



**THE CITY OF WINNIPEG**

# **REQUEST FOR PROPOSAL**

**RFP NO. 583-2016**

**PROFESSIONAL CONSULTING SERVICES FOR THE REGIONAL WATER DISTRIBUTION  
SYSTEM SCADA SYSTEM UPGRADE, PLC REPLACEMENT AND POWER RELIABILITY  
UPGRADES**

**Proposals shall be submitted to:**

**The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1**

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## PART B - BIDDING PROCEDURES

### B1. CONTRACT TITLE

B1.1 PROFESSIONAL CONSULTING SERVICES FOR THE REGIONAL WATER DISTRIBUTION SYSTEM SCADA SYSTEM UPGRADE, PLC REPLACEMENT AND POWER RELIABILITY UPGRADES

### B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 12:00 noon. Winnipeg time, **December 9, 2016**.
- B2.2 Proposals determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.
- B2.3 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 The Project Manager or an authorized representative will conduct a Site investigation tour of the Shoal Lake Intake Facility on **November 21, 2016, starting at 8:00 am**. Due to a limited number of seats on the track car, a maximum of two (2) representatives from each Proponent may attend the Shoal Lake Intake Facility Site investigation.
- B3.1.1 The meeting point for the Shoal Lake Intake Facility Site investigation will be the Winnipeg WTP (located on Provincial Road 207).
- (a) Proponents must provide their own transportation to the Winnipeg WTP, and may be required to provide their own transportation from the Winnipeg WTP to the pickup point along the Greater Winnipeg Water District (GWWD) railway.
  - (b) The Site investigation will take approximately seven to eight (7-8) hours including road and rail travel.
  - (c) Proponents will not be permitted to walk through the facilities unattended.
  - (d) Directions to the meeting point and to the pickup point along the GWWD railway will be given to the Proponent upon completion of the registration process.
- B3.2 The Project Manager or an authorized representative will conduct a Site investigation tour of the following facilities on **November 25, 2016, starting at 10:00 am**:
- (a) McPhillips Pumping Station and McPhillips Control Centre
  - (b) Tache Booster Pumping Station
  - (c) Deacon Booster Pumping Station
  - (d) Winnipeg Water Treatment Plant (WTP)
- B3.2.1 The Site investigation will start at McPhillips Pumping Station located at 360 McPhillips Street.
- (a) Proponents must provide their own transportation between the facilities.
  - (b) Proponents will not be permitted to walk through the facilities unattended.
  - (c) Directions to the Deacon Site will be given to the Proponent upon completion of the registration process.
- B3.2.2 Tours of each facility will be limited to areas directly related to the Regional Water Distribution System (RDS) Supervisory Control and Data Acquisition (SCADA) upgrade, Programmable Logic Controller (PLC) replacement and power reliability upgrades.
- B3.3 Proponents are required to register for the Site investigation at least 48 hours prior by contacting the Project Manager identified in D2.1.

- B3.3.1 Proponents wishing to register for the Site investigation must provide the Project Manager with a Public Safety Verification Check obtained not earlier than one (1) year prior to the Site visit.
- (a) 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 PART E - Security Clearance for further information.
- (b) 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 of Winnipeg.
- B3.3.2 Proponents registering for a Site investigation of the Shoal Lake Intake Facility must additionally sign the GWWD railway Waiver Form prior to travel on the GWWD railway.
- (a) Waiver form available upon request to the Project Manager.
- B3.3.3 Proponents are required to bring their own personal protective equipment for all Site investigations. This includes safety boots, safety glasses and a hard hat.
- B3.3.4 Proponents will not be allowed to take pictures at any of the Site investigations. The Proponent may request pictures of specific areas from the Project Manager. The pictures will then be issued to all the Proponents registered for the Site investigations.
- B3.4 Although attendance at the Site investigations is not mandatory, the City strongly suggests that Proponents attend.
- B3.5 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 Project Manager identified in D2 in writing.
- 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 If the Proponent is unsure of the meaning or intent of any provision therein, the Proponent should request clarification as to the meaning or intent prior to the Submission Deadline.
- B4.4 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.
- B4.5 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.
- B4.6 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 Proponent's Proposal Submission.

B4.7 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.

