) Final design documents irrespective of the level of design shall bear an engineer's seal.

D6.1.2 Progress estimates, completion certificates, and other reports related to the technical aspects of this Project shall be endorsed by the Consultant's Representative in a manner acceptable to the City.

D6.1.3 The Consultant shall, at a minimum, utilize the most current industry standard sustainable practices and conform to the latest codes, standards, regulations, and legislative requirements in effect. The Consultant shall liaise with the City's Project Manager on the application of codes and standards.

D6.1.4 The Consultant shall not substitute or replace Key Personnel throughout the duration of the Project without written approval of the City's Project Manager.

- (a) Experience and qualifications as specified in B11 shall be submitted for all requested substitute(s) and replacement(s).

D6.1.5 The Consultant shall coordinate with outside agencies as required to perform the Services. The Consultant shall confirm with the City's Project Manager the agencies that are being contacted prior to doing so.

D6.1.6 The following publicly available design guides and standards as indicated in Appendix A – Relevant Documents shall apply to the Services:

- (a) City of Winnipeg Water & Waste Department Electrical Design Guide.
- (b) City of Winnipeg Water & Waste Department Electrical Identification Standard.
  - (i) This standard is only applicable to new equipment. Existing equipment names shall be maintained as much as is practical to minimize impact to existing systems.
- (c) City of Winnipeg Water and Waste Department Computer Assisted Drafting (CAD) and Geographic Information System (GIS) Standards.

D6.1.7 The Consultant shall coordinate with the City's Project Manager to coordinate travel to and from SLAIF.

## **D6.2 Project Deliverables**

D6.2.1 Project Deliverables include but are not limited to the:

- (a) Updated project management plan as detailed in D8.2;
- (b) Deacon Reservoirs Invasive Mussel Control System Option Analysis technical memorandum (TM) as detailed in D10;
- (c) PowerPoint presentation for the regulators and authorities as detailed in D11;
- (d) Deacon Reservoirs Invasive Mussel Control System Geotechnical Report as detailed in D12;
- (e) Deacon Reservoirs Invasive Mussel Control System Preliminary Design Report as detailed in D13;
- (f) SLAIF Invasive Mussel Control System Dosing Analysis TM as detailed in D14; and
- (g) SLAIF invasive mussel control system detail design submission as detailed in D15.

D6.2.2 All Project Deliverables are to be delivered with a document lifecycle approach.

D6.2.3 Where possible, include all documents in a searchable PDF format.

D6.2.4 Unless otherwise indicated, the review period for Project Deliverables shall be a minimum of ten (10) Business Days. The Consultant shall indicate these review periods on the schedule as outlined in B13 Project Schedule (Section F).

D6.2.5 All Deliverables shall have incorporated the Consultant's internal quality procedures before being submitted to the City.

- (a) All Deliverables shall be reviewed by representatives of the Consultant who is proficient in technical writing and technical drawings prior to being submitted to the City.
- (b) Any Deliverables deemed by the City to be of poor quality shall be rejected and will be required to be revised and resubmitted at no additional cost to the City and shall not impact the timing of the Project schedule.

D6.2.6 All draft Deliverables shall be submitted in both native format (MS Word, MS Excel, MS Project, etc.) and PDF format while final Deliverables shall be submitted in PDF format. Include the Autodesk AutoCAD formats for all technical drawing submissions and MS Project formats for schedule submissions.

D6.2.7 The Deliverables shall be submitted in a substantially completed draft format for review prior to submittal as a final document.

- (a) All Deliverables shall be submitted to the City's Project Manager.
- (b) All City review comments shall be considered and incorporated into the final version, as applicable.

## **D6.3 Drawings**

D6.3.1 Drawings shall be prepared in accordance with the W&W's CAD-GIS Specifications.

D6.3.2 Drawings shall not be prepared using the City's GeoMedia and Google Earth screen captures and instead shall be prepared from the legal plans, certificates of title, as-built records, and topographic survey.

D6.3.3 Process, utility, and building Drawings shall have the following scales:

- (a) Details: 1:1, 1:5, 1:10, or 1:20;
- (b) Process plans, sections, and elevations: 1:10, 1:20, or 1:50; and

(c) Utility and building plans, sections, and elevations: 1:10, 1:20, 1:50, or 1:100.

- D6.3.4 All profile components of Drawings shall be in natural scale.
- D6.3.5 Where existing systems are being modified, the existing Drawings shall be modified or superseded rather than creating a new partial drawing only showing the new work.
- D6.3.6 The City will provide comments on the draft Drawings. Comments shall be reviewed and incorporated into the final Drawings, as applicable.
- D6.3.7 All final Drawings shall be submitted in AutoCAD format version 2012, PDF, and in 11x17 hard copy format, unless otherwise specified.
- D6.3.8 Instrumentation Loop Drawings and P&ID Drawings shall be in accordance with requirements indicated in Appendix G and Appendix H respectively.
- D6.3.9 The City shall provide Drawing numbers for all new Drawings that are generated. All references in the final Drawings shall reference the City's Drawing number not the Consultant's Drawing number.
- D6.3.10 Provide a cross reference on the Drawings to other associated Drawings, whether new Drawings included with this Work or the available historic Drawings.

#### **D6.4 Specifications**

- D6.4.1 The City of Winnipeg Standard Construction Specifications shall be used where applicable. The City of Winnipeg Construction Specification is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [www.winnipeg.ca/matmgt/Spec/Default.stm](http://www.winnipeg.ca/matmgt/Spec/Default.stm).
- D6.4.2 The specifications for process, instrumentation, controls, and building upgrades shall follow the NMS format.
- D6.4.3 The City will provide comments on the draft specifications. Comments shall be reviewed and incorporated into the final specifications, as applicable.
- D6.4.4 The Consultant shall review with W&W the special requirements for materials of construction and/or process which shall be incorporated into the specifications.

#### **D6.5 Photographs**

- D6.5.1 All photographs submitted to the City as part of the Project shall include captions with the following information:
- (a) date photograph was taken;
  - (b) location and orientation where the photograph was taken; and
  - (c) a brief description of what is depicted in the photograph.

#### **D6.6 Meetings**

- D6.6.1 Schedule and chair Project meetings.
- (a) Provide an agenda within two (2) Business Days prior to the meeting date.
  - (b) Provide meeting minutes within five (5) Business Days of the meeting date or as
  - (c) shall be held at the Winnipeg Drinking Water Treatment Plant, as practical. Alternative meeting locations shall include 1199 Pacific Avenue (Winnipeg, Manitoba), the Consultant's Winnipeg office, or any alternative site agreed upon by the Project Manager and the Consultant.

#### **D7. SCOPE OF SERVICES**

- D7.1 The Scope of Work for this RFP generally consists of consulting engineering design services for the following:
- (a) preliminary design of an invasive mussel control system for the Deacon Reservoirs; and



- (b) detailed design of an invasive mussel control system for the SLAIF.
- D7.2 The Services required under this Contract shall be in accordance with the following phases:
  - (a) Project Management as outlined in D8;
  - (b) Historical Information Review and Stakeholder Engagement as outlined in D9;
  - (c) Deacon Reservoirs Invasive Mussel Control System Option Analysis as outlined in D10;
  - (d) Regulator and Authority Interfacing as outlined in D11;
  - (e) Deacon Reservoirs Invasive Mussel Control System Geotechnical Report as outlined in D12;
  - (f) Deacon Reservoirs Invasive Mussel Control System Preliminary Design Report as outlined in D13;
  - (g) SLAIF Invasive Mussel Control System Dosing Analysis as outlined in D14; and
  - (h) SLAIF Invasive Mussel Control System Detail Design as outlined in D15.
- D7.2.1 Multiple Services detailed in in D7.2(a) to D7.2(g) can be performed concurrently where appropriate.
- D7.3 Unless otherwise stated, Appendix C – Definition of Professional Consultant Services (Consulting Engineering Services) shall be applicable to the provision of Professional Engineering services for this Project. These services are specific to advisory, preliminary design, and detailed design services.
- D7.4 The Services required shall be in accordance with the City's Project Management Manual <http://winnipeg.ca/infrastructure/asset-management-program/templates-manuals.stm#2> and templates <http://winnipeg.ca/infrastructure/asset-management-program/templates-manuals.stm#4> . Notwithstanding the foregoing, the Consultant is being engaged by the City for its professional expertise; the Consultant shall bring to the Project Manager's attention any aspect of the City's Project Management Manual or templates which the Consultant is of the opinion is not consistent with good industry practice.

## **D8. PROJECT MANAGEMENT**

- D8.1 Plan, organize, secure, and manage resources to complete the phases outlined in D10 to D16.
- D8.2 The City Project Manager has prepared a project management plan. Review and update the project management plan no later than fifteen (15) Business Days after Project Award. The project management plan includes:
  - (a) Scope and Schedule
    - (i) Include the information required in B13.
    - (ii) Provide a Deliverable based Work Breakdown Structure (WBS) that identifies major elements relative to how the assignment will be managed and in terms of tangible and verifiable results (including milestones, critical triggers, Deliverables, etc.).
    - (iii) Update the Project schedule (Gantt chart and network diagram) submitted in B13 with a Three-Point Estimate analysis indicating the optimistic, likely, and pessimistic time lines for the tasks and show the anticipated task times in the schedule. The Project schedule should list all Project activities and milestones and identify responsibilities, resources, timelines, and dependencies for all activities and milestones.
    - (iv) The approved schedule will be used as the Project baseline throughout the Project.
  - (b) Budget
    - (i) Include the information required in B9.
    - (ii) Include a description of the processes used to carry out earned value analysis such that the Project's performance can be measured against scope, schedule, and cost baselines.

- (c) Quality Management
    - (i) Describe quality management methods used to address quality planning, quality assurance, and quality control for the following:
      - (i) field surveying procedures and controls;
      - (ii) data review, verification, and validation;
      - (iii) City reviews;
      - (iv) corrective action process; and
      - (v) quality assurance and control of Deliverables.
  - (d) Human Resources
    - (i) Describe the team organizational and management approach.
    - (ii) Include an organizational chart.
  - (e) Communication
    - (i) Describe communication interfaces (organizational, technical, and interpersonal) and the roles and responsibilities of each stakeholder.
    - (ii) Identify the processes that will be used to liaise with the City throughout the provision of the Services and to provide ample opportunity for input and review by the City's Project team.
  - (f) Change Management Plan
    - (i) Identify the schedule, quality, and budget impacts of any proposed changes.
  - (g) Quality Assurance and Control plan
    - (i) Establish appropriate levels of review and approvals for all Project Deliverables.
  - (h) Risk Management Plan
    - (i) Update the risk management plan identifying risk event causes, risk event outcomes, degree of certainty, effects on Project objectives, severity of risk, response/action(s) to be undertaken, contingency plan, and associated costs to manage risks.
    - (ii) Outline process for updating the risk management plan in various phases of the Project.
- D8.3 Submit five (5) project status reports to be issued every sixty (60) Business Days after the pre-commencement meeting up to the completion of the Project. Project status reports to include:
- (a) work carried out in the previous sixty (60) Business Days;
  - (b) work in progress;
  - (c) work anticipated for the next sixty (60) Business Days, including projected person-hours;
  - (d) percentage completion of each phase and the overall Project;
  - (e) information requests for the next sixty (60) Business Days;
  - (f) issues to date;
  - (g) schedule and quality performance. In particular, report on items that are behind schedule and how they will be addressed;
  - (h) any modifications to the Project Management Plan;
  - (i) budget and actual cost for completed phases and projected cost for planned phases; and
  - (j) description, action, and mitigation of extreme and high risk(s).
- D8.3.1 Project status reports shall be a maximum of four (4) pages.
- D8.3.2 If critical stages outlined in D21 are not achieved, submit project status reports every thirty (30) Business Days until the deliverables indicated in D10 to D15 are approved by the City. No additional fees will be contemplated for additional project status reports.

- D8.4 Coordinate regular monthly project meetings and provide minutes. The meetings shall be used to update the Project Manager or designated representative on the status of the Project, deliverable items, and to discuss other project management issues.
- D8.4.1 Schedule all of the regular monthly project meetings within five (5) days of the pre-commencement meeting.
- D8.4.2 If critical stages outlined in D21 are not achieved, regular project meeting frequency shall increase to every two weeks until the deliverables indicated in D10 to D15 are approved by the City. The Project Manager identified in B11.2 to attend the project meetings. No additional fees will be contemplated for additional meetings.
- D8.4.3 The frequency of meetings may vary based upon the level of project activity.
- D8.5 In addition to the regular monthly project meetings detailed in D8.4, schedule and chair the following meetings:
- (a) pre-commencement meeting – to be scheduled immediately upon award of the Project;
  - (b) stakeholder workshop (as described in D9.3);
  - (c) meeting to review the draft Deacon Reservoirs Invasive Mussel Control System Option Analysis TM (as described in D10);
  - (d) meeting to present the proposed invasive mussel control systems for the Deacon Reservoirs and SLAIF to the Regulators (as described in D11).
  - (e) meeting to review the draft Deacon Reservoirs Invasive Mussel Control System Preliminary Design Report (as described in D13);
  - (f) meeting to review the draft SLAIF Invasive Mussel Control System Dosing Analysis TM (as described in D14);
  - (g) meeting to review the 66% draft SLAIF invasive mussel control system detail design specifications and Drawings (as described in D15); and
  - (h) Project closeout meeting.
- D8.5.1 Meetings can be combined if appropriate.
- D8.6 Provide ten (10) Business Day notice prior to any Site visit or work that will require assistance from City personnel or travel to SLAIF.
- D8.7 Carry out other project management activities as required.

## **D9. HISTORICAL INFORMATION REVIEW AND STAKEHOLDER ENGAGEMENT**

- D9.1 Review all pertinent background information including, but not limited to:
- (a) historical drawings;
  - (b) past reports;
  - (c) operational data; and
  - (d) past TMs.
- D9.2 Conduct detailed Site investigations of the SLAIF, the Hadashville Section Yard, Ross Section Yard, the Deacon Reservoirs, and the applicable Winnipeg Drinking Water Treatment Plant facilities to verify historical drawings and documents reviewed in D9.1 and to familiarize yourselves with the various Sites.
- D9.3 Conduct a stakeholder workshop.
- D9.3.1 The purpose of the stakeholder workshop is to determine stakeholder expectations for the Work. Expectation may include but are not limited to:
- (i) appropriate materials and equipment are selected for process systems;

- (ii) systems are selected based on simplicity of maintenance, operation, and installation;
- (iii) deficiencies and issues in the current systems are addressed and included in the design; and
- (iv) consideration be given to the remoteness of the Site and the challenges associated with transport of material, equipment, vehicles, tooling, and personnel.

D9.3.2 The stakeholder workshop to be a minimum of 3.5 hours long.

D9.3.3 Provide minutes of the stakeholder workshop within fifteen (15) Business Days of completion of the workshop. The minutes shall include critical Project success factors developed from the stakeholders' expectations.

## **D10. DEACON RESERVOIRS INVASIVE MUSSEL CONTROL SYSTEM OPTION ANALYSIS**

D10.1 Provide all necessary engineering services (process, civil, geotechnical, structural, mechanical, electrical, instrumentation, and rail engineering) as required to review and compare at least two possible systems for invasive mussel control at the Deacon Reservoirs.

D10.2 Two potential options may include but are not limited to:

D10.2.1 pH adjustment at Deacon Reservoirs, including:

- (a) a new chemical dosing system capable of pumping 97% sulphuric acid to the inlets of Cells 2 and 4 at the Deacon Reservoirs in order to maintain a maximum pH of 6.9 in the four cells from June to September;
- (b) redesign and reuse of the unused ammonia room in the Bulk Chemical Storage Building to accommodate storage of 97.5% sulphuric acid;
- (c) redesign of the truck unloading and containment system outside the ammonia room to accommodate unloading of 97.5% sulphuric acid; and
- (d) design of a new carrier water piping, pumping, and injection system for dilution of 97.5% sulphuric acid using raw water from the Raw Water Pumping Station, raw water from Cell 1, or the supernatant water from the residuals handling area.