## **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.

B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>

B6.2.2 The Proponent is responsible for ensuring that it has received all Addenda and is advised to check the Materials Management Division website for Addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B6.3 The Proponent shall acknowledge receipt of each addendum in Paragraph 9 of Form A: Proposal. Failure to acknowledge receipt of an addendum may render a Proposal non-responsive.

## **B7. PROPOSAL SUBMISSION**

B7.1 The Proposal shall consist of the following components:

- (a) Form A: Proposal (Section A) in accordance with B8;
- (b) Form B: Summary of All Fees (Section B) in accordance with B9;
- (c) Form C: Fee Summation (Section B) in accordance with B9
- (d) Form D: Hourly Rates – Time-Based Fees (Section B) in accordance with B9;

B7.2 The Proposal should also consist of the following components:

- (a) Experience of Proponent and Subconsultants (Section C) in accordance with B10;
- (b) Experience of Key Personnel Assigned to the Project (Section D), in accordance with B11;
- (c) Project Understanding and Methodology (Section E) in accordance with B12; and
- (d) Project Schedule (Section F) in accordance with B13.

B7.3 Further to B7.1 and B7.2, all components of the Proposal shall be submitted by the Proponent in the order indicated no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Proposal.

- B7.4 Proponents should submit one (1) unbound 8.5" x 11" original (marked "original") including drawings and six (6) copies (copies can be in any size format) for sections identified in B7.1 and B7.2.
- B7.5 Proposal format, including type of binding, 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 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 team.
- B7.6 Proponents are advised that inclusion of terms and conditions inconsistent with the RFP, will be evaluated in accordance with B22.1(a).
- B7.7 The Proposal shall be submitted enclosed and sealed in an envelope/package clearly marked with the RFP number and the Proponent's name and address.
- B7.8 Proposals submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.9 Proposals shall be submitted to:  
The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1
- B7.10 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: Proposal, making all required entries.
- B8.2 Paragraph 2 of Form A: 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: Proposal, the Proponent shall identify a contact Person who is authorized to represent the Proponent for purposes of the Proposal.
- B8.4 Paragraph 11 of Form A: 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 and the corporate seal, if the corporation has one, should be affixed;

- (d) if the Proponent is carrying on business under a name other than its 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: Proposal should be printed 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 complete Form B: Summary of All Fees, Form C: Fee Summation and Form D: Hourly Rates – Time-Based Fees making all required entries and summarizing all Fees for the Scope of Services. The Proponent shall be responsible to verify and ensure the correctness of the associated submittals.

B9.1.1 The Fees comprise of the following tables:

- (a) Form B: Summary of All Fees;
- (b) Form C: Fee Summation; and
- (c) Form D: Hourly Rates – Time-Based Fees

B9.1.2 Fees shall include Allowable Disbursements as defined in C1.1(b).

B9.1.3 Notwithstanding C1.1(b), overhead costs or disbursements typically referred to as type 1 disbursements or general expenses shall be included in the hourly rates.

B9.2 The Proponent shall submit Fixed Fees for Preliminary Design Services, Procurement Services and their associated Project Management Services as described in the Scope of Services and as listed in Form B: Summary of all Fees.

B9.2.1 In addition to the Form B: Summary of all Fees, proposals shall **also** include detailed breakdown of the Fixed Fees in matrix format according to the Scope of Services, refer to Appendix A for a sample detailed breakdown of fees table. Details shall include as a minimum:

- (a) the work activities and Deliverables of the proposed Services;
- (b) name and role of proposed individuals;
- (c) the respective engineering discipline or management function as applicable;
- (d) the respective number of hours per work activity per task per each proposed individual;
- (e) applicable hourly rates of proposed individuals; and
- (f) the associated disbursements.

B9.3 The Proponent shall submit Time-Based Fees for Contract Administration Services and Post Construction Services and their associated Project Management Services as described in the Scope of Services and as listed in Form B: Summary of All Fees.

B9.3.1 General Requirements for Time-Based Fee Services

- (a) An estimated minimum number of hours is indicated in the RFP for each Time-Based line item in Form B: Summary of All Fees to guide the Proponent in developing their fee proposal.
- (b) The estimated minimum number of hours indicated for each line item is based upon the Proponent utilizing experienced personnel who are familiar with the City's requirements and procedures performing the work. Additional hours may be required for less experienced personnel; fewer hours may be required for more experienced personnel.

- (c) Where the proposed number of hours deviates significantly from the estimated minimum number of hours indicated in the RFP, the Consultant should provide a detailed explanation of the fees and how the scope of work will be accomplished.
- (d) The fees proposed by the Proponent in Form B: Summary of All Fees shall constitute an upset limit. Ensure the hours proposed are sufficient to complete the specified work.

**B9.3.2 Form B: Summary of all Fees – Project Management Services for Contract Administration and Post Construction Services**

- (a) Indicate the proposed hours and fees for Project Management Services for Contract Administration and Post Construction Services as per D5.4 with resources allocated as per below:
  - (i) Project manager: 90% minimum
  - (ii) Administrative: 10% maximum
- (b) The estimated minimum number of hours to complete this work is **280 hours**.

**B9.3.3 Form B: Summary of All Fees – Contract Administration Non-Resident Engineering Services**

- (a) Indicate the proposed hours and fees for Contract Administration Non-Resident Engineering Services as per D5.7 with resources allocated as per below:
  - (i) Project manager: 5% minimum
  - (ii) Intermediate and Senior engineers: 50% minimum
  - (iii) Administrative: 10% maximum
  - (iv) Other engineering/technical resources may be allocated for the remainder.
- (b) The estimated minimum number of hours to complete this work is **565 hours**.

**B9.3.4 Form B: Summary of All Fees – Contract Administration Resident Engineering Services**

- (a) Indicate the proposed hours and fees for Contract Administration Resident Engineering Services as per D5.8 with resources allocated as per below:
  - (i) Project manager: 5% minimum
  - (ii) Lead Resident Engineer and Intermediate and Senior engineers: 75% minimum
  - (iii) Administrative: 5% maximum
  - (iv) Other engineering/technical resources may be allocated for the remainder.
- (b) The estimated minimum number of hours to complete this work is **800 hours** including 300 hours of on-Site inspection, 400 hours of Factory Acceptance Testing (FAT) and 100 hours for all other Resident Engineering Services.
- (c) A travel budget of \$40,000 for travel expenses for the purposes of attending FAT shall be included. This travel allowance shall not be used for any travel expenses not directly related to FAT.

**B9.3.5 Form B: Summary of All Fees – Contract Administration Commissioning Services**

- (a) Indicate the proposed hours and fees for Contract Administration Commissioning Services as per D5.9 with resources allocated as per below:
  - (i) Project manager: 5% minimum
  - (ii) Lead Commissioning Expert: 50% minimum
  - (iii) Administrative: 10% maximum
  - (iv) Other engineering/technical resources may be allocated for the remainder.
- (b) The estimated minimum number of hours to complete this work is **750 hours**.

**B9.3.6 Form B: Summary of All Fees – Post Construction Services**

- (a) Indicate the proposed hours and fees for Post Construction Services as per D5.10 with resources allocated as per below:

- (i) Project manager 5% minimum
- (ii) Senior engineers 20% minimum
- (iii) Administrative 10% maximum
- (iv) Other engineering/technical resources may be allocated for the remainder.

(b) The estimated minimum number of hours to complete this work is **200 hours**.

B9.3.7 In addition to the Form B: Summary of All Fees, proposals shall **also** include detailed breakdown of the Time-Based Fees in matrix format according to the Scope of Services, refer to Appendix A for a sample detailed breakdown of fees table. Details shall include as a minimum:

- (a) the work activities and Deliverables of the proposed Services;
- (b) name and role of proposed individuals;
- (c) the respective engineering discipline or management function as applicable;
- (d) the respective number of hours per work activity per task per each proposed individual;
- (e) applicable hourly rates of proposed individuals; and
- (f) the associated disbursements.

B9.3.8 In addition to B9.3.7, the Proponent shall **also** provide Form D: Hourly Rates – Time-Based Fees:

- (a) A table of hourly rates for each year used for the Contract Administration Services and Post Construction Services and their associated Project Management Services. The table shall include hourly rates for all personnel and categories/titles of personnel expected to work on the project.