D10.2.2 pH adjustment upstream of the Deacon Reservoirs, including:

- (a) a new chemical dosing system capable of pumping 97% sulphuric acid to the in the Shoal Lake Aqueduct in order to maintain a maximum pH of 6.9 in the four Deacon Reservoir cells from June to September. The new chemical dosing system could be located at:
  - (i) the SLAIF;
  - (ii) the Ross Section Yard; or
  - (iii) the Hadashville Section Yard.
- (b) an assessment of any potential impacts to the Shoal Lake Aqueduct resulting from the pH suppression.

D10.3 For each option considered, prepare the following as appropriate:

- (a) Design documents including:
  - (i) preliminary building plans showing the general arrangement of equipment and estimated space requirements as rough outline drawings.
  - (ii) preliminary P&IDs, process flow diagrams, and electrical single line diagram; and
  - (iii) mass balance calculations and ventilation calculations (based on CCOHS and ACGIH guidelines for industrial applications) based on existing system capacities.
- (b) Class 5 cost estimate including:
  - (i) A list of assumptions and exclusions for the estimate (e.g. currency exchange rates, factored equipment costs, factored building costs, quality of construction, levels of redundancy, chemical costs, contractor overheads and profits, etc.);

- (ii) A breakdown of costs separated by each individual W&W facility (e.g. Deacon Reservoirs, Water Treatment Plant Chemical Building, etc.) and by NMS division;
    - (iii) utility agency (i.e. Manitoba Hydro) costs;
    - (iv) construction General Condition costs included as a percentage of overall Division costs;
    - (v) contingency costs for potential risks broken down by item;
    - (vi) professional consulting services for detailed design and contract administration as a percentage of overall construction costs;
    - (vii) MRST as applicable.
  - (c) Life-cycle cost-benefit assessment of the options, including:
    - (i) operation and maintenance costs for the associated option. The City will provide the data regarding utility rates, chemical rates, and City labour costs rates to be assumed in the estimate;
    - (ii) the service life of each option.
  - (d) Completion of all tabs in the City's Net Present Value and Benefit Calculation template excluding the "*Benefits*" and the "*Status Quo*" tab. The City's Net Present Value and Benefit Calculation Template can be found at <https://winnipeg.ca/infrastructure/asset-management-program/templates-manuals.stm#4>. Before starting the task, the Consultant shall ensure the most recent version of the template is being used as the templates are updated on a regular basis.
  - (e) A tabulated comprehensive list of pros and cons for each option, including ease of implementation, financially immeasurable benefits (e.g. increased safety, operational flexibility, etc.), and effect on water quality;
- D10.4 Make a recommendation as to the most advantageous invasive mussel control option for the Deacon Reservoirs.
- D10.5 Utilising the information obtained in D10.1 to D10.3, prepare a TM on the Deacon Reservoirs Invasive Mussel Control System Option Analysis.
- D10.5.1 Submit a draft of the TM for City review and comment.
- D10.5.2 Conduct a meeting with the City Project team to discuss the findings and recommendations of the TM approximately fifteen (15) Business Days following the submission of the draft TM.
- D10.5.3 Resubmit the final TM on the Deacon Reservoirs Invasive Mussel Control System Option Analysis after incorporating City review comments and comments that arose during the draft TM review meeting.
- D10.6 Upon City approval, the recommended option is to be developed further in accordance with D13 Preliminary design.
- D11. REGULATOR AND AUTHORITY INTERFACING**
- D11.1 Consult with regulators and authorities regarding the proposed invasive mussel control systems for both the Deacon Reservoirs and the SLAIF,
- D11.1.1 Regulators and authorities include but are not limited to:
- (a) ODW;
  - (b) DFO;
  - (c) Health Canada; and
  - (d) local municipal or provincial authorities.
- D11.2 Prepare a PowerPoint presentation suitable for the presentation to regulators and authorities.
- D11.2.1 PowerPoint presentation to contain at a minimum:

- (a) the description of the proposed invasive mussel control systems for both the Deacon Reservoirs and the SLAIF;
- (b) the intent of the proposed invasive mussel control systems for both the Deacon Reservoirs and the SLAIF;
- (c) the impacts related to the implementation of the proposed invasive mussel control systems; and
- (d) any specific concerns or questions that the applicable regulators and authorities may have. This may require that the Consultant contact the applicable regulators and authorities in advance of the preparation of the PowerPoint presentation.

D11.2.2 The PowerPoint presentation to be a maximum of 60-minutes in duration.

D11.2.3 Submit the draft PowerPoint presentation to the City for review and approval.

D11.3 Schedule and chair a meeting to present and discuss the proposed invasive mussel control systems for both the Deacon Reservoirs and the SLAIF to the regulators and authorities.

D11.3.1 For bidding purposes, assume that only one meeting with the regulators and authorities will be required.

D11.3.2 Coordinate the timing of the meeting with the regulators and authorities and the City

D11.3.3 Host the meeting at one of the W&W facilities (1199 Pacific, 552 Plinguet, or the Winnipeg Drinking Water Treatment Plant), the Consultant's office, or virtually if required. The location of the meeting to be approved by the City.

D11.3.4 The meeting is to be approximately two hours in length with time left over at the end for discussion.

D11.3.5 At a minimum, the Consultant Project Manager and lead process professional shall present at the meeting.

D11.4 Provide minutes within fifteen (15) Business Days of the meeting.

## **D12. DEACON RESERVOIRS INVASIVE MUSSEL CONTROL SYSTEM GEOTECHNICAL REPORT**

D12.1 Provide the geotechnical field investigations and soil testing for use in the development of the preliminary design report for the applicable recommendation.

- (a) Provide a complete geotechnical report with the results of the field investigation and analysis. The report shall be suitable for use in detailed design and excavation design.
- (b) The cost to the Consultant for the provision of third-party testing shall be included as part of the fees.

## **D13. DEACON RESERVOIRS INVASIVE MUSSEL CONTROL SYSTEM PRELIMINARY DESIGN REPORT**

D13.1 The Consultant shall provide all necessary engineering services (process, civil, geotechnical, structural, mechanical, electrical, instrumentation, and rail engineering) as required to prepare the preliminary design of the recommended invasive mussel control system for Deacon Reservoirs as determined in D10.

D13.2 Prepare a preliminary design report of the recommended invasive mussel control system for Deacon Reservoirs as determined in D10.

D13.3 The preliminary design report at a minimum shall include:

D13.3.1 A general system description and preliminary control narrative.

D13.3.2 Preliminary design Drawings including at a minimum:

- (a) equipment layout drawings;
  - (b) P&IDs;
  - (c) electrical single line drawings; and
  - (d) Site plan.
- D13.3.3 Design calculations including at a minimum:
  - (a) mass balance calculations, and
  - (b) ventilation calculations (based on CCOHS and ACGIH guidelines for industrial applications).
- D13.3.4 Major equipment lists.
- D13.3.5 AACE Class 3 cost estimate for construction including at a minimum:
  - (a) the list of assumptions and exclusions for the estimate (e.g. currency exchange rates, factored equipment costs; factored building costs, quality of construction, levels of redundancy, chemical costs, contractor overheads and profits, etc.);
  - (b) a breakdown of costs by individual sections within the NMS divisions (e.g. pumps, switchgear, MCC, equipment housekeeping pad, etc.);
  - (c) utility agency (i.e. Manitoba Hydro) costs;
  - (d) construction General Conditions costs included as a percentage of overall division costs;
  - (e) contingency costs for potential risks broken down by item;
  - (f) MRST as applicable; and
  - (g) Three-Point Estimate analysis indicating the optimistic, likely, and pessimistic costs for each division and the resultant anticipated cost.
- D13.3.6 AACE Class 3 estimate for detailed design engineering and contract administration considering at a minimum:
  - (a) an hourly fee analysis considering the WBS; and
  - (b) MRST as applicable.
- D13.3.7 Annual operating and maintenance costs of the recommended option.
- D13.3.8 A life-cycle cost-benefit assessment of the recommended option. Include the expected service life.
  - (a) complete all tabs in the City's Net Present Value and Benefit Calculation template excluding the "Benefits" and the "Status Quo" tab. The City's Net Present Value and Benefit Calculation Template can be found at <https://winnipeg.ca/infrastructure/asset-management-program/templates-manuals.stm#4>. Before starting the task, ensure the most recent version of the template is being used as the templates are updated on a regular basis.
- D13.3.9 Construction Schedule that includes:
  - (a) Gantt chart and network diagram for the implementation of the recommended option; and
  - (b) anticipated task times.
- D13.4 Prepare and submit the draft preliminary design report for review and acceptance by the City.
  - (a) Conduct a meeting with the City Project team to discuss the draft preliminary design report approximately fifteen (15) Business Days following the submission of the draft preliminary design report.
  - (b) Resubmit the final preliminary design report after incorporating City review comments and comments that arose during the review meeting in D12.4(a).

#### **D14. SLAIF INVASIVE MUSSEL CONTROL SYSTEM DOSING ANALYSIS**

D14.1 Provide all necessary engineering services (process, civil, geotechnical, structural, mechanical, electrical, instrumentation and rail engineering) as required to review and compare at least two potential chlorine dosing options for the invasive mussel control system at Shoal Lake Aqueduct Intake Facility.

D14.1.1 Two potential chlorine dosing options to include:

- (a) a bulk 12.5% sodium hypochlorite system as outlined in the “Preliminary Design of Mussel Control at the Shoal Lake Intake Facility”, 2017 prepared by AECOM; and
- (b) a chlorine gas dosing system with tonners, a vacuum pressure system, and chlorine scrubbers.

D14.1.2 For each option considered, prepare the following as appropriate:

- (a) Design documents including:
  - (i) preliminary building plans showing the general arrangement of equipment and estimated space requirements as rough outline drawings.
  - (ii) preliminary P&IDs, process flow diagrams, and electrical single line diagram; and.
  - (iii) mass balance calculations and ventilation calculations (based on CCOHS and ACGIH guidelines for industrial applications) based on existing system capacities.
- (b) A Class 5 cost estimate including:
  - (i) A list of assumptions and exclusions for the estimate (e.g. currency exchange rates, factored equipment costs, factored building costs, quality of construction, levels of redundancy, chemical costs, contractor overheads and profits, etc.);
  - (ii) costs split out by NMS division;
  - (iii) utility agency (i.e. Manitoba Hydro) costs,
  - (iv) construction General Condition costs included as a percentage of overall Division costs;
  - (v) contingency costs for potential risks broken down by item;
  - (vi) professional consulting services for detailed design and contract administration as a percentage of overall construction costs;
  - (vii) MRST as applicable;
- (c) A Life-cycle cost-benefit assessment of the options including:
  - (i) operation and maintenance costs for the associated option. The City will provide the data regarding utility rates, chemical rates, and City labour costs rates to be assumed in the estimate;
  - (ii) the service life of each option.
- (d) Completion of all tabs in the City’s Net Present Value and Benefit Calculation template excluding the “Benefits” and the “Status Quo” tab. The City’s Net Present Value and Benefit Calculation Template can be found at <https://winnipeg.ca/infrastructure/asset-management-program/templates-manuals.stm#4>. Before starting the task, the Consultant shall ensure the most recent version of the template is being used as the templates are updated on a regular basis.
- (e) A tabulated comprehensive list of pros and cons for each option, including ease of implementation, financially immeasurable benefits (e.g. increased safety, operational flexibility, etc.), and effect on water quality;

D14.1.3 Make a recommendation as to the most advantageous chlorine dosing system for the invasive mussel control system at SLAIF.

D14.1.4 Utilising the information obtained in D14.1.1 to D14.1.3, prepare a SLAIF Invasive Mussel Control System Option Analysis TM.



- (a) Submit a draft TM for City review and comment.
- (b) Conduct a meeting with the City Project team to discuss the findings and recommendations of the TM approximately fifteen (15) Business Days following the submission of the draft TM.
- (c) Resubmit the final SLAIF Invasive Mussel Control System Dosing Analysis TM after incorporating City review comments and comments that arose during the draft TM review meeting.

D14.2 Upon City approval, the recommended option is to be developed further in Detailed Design.

## **D15. SLAIF INVASIVE MUSSEL CONTROL SYSTEM DETAIL DESIGN**

D15.1 The Consultant shall provide all necessary engineering services (process, civil, geotechnical, structural, mechanical, electrical, instrumentation, and rail engineering) as required for the detailed design of a new invasive mussel control as recommended in the TM prepared in D14 and the "Preliminary Design of Mussel Control at the Shoal Lake Intake Facility", 2017 report prepared by AECOM.

D15.1.1 In addition to the design considerations outlined in the "Preliminary Design of Mussel Control at the Shoal Lake Intake Facility", 2017 report prepared by AECOM, the following differences or additional requirements shall apply:

- (a) The chlorine system design shall include:
  - (i) the design of the new chlorine dosing system shall be based on the recommended option determined in D14;
  - (ii) If a bulk 12.5% sodium hypochlorite system is recommended, upgrades to include railcar unloading systems, railcar environmental protection structure and leak containment;
  - (iii) If a chlorine gas system is recommended, an additional structure and associated systems will be required for tonner storage;
  - (iv) a complete decommissioning plan of any and all process, mechanical, electrical, instrumentation, and structural components of the abandoned chlorine gas system;
  - (v) chlorine dosing piping designed in accordance with ASME B31.3 – Process Piping;
  - (vi) upgrades to the existing emergency shower and eyewash system to provide a minimum of 45 minutes of operating time with a 25 Celsius tempered potable water supply of for the Chlorine Building. This will require upgrades to the potable water supply for to the Chlorine Building to prevent stagnation;
  - (vii) upgrades to the ventilation and heating system within the existing Chlorine Building to accommodate the new dosing system;
  - (viii) upgrades to the electrical system to accommodate the new chlorine system. The existing service is fed from PL-3 in the Electrical Room in the Pump House;
  - (ix) a new stand-alone PLC system for the operation of the new chlorine dosing system that will be integrated back to the main facility PLC via a new fibre-optic feed; and
  - (x) site grading, drainage, and restoration.
- (b) The Gatehouse modification shall include:
  - (i) upgrades to the cooling systems for the onsite power generation and the diesel engine low lift pump to provide closed looped cooling systems;
  - (ii) upgrades to the rotating screen backwash cycle to interlock with the chlorine headwall dosing system;
  - (iii) upgrades to the ventilation system within the Gatehouse to accommodate potentially higher ambient chlorine levels in the air during the dosing season. an
- (c) The requirement for the design of a construction lay-down area.

- (i) Lay down area will be required to support the Contractor during the construction of the upgrades; and
- (ii) Restoration of the lay down area back to original condition.
- (d) The requirement to consider the remote location during design and that material, equipment, and personnel transport will have to be coordinated with the City.