B9.4 Adjustments to Fees will only be considered based on increases to the Scope of Services.

B9.4.1 The City will not consider an adjustment to the Fees based on changes in the Project budget or the Final Total Construction Cost.

B9.4.2 The City will not consider an adjustment to the Fees based on increases to hourly rates.

- (a) The Proposal shall identify and detail all rate escalations including salary adjustments.
- (b) The total Fee in the Proposal shall include all escalations.

B9.4.3 If the City requires additional services, the rates to be used will be based on the rates provided in the Proponent's Proposal.

B9.5 Notwithstanding C10.1, 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.

- (a) For City information purposes, the subtotal Fees per phase shall be broken down into Category III and non-Category III Consultant Services as indicated in Form B: Summary of All Fees and
- (b) Described in the Province of Manitoba Tax Bulletin 058 at <http://www.gov.mb.ca/finance/taxation/pubs/bulletins/058.pdf>.

B9.6 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, design-build procurement (including Request for Qualification [RFQ] and RFP preparation) and management and contract administration services on up to **three (3)** projects of similar complexity, scope and value.

- (b) details on prior work for the City of Winnipeg (if applicable). Highlight projects relevant to the scope of services listed in D5.

B10.2 For each project listed in B10.1(a), the Proponent should provide the following:

- (a) Description of the project;
- (b) Role of the consultant;
- (c) Project's original contracted cost and actual project cost;
- (d) Project's schedule (anticipated project schedule and actual project delivery schedule);
- (e) Project owner; and
- (f) Reference information (consisting of two (2) current contact names, email addresses and telephone numbers).

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 volume of work, number of employees and other pertinent information for the Proponent and all Subconsultants demonstrating their ability to undertake the current work.

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

B11.1 The Proponent should describe their approach to overall team formation and coordination of team members.

B11.1.1 Include an organizational chart for the Project.

B11.2 The Proponent should identify the following key personnel for the Services detailed in D5. The Proponent is responsible for ensuring they have adequate staff for the successful delivery of the Project.

- (a) Owner's Advocate (OA) Project Manager: This key role shall serve as the project manager for the Services detailed in D5.
- (b) Design Build Procurement Lead: This key role shall lead the Procurement Services detailed in D5.6.
- (c) Design Leaders including electrical, instrumentation, control and automation.
- (d) Lead Resident Engineer: This role is outlined in D5.8.
- (e) Lead Commissioning Expert: This role is outlined in D5.9.

B11.2.1 For evaluation purposes, higher scores will be given to key personnel with experience in similar roles in comparable projects.

B11.2.2 In addition to B11.2.1, the Owner's Advocate Project Manager and Design Build Procurement Lead shall have Design Build experience in a similar role within the past ten (10) years.

B11.2.3 Further to B11.2.1, the instrumentation, control and automation lead designer(s) shall have a minimum of ten (10) years control system design and system integration experience.

B11.3 Submit the experience and qualifications of the key personnel assigned to the Project for projects of similar complexity, scope and value, including at a minimum:

- (a) proposed role and responsibilities;
- (b) core capabilities and/or technical skills;
- (c) educational background and degrees;
- (d) professional registration;
- (e) job title;

- (f) years of experience in current position;
- (g) years of experience related to the Scope of Services identified in D5 and in a similar role as proposed; and
- (h) years of experience with existing employer.

- B11.4 Identify roles of each of the key personnel in the Project and who they will report to on this project and include in the organizational chart referred to in B11.1.1.
- B11.5 For each Person identified, list at least **two (2)** comparable projects completed in the last 10 years in which they have played a primary role. If a project selected for 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) Description of project;
  - (b) Role of the Person;
  - (c) Project owner; and
  - (d) Reference information (consisting of two (2) current names, email addresses and telephone numbers).
- B11.6 Proponents shall not substitute or replace key personnel throughout the duration of the Project without the written approval of the Project Manager.
- (a) Experience and qualification as specified in B11 shall be submitted for all requested substitute(s) and replacement(s).

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

- B12.1 Describe your firm's project management approach and team organization during the performance of Services using project specific details, so that the evaluation committee has a clear understanding of the methods the Proponent will use in the delivery of this Project. The methods should include:
- (a) activities to be performed outside the City of Winnipeg either by the Proponent's staff or by Subconsultants. Identify proposed arrangements involving out-of-town staff to participate in coordination and review functions; and
  - (b) the collaborative process/method to be used by the key personnel of the team in the various phases of the Project.
- B12.2 Proponents should provide an overview of their quality management system used to demonstrate sophisticated levels of management, scope control, cost control, schedule control, quality control, and communications and how it is proposed these will be applied specifically to this Project.
- B12.3 Proposals should address:
- (a) the methodology that the Proponent intends to use to carry out the Scope of Services;
    - (i) methodology should be presented in accordance with the Scope of Services identified in Part D5.
  - (b) the team's understanding of the broad functional and technical requirements by:
    - (i) clearly identifying and explaining work activities;
    - (ii) stating assumptions and interpretations of the Scope of Services;
    - (iii) stating the Proponents' understanding of the constraints that will affect the work;
    - (iv) indicating activities and services to be provided by the City; and
    - (v) stating other information that conveys the Proponent's understanding of the Project requirements.
- B12.4 For each Person identified in B11.2, list:

- (a) The total number of hours to be dedicated to the Project;
- (b) The number of hours to be dedicated to each phase of the Project as listed in D5.2; and
- (c) The hourly chargeout rate.

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

B13.1 Proponents should present the most effective schedule attainable by developing a carefully considered critical path method schedule using Microsoft Project or similar project management software. The schedule should address each requirement of the Scope of Services.

B13.2 The Proponent's schedule should include:

- (a) Work Breakdown Structure (WBS);
- (b) resource assignments (all resources);
- (c) durations (weekly timescale);
- (d) milestone dates or events;
- (e) critical dates for review;
- (f) anticipated approval processes by the City during the Preliminary Design Services and Procurement Services phases of the Project
  - (i) Include a minimum of three (3) weeks for reviews by the City project team unless otherwise agreed. The review period to be commensurate to the number of pages and complexity of the document;
  - (ii) Provide reasonable times for other City departments review and guidance/approval processes if required; and
  - (iii) If Deliverables do not meet City expectations, the Consultant may need to submit the Deliverable for additional rounds of City reviews.
- (g) adequate time for the award of RFQ and RFP documents by the City.
  - (i) Shortlisting of DB proponents through RFQs may take a minimum of seven (7) months from posting the RFQ.
  - (ii) The award of the DB contract from posting of the RFP to contract award may take a minimum of 11 months.
- (h) Project meetings; and
- (i) submission dates for required Deliverables.

B13.3 The schedule shall be based upon the project constraints listed in F3.6.2(f) and the critical stages listed in D11.

**B14. DISCLOSURE**

B14.1 Various organizations provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure.

B14.2 The organizations are:

- (a) SNC-Lavalin Inc.;
- (b) Dillon Consulting Ltd.;
- (c) Stantec Consulting Ltd.; and
- (d) AECOM Canada Ltd.

B14.3 The following reports were prepared by the organizations identified in B14.2(a) to B14.2(d) (and are also listed in Appendix C).

- (a) Water Pumping Stations Power Reliability Study, SNC-Lavalin Inc., 2008

- (b) Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report, SNC-Lavalin Inc., 2013
- (c) The City of Winnipeg – Water Pumping Stations, Fast Restart Analysis and Recommendations Preliminary Design Report, Stantec Consulting Ltd., 2016
- (d) Regional Water Distribution SCADA System Upgrade Study Dillon Consulting, Ltd. 2015
- (e) Shoal Lake Aqueduct Intake Facility Assessment – Site Inspections and Assessment, AECOM Canada Ltd., 2012

B14.4 The reports listed in B14.3(a) to B14.3(e) and Appendix C are available in electronic Portable Document Format (PDF) by request to the Project Manager.

B14.4.1 The Proponent will be required to sign a non-disclosure agreement prior to receiving the report(s). Appendix E includes a sample non-disclosure agreement.

## **B15. ELIGIBILITY**

B15.1 Any organization that works on this Project (Professional Consulting Services for the Regional Water Supply System SCADA System Upgrade, PLC Replacement and Power Reliability Upgrades) as an OA, Consultant, Subconsultant, member of consortium etc., as a result of being awarded the Project by the City shall be deemed ineligible to participate in the potential design-build contract for the Regional Water Supply System SCADA System Upgrade, PLC Replacement and Power Reliability Upgrades.