D15.2 The detailed design submission shall include:

- (a) Detailed design Drawings
  - (i) Draft Drawings to be submitted to the City for review and comment at 33%, 66%, and 99% completion. Comments shall be reviewed and incorporated into the final Drawings, as applicable.
- (b) Technical specifications
  - (i) A process control narrative associated with the upgrades to be included in the technical specifications;
  - (ii) An instrumentation index and instrumentation specification sheets to be included in the technical specifications.
  - (iii) A PLC I/O index to be included in the technical specifications.
  - (iv) Equipment schedules and spare parts listings shall be included in the technical specifications.
  - (v) Draft technical specifications to be submitted to the City for review and comment at 33%, 66%, and 99% completion. Comments shall be reviewed and incorporated into the final technical specifications, as applicable.
- (c) Design calculations including at a minimum:
  - (i) process mass balance calculations;
  - (ii) duct and pipe sizing calculation;
  - (iii) structural calculations;
  - (iv) HVAC calculations including ventilation rates (considering CCOHS and ACGIH guidelines, standards, and recommended practices), heating and cooling loads;
  - (v) hot water tank calculations; and
  - (vi) electrical calculations.
- (d) AACE Class 1 Cost Estimate
  - (i) List all assumptions and exclusions for the estimate (e.g. currency exchange rates, labour rates; project delivery method, basis for labour hours, etc.).
  - (ii) Include line item take-offs for equipment, materials, and rentals showing the unit price, unit labour hours, and quantities. Material costs and labour hours to be extended out based on indicated quantities.
  - (iii) Include assumed base labour rates,
  - (iv) Include general condition costs including but not limited to bonding, insurance, permits, as-builts, shop drawings, and health & safety;
  - (v) Include Mark-ups for general contractor, division trades, and sub-trades; and
  - (vi) Include for MRST as applicable.
- (e) Construction Schedule
  - (i) Prepare an estimated construction schedule for the implementation of the design, taking into consideration whether phased construction requirements will be required to maintain compliance with the City's operation of the system.
  - (ii) Use the Three-Point Estimate analysis in the construction schedule to indicate the optimistic, likely, and pessimistic time lines for the tasks and show the anticipated task times.
- (f) Construction Plan
  - (i) Provide a construction plan that details the proposed construction sequence and mitigation of Site constraints. The plan shall clearly demonstrate how the installation

will be implemented while maintaining operation of the Shoal Lake Aqueduct Intake and the Shoal Lake Aqueduct.

- (ii) The plan shall be suitable for both City and contractor use.
- (iii) The report shall consist of the following sections at a minimum:
  - (a) Introduction
  - (b) Construction Sequence and Schedule
  - (c) Controls to Maintain System Operations
  - (d) Temporary Construction Requirements
  - (e) Risk Analysis

#### **D16. ADDITIONAL WORK ALLOWANCE**

- D16.1 Include in the Proposal fees, Additional Work Allowance as stated herein.
- D16.2 The Additional Work Allowance of fifty thousand (50,000) dollars is to be used for substantial changes in engineering services that arise due to unforeseen conditions with the Sites, if the existing documentation, and/or the Contract is at variance with any laws, ordinances, rules, regulations or codes of authorities having jurisdiction, or if changes are made to any laws, ordinances, rules, regulations and codes subsequent to the Submission Deadline which require modifications to the Contract. When these circumstances occur, the Consultant shall promptly provide notice thereof to the City's Project Manager, including:
- (a) the description of the unforeseen condition;
  - (b) a detailed description of the proposed Change in Services; and
  - (c) the Consultant's proposed method(s) to determine the adjustment, if any, to the Contract.
- D16.3 Expenditures under the Additional Work Allowance shall be authorized by the City's Project Manager.
- D16.4 Where the actual cost of the Additional Work Allowance exceeds the amount of the allowance, the Consultant shall be compensated for the excess incurred and substantiated plus the amounts outlined in C8.4. Where the actual cost of the Additional Work Allowance is less than the amount of the allowance, the City shall be credited for the unexpended portion of the allowance.

#### **SUBMISSIONS**

##### **D17. AUTHORITY TO CARRY ON BUSINESS**

- D17.1 The Consultant 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 Consultant does not carry on business in Manitoba, in the jurisdiction where the Consultant does carry on business, throughout the term of the Contract, and shall provide the Project Manager with evidence thereof upon request.

##### **D18. SAFE WORK PLAN**

- D18.1 The Consultant shall provide a Safe Work Plan no later than the date specified in C4.1 for the return of the executed Contract.
- D18.1.1 No Work shall commence on Site until the Safe Work Plan has been reviewed as acceptable by the City.
- D18.2 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>

## **D19. INSURANCE**

- D19.1 The Consultant shall procure and maintain, at its own expense and cost, insurance policies with limits no less than those shown below.
- D19.2 As a minimum, the Consultant shall, without limiting its obligations or liabilities under any other contract with the City, procure and maintain, at its own expense and cost, the following insurance policies:
- (a) Comprehensive or Commercial General Liability Insurance including:
    - (i) an inclusive limit of not less than \$2,000,000 for each occurrence or accident with a minimum \$2,000,000 Products and Completed Operations aggregate and \$5,000,000 general aggregate;
    - (ii) all sums which the Consultant shall become legally obligated to pay for damages because of bodily injury (including death at any time resulting therefrom) sustained by any person or persons or because of damage to or destruction of property caused by an occurrence or accident arising out of or related to the Services or any operations carried on in connection with this Contract;
    - (iii) coverage for Products/Completed Operations, Blanket Contractual, Consultant's Protective, Personal Injury, Contingent Employer's Liability, Broad Form Property Damage, Employees as Additional Insureds, and Non-Owned Automobile Liability;
    - (iv) a Cross Liability clause and/or Severability of Interest clause providing that the inclusion of more than one Insured shall not in any way affect the rights of any other Insured hereunder in respect to any claim, demand, suit or judgment made against any other Insured.
  - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Consultant directly or indirectly in the performance of the Service. 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) Professional Errors and Omissions Liability Insurance including:
    - (i) an amount not less than \$5,000,000 per claim and \$5,000,000 in the aggregate.
- D19.2.1 The Consultant's Professional Errors and Omissions Liability Insurance shall remain in force for the duration of the Project and for twelve (12) months after Total Performance.
- D19.3 The policies required in D19.2(a) shall provide that the City is named as an Additional Insured thereunder and that said policies are primary without any right of contribution from any insurance otherwise maintained by the City.
- D19.4 During the transportation of equipment, material, supplies and personnel via the GWWD Railway, the Consultant is to provide and maintain the following insurance coverage:
- (a) Commercial general liability insurance as outlined in D19.2(a) with the certificate of insurance to specify that coverage includes transportation via railway;
  - (b) If required, all risk property policy carrying adequate limits to cover all machinery, equipment, supplies and/or materials transported via railway and brought to the Shoal Lake Intake site or sites along the GWWD Railway;
  - (c) If required, property in transit for the full value of machinery, equipment and supplies while being transported via railway; and
  - (d) A signed waiver of liability and assumption of risk agreement prior to the transporting of any supplies, equipment, machinery, material and personnel.
- D19.5 The Consultant shall require any Consultants hired to perform geo technical drilling and sample collecting to procure and maintain, at its own expense and cost, comparable insurance to that set forth under D19.2(a) and D19.2(b).

- D19.6 The Consultant shall require each of its Subconsultants hired for design, architectural or engineering services as outlined in the Scope of Services to provide comparable insurance to that set forth under D19.2(a) and D19.2(c).
- D19.7 The Consultant shall provide the Project Manager 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 Services, but in no event later than the date specified in C4.1 for the return of the executed Contract. Such certificates shall state the exact description of the Services and provide for written notice in accordance with D19.10.
- D19.8 The Consultant may take out such additional insurance as it may consider necessary and desirable. All such additional insurance shall be at no expense to the City.
- D19.9 All insurance, which the Consultant is required to obtain with respect to this Contract, shall be with insurance companies registered in and licensed to underwrite such insurance in the Province of Manitoba.
- D19.10 The Consultant shall not cancel, materially alter, or cause any policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the City.

## **SCHEDULE OF SERVICES**

### **D20. COMMENCEMENT**

- D20.1 The Consultant shall not commence any Services until it is in receipt of a notice of award from the City authorizing the commencement of the Services.
- D20.2 The Consultant shall not commence any Services until:
- (a) the Project Manager has confirmed receipt and approval of:
    - (i) evidence of authority to carry on business specified in D17;
    - (ii) evidence of the insurance specified in D19.
  - (b) the Consultant has attended a meeting with the Project Manager, or the Project Manager has waived the requirement for a meeting.
- D20.3 The Consultant shall not commence any Work on Site until the Safe Work Plan indicated in D18 has been reviewed by the City.
- D20.4 The City intends to award this Contract by January 6, 2021.

### **D21. CRITICAL STAGES**

- D21.1 The Consultant shall achieve critical stages of the Services for this Contract in accordance with the following requirements:
- (a) Meeting to present the proposed invasive mussel control systems for the Deacon Reservoirs and SLAIF to the Regulators as detailed in D11 within one hundred fifty (120) Business Days from the pre-commencement meeting;
  - (b) Project closeout meeting within three hundred fifty (350) Business Days from the pre-commencement meeting.

### **D22. COVID-19 SCHEDULE DELAYS**

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

- D22.2 If the Consultant is delayed in the performance of the Services by reason of the COVID-19 pandemic, the Services schedule may be adjusted by a period of time equal to the time lost due to such delay and costs related to such delay will be determined as identified herein.
- D22.3 Within seven (7) Calendar Days of the award of Contract, the Consultant shall declare whether COVID-19 will affect the start date. If the Consultant declares that COVID-19 will affect the start date, the Consultant shall provide sufficient evidence that the delay is directly related to COVID-19, including but not limited to evidence related to availability of staff or work by others.
- D22.4 For any delay related to COVID-19 and identified after Services have commenced, the Consultant shall within seven (7) Calendar Days of becoming aware of the anticipated delay declare the additional delay and shall provide sufficient evidence as indicated in D22.3. Failure to provide this notice will result in no additional time delays being considered by the City.
- D22.5 Any time or cost implications as a result of COVID-19 and in accordance with the above, as confirmed by the City's Project Manager, shall be documented in accordance with C8.

## PART E - SECURITY CLEARANCE

### E1. SECURITY CLEARANCE

E1.1 Each individual proposed to perform Services under this Contract within facilities associated with the water supply, treatment, and distribution system including the SLAIF, Shoal Lake Aqueduct, Deacon Reservoir, WTP, RPS, and BPS shall be required to obtain a Public Safety Verification Check and a Police Information Check as detailed below.

E1.1.1 The Public Safety Verification Check must be obtained through Sterling BackCheck.

- (a) A Sterling BackCheck account must be setup seventy-two (72) hours prior to individual security clearances to allow sufficient time for activation of the contracting company's account. If the contracting company has an existing City of Winnipeg Sterling Backcheck vendor account, they may skip to (d) below.
- (b) An authorized individual of the contracting company must complete the Sterling Backcheck Setup Form. Click on the link below, complete the form, and hit submit.  
\*\*(This form is to be completed by the company, not by the employee requiring the security clearances). <https://forms.sterlingbackcheck.com/partners/platform2-en.php?partner=winnipegcity>
- (c) Within forty-eight (48) hours of completing the Sterling Backcheck Setup Form, the authorized individual of the contracting company will receive a username and password for Sterling Backcheck. It will appear in their inbox as a "Welcome to Sterling Backcheck" e-mail. Upon receipt, the authorized individual of the contracting company will be asked to login to the Sterling Backcheck website to set their security questions and password. Once completed, individual security clearance requests can be submitted.
- (d) In order to run a Public Safety Verification Check and/or a Police Information Check, follow the steps below:
  - (i) click on the sub-tab labelled "Order eConsent";
  - (ii) fill out the required information about the employee proposed to perform Services under this Contract within City facilities (the person that requires the security clearances);
  - (iii) select your location under the "Order Information" section and enter the organization's phone number, if required;
  - (iv) select the required individual service(s) in the dropdown menu under the "Select Services" section. If both the Public Safety Verification Check and the Police Information Check are required, select the Sterling Backcheck Package One (with electronic identity verification). Once selected, both the Public Safety Verification Check and the Police Information Check should have a grey check mark beside them;
  - (v) Scroll down to the bottom and click the blue "Submit" button. The employee proposed to perform Services under this Contract within City facilities will be invited to complete their security clearance;
  - (vi) The employee will receive the invitation and must click on the link and complete their Public Safety Verification Check and/or Police Information Check;
  - (vii) The results of the Public Safety Verification Check and/or Police Information Check will go directly to the City of Winnipeg and to the authorized individual of the contracting company within twenty-four (24) hours; and
  - (viii) contact Ron Risley at 204-986-3758 if you have any questions regarding the Public Safety Verification Check.
- (e) Any questions related to the Sterling BackCheck process can be directed to Linda Ferens at 204-999-0912 or by email at: [linda.ferens@sterlingcheck.com](mailto:linda.ferens@sterlingcheck.com) OR [managedsupport@sterlingcheck.com](mailto:managedsupport@sterlingcheck.com)

E1.1.2 The Police Information Check must be obtained from one of the following:

- (a) Sterling BackCheck;

- (i) see E1.1.1(a) thru (e) for instructions on how to set up an account and submit individuals for security checks; or
  - (b) a police service having jurisdiction at his/her place of residence;
    - (i) the original Police Information Check (Form P-612) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner;
    - (ii) the applicant shall provide the original Police Information Check (Form P-612) to the Contract Administrator; or
  - (c) Commissionaires (Manitoba Division);
    - (i) forms to be completed can be found on the website at: <https://www.commissionaires.ca/en/manitoba/home>
    - (ii) the applicant shall provide the original Police Information Check to the Contract Administrator; or
  - (d) FASTCHECK Criminal Record & Fingerprint Specialists;
    - (i) forms to be completed can be found on the website at: <https://myfastcheck.com>
    - (ii) the applicant shall provide the original Police Information Check to the Contract Administrator.
- E1.2 Any individual for whom a Public Safety Verification Check and/or a Police Information Check is not provided will not be permitted to perform any Services.
- E1.3 Individuals for whom a Public Safety Verification Check indicates "CLEAR" and a Police Information Check demonstrates no previous convictions or pending charges will be permitted to perform Services as specified in E1.1.
- E1.4 Individuals for whom a Public Safety Verification Check does not indicate "CLEAR" and/or a Police Information Check demonstrates previous convictions or pending charges may not be permitted to perform any Services as specified in E1.1.
  - (a) Previous convictions or pending charges may be investigated and a determination will be made by the City as to whether the individual will be permitted to perform any Services.
  - (b) Convictions or pending charges that may preclude an individual from performing any Services include but are not limited to:
    - (i) convictions or pending charges related to property offences; and/or
    - (ii) convictions or pending charges related to crimes against another person.
  - (c) Where additional investigation related to a Public Safety Verification Check or a Police Information Check is required by the City, no extension to critical stages, Substantial Performance, or Total Performance, as applicable, will be provided.
  - (d) Additional investigation by the City may take upwards of six (6) weeks.
- E1.5 Prior to the award of Contract, and during the term of the Contract, if additional or replacement individuals are proposed to perform Services within City facilities, the Contractor shall supply the Contract Administrator with a Public Safety Verification Check and a Police Information Check satisfactory to the City obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform the Services.
- E1.6 Any Public Safety Verification Check and Police Information Check determined to be satisfactory to the City will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.
- E1.7 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated Public Safety Verification Check and/or a Police Information Check. Any individual who fails to provide a Public Safety Verification Check and/or a Police Information Check satisfactory to the City as a result of a repeated records search will not be permitted to continue to perform any Services as specified in E1.1.



## APPENDIX A – RELEVANT DOCUMENTS

The following documents are available electronically by request to the Project Manager after completion of a Non-Disclosure Agreement:		
<b>1</b>	<b>Final Asbestos Reassessment: Shoal Lake Aqueduct Intake Facility</b>	
	Author: Pinchin Environmental Ltd.	Report updating the original 2007 survey report.
	Published: 2017	
<b>2</b>	<b>Shoal Lake Aqueduct Intake Facility Assessment – Site Inspections and Assessment</b>	
	Author: AECOM Canada Ltd.	Condition assessment of buildings and systems at the Shoal Lake Intake facility
	Published: 2012	
<b>3</b>	<b>Mussel Control at the Shoal Lake Intake Facility Assessment</b>	
	Author: AECOM Canada Ltd.	To determine the most suitable treatment method to control invasive aquatic species at Shoal Lake Aqueduct Intake Facility.
	Published: 2016	
<b>4</b>	<b>Preliminary Design of Mussel Control at the Shoal Lake Intake Facility</b>	
	Author: AECOM Canada Ltd.	To prepare recommendations for the detailed design of the invasive aquatic species control system at Shoal Lake Intake Facility.
	Published: 2017	
<b>5</b>	<b>Foundation Recommendations for Proposed Sodium Hypochlorite Building at Shoal Lake Aqueduct</b>	
	Author: Trek Geotechnical	To prepare recommendations for the design of foundations for the expansion of the current Chlorine Building.
	Published: 2015	
<b>6</b>	<b>Drinking Water Quality Standard</b>	
	Author: CH2M Hill	To prepare recommendations for the operations of systems for zebra mussel and Aqueduct slime control.
	Published: 2012	
The following documents are available electronically online		
<b>7</b>	<b>The City of Winnipeg Water &amp; Waste Department Electrical Design Guide</b> <a href="https://winnipeg.ca/waterandwaste/pdfs/dept/ElectricalDesignGuide.pdf">https://winnipeg.ca/waterandwaste/pdfs/dept/ElectricalDesignGuide.pdf</a>	
<b>8</b>	<b>The City of Winnipeg Water &amp; Waste Department Identification Standard</b> <a href="https://winnipeg.ca/waterandwaste/pdfs/dept/IdentificationStandard.pdf">https://winnipeg.ca/waterandwaste/pdfs/dept/IdentificationStandard.pdf</a>	
<b>9</b>	<b>The City of Winnipeg Water &amp; Waste Department Drawing Standard</b> <a href="https://winnipeg.ca/waterandwaste/dept/cad_gis.stm">https://winnipeg.ca/waterandwaste/dept/cad_gis.stm</a>	

## APPENDIX B – HISTORICAL DRAWINGS

The following historical drawings are available electronically by request to the Project Manager after completion of a Non-Disclosure Agreement.

Drawing Number	Drawing Name/Title
<b>General</b>	
1-0600A-P0001-001	Shoal Lake Intake & Aqueduct Process and Instrumentation Legend and Details
1-0600A-P0001-002	Shoal Lake Intake & Aqueduct Process and Instrumentation Legend and Details
1-0600A-P0001-003	Shoal Lake Intake & Aqueduct Process and Instrumentation Legend and Details
1-0600A-P0002-001	Shoal Lake Intake & Aqueduct Process and Instrumentation - Miscellaneous HVAC
1-0600A-P0003-001	Shoal Lake Intake & Aqueduct Process and Instrumentation - Miscellaneous
1-0600M-E0003-001	Shoal Lake Intake Facility – Arc Flash Study – Electrical Single Line Diagram – Legends & Details
<b>Chlorine Building</b>	
1-0600C-P0001-001	Process and Instrumentation Diagram - Chlorine Railcar Shutoff Valves
1-0600C-P0002-001	Process and Instrumentation Diagram - Chlorine Building - EVP-C281
1-0600C-P0003-001	Process and Instrumentation Diagram - Chlorine Building - EVP-C282
1-0600C-P0004-001	Process and Instrumentation Diagram - Chlorine Building - HVAC & Miscellaneous
1-0600M-A0002-001	Chlorine Emergency Isolation System - Process and Instrumentation Diagram - Chlorine Railcar Shutoff Valves
1-0600M-A0003-001	Chlorine Emergency Isolation System - Site Plan - Electrical, Instrumentation and Device Locations
1-0600M-A0004-001	Chlorine Emergency Isolation System -Panel Layout - Panel CP810 Details
1-0600M-A0005-001	Chlorine Emergency Isolation System -Panel Layout - Panel CP800B Bill of Materials/Details
1-0600M-A0006-001	Chlorine Emergency Isolation System -Panel Layout - E-Stop IC-810-HS-2 Bill of Materials/Details
1-0600M-A0007-001	Chlorine Emergency Isolation System - Control Schematic - Panel CP810
1-0600M-A0008-001	Chlorine Emergency Isolation System - Control Wiring Diagram - Panel CP810
1-0600M-A0009-001	Chlorine Emergency Isolation System - Instrumentation Loop Diagram - IC-800-ASH-1 and IC-800-ASH-2 Chlorine Detection
1-0600M-A0010-001	Chlorine Emergency Isolation System - Instrumentation Loop Diagram - IC-811-XSV Valve
1-0600M-A0011-001	Chlorine Emergency Isolation System - Instrumentation Loop Diagram - IC-812-XSV Valve
1-0600M-A0012-001	Chlorine Emergency Isolation System - Instrumentation Loop Diagram - IC-815-XSV Valve
1-0600M-A0013-001	Chlorine Emergency Isolation System Instrument Loop Diagram IC-816-XSV Valve
1-0600M-A0014-001	Chlorine Emergency Isolation System Instrument Loop Diagram IC-813-PSL Low Pressure Switch

1-0600M-A0015-001	Chlorine Emergency Isolation System Control Wiring Diagram and Main Alarm Panel PL-15
1-0600M-A0016-001	Chlorine Emergency Isolation System Control Wiring Diagram Panel CP800B
1-0600M-A0017-001	Chlorine Emergency Isolation System Control Wiring Diagram Junction Box JB810B
1-0600M-A0018-001	Chlorine Emergency Isolation System Control Schematic Panel CP800B
1-0600M-A0019-001	Chlorine Emergency Isolation System Control Schematic Alarm Relay Panel CP810C and Main Alarm Panel PL-15
1-0600M-A0020-001	Chlorine Emergency Isolation System Panel Layout - Panel CP810 Bill of Materials
1-0600M-M0001-001	Shoal Lake Intake - Chlorine Rail Car Emergency Isolation System Piping Isometric - Rail Car Connection - West Spur
1-0600M-M0002-001	Chlorine Rail Car Emergency Isolation System Piping Isometric - Rail Car Connection - East Spur
1-0600M-M0003-001	Chlorine Rail Car Emergency Isolation System Piping Diagram Nitrogen Supply
D-1770	Upgrading of Chemical Feeding Facility – New Chlorination Building
D-1771	Upgrading of Chemical Feeding Facility – New Chlorination Building
D-1772	Upgrading of Chemical Feeding Facility – New Chlorination Building
D-1773	Upgrading of Chemical Feeding Facility – New Chlorination Building
D-1774	Chemical Upgrading Chlorine Building Floor Plan - Electrical
D-1775	Chemical Upgrading Chlorine Building Wiring Diagram - Electrical
D-1776	Chemical Upgrading Chlorine Building Wiring Diagrams - Electrical
D-1804	Indian Bay Chemical Upgrading - Chlorine Building - Schematic Layout
D-1805	Indian Bay Chemical Upgrading - Chlorination Building - Schematic Piping
D-1806	Indian Bay Chemical Upgrading – Evaporator Room Elevations & Details
D-1807	Indian Bay Chemical Upgrading – Chlorine Room Elevations & Details
D-3804	Shoal Lake Intake Facility- Zebra Mussel Control System – Chlorination Off-Loading Tower
D-3805	Shoal Lake Intake Facility- Zebra Mussel Control System – Chlorine Building Piping Schematic
D-3806	Shoal Lake Intake Facility- Zebra Mussel Control System – Chlorine Building Piping Section
D-3807	Shoal Lake Intake Facility- Zebra Mussel Control System – Chlorine Building Evaporator Modifications
D-3808	Shoal Lake Intake Facility- Zebra Mussel Control System – Chlorine Building Piping Modifications
D-3809	Shoal Lake Intake Facility- Zebra Mussel Control System – Underground Piping Details
D-3810	Shoal Lake Intake Facility- Zebra Mussel Control System – Aqueduct Section and Details
D-3870	Shoal Lake Intake Facility Upgrading - Chlorine Building - Electrical Equipment Layout
D-3875	Shoal Lake Intake Facility Upgrading - Chlorine Building - 208/120V AC Distribution PL-6 - Single Line Diagram
D-3876	Shoal Lake Intake Facility Upgrading - Chlorine Building - 208/120V AC Distribution - Schematic Diagram
D-3877	Shoal Lake Intake Facility Upgrading - Chlorine Building - Evaporator EV-1 & EV-2 - Typical Schematic Diagram
D-3911	Shoal Lake Intake Facility Upgrading - Existing Chlorine Building - Alarm Control Panel Layout & Schematic

D-4190	Shoal Lake Intake Facility Upgrade - Chlorine Building PLC Panel Layout
D-4194	Shoal Lake Intake Facility Upgrade - Chlorine Building - Modifications to Existing Chlorine Alarm Panel (PL-61)
D-4195	Shoal Lake Intake Facility Upgrade - Chlorine Building - Modifications to Existing Chlorine Alarm Panel (PL-61)
D-4195A	Shoal Lake Intake Facility Upgrade - Chlorine Building - Chlorine Alarm Panel (PL-61)
D-4195B	Shoal Lake Intake Facility Upgrade - Chlorine Building - Relay Wiring Chlorine Alarm Panel (PL-61)
D-4195F	Shoal Lake Intake Facility Upgrade - Chlorine Building - Chlorine Alarm Panel (PL-61)
D-4195H	Shoal Lake Intake Facility Upgrade - Chlorine Building - Chlorine Alarm Panel (PL-61)
D-4195I	Shoal Lake Intake Facility Upgrade - Chlorine Building - Chlorine Alarm Panel (PL-61)
D-4235	Shoal Lake Intake Facility Upgrading - Chlorine Building and Dechlorination Building Cable & Conduit Layout
D-4341	Shoal Lake Intake Facility - Chlorine Induction Equipment Installation Details
D-4342	Shoal Lake Intake Facility - Chlorine Induction Manhole Hatch Cover and Details
D-4343	Shoal Lake Intake Facility - Chlorine Induction Equipment Frame Details
D-4344	Shoal Lake Intake Facility - Chlorine Induction Equipment Electrical Details
<b>Dechlorination Building</b>	
D-3814	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination Building Equipment Floor Plan and Isometrics
D-3815	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination Building Elevations
D-3816	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination Building, Roof Plan, Section and Details
D-3817	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination Building General Structural Notes
D-3818	Shoal Lake Intake Facility - Zebra Mussel Control System - SO2 Diffuser and Sample Manholes
D-3819	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination Monitoring / Initiation Control Schematic & Water Service Schematic
D-3820	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination System Process and Instrumentation Diagram
D-3821	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination Building Electrical Plan Power and Details
D-3822	Shoal Lake Intake Facility - Zebra Mussel Control System - Dechlorination Building Electrical Control and Schematics
D-4200	Shoal Lake Intake Facility Upgrade - Dechlorination Alarm Panel (PL-42) - Dechlorination Building PLC Panel Layout
D-4201	PL-42 PLC to TB Interconnection
D-4202	PL-42 Terminal Block - Wiring Diagram & Layout
D-4203	PL-42 Terminal Block - Wiring Diagram & Layout
D-4204	Shoal Lake Intake Facility Upgrade - Dechlorination SO2 Building - SO2 Alarm Panel (PL60) Wiring Diagram
D-4205	Shoal Lake Intake Facility Upgrade - Dechlorination SO2 Building - SO2 Alarm Panel (PL60) Wiring Diagram

D-4206	Shoal Lake Intake Facility Upgrade - Dechlorination SO2 Building - SO2 Alarm Panel (PL60) Wiring Diagram
D-4207	Shoal Lake Intake Facility Upgrade - Dechlorination SO2 Building - Panel 44 Panel & Wiring Diagram
D-4208	Heat Trace Panel PL-78 Wiring Diagram
D-4209	Heat Trace Panel PL-78 Wiring Diagram
D-4221	Shoal Lake Intake Facility Upgrade - Dechlorination SO2 Building - SO2 Alarm Panel (PL60) Wiring Diagram
D-4222	Shoal Lake Intake Facility Upgrade - Dechlorination SO2 Building - SO2 Alarm Panel (PL60) Wiring Diagram
D-4223	MODS to SO2 Residual Analyzer Sys.
D-4224	Shoal Lake Intake Facility Upgrade - SO2 Dechlorination Control Panel PL-16 Timing Sequence
D-4225	Dechlorination Timers
D-4226	Shoal Lake Intake Facility Upgrade - Dechlorination SO2 Building - SO2 Alarm Panel Bill of Materials
D-4238	Shoal Lake Intake Facility Upgrading - Dechlorination Building - Electrical Services Schematic Diagram
D-4345	Shoal Lake Intake Facility Upgrading - Dechlorination System - Probe Installation Details
D-4346	Shoal Lake Intake Facility Upgrading - Dechlorination System - Sample Manhole Modifications
D-4430	Shoal Lake Intake Facility Upgrading - Dechlorination Building - Piping Heat Trace PL-77 & PL-78 Schematic Diagram
D-4550	Dechlorination Building Alarms
D-4551	Dechlorination Building
D-4552	Dechlorination Building Valve Actuators
D-4553	Dechlorination Building Valve Actuators
<b>Intake Structure</b>	
1-0600M-E0004-001	Shoal Lake Intake Facility – Arc Flash Study – Electrical Single Line Diagram – 600V Switchgear – Electrical Room
1-0600M-E0005-001	Shoal Lake Intake Facility – Arc Flash Study – Electrical Single Line Diagram 600V MCC & 120/208V Distribution Electrical Room
1-0600M-E0008-001	Shoal Lake Intake Facility – Arc Flash Study – Three Line Diagram – SGR-A1 & SGR-B1
1-0600M-E0008-002	Shoal Lake Intake Facility – Arc Flash Study – Three Line Diagram – SGR-A1 & SGR-B1
1-0600M-E0009-001	Shoal Lake Intake Facility – Arc Flash Study – Panel Schedule and Layout PL-3
C-277	Greater Winnipeg Water District – Details of Screen at Intake at Waugh
D-441	Greater Winnipeg Water District - Gate House at Waugh - Contract 35
D-442	Greater Winnipeg Water District – Intake and Gate House – General Sections – Contract 35
D-479	Greater Winnipeg Water District – Gate House at Waugh – Gate Details – Contract 35
D-511	Greater Winnipeg Water District – Gate House at Waugh
D-836	Alterations to Gate House for Installation of Screens
D-842	Cross-section thru Existing Gate and New Pump House
D-843	Plan of New Pump House & Existing Gate House
D-1782	Gate House Layout & Details
D-1783	Gate House Piping Details
D-1784	Gate House Chlorine / Domestic / Irrigation Piping Details
D-3811	Shoal Lake Intake Facility- Zebra Mussel Control System – Gate House Plan and Profile

D-3812	Shoal Lake Intake Facility- Zebra Mussel Control System – Gate House Details
D-3813	Shoal Lake Intake Facility- Zebra Mussel Control System – Diffuser Details
D-3829	Shoal Lake Intake Facility Upgrading - Control Building Floor Plan
D-3838	Shoal Lake Intake Facility Upgrading - Pumphouse Floor Plan & Section
D-3839	Shoal Lake Intake Facility Upgrading - Pumphouse Mechanical Floor Plan & Section
D-3840	Shoal Lake Intake Facility Upgrading - Gatehouse and Pumphouse Piping Schematic
D-3841	Shoal Lake Intake Facility Upgrading - Gatehouse Distribution Pump Details
D-3848	Shoal Lake Intake Facility Upgrading - 7.2/0.240kV Distribution Single Line Diagram
D-3849	Shoal Lake Intake Facility Upgrading - 12.47/06.00 - 0.208kV Distribution Single Line Diagram
D-3851	Shoal Lake Intake Facility Upgrading - 600V Protection & Metering Single Line Diagram
D-3852	Shoal Lake Intake Facility Upgrading - Gatehouse Electrical Equipment & Services Layout
D-3854	Shoal Lake Intake Facility Upgrading - Pumphouse 208/120V Electrical Services Schematic Diagram
D-3855	Shoal Lake Intake Facility Upgrading - Pumphouse 208/120V Electrical Services Schematic Diagram
D-3856	Shoal Lake Intake Facility Upgrading - Pumphouse 208/120V Electrical Services Schematic Diagram
D-3857	Shoal Lake Intake Facility Upgrading - Pumphouse Electrical Equipment & Services Layout
D-3858	Shoal Lake Intake Facility Upgrading - Pumphouse Switchboard 208/120V AC Distribution PL-1 Single Line Diagram
D-3859	Shoal Lake Intake Facility Upgrading - Pumphouse Switchboard 208/120V AC Distribution PL-2 Single Line Diagram
D-3860	Shoal Lake Intake Facility Upgrading - Pumphouse Switchboard 208/120V AC Distribution PL-3 Single Line Diagram
D-3897	Shoal Lake Intake Facility Upgrading - Pumphouse Electrical Room 48V DC Distribution PL-14 Single Line Diagram
D-3901	Shoal Lake Intake Facility Upgrading - MCC Cell 52 Rotary Screen Motor RS-2 Schematic Diagram
D-3902	SLI Facility Upgrading - Diesel Generator / Diesel Pump Protection and Metering Single Line Diagram
D-4104	Shoal Lake Intake Facility - Engine Shed Feeder ESF-1 (Cell 15) - Wiring Diagram
D-4110	Spare 15 Amp (Cell 32) - Wiring Diagram
D-4111	Transformer TF-1 (Cell 33) - Wiring Diagram
D-4112	Water Pump WP-2 (Cell 34) - Wiring Diagram
D-4113	MCC-1 Tie Breaker (Cell 41) - Wiring Diagram
D-4114	Alarm Marsh Compart Terminal Block (Cell 43) - Wiring Diagram
D-4115	Water Dist Pumps PLC To TB (Cell 42) - Interconnection
D-4116	Water Dist Pumps Terminal Block (Cell 42) - Wiring Diagram
D-4117	Bar Screen Motor BSM-2 (Cell 52) - Wiring Diagram
D-4118	Unit Heater UH-2 (Cell 43) - Wiring Diagram
D-4119	Waste Water Pump WWP-2 (Cell 54) - Wiring Diagram
D-4120	Fluid Coupling Rad Fan F-3 (Cell 55) - Wiring Diagram
D-4121	Water Pump WP-3 (Cell 61) - Wiring Diagram
D-4122	Gate Motor GM-2 (Cell 63) - Wiring Diagram
D-4123	Rotary Screen Motor RS-2 (Cell 64) - Wiring Diagram
D-4124	Battery Charger BC-1 (Cell 65) - Wiring Diagram