## **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;
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Services in strict accordance with the terms and provisions of the Contract;

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 <http://www.winnipeg.ca/matmgt/debar.stm>

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 services for the programming; design, management of construction and contract administration for architectural and/or engineering projects of similar complexity, scope and value; and to those required for this Project;
- (b) be fully capable of performing the Services required to be in strict accordance with the terms and provisions of the Contract;
- (c) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba);
- (d) have the knowledge and resources to administer the requirements of The Workplace Safety and Health Act (Manitoba) during the construction works associated with this Contract;

- (e) undertake to meet all licensing and regulatory requirements of the appropriate governing authorities and associations in the Province of Manitoba; and
- (f) provide proof upon request of the Project Manager of the Security Clearances as identified in PART E - SECURITY CLEARANCE.

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 names of the Proponents and the Contract amount of the successful Proponent will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>.

B17.3 To the extent permitted, the City shall treat all Proposal Submissions as confidential. However, the Proponent is advised that any information contained in any Proposal may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B17.4 Following the award of Contract, a Proponent will be provided with information related to the evaluation of its 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 10 of Form A: 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 until a Contract for the Services has been duly executed as herein provided, but any offer shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 10 of Form A: Proposal.

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

B19.1 A Proponent may withdraw its Proposal without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B19.1.1 The time and date of receipt of any notice withdrawing a Proposal shall be the time and date of receipt as determined by the Manager of Materials.

B19.1.2 The City will assume that any one of the contact Persons named in Paragraph 3 of Form A: Proposal or the Proponent's authorized representatives named in Paragraph 11 of Form A: Proposal, and only such Person, has authority to give notice of withdrawal.

B19.1.3 If a Proponent gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Proposal until after the Submission Deadline has elapsed;
- (b) open the Proposal to identify the contact Person named in Paragraph 3 of Form A: Proposal and the Proponent's authorized representatives named in Paragraph 11 of Form A: Proposal; and

- (c) if the notice has been given by any one of the Persons specified in B19.1.3(b), declare the Proposal withdrawn.

B19.2 A Proponent who withdraws its Proposal after the Submission Deadline but before its offer has been released or has lapsed as provided for in B18.2 shall be liable for such damages as are imposed upon the Proponent by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

## **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 or otherwise, 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) Fees; (Section B)   | 40%         |
| (d) Experience of Proponent and Subconsultants; (Section C)   | 20%         |
| (e) Experience of Key Personnel Assigned to the Project; (Section D)                                | 17%         |
| (f) Project Understanding and Methodology (Section E)   | 18%         |
| (g) Project Schedule. (Section F)   | 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 responsible and qualified.

B22.4 Further to B22.1(c), Fees will be evaluated based on the Total Fixed Fees and Total Time-Based Fees submitted in accordance with B9.

- B22.4.1 Fees appearing to be inappropriately proportioned within or between the Fixed Fees may be determined to be non-responsive and rejected by the Award Authority in its sole discretion acting reasonably.
- B22.4.2 Fees appearing to be inappropriately proportioned within or between the Time-Based Fees may be determined to be non-responsive and rejected by the Award Authority in its sole discretion acting reasonably.
- B22.4.3 Fees, hours and Hourly Rates appearing to be inappropriately proportioned between the Fixed Fees and Time-Based Fees may be determined to be non-responsive and rejected by the Award Authority in its sole discretion acting reasonably.
- B22.5 Further to B22.1(d), Experience of Proponent and Subconsultants will be evaluated considering the information provided in response to B10, including but not limited to the following criteria:
- (a) ability of Proponent to complete the job;
  - (b) similarity of the Proponent's past projects;
  - (c) success of the Proponent on past projects; and
  - (d) past performance on City of Winnipeg projects, including 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.
- B22.5.1 Proponents that have not worked with the City before will be evaluated based on the information provided in response to B10.1(a)
- B22.5.2 Proposals that receive less than half the available evaluation points for Experience of Proponent and Subconsultants will be rejected in accordance with B22.3.
- B22.6 Further to B22.1(e), Experience of Key Personnel Assigned to the Project will be evaluated considering the information provided in response to B11, including but not limited to the following criteria:
- (a) similarity of key personnel's past projects;
  - (b) appropriateness of related years of experience of the key personnel;
  - (c) relevancy of experience of the key personnel; and
  - (d) appropriateness of approach to overall team formation and coordination of team members.
- B22.6.1 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.
- B22.7 Further to B22.1(f), Project Understanding and Methodology 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 and its constraints; and
  - (e) demonstration of insight beyond the information that was presented in this RFP.
- B22.7.1 Proposals that receive less than half the available evaluation points Project Understanding, Methodology and Schedule will be rejected in accordance with B22.3.
- B22.8 Further to B22.1(g), Project Schedule will be evaluated considering the information provided in response to B13 including, but not limited to the following criteria:
- (a) completeness of the Project schedule; and
  - (b) appropriateness of the timelines provided.