D-4125	Screen Water Pump SWP-2 (Cell 71) Wiring Diagram
D-4126	Water Pump WP-4 (Cell 73) - Wiring Diagram
D-4127	Spare 175 Amp (Cell 75) - Wiring Diagram
D-4128	60A Receptacles (Cell 76) - Wiring Diagram
D-4129	Water Pump WP-5 (Cell 81) - Wiring Diagram
D-4130	Fresh Air Fan F-2 (Cell 83) Wiring Diagram
D-4131	SLI Facility Upgrading - Day Tank Oil Pump OP-1 (Cell 84) Wiring Diagram Manco No M2169-8N (PL-37)
D-4132	Radiatn Heaters RH-1,2,3 (Cell 85) Wiring Diagram
D-4133	Motor Control Centre Bill of Materials
D-4134	Control Panels Bill of Materials Manco No M2169-BM2
D-4136	Heat Exchanger Fan (Cell 36) Wiring Diagram
D-4137	Terminal (Cell 43) Block Layout
D-4140	Main - RTU/PLC Panel Layout Manco
D-4141	Main Alarm Panel (PL-15) PLC to TB Interconnection
D-4142	Main Alarm Panel (PL-15) PLC to TB Interconnection
D-4143	Main Alarm Panel (PL-15) Terminal Block Wiring Diagram & Layout
D-4144	Main Alarm Panel (PL-15) Terminal Block Wiring Diagram & Layout
D-4145	Main Alarm Panel (PL-15) Terminal Block Wiring Diagram & Layout
D-4146	Main Alarm Panel (PL-15) Terminal Block Wiring Diagram & Layout
D-4150	Electrical Room Alarm Panel (PL-43) Electrical Room PLC Alarm Panel Layout Manco No M2169-14
D-4151	Electrical Room Alarm Panel (PL-43) PLC to TB Interconnection
D-4152	Electrical Room Alarm Panel (PL-43) Terminal Block Wiring Diagram & Layout
D-4153	Electrical Room Alarm Panel (PL-43) Terminal Block Wiring Diagram & Layout
D-4155	Pump Room Alarm Panels Bill of Materials
D-4158	Pump Room Alarm Panel (PL-17) Annunciator Window Captions
D-4159	Pump Room Alarm Panel (PL-17) Annunciator Window I/O Programming
D-4160	Pump Room Alarm Panel (PL-17) Pump Room Alarm PLC Panel Layout Manco No
D-4161	Pump Room Alarm Panel (PL-17) PLC to Annunciator Wiring Diagram
D-4162	Pump Room Alarm Panel (PL-17) PLC to Annunciator Wiring Diagram
D-4163	Pump Room Alarm Panel (PL-17) PLC Wiring Diagram
D-4164	Pump Room Alarm Panel (PL-17) Annunciator Wiring Diagram
D-4165	Pump Room Alarm Panel (PL-17) Terminal Block Wiring Diagram & Layout
D-4166	Pump Room Alarm Panel (PL-17) Terminal Block Wiring Diagram & Layout
D-4167	Pump Room Alarm Panel (PL-17) Terminal Block Wiring Diagram & Layout
D-4168	Pump Room Alarm Panel (PL-17) Terminal Block Wiring Diagram & Layout
D-4210	Heat Trace Panel PL-45 Wiring Diagram & Layout
D-4219	Modifications to Remote Alarm Panels
D-4234	SLI Facility Upgrading - Pumphouse Cable and Conduit Layout
D-4250	Motor Control Centre Key Plan
D-4431	SLI Facility Upgrading - Pumphouse 208/120V AC Distribution PL-107 Single Line Diagram
D-4510	Pumphouse Audible Alarm
D-4511	SLI Facility - Pumproom Alarm Panel PL-17
D-4512	SLI Facility - Pumproom Alarm Panel PL-17
D-4513	SLI Facility - Pumproom Alarm Panel PL-17

D-4514	SLI Facility - Pumproom Alarm Panel PL-17
D-4515	Control Room
D-7153	SLI Facility - Electrical Room MCC Single Line Diagram
D-7154	SLI Facility - Electrical Room Main Switchgear Single Line Diagram
<b>Site</b>	
A-893-1	X-Sec's of Intake at Indian Bay
A-893-2	X-Sec's of Intake at Indian Bay
C-426	Greater Winnipeg Water District - Intake Contour Plan
E-17	Greater Winnipeg Water District – Plan of Facilities at Waugh
G-91	Greater Winnipeg Water District – Plan Showing Topography at Staff House Waugh
C-289	Greater Winnipeg Water District – Precise Level Bench Marks From Deacon to
D-743	Low Lift Pump Station – Manhole Detail
D-1759	Indian Bay Chemical Upgrading Proposed Site Layout
D-1760	Indian Bay Chemical Upgrading Site Plan Electrical
D-1761	Indian Bay – Servicing Layout
D-1762	Indian Bay – Irrigation Layout
D-1763	Indian Bay – Watermain
D-1764	Indian Bay – Watermain
D-1765	Indian Bay – Watermain
D-1780	Indian Bay Water Distribution and Fire Protection Upgrading Details
D-1781	Indian Bay Water Distribution and Fire Protection Upgrading Details
D-1809	Indian Bay Chemical Upgrading – Miscellaneous Details
D-2174	Shoal Lake Pumping Station Upgrade - SLI 7.2/0.240kV Distribution Single Line Diagram
D-3201	Indian Bay Communication Cable Layout
D-3802	Shoal Lake Intake Facility Upgrading – Key Plan
D-3803	Shoal Lake Intake Facility Zebra Mussel Control System – Site Plan
D-3818	Shoal Lake Intake Facility – Zebra Mussel Control System SO <sub>2</sub> Diffuser and Sample Manholes
D-3823	SLI Facility Upgrading - Fuel, Drainage and Wastewater Systems
D-3824	SLI Facility Upgrading - Fuel Storage System Base Plan & Sections
D-3825	SLI Facility Upgrading - Drainage Tank Structure
D-3826	SLI Facility Upgrading - Transformer Pad and Drainage System Details
D-3862	SLI Facility Upgrading - Overall Site Cabling Layout
D-3898	SLI Facility Upgrading - Fuel Pump and Drainage Tank Electrical Details
D-3924	MB Hydro District Falcon Lake Shoal Lake Pumping Station MBH No 05600-E-01402-003-003-01
D-4211	Storage Shed Waste Water Pump WWP-1 Panel & Wiring Diagram
D-4218	SLI Facility Upgrading - Modbus Plus System Architecture
D-4425	Shoal Lake Intake Facility Upgrading - Overall Site Cabling Sections
D-4426	Shoal Lake Intake Facility Upgrading - Overall Site Cabling Sections



## **APPENDIX C – DEFINITION OF PROFESSIONAL CONSULTANT SERVICES**

### **1 INTRODUCTION**

- 1.1 It is the intent of the City of Winnipeg, in defining Professional Consultant Services (Consulting Engineering Services), to clarify the role required of consulting Engineers; to more fully identify the services to be rendered by consulting Engineers to the City and to other parties on behalf of the City; and to provide a more clearly determined basis of obligation in respect thereof by consulting Engineers to the City and to third parties in the provision of such services
- 1.2 The services shall be performed in the City of Winnipeg, unless otherwise authorized by the City, under direct supervision of a professional Engineer. All drawings, reports, recommendations and other documents, originating therefrom involving the practice of professional engineering, shall bear the stamp or seal and signature of a qualified Engineer as required by the Engineering and Geoscientific Professions Act of the Province of Manitoba and By-laws of the Association of Professional Engineers and Geoscientists of the Province of Manitoba. Other reports and documents not involving the "practice of professional engineering", such as letters of information, minutes of meetings, construction progress reports, may be originated and signed by other responsible personnel engaged by the consulting Engineer and accepted by the City. Progress estimates, completion certificates and other reports related to the technical aspects of a project, must be endorsed by the Engineer in a manner acceptable to the City.

### **2 ADVISORY SERVICES**

- 2.1 Advisory services are normally not associated with or followed by preliminary design and/or design services, and include, but are not limited to:
- (a) Expert Testimony;
  - (b) Appraisals;
  - (c) Valuations;
  - (d) Rate structure and tariff studies;
  - (e) Management services other than construction management;
  - (f) Feasibility studies;
  - (g) Planning studies;
  - (h) Surveying and mapping;
  - (i) Soil mechanics and foundation engineering;
  - (j) Inspection, testing, research, studies, or reports concerning the collection, analysis, evaluation; and
  - (k) Interpretation of data and information leading to conclusions and recommendations based upon specialized engineering experience and knowledge.

### **3 PRELIMINARY DESIGN**

- 3.1 Preliminary design services are normally a prelude to the detailed design of a project and include, but are not limited to:
- (a) Preliminary engineering studies;
  - (b) Engineering investigation;
  - (c) Surface and subsurface site explorations, measurements, investigations, and surveys;
  - (d) Operations studies including drainage studies, traffic studies, etc.;
  - (e) Functional planning;
  - (f) Physical, economical (capital and operating) and environmental studies including evaluation, comparison, and recommendation regarding alternative preliminary designs;
  - (g) Preparation and submission of a report and appropriate drawings to the City, fully documenting data gathered, explaining adequately the assessment made, stating with clarity the resulting conclusions, and containing all recommendations which are relevant to this stage of project implementation;

- (h) Special applications to public agencies for necessary authorizations, preparation and submission of reports and drawings thereto and appearance before same in support of the application.

#### **4 DETAILED DESIGN**

4.1 Detailed design services normally involve preparation of detailed designs, tender specifications and drawings, and analysis of bids and recommendations for contract award, and include, but are not limited to:

- (a) Addressing alternative methods of accommodating; relocating; avoiding, and/or avoiding injury to Utilities and railways; proposing alternative methods of solution, reviewing same with the appropriate Regulatory approval agencies and stakeholders;
- (b) Application to public agencies for necessary authorizations, preparation and submission of reports and drawings thereto, and appearance before same in support of the application;
- (c) Preparation and submission of detailed engineering calculations, drawings, and criteria employed in the design(s), securing review of and an acceptance by the City;
- (d) Preparation of detailed engineering drawings, specifications and tender documents consistent with the standards and guidelines of the City, securing review of acceptance by the City;
- (e) Preparation and provision to the City in written form, a fully detailed formal construction contract estimate;
- (f) Provision of appropriate response to bidders and advice to the City during the bid period and, subject to acceptance by the City, issuing addenda to the tender documents;
- (g) Submission of a review, analysis, comparison, tabulation, calculation, and evaluation of the bids received, to the City;
- (h) Preparation of a report including revised contract estimate, identifying and explaining variations from the earlier formal estimate, and containing recommendation regarding contract award identifying the reasons therefore.

#### **5 CONTRACT ADMINISTRATION SERVICES**

5.1 Contract administration services are associated with the construction of a project and include the office and field services required to ensure the conduct of the project in accordance with the intent of the City and in conformance with the particulars of the drawings and specifications; and include but are not limited to:

##### **NON-RESIDENT SERVICES**

- (a) Consultation with and advice to the City during the course of construction;
- (b) Review and acceptance of shop drawings supplied by the contractor or supplier to ensure that the drawings are in conformance with the drawings and specifications, without relieving the contractor of his contractual and other legal obligations in respect thereof;
- (c) Review and report to the City upon laboratory, shop and other tests conducted upon materials and/or equipment placed or installed by the contractor to ensure to the City conformance with the drawings and specifications, without relieving the contractor of his contractual and other legal obligations in respect thereof;
- (d) Acceptance of alternate materials and methods, subject to prior acceptance by the City, without relieving the contractor of his contractual and other legal obligations in respect thereof;
- (e) Provision to the City of a complete current report on the project status on a monthly basis;
- (f) Provision to the City a current update of revised contract-end cost estimate on a monthly basis, or more frequently if found necessary, with explanation and justification of any significant variation from the preceding contract-end cost estimate;
- (g) Definition and justification of and estimate of cost for additions to or deletions from the contract for authorization by the City;
- (h) Furnishing the City with a copy of all significant correspondence relating directly or indirectly to the project, originating from or distributed to, parties external to the consulting Engineer, immediately following receipt or dispatch of same by the consulting Engineer;

- (i) Provision of adequate and timely direction of field personnel by senior officers of the Consultant;
- (j) Establishment prior to construction and submission to the City of written and photographic records of, and assessment of the physical condition of adjacent buildings, facilities, and structures sufficient to equip the consulting Engineer to provide valid evidence and relevant testimony in settlement of any claim involving the City by any court of law, or by any other party for damages thereto arising from the project;
- (k) Arranging and attending pre-construction meetings and on-site or off-site review meetings, which meetings shall include representatives of the contractor and the City;
- (l) The preparation and submission of:
  - i. a detailed design notes package including items such as structural geotechnical, hydraulic and heating, air-conditioning and ventilation design calculations; mechanical and electrical design calculations related to process equipment and building services; process design calculations; and instrumentation and process control design calculations;
  - ii. approved related shop drawings and equipment process manuals all within one (1) month of completion of each separate installation contract required to complete the Works.