- B22.9 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.
- B22.10 Reference checks to confirm information provided may not be restricted to only those submitted by the Proponent, and may include organizations, including the City of Winnipeg, representing Persons known to have done business with the Proponent.
- B22.11 The City has full power to conduct an independent verification of information in any Proposal Submission received and generally pertaining to the qualifications and experience of the Proponent and any proposed members of its team.
- B22.12 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 responsible and 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 The City intends to award the entire Scope of Services; however,
- (a) Preliminary Design Services, Procurement Services and their associated Project Management Services will be awarded separately at the agreed to fee.
  - (b) At the City's sole discretion, Contract Administration Services, Post Construction Services and their associated Project Management Services will be awarded together or separately.
    - (i) Contract Administration Services, Post Construction Services and their associated Project Management Services shall only proceed at the City's sole discretion.
    - (ii) The City reserves the right to negotiate the final details of Contract Administration Services, Post Construction Services and their associated Project Management Services and the associated fees based on the terms of this RFP and the Proponent's submission.
    - (iii) The Consultant shall not proceed with Contract Administration Services, Post Construction Services and their associated Project Management Services without written authorization from the City.
- B23.5.1 The City of Winnipeg, in its sole discretion, after consideration of the Consultant's performance with the work associated with B23.5(a), may enter into negotiations with the Consultant, to undertake the work associated with B23.5(b) without a public bid solicitation.

- (a) Negotiations may include the Scope of Services and level of effort. The hourly rates to be applied shall be those submitted in Form D: Hourly Rates – Time-Based Fee Period to achieve a “not to exceed price”, which may be more or less than the fees submitted for Contract Administration Services, Post Construction Services and their associated Project Management Services in the Proposal and will be determined by the level of effort required for the phase.
- (b) The City will provide terms and conditions and other details if it initiates negotiations with the Consultant;
- (c) No compensation will be provided to the Consultant for participating in this negotiation;
- (d) The City of Winnipeg will be under no obligation to initiate negotiations or enter into subsequent contracts; and
- (e) The City may choose to issue a public bid solicitation for the Work with respect to Contract Administration Services and Post Construction Services and their associated Project Management Services.

B23.6 Notwithstanding Paragraph 6 of Form A: Proposal and C4, the City will issue a Letter of Intent to the successful Proponent in lieu of execution of a Contract.

B23.6.1 The Contract documents as defined in C1.1(n)(ii) in their entirety shall be deemed to be incorporated in and to form a part of the Letter of Intent notwithstanding that they are not necessarily attached to or accompany said Letter of Intent.

B23.7 The form of Contract with the City of Winnipeg will be based on the Contract as defined in C1.1(n).

B23.8 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.