## RESIDENT SERVICES

- (a) Provision of qualified resident personnel acceptable to the City present at the project site to carry out the services as specified immediately below, without relieving the contractor of his contractual and other legal obligations in respect thereof:
  - i. inspection of all pipe prior to installation;
  - ii. inspection and acceptance of excavation for, and full time inspection at the time of bedding placement, pipe laying and backfilling in respect of installation of watermains, land drainage sewers, and wastewater sewers;
  - iii. inspection of installation of all connections to watermains, sewers, manholes, valves, hydrants or house services, and excavation and/or exposing of all underground services, structures, or facilities;
  - iv. "full time inspection" and/or testing of watermains and sewers;
  - v. inspection of all excavations to determine soil adequacy prior to installation of base and subbase courses for sidewalks, public back lanes, and street pavements. It is to be understood that "full time inspection" will require assignment of a qualified person to each specific location when the referenced work is being undertaken by the contractor.
- (b) Without relieving the contractor of his contractual and other legal obligations in respect thereof, conduct detailed inspection of construction sufficient to ensure that the construction carried out by the contractor is in conformance with the drawings and specifications;
- (c) Co-ordination and staging of all other works on the project site including traffic signal installations, hydro, telephone, and gas utility work, railway work forces and City or developer work;
- (d) In conjunction with the City, provision of notice to adjacent residents and businesses of those stages of construction of the project that will interrupt public services or access thereto, sufficiently in advance of same to permit preparation therefore;
- (e) Enforcement of contractor conformance with the City of Winnipeg Manual of Temporary Traffic Control in Work Areas on City Streets and with reasonable standards of safety for motorists and pedestrians, without relieving the contractor of his contractual and other legal obligations in respect thereof;
- (f) Provision of reference line and elevation to the contractor and checking upon the contractor's adherence thereto, without relieving the contractor of his contractual and other legal obligations in respect thereof;
- (g) Responsible, sensitive, and prompt reaction to the reasonable requests and complaints of citizens regarding the conduct of the project, acting in the interest of the City;

- (h) Arranging for and carrying out of testing of materials utilized by the contractor to ensure conformance with the drawings and specifications, without relieving the contractor of his contractual and other legal obligations in respect thereof;
- (i) Preparation, certification, and prompt submission of progress estimates to the City for payment to the contractor for construction performed in accordance with the drawings and specifications;
- (j) Arrange, attend and prepare and distribute records of and minutes for, regularly held on-site or offsite project review meetings including representatives of the contractor and the City;
- (k) Promptly reporting to the City upon any significant and unusual circumstances;
- (l) Promptly arranging for and taking part in a detailed final inspection of the project with the contractor and the City prior to commencement of the period of contractor maintenance guarantee specified in the contract for the project and providing to the City in written form an appropriate recommendation of acceptance of the constructed or partially constructed project;
- (m) Act as Payment Certifier and administer all contracts as required under the Builder's Liens Act of Manitoba;
- (n) Prepare a Certificate of Substantial Performance;
- (o) Preparation and submission to the City of "as-constructed" drawings for the project within 1 month of project completion;
- (p) Prepare a Certificate of Total Performance;
- (q) Provision of inspection services during the maintenance guarantee period of the contract;
- (r) Undertake a detailed inspection of the project with the contractor and the City prior to the end of the period of contractor maintenance guarantee specified in the contract for the project;
- (s) Keep a continuous record of working days and days lost due to inclement weather during the course of contract works;
- (t) Prepare a Certificate of Acceptance.

## **6 ADDITIONAL SERVICES**

6.1 Additional services are in addition to those specified in other Types of Services and may or may not be associated with a construction project, but are not in place of or in substitution for those services elsewhere specified in the Definition of Standard Consulting Engineering Services in respect of other Types or Categories of Services.

- (a) Revision of completed, or substantially completed, drawings and/or specifications that were in conformance with the original intent of the City or had been accepted by the City;
- (b) Preparation of operating manuals and/or training of operating personnel;
- (c) Startup and/or operation of operating plants;
- (d) Procurement of materials and equipment for the City;
- (e) Preparation for and appearance in litigation on behalf of the City;
- (f) Preparation of environmental studies and reports and presentation thereof in public hearings.

## **APPENDIX D – USE OF GREATER WINNIPEG WATER DISTRICT RAILWAY**

### **1 GENERAL**

- 1.1 The City of Winnipeg owns and operates the Greater Winnipeg Water District (GWWD) Railway between the Railway Yard in St. Boniface (598 Plinquet Street) and the Intake at Shoal Lake. Work trains routinely deliver fuel, sodium hypochlorite and other supplies to the Intake and materials for track upgrading and maintenance. The diesel locomotives are available along with an assortment of rolling stock. The GWWD Railway is available to the Consultant to deliver equipment and material to the work area. The GWWD Railway assumes no risk for the transportation of these goods and the Consultant must provide evidence of insurance as per D10.2(b) and D10.2(c) and a signed Waiver as per D10.2(d) if they wish to utilize the use of the GWWD.
- 1.2 Prior to GWWD Railway use all non-City of Winnipeg personnel and the transportation of Consultant equipment will be required to have signed GWWD Railway Waiver Forms included in Appendix F.
- 1.3 The Consultant shall not have unlimited use of the GWWD Railway facilities. The Consultant shall develop a preliminary schedule outlining all required GWWD Railway activities and resources and the associated timetable prior to the commencement of construction. The City requires this schedule to deploy the necessary level of railway resources to the project in a timely manner and to schedule the Consultant's requirements with routine track usage. Submit to the City's Project Manager three (3) Working Days prior to the start of the subsequent work week the revisions to the schedule for rail service (i.e. materials, equipment, etc.). Changes to the schedule must be made through the City's Project Manager three (3) Working Days in advance of the requirement.
- 1.4 Bidders are advised that emergency railway services will take precedence over material and equipment deliveries. The City shall be held liable for failing to provide rail transportation in any event.
- 1.5 The Consultant shall ensure that all equipment, vehicles, personnel, and materials are kept off the railway and away from the trackbed, unless instructed otherwise by the City's Project Manager or authorized representative. The Consultant shall provide all labour and equipment necessary for loading and unloading equipment and materials including all equipment necessary to tie down loads.

### **2 TRAIN SERVICE**

- 1.1 Rolling Stock that available for the Contractor's use on this project:
  - (a) Five (5) flatbed cars with a deck width of 2.44 metres, deck length of 16.9 metres and a maximum load capacity of 55,000 kilograms
  - (b) One (1) ramp car with a deck with of 2.44 metres, deck length of 16 metres and a maximum load capacity of 55,000 kilograms
  - (c) One (1) caboose
  - (d) Two (2) side dump cars with a capacity of 20 to 30 cubic metres
- 1.2 The GWWD Railway right-of-way has sufficient horizontal clearances to transport loads up to 3.66 metres wide.

### **3 TRAIN USE AND SCHEDULING**

- 1.1 A train consists of one (1) locomotive, one (1) caboose and any combination of the remaining rolling stock identified in 2.

- 1.2 A train crew shift consists of a train as previously described and the train crew (2 people). The maximum train crew shift duration allowed is 12 hours per Calendar Day.
- 1.3 The GWWD Railway can provide one (1) train crew for use on this project. Each train crew can work a maximum of one full train crew shift per Calendar Day and a maximum of ten (10) train crew shifts per fourteen (14) Calendar Day period.
- 1.4 The Contractor shall submit a preliminary list of GWWD Railway equipment, GWWD Railway Track Car Units and GWWD Operators they will require for the duration of the Work a minimum of ten (10) Business Days prior to the pre-construction meeting.
- 1.5 The Contractor shall submit a preliminary schedule detailing the required GWWD Railway activities and associated timetable a minimum of ten (10) Business Days prior to the pre-construction meeting.

#### **4 TRANSPORTATION OF CONSULTANT'S EQUIPMENT**

- 1.1 Rolling stock identified in 2 will be made available to the Consultant for the transportation of large equipment to and from the work area. Large equipment shall be loaded and unloaded via mobile loading ramp at East Braintree and earthen ramps at Shoal Lake Aqueduct Intake and the GWWD Railway Yard in St. Boniface.
- 1.2 The loading and securing of Consultant's equipment is the responsibility of the Consultant.

#### **5 TRANSPORTATION OF PERSONNEL**

##### **1.1 GWWD Railway Track Car Units**

- (e) One track car unit is available to transport a maximum of seven (7) of the Consultant's personnel to and from the work area at Mile 82.44 (approximately 8 km east of East Braintree, MB) at no cost to the Consultant. Only one (1) track car unit is permitted to be used at any given time for the purposes of transporting the Consultant's personnel.
- (f) Transportation of the Consultant's personnel will be provided such that there is no interference with GWWD staff duties during normal working hours (0800 to 1630 hours, Monday to Friday).

## **APPENDIX E –SHOAL LAKE AQUEDUCT INTAKE ORIENTATION**

### **1 SHOAL LAKE AQUEDUCT INTAKE FACILITY HOURS OF OPERATION**

- 1.1 The standard hours of operations for the Shoal Lake Aqueduct Intake facility at Indian Bay is 0730 hours to 1600 hours during the weekdays.

### **2 STAFF HOUSE ACCOMMODATIONS**

#### **2.1 General**

- (g) Accommodations are available at no cost to the Consultant in the Staff House or one of the residences located at the Aqueduct Intake at Indian Bay (Shoal Lake). The Intake and Staff House are located approximately 150 kilometers from Winnipeg and are only accessible by rail. The nearest highway contact with the rail line is approximately 24 kilometers (30-40 minutes) from the facility. There are no medical services available. Portions of the facility available to the Consultant and sub-consultants include sleeping quarters, dining room, recreation area, and washroom/shower facilities.
- (h) The City will provide at no cost to the Consultant accommodations in the Staff House for up to 8 Consultant personnel and if required, a designated area for the location of a Consultant supplied bunkhouse to house additional personnel.
  - i. The Consultant shall not have unlimited or exclusive use of the Staff House and residence.
  - ii. The Staff House and residence may be used to accommodate City or other Contract personnel in addition to the Consultant's personnel.
  - iii. The City reserves the right to reassign Consultant room allocations within the Staff House and residences to accommodate other personnel as required.
- (i) The Consultant shall be responsible for all food, meal preparation and housekeeping associated with the use of the Staff House and any residence being used by the Consultant.
- (j) The City will provide at no cost to the Consultant toilet paper, paper towels and bedding.
- (k) The Consultant shall provide all cleaning supplies for use in the Staff House and residence.
- (l) The Consultant will be responsible for all other personal incidentals including towels, soap, shampoo, toothpaste, toothbrushes etc.
- (m) A safety orientation will be provided by the Intake Foreman or designated representative.

#### **2.2 Operation of Staff House and residences at Indian Bay - Person in Charge**

- (n) If arrangements are made for personnel to stay at the Staff House or residence at Indian Bay, the Consultant shall designate a "person in charge". This person shall ensure that all Consultant's personnel follow all Staff House, residence and Railway requirements in effect for the duration of the Contract. As soon as the "person in charge" becomes aware of a breach in requirements, or is informed of same by Railway or Intake staff, the "person in charge" shall immediately rectify the condition.
- (o) The "person in charge" shall clearly instruct the group as to the requirements in place and note that failure to follow the rules may result in ejection from the premises. Failure by the "person in charge" to enforce these requirements may also result in ejection from the premises. The requirements in effect at this time are included in this appendix for reference and are posted in the Staff House and Residence.
  - i. Alcoholic beverages and other intoxicating substances are not to be consumed or carried outside the Staff House or residences. Intoxication on City of Winnipeg property is prohibited at all times.
- (p) The "person in charge" is responsible for responding to any medical emergency which affects a member of the group. Personnel are required to complete the Personal Information

and Waiver Form (Appendix F) indicating any medical condition which may be of concern and should be retained by the “person in charge”.

### 2.3 Staff House and Transportation Scheduling

- (q) The Consultant shall develop a preliminary schedule outlining all required Staff House and personnel transportation requirements to and from the site prior to the commencement of the Work. The City requires this schedule to coordinate the onsite accommodations and the transportation of Consultant personnel in a timely manner and to schedule the Consultant's requirements with routine track usage. Update the schedule and submit to the City's Project Manager three (3) working days prior to the start of the subsequent work week. Changes to the schedule must be made through the City's Project Manager three (3) Working Days in advance of the requirement.

### 2.4 Staff House and Residence Housekeeping Requirements

- (r) The Staff House or the assigned residences do not have a caretaker onsite. The responsibilities of the day-to-day upkeep of the accommodations are the Consultants. The Staff House or the assigned residences are to be kept in a clean and orderly fashion, which includes:
  - (i) Wiping counters and tables;
  - (ii) Emptying the toaster crumb pan;
  - (iii) Emptying the garbage cans;
  - (iv) Cleaning the barbeque after use;
  - (v) Wiping the coffee machine heater element;
  - (vi) Cleaning spilled surfaces on stove & in oven;
  - (vii) Keeping the washroom areas clean;
  - (viii) Replacing spent toilet paper/paper towel rolls;
  - (ix) Vacuuming and sweeping of floors;
  - (x) Washing dishes and putting them away;
  - (xi) Taking shoes off when in the Staff House or residences;
  - (xii) Not using the fireplace;
  - (xiii) Using the dining room for eating – not eating in bedrooms or television rooms; and
  - (xiv) Stripping the linen from your bed when leaving.
- (s) Any problems or concerns shall be reported to the Shoal Lake Aqueduct Intake Foreman.

### 2.5 Smoking and Electronic Cigarettes (E-Cigarettes)

- (t) The Shoal Lake Aqueduct Intake facilities including the Staff House and/or an assigned residence are smoke and electronic cigarette free environments. Smoking and the use of electronic cigarettes are only permitted in the designated location outside of the Staff House. Dispose of cigarettes in designated devices.



## **APPENDIX F - SHOAL LAKE AQUEDUCT INTAKE FORMS**



**Water and Waste Department • Service des eaux et des déchets**  
**Safety Orientation – Shoal Lake Intake**

1. Hours of Operation – Monday to Friday from 08:00 to 16:30 hours. Lunch is 30 minutes from 12:00 to 12:30, coffee from 10:00 to 10:15 and 14:00 to 14:15 hours.
2. Telephone contacts – **INTAKE 204-783-3847**. This phone will be answered 24/7. The Staff House is 204-783-3754. All numbers are direct to/from Winnipeg. Additional contact numbers are located near all telephones. Emergency response at the Intake is from Deacon Control at 204-986-4781.
3. Fire Safety Plan
  - a. Take note of the building exit locations you are working in. The evacuation meeting (muster) point is at the heli-pad located in front of the Staff House across the railway track.
  - b. Upon hearing a fire alarm bell or a fire alarm announcement over the two way radio, immediately evacuate to the muster point. The contractor/City lead hand tradesperson is responsible to account for their staff and report to the Chief Fire Warden upon arrival to the muster point.
  - c. Fire extinguishers are located throughout the plant and have signs posted above for ease of locating. Use them if required and only if safe to do so.
  - d. The fire plan is posted near the main Staff House washrooms, Engine Shed phone area & Intake Control Room.
4. First Aid - Any minor cuts and scrapes should be attended to immediately. If there is an injury, please radio the Intake Foreman. Intake Staff will stabilize the patient for transport in a track unit. If more serious, a medi-evacuation will take place via helicopter. Please let us know if there are medical conditions that you feel we should be made aware of.
5. First Aid Equipment
  - a. AED's – There are three AED's on site, located at the Intake Control Room, in the Engine Shed and in the Staff House off the kitchen, on the residence side.
  - b. The first aid kit in the Staff House is located in the kitchen across from the kitchen sink. The blue tab on the kit only indicates that the box is complete with supplies. Please remove the tab if something is needed from the kit.
  - c. The portable eyewash station is located in the kitchen across from the kitchen sink as well.. There are eyewash/shower stations and first aid kits at various locations – please familiarize yourself with their locations.
6. The City of Winnipeg prohibits smoking in buildings or vehicles. Please dispose of cigarette butts outside appropriately—do not throw on the ground.
7. Area Familiarization – The contractor/City employee should be familiarized with the safety issues in the area they are working in. The Intake Foreman or designate will do a walk around with the contractor/City employee prior to any work starting.
8. LOTO – Lock-out/Tag-out should be coordinated with the Foreman or designate if required to isolate equipment. Personal locks are required by contractor or City employees to lock out the equipment they are personally working on.
9. Automatic Controls – Equipment can start/stop automatically. Do not come into contact with equipment as it may start up remotely.
10. PPE – All appropriate PPE must be provided by the contractor/City employees. Certain areas require hearing protection as discussed during the area familiarization and what the worker would need to use the appropriate PPE.
11. If calling 911 from an Intake landline, please refer to the yellow safety sheets mounted at each phone. It is important that you ask to be transferred to Provincial 911. If calling from a cellular phone, that call will automatically be routed to Provincial 911. If 911-assistance needed please ensure the Intake Foreman is aware.
12. Two-way radios are required at all times. Ensure the radio is on channel 1 – Ross/Intake. If you need assistance on how to use the radio, contact the Intake Foreman. Ensure the radio is working and the battery charged. When placing the radio on the charger ensure it is off. Fully charged battery shows green; flashing red indicates it is not in the charger properly and the red solid light indicates it is charging properly.
13. Always drive carefully and to the conditions with your vehicle. Do not drive on the grass. NO city vehicles are allowed on the Lakeview trail past the Headwall area. Please ensure you stay to the established trails or roadways. Helmets are required when using the City gators.
14. If going outside after hours, ensure someone is apprised to where you are going and ensure you have a portable radio with you. Attempt to stay in the illuminated areas. Carry a flashlight if possible.

15. Do not approach or feed the wildlife. Rez dogs, wolves and foxes are common here. Bear hazing devices are located in each residence and the Staff House along with an standard operating procedure on how to use the device.
16. Sodium hypochlorite maybe on site. Weekly 7-hour slug feeds are done - usually on Wednesday. The Intake Foreman will advise you when they are taking place. Please check the wind direction each morning – indicated by one of the many windsocks. Always muster upwind from the chlorine (sodium hypochlorite) building. If a chemical situation were to happen, you will be notified by radio. Do not approach the Intake if the small flashing red light on the tower is on or the red light outside the chlorine (sodium hypochlorite) building door. This indicates a potential problem.
17. For security reasons, if there is a need to evacuate, the meeting point will be the helipad. Situations may arise that there may be a need to shelter in place. The shelter in place location is the Intake. In both cases, personnel will be notified via two way radio.
18. If you see someone you do not know, do not approach them and if you see something that looks out of place or not right, please contact the Intake Foreman. Refer all media inquiries to 311.
19. Audible alarms occur during the normal course of the day. If the alarm is something that affects you, Intake Staff will contact you via two way radio and direct you in the procedure to take.
20. Picture and video taking must be pre-approved and follow established City of Winnipeg guidelines.
21. If you have any questions or concerns, please contact the Intake Foreman.

Name	Signature	Company Name

Safety Orientation performed by: \_\_\_\_\_

Date: \_\_\_\_\_

Note: We will have to stop the work from proceeding until compliance with these requirements has been met to the satisfaction of the City of Winnipeg personnel.

### PERSONAL INFORMATION

Shoal Lake is a remote community located approximately 147 kilometers (92 miles) from Winnipeg and is only accessible by rail. The nearest highway contact with the rail line is approximately 24 kilometers (30-40 minutes) from the facility. There are no medical services available.

The nearest hospital is located at Kenora which is approximately 65 kilometers (40 miles) from the point of highway contact. Ambulance service is available on a 24-hour basis from Falcon Lake.

Because of this isolation factor, we request the following information for your own protection:

NAME \_\_\_\_\_ DEPARTMENT \_\_\_\_\_ BIRTH DATE \_\_\_\_\_

1. In case of emergency, who should be called?

_____	_____	_____	_____
Name	Relation	Business Phone	Home Phone

2. \_\_\_\_\_  
NAME OF FAMILY DOCTOR OR CLINIC \_\_\_\_\_ Phone \_\_\_\_\_

3. Medical conditions we should be aware of: \_\_\_\_\_

4. Allergies: \_\_\_\_\_

5. Medications required\*\*: \_\_\_\_\_

\_\_\_\_\_

6. Treatment used: \_\_\_\_\_

\_\_\_\_\_

7. Special dietary needs (health or religious reasons only): \_\_\_\_\_

\_\_\_\_\_

\*\* If you are on medication, please be sure to take a **more than adequate** supply for the days away from the city.

I PREFER not to divulge the information requested and waive all rights of action which I might have against the City of Winnipeg arising from damage, injuries or costs which I may sustain or incur as a consequence of my not providing such information.

☐

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

NOTE: THIS FORM WILL BE DESTROYED AT THE END OF THE SESSION



## **WAIVER OF LIABILITY, INDEMNITY AND ASSUMPTION OF RISK AGREEMENT**

By signing this document, you will waive certain legal rights, including the right to sue. You are also agreeing to indemnify the City against lawsuits brought by others.

Please read carefully!

In consideration of permission granted now or in the future by the City of Winnipeg to me as an operator using the rail line to transport my vehicle and/or equipment at no cost on the Greater Winnipeg Water District Railway ("GWWD"), which is owned and operated by the City of Winnipeg, to and from the aqueduct intake on Shoal Lake in the Province of Manitoba on \_\_\_\_\_ (date), I agree and acknowledge as follows:

1. I acknowledge that I am using the rail line to transport myself and/or my equipment without charge or consideration by the City of Winnipeg on the GWWD Railway, which is not a railway company, a common carrier or owner of a public utility for the conveyance of persons or goods to or for the public and is under no obligation to convey persons or goods for the public.
2. I agree to comply with the rules set by and the instructions given to me by City of Winnipeg employees or agents during the course of my use of the rail lines to transport myself and/or my equipment to and from the aqueduct intake. Nevertheless, I acknowledge that there are risks and hazards inherent in the very nature of the use of the rail lines provided on the GWWD Railway and that as a result of these risks and hazards, as an operator, I may suffer personal injury, even death, as well as property loss. I nevertheless freely and voluntarily assume the aforementioned risks and hazards and accordingly my use of the rail lines to and from the aqueduct intake shall be entirely at my own risk.
3. I acknowledge that I accept full responsibility, in the absence of insurance, for any loss or damage to my high-rail vehicle(s) and/or equipment that is transported on the GWWD rail line.
4. I waive any claim I may have against the City of Winnipeg, its servants, employees or agents arising from my use of the rail lines to transport myself and/or equipment to and from the aqueduct intake. I further agree to indemnify and hold harmless the City of Winnipeg, its servants, employees or agents from and against all claims, actions or proceedings arising from loss, injury or, damages by any person arising from my use of the rail lines to and from the aqueduct intake.
5. I agree that this WAIVER OF LIABILITY, INDEMNITY AND ASSUMPTION OF RISK AGREEMENT is binding on me, my heirs, successors, my executors, administrators, personal representatives and assigns.
6. I acknowledge and represent that I am 18 years of age and older, I have read this document and fully understand it and sign it freely and voluntarily.

DATED at the City of Winnipeg, in Manitoba, this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

\_\_\_\_\_  
Signature of Operator

\_\_\_\_\_  
Signature of Witness

\_\_\_\_\_  
Name of Operator  
(please print)

\_\_\_\_\_  
Name of Witness  
(please print)



## **WAIVER OF LIABILITY, INDEMNITY AND ASSUMPTION OF RISK AGREEMENT**

By signing this document, you will waive certain legal rights, including the right to sue. You are also agreeing to indemnify the City against lawsuits brought by others.

Please read carefully!

In consideration of transportation granted now or in the future by the City of Winnipeg to me as the owner/ renter of equipment being conveyed at no cost on the Greater Winnipeg Water District Railway ("GWWD"), which is owned and operated by the City of Winnipeg, to and/or from the aqueduct intake on Shoal Lake in the Province of Manitoba on \_\_\_\_\_ (date), I agree and acknowledge as follows:

1. I acknowledge that equipment/supplies is/are being transported without charge or consideration by the City of Winnipeg on the GWWD Railway, which is not a railway company, a common carrier or owner of a public utility for the conveyance of persons or goods to or for the public and is under no obligation to convey persons or goods for the public.
2. I agree to comply with the rules set by and the instructions given to me by City of Winnipeg employees or agents during the course of the transportation of equipment to and from the aqueduct intake. Nevertheless, I acknowledge that there are risks and hazards inherent in the very nature of the transportation provided on the GWWD Railway and that as a result of these risks and hazards, as a participant, I may suffer personal injury, even death, as well as property loss. I nevertheless freely and voluntarily assume the aforementioned risks and hazards and accordingly the transportation of the equipment to and from the aqueduct intake shall be entirely at my own risk.
3. I waive any claim I may have against the City of Winnipeg, its servants, employees or agents arising from the transportation of equipment to and from the aqueduct intake. I further agree to indemnify and hold harmless the City of Winnipeg, its servants, employees or agents from and against all claims, actions or proceedings arising from loss, injury or, damages by any person arising from my transportation to and from the aqueduct intake.
4. I agree that this WAIVER OF LIABILITY, INDEMNITY AND ASSUMPTION OF RISK AGREEMENT is binding on me, my heirs, successors, my executors, administrators, personal representatives and assigns.
5. I acknowledge and represent that I am 18 years of age and older, I have read this document and fully understand it and sign it freely and voluntarily.

DATED at \_\_\_\_\_, in \_\_\_\_\_, this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Signature of Equipment Owner

\_\_\_\_\_  
Signature of Witness

\_\_\_\_\_  
Name of Equipment owner (please print)

\_\_\_\_\_  
Name of Witness (please print)



## **WAIVER OF LIABILITY, INDEMNITY AND ASSUMPTION OF RISK AGREEMENT**

By signing this document, you will waive certain legal rights, including the right to sue. You are also agreeing to indemnify the City against lawsuits brought by others.

Please read carefully!

In consideration of transportation granted now or in the future by the City of Winnipeg to me as a passenger being conveyed at no cost on the Greater Winnipeg Water District Railway ("GWWD"), which is owned and operated by the City of Winnipeg, to and from the aqueduct intake on Shoal Lake in the Province of Manitoba on \_\_\_\_\_ (date), I agree and acknowledge as follows:

1. I acknowledge that I am being transported without charge or consideration by the City of Winnipeg on the GWWD Railway, which is not a railway company, a common carrier or owner of a public utility for the conveyance of persons or goods to or for the public and is under no obligation to convey persons or goods for the public.
2. I agree to comply with the rules set by and the instructions given to me by City of Winnipeg employees or agents during the course of my transportation to and from the aqueduct intake. Nevertheless, I acknowledge that there are risks and hazards inherent in the very nature of the transportation provided on the GWWD Railway and that as a result of these risks and hazards, as a participant, I may suffer personal injury, even death, as well as property loss. I nevertheless freely and voluntarily assume the aforementioned risks and hazards and accordingly my transportation to and from the aqueduct intake shall be entirely at my own risk.
3. I waive any claim I may have against the City of Winnipeg, its servants, employees or agents arising from my transportation to and from the aqueduct intake. I further agree to indemnify and hold harmless the City of Winnipeg, its servants, employees or agents from and against all claims, actions or proceedings arising from loss, injury or, damages by any person arising from my transportation to and from the aqueduct intake.
4. I agree that this WAIVER OF LIABILITY, INDEMNITY AND ASSUMPTION OF RISK AGREEMENT is binding on me, my heirs, successors, my executors, administrators, personal representatives and assigns.
5. I acknowledge and represent that I am 18 years of age and older, I have read this document and fully understand it and sign it freely and voluntarily.

DATED at the City of Winnipeg, in Manitoba, this \_\_\_\_\_ day of \_\_\_\_\_, 20 .

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Signature of Witness

\_\_\_\_\_  
Name of Participant  
(please print)

\_\_\_\_\_  
Name of Witness  
(please print)

## **APPENDIX G – INSTRUMENT LOOP DIAGRAM REQUIREMENTS**

### **1 SCOPE**

- 1.2 This appendix describes the requirements for Instrument Loop Diagram format and content.
- 1.3 Application of ISA-5.4-1991, Instrument Loop Diagrams, is required for safety-related instrumentation systems. This appendix provides additional guidance in the preparation and use of instrument loop diagrams. For examples, refer to the ISA standard.
- 1.4 Loop diagrams shall be developed for each installed instrument and device for tender ready documents and typical loop diagrams for each type of instrument and device for preliminary designs. Typical or generic loop diagrams are not acceptable.
- 1.1 This appendix covers the generation of new Instrument Loop Diagrams and does not apply to the revision of existing instrument loop diagrams. This appendix also applies to Instrument Loop Diagrams provided by packaged equipment vendors and Contractors.
- 1.2 The requirements provided in this appendix provide a balance between showing all data on Instrument Loop Diagrams and making Instrument Loop Diagrams legible and easy to read. While this appendix is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this appendix. Determinations concerning fitness for purpose and particular matters or application of the appendix to particular project or engineering situations should not be made solely on information contained in these materials.

### **2 APPLICATION**

- 2.1 Existing facilities do not necessarily comply with this appendix. The expectations regarding application of this appendix to existing facilities must be decided on a case-by-case basis in consultation with the City's Project Manager, however general guidelines for application are presented as follows:
- All new facilities must comply completely.
  - All major upgrades to a facility, or a larger facility's process area, must completely comply. Any existing instruments within the area being upgraded should be re-identified.
  - All minor upgrades should utilize this appendix as far as practical for new instruments, however in some cases compromise with the existing practice may be required.

### **3 REFERENCES**

- 3.1 City of Winnipeg Water & Waste Department (W&W)
- Water and Waste Department Electrical Design Guide
  - Water and Waste Department Identification Standard
- 3.2 The Instrumentation, Systems, and Automation Society (ISA)
- ISA 5.1 – Instrumentation Symbols and Identification
  - ISA 5.4 – Instrument Loop Diagrams
  - ISA 84.01 – Application of Safety Instrumentation Systems for the Process Industries



### 3.3 The Government of Manitoba

- C.C.S.M. C W210 – The Workplace Health and Safety Act

## 4 REQUIREMENTS

### 4.1 Diagram Format and Layout

- 4.1.1 Size of Drawing: Loop diagrams shall be prepared as ANSI B (11 x 17 inch) drawings. The smallest letter size shall not be less than 2.5 mm (3/32 inches).
- 4.1.2 The loop diagram will generally contain only one loop. Special situations may necessitate a combination of loops on one drawing. The drawing should be arranged to prevent congestion and should provide extra space for future revisions. Complex loops that require more than one sheet may be expanded to as many ANSI B sheets as necessary. Adequate continuation points should be provided for proper understanding of the total loop configuration.
- 4.1.3 The title block format shall be acceptable to the City and utilize a City issued drawing number and include a revision table.

### 4.2 Diagram Content

- 4.2.1 All components should be clearly labeled and uniquely identified.
- 4.2.2 All components of the loop and the loop itself, including connections to multi-point devices, programmable logic controllers, power sources, etc should be identified (all instrument numbers should agree with the P&ID).
- 4.2.3 The loop diagram should include word descriptions of loop functions. The title should be adequate and include the device identification tag. Descriptions of special functions and features that are not obvious, especially safety and shutdown circuits, should be given.
- 4.2.4 All interconnections with electrical cables, conductor pairs, pneumatic multi tubes, and individual pneumatic and hydraulic tubing should be shown (this includes junction boxes, terminals, bulkheads, ports, and computer input/output, such as I/O connections, grounding systems, grounding connections, and signal levels). All interconnections should be uniquely identified and clearly labeled per the City of Winnipeg Water and Waste Department Identification Standard.
- 4.2.5 The location of devices should be identified using descriptors such as field, field terminals, control cabinet, PLC section, rack and slots.
- 4.2.6 Electrical power, air and hydraulic supplies, including the designated voltage and pressure values, should be shown.
- 4.2.7 Supplemental drawings and records should be referenced to show interrelations with other control loops, such as overrides, interlocks, cascades, and shutdowns.
- 4.2.8 Although loop design often requires input from several different design areas, design responsibility and configuration control of the loop should be centered within a single function.
- 4.2.9 Descriptions should be given for controller action, control valve action, control valve failsafe action (electronic and/or pneumatic failure), and solenoid valve action.
- 4.2.10 Calibration information should be shown in consistent units that match the applicable instrumentation index.

- 4.2.11 Unique identification numbers consistent with other record documents should be shown for equipment such as racks, panels, and junction boxes.

#### 4.3 Symbols

- 4.3.1 Symbols used in instrument loop diagrams are provided in ANSI/ISA-5.1-1984, Instrumentation Symbols and Identification, and ISA-5.3-1983, Graphic Symbols for Distributed Control / Shared Display Instrumentation, Logic and Computer Systems or match existing Instrumentation Loop Diagrams for the facility.

## **APPENDIX H – PROCESS AND INSTRUMENTATION DIAGRAM REQUIREMENTS**

### **1 SCOPE**

- 1.1 This appendix describes the requirements for Process and Instrumentation Diagrams (P&IDs) format and content.
- 1.2 This appendix covers the generation of new P&IDs and does not apply to the revision of existing P&IDs. This appendix also applies to &IDs provided by packaged equipment vendors and Contractors.
- 1.3 The requirements provided in this appendix provide a balance between showing all data on P&IDs and making P&IDs legible and easy to read. While this appendix is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this appendix. Determinations concerning fitness for purpose and particular matters or application of the appendix to particular project or engineering situations should not be made solely on information contained in these materials.

### **2 APPLICATION**

- 2.1 Existing facilities do not necessarily comply with this appendix. The expectations regarding application of this appendix to existing facilities must be decided on a case-by-case basis in consultation with the City's Project Manager, however general guidelines for application are presented as follows:
  - All new facilities must comply completely.
  - All major upgrades to a facility, or a larger facility's process area, must completely comply. Any existing instruments within the area being upgraded should be re-identified.
  - All minor upgrades should utilize this appendix as far as practical, however in some cases compromises with the existing P&IDs may be required.

### **3 REFERENCES**

#### 3.1 City of Winnipeg Water & Waste Department (W&W)

- Water and Waste Department Electrical Design Guide
- Water and Waste Department Identification Standard

#### 3.2 The Instrumentation, Systems, and Automation Society (ISA)

- ISA 5.1 – Instrumentation Symbols and Identification
- ISA 5.2 – Binary Logic Diagrams for Process Operations
- ISA 5.3 – Graphic Symbols for Distributed Control / Shared Display Instrumentation, Logic and Computer Systems
- ISA 84.01 – Application of Safety Instrumentation Systems for the Process Industries

#### 3.3 The Government of Manitoba

- C.C.S.M. C W210 – The Workplace Health and Safety Act

### **4 DEFINITIONS**

4.1 For the purpose of this Practice, the following definitions apply:

- 4.1.1 Accessible: Term applied to a device or function that can be used or seen by an operator for the purpose of performing control actions (e.g. set point changes, auto-manual transfer, or on/off actions) (Reference ISA 5.1)
- 4.1.2 Automated Valve: Any valve with a locally or remotely controlled actuator. Examples are throttling control valves and on/off block valves. Actuators are typically air-operated (diaphragm or piston), electric or hydraulic, some with spring return function. Manually operated valves are sometimes tagged as automated valves (e.g., if a manual valve is fitted with position switches).
- 4.1.3 Auxiliary P&ID: Used to show details to unclutter other P&IDs (e.g., lube oil system, sample systems, instrument details).
- 4.1.4 Basic Process Control System (BPCS): Control equipment and system installed to regulate normal production functions. It may contain combinations of single-loop pneumatic controllers, single-loop electronic controllers, Programmable Logic Controllers (PLCs), Supervisory Control and Data Acquisition (SCADA) and Distributed Control Systems (DCSs). The BPCS is required to operate the process. Examples of control functions included in the BPCS are cascade control, override control, and pump start/stop. Also known as Basic Regulatory Controls. (See also HLCS and SIS).
- 4.1.5 Bubble: Circular symbol used to denote and identify the purpose of an instrument or function. The bubble usually contains a tag number. (Synonym for balloon) (Reference ISA 5.1).
- 4.1.6 Design Pressure: Pressure used in the design of a vessel component together with the coincident design metal temperature for determining the minimum permissible thickness or physical characteristics of the different zones of the vessel. (Reference ASME Boiler Pressure Vessel Code, Section VIII, Division 1, Appendix 3)
- 4.1.7 Fail Closed (FC): Characteristic of an automated valve that causes the valve to close as a result of specific malfunctions, including loss of signal or motive power. (Reference ISA 5.1).
- 4.1.8 Fail Indeterminate (FI): Characteristic of an automated valve that causes the valve to move to an unknown position as a result of specific malfunctions, including loss of signal or motive power. Some automated valves will not stay at the last position upon failure and instead move with the process differential pressure. Additional equipment may be needed to meet the definition of FC, FO, or FL. (Reference ISA 5.1).
- 4.1.9 Fail Locked (FL) Last Position: Characteristic of an automated valve that causes the valve to remain in the last (locked) position as a result of specific malfunctions, including loss of signal or motive power. Automated valves may fail indeterminately without additional equipment. (Reference ISA 5.1).
- 4.1.10 Fail Open (FO): Characteristic of an automated valve that causes the valve to open as a result of specific malfunctions, including loss of signal or motive power. (Reference ISA 5.1).
- 4.1.11 Hand Switch (HS): Any operator-manipulated discrete control device, including hardwired panel switches and software points.
- 4.1.12 Heat Exchanger Type: Type designation shall be shell and tube, plate and frame, spiral, etc. For shell and tube exchangers, use the three-letter designation describing stationary head, shell, and rear end or head, in that order, in accordance with TEMA.

- 4.1.13 Higher Level Control System (HLCS): Provides sophistication above that of the BPCS. The HLCS is not necessary to operate the process. HLCS functions are typically based in process computers or higher level DCS hardware that interacts with the process by manipulating set points in the BPCS. Examples of control functions in the HLCS are statistical process control and model predictive control. (See also BPCS and SIS).
- 4.1.14 Interlock: System that, in response to a predetermined condition, initiates a predefined action. Typically comprised of binary (on/off) signals and logic used for process control, sequencing, or protective interruption of normal process control functions. Protective interlocks are typically further defined as being either safety-related or commercial-related (asset or production protection).
- 4.1.15 Isolation Valve: A valve used for isolation of process equipment while performing activities such as purging, de-pressuring or de-inventorying. This valve is also commonly referred to as the primary block valve.
- 4.1.16 Line Class: Section of the Piping Material Specifications that provides a listing of piping components for specific design conditions.
- 4.1.17 Logic Solver: Control equipment that performs the logic function. It can be either hardwired (e.g., relays) or Programmable Electronic Systems (e.g., DCS-based or PLC-based, including dual-redundant or triple-redundant microprocessors).
- 4.1.18 Packaged Equipment: One or more pieces of equipment furnished by a vendor with supportive devices and components to perform a specific operation as a unit.
- 4.1.19 Process and Instrumentation Diagram (P&ID): Detailed graphical representation of a process including the hardware and software (i.e., piping, equipment, and instrumentation) necessary to design, construct and operate the facility. Common synonyms for P&IDs include Engineering Flow Diagrams (EFDs), Utility Flow Diagrams (UFDs), and Mechanical Flow Diagrams (MFDs).
- 4.1.20 Programmable Electronic System (PES): Logic performed by programmable or configurable devices (Reference ISA 84.01).
- 4.1.21 Root Valve: First valve or valves between the process and an auxiliary device (e.g., an instrument) that contacts the process and is used to isolate the device from the process. This valve is typically a line class valve used for shut-off and isolation.
- 4.1.22 Safety Integrity Level (SIL): One of four possible discrete integrity levels (SIL 1, SIL 2, SIL 3, and SIL 4) of Safety Instrumented Systems. SILs are defined in terms of Probability of Failure on Demand (PFD). (Reference ISA 84.01).
- 4.1.23 Safety Instrumented Systems (SIS): Systems composed of sensors, logic solvers, and final control elements for the purpose of taking the process to a safe state if predetermined conditions are violated. Other terms commonly used include Emergency Shutdown System (ESD or ESS), Safety Shutdown System (SSD), and Safety Interlock System (SIS). (Reference ISA S84.01) (See also BPCS and HLCS).
- 4.1.24 Skirt: Cylindrical supporting structure, welded to the bottom of a vertical vessel and extended to the base support.
- 4.1.25 Tagged: For the purposes of labeling instrumentation and control components, a hardware device or a software point that is identified with a W&W or ISA style tag number.
- 4.1.26 Tight Shut-Off (TSO): Tight Shut-Off is defined in this Practice as ANSI Class V or ANSI Class VI in accordance with ANSI/FCI 70-2.

- 4.1.27 Trim: Item attached to equipment as an integral component, identified as part of the equipment that is exposed to the process, and having a function local to the equipment being served. Examples are vent and drain valves, instrument bridles, blind flanges, plugs, or other miscellaneous items associated with a piece of equipment. Typically, trim is purchased independently from the equipment

## 5 GENERAL REQUIREMENTS

- 5.1 Most details available from other types of documentation (e.g., instrument loop diagrams and vessel data sheets) should not be included on P&IDs.
- 5.2 This appendix uses the concepts of typical details with implied components where appropriate to simplify P&IDs.
- 5.3 While the intent of this appendix is to simplify the P&IDs through the use of implied components and cover sheets, this may not be compatible with the work processes or design software used for a project. Therefore, this Practice does not require the use of implied components. It is the responsibility of the project team to determine the compatibility of implied components with project needs and work.

## 6 DRAWING LAYOUT

*Comment: The layout and orientation statements specified herein are recommended as optimal and slight deviation, although not encouraged, may be required due to space constraints.*

### 6.1 General

- 6.1.1 Drawing size shall be consistent with the other drawings in the tender documents.
- 6.1.2 Each P&ID shall be laid out to avoid clutter and allow future modifications. No more than three pieces of major equipment shall be shown on a single P&ID. A set of pumps in the same service shall be one piece of equipment for the purpose of a P&ID layout.
- 6.1.3 Equipment arrangement shall be shown relative to its elevation to grade where practical.
- 6.1.4 A control valve actuator shall be shown above a horizontal line or left of a vertical line.
- 6.1.5 Typical details shall be used if clutter can be eliminated without detracting from clarity. These details shall be shown on the P&ID, on an auxiliary P&ID, or on a cover sheet

### 6.2 Flow Orientation

- 6.2.1 Primary flow shall be shown on each P&ID from left to right. Flow through equipment shall be shown relative to the actual arrangement, such as filter influent in the top of the tank and filter effluent out the bottom of the tank.
- 6.2.2 Primary process lines shall be shown as a heavier line weight than secondary and utility lines.

### 6.3 Connectors

- 6.3.1 Off-page connectors for primary, secondary, and instrumentation lines shall be shown entering the P&ID horizontally from the left inside the borderline and existing horizontally from the right inside the borderline.
- 6.3.2 Service description, connector number, P&ID number and origin/destination shall be shown for off-page connectors.

- 6.3.3 Origin/destination shall be shown as an equipment tag, line number or loop number.
- 6.3.4 Service description for a piping off-page connector shall be shown as name of fluid or line description.
- 6.3.5 Service description for instrumentation off-page connector shall be shown as a line function or equipment to be controlled.
- 6.3.6 Text associated with off-page connectors on the left side of the P&ID should be left justified; text associated with offpage connectors on the right side of a P&ID should be right justified.

## 6.4 Equipment

### 6.4.1 Information

- 6.4.1.1 Equipment numbers shall be underlined.
- 6.4.1.2 Equipment descriptions and data shall be immediately beneath the equipment number.
- 6.4.1.3 Equipment information for fixed or static equipment (e.g, tanks, vessels, filters, etc.) shall be shown immediately below the top boaderline and motorized/rotating equipment (e.g., pumps, blowers, compressors, etc.) shall be shown immediately above the bottom borderline. Equipment numbers for the top or bottom identification shall be on the same horizontal plane as other equipment identification.

### 6.4.2 Symbols

- 6.4.2.1 Equipment symbols shall be as indicated in the facility P&ID legends where applicable or available.
- 6.4.2.2 Equipment shall be shown with a simple outline representation.
- 6.4.2.3 Discretion shall be exercised for equipment symbols to not dominate the drawing, but the symbols shall be drawn large enough for clear understanding.
- 6.4.2.4 Equipment shall not be drawn to scale.
- 6.4.2.5 Equipment shall be shown relative to associated equipment both in size and general orientation.

### 6.4.3 Nozzles

- 6.4.3.1 Nozzles, including spares, shall be shown on equipment as single lines.
- 6.4.3.2 Manways shall be shown as double lines.
- 6.4.3.3 Process and utility nozzles may be labeled.
- 6.4.3.4 Nozzle sizes shall be shown, unless the size is implied by piping connections.

### 6.4.4 Equipment identification shall be in accordance with Water and Waste Identification Standards.

- 6.4.5 Equipment elevations shall not be shown unless the elevations are necessary to specify process requirements for associated equipment location or orientation relative to one another.

- 6.4.6 Associated trim (e.g., vents, drain valves, etc.) for equipment shall be shown.
- 6.4.7 Jacketing and tracing requirements for equipment shall be shown.
- 6.4.8 The type of insulation (e.g., personnel protection, heat conservation) for equipment shall be shown as part of the equipment data. Insulation thickness shall be shown where applicable.
- 6.4.9 Drivers shall be shown with driven equipment and shall use the symbols for motors, and diesel/natural gas engines.

## 6.5 Instrumentation and Controls

### 6.5.1 Symbols

- 6.5.1.1 Instrumentation and control symbols shall be as indicated in the facility P&ID legends where applicable or available.
- 6.5.1.2 If necessary a descriptive text label may be added (e.g.
- 6.5.1.3 Directional arrows on instrumentation signal lines shall be used only if the function is not obvious.
- 6.5.1.4 Instrument function symbols shall be used to clarify the function of certain tagged instrument bubbles. The symbol shall be placed outside the bubble at the upper right.

### 6.5.2 Automated Valves

- 6.5.2.1 Automated valve fail actions shall be shown with text (i.e. FO/FC/FI/FL)
- 6.5.2.2 Valves with different fail actions for loss of signal and for loss of motive power require an explanatory note.
- 6.5.2.3 Valve body sizes shall be shown for all automated valves if not line sized or otherwise implied.
- 6.5.2.4 For automated valves, tight shut-off requirements shall be identified by using the abbreviation "TSO".



## **APPENDIX I – CITY OF WINNIPEG COVID-19 SELF-SCREENING QUESTIONNAIRE**

## COVID-19 Daily Self-Screening Questionnaire

**These are questions that employees should ask themselves prior to starting to their work day:**

Any employee who is experiencing ANY of the symptoms below should NOT enter the workplace until they are symptom free for a full 24 hour period. <https://sharedhealthmb.ca/covid19/screening-tool/> Manitobans are reminded that if they are showing symptoms of COVID-19 and meet testing criteria, they can call Health Links–Info Santé at 204-788-8200 or (toll-free) at 1-888-315-9257 for more information.

Do you have any of the below symptoms?		
Feeling of fever or chills?	Yes	No
New onset of cough or increase in amount of coughing?	Yes	No
Sore throat?	Yes	No
Shortness of Breath?	Yes	No
New onset symptom: runny nose/ congestion (not related to allergies)?	Yes	No
Headache or unusual headache?	Yes	No
Sore muscles not related to overexertion or exercise?	Yes	No
New onset symptom: diarrhea?	Yes	No
New onset symptom: loss of taste and/or smell?	Yes	No
Have you had close contact (within 2 metres) with a confirmed case of COVID-19?	Yes	No
Have you been told by Public Health to be in self-isolation?	Yes	No
In the last 14 days have you returned from international travel, or from Ontario (east of Terrace Bay), Quebec or the Atlantic provinces? Travel restrictions are subject to change; up-to-date information is available at: <a href="https://www.gov.mb.ca/covid19/soe.html">https://www.gov.mb.ca/covid19/soe.html</a>	Yes	No
<p><b><u>IF ALL ANSWERS ARE NO</u></b></p> <ul style="list-style-type: none"> <li>Clean your hands again and enter the work location</li> </ul>		
<p><b><u>IF ANY ANSWERS ARE YES</u></b></p> <ul style="list-style-type: none"> <li><b>DO NOT ENTER FURTHER INTO THE WORK LOCATION</b></li> <li>Contact your workplace supervisor</li> <li>Call Health Links–Info Santé at 204-788-8200 or (toll-free) at 1-888-315-9257</li> <li>Return home maintaining social distancing</li> </ul>		

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Name (Please Print)

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Signature

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Date

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Company