B23.9 If, after the award of Contract, the Project is cancelled, the City reserves the right to terminate the Contract. The Consultant 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 2010-10-01) 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

### 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.
- D1.2 If there is any conflict or inconsistency between the Proposal and the General Conditions for Consultant Services, the General Conditions for Consultant Services shall take precedence.
- D1.3 Further to C.1.1(b) and C10, the following is applicable to Allowable Disbursements:
- (a) Booking of transportation and accommodations are expected to take place well in advance to obtain optimal discounted rates;
  - (b) The acceptable standard for air travel shall be economy class;
  - (c) Air travel premium fees. Such as seat selection premiums etc., will not be reimbursable unless specifically approved by the Project Manager;
  - (d) The acceptable standard for accommodation will be a single room in a safe environment, conveniently located and comfortably equipped;
  - (e) The acceptable standard for rental vehicles shall be mid-size;
    - (i) Car rental premium fees, such as prepaid fuel or re-fuelling surcharges etc. will not be reimbursable unless specifically approved by the Project Manager;
  - (f) Costs for alcoholic beverages will not be reimbursable and shall not be claimed.
  - (g) Copies of originating merchant/vendor detail receipts shall be provided as backup documentation when invoicing Allowable Disbursements, credit/debit card receipts or statements are not acceptable as backup; and
  - (h) GST is to be removed from the reimbursable value of merchant/vendor invoices.
- D1.4 Monthly Invoices
- D1.4.1 In addition to C10.7, the Consultant shall submit monthly invoices for the Scope of Services.
- D1.4.2 Each invoice shall specify category III Consultant Services and tangible personal property of the category III Services as defined in the Province of Manitoba Tax Bulletin 058 at <http://www.gov.mb.ca/finance/taxation/pubs/bulletins/058.pdf>.
- D1.4.3 Project Management Services
- (a) All payments for the Fixed Fee portion of Project Management Services will be made upon progress estimates approved by the Project Manager.
  - (b) All payments for the Time-Based Fee portion of Project Management Services will be made on a time basis, as approved by the Project Manager.
- D1.4.4 Preliminary Design Services
- (a) All payments for the Fixed Fee Preliminary Design Services will be made upon progress estimates approved by the Project Manager, with the following as maximums:
    - (i) A maximum of 60% of Preliminary Design Services prior to submission of the draft Preliminary Design report – 66 % complete.
    - (ii) A maximum of 80% of Preliminary Design Services upon submission of the draft Preliminary Design report – 99% complete.
    - (iii) A maximum of 95% of Preliminary Design Services upon submission of the final Preliminary Design report.
  - (b) The remaining amount of Preliminary Design Services will be paid out upon acceptance by the Project Manager of the updated project management plan as described in D5.5.1(f).

#### D1.4.5 Procurement Services

- (a) All payments for the Fixed Fee Procurement Services will be made upon progress estimates approved by the Project Manager, with the following as maximums:
  - (i) A maximum of 25% of Procurement Services prior to submission of the final RFQ documents.
  - (ii) A maximum of 60% of Procurement Services upon City acceptance of the final RFP documents.
  - (iii) A maximum of 90% of Procurement Services upon close of the design-build RFP Bid Period.
- (b) The remaining amount of Procurement Services will be paid out upon acceptance by the Project Manager of completion of all Procurement Services requirements, including, but not limited to D5.6.4.

#### D1.4.6 Contract Administration Services

- (a) All payments for Contract Administration Services will be made on a time basis, as approved by the Project Manager.
  - (i) An estimate of travel expenses for FAT shall be provided by the Consultant and must be approved by the City prior to incurring any FAT expenses.
- (b) All allocated fees shall be considered upset limits.

#### D1.4.7 Post Construction Services

- (a) All payments for Post Construction Services will be made on a time basis, as approved by the Project Manager.
- (b) All allocated fees shall be considered upset limits.

D1.4.8 It is expected that the values stated in Form B: Summary of All Fees will form the basis for valuation of the completed work, for the purposes of payment via progress estimates. However, if in the opinion of the Project Manager, the values are "front loaded" such that the Form B: Summary of All Fees prices reflect higher values for work that is sequenced earlier in the schedule, the Project Manager reserves the right to revise the payments as required to ensure that the total payment does not exceed the true value of the work performed.

D1.4.9 Invoices shall be submitted in both paper copies and Native Formats.

## D2. PROJECT MANAGER

D2.1 The Project Manager is:

Alison Weiss, P.Eng.

Email: aweiss@winnipeg.ca

Telephone No. 204 986-8376

Facsimile No. 204 224-0032

D2.2 At the Project initiation meeting, the Project Manager will identify additional personnel representing the Project Manager and their respective roles and responsibilities for the Services.

D2.3 Proposal Submissions must be submitted to the address in B7.9.

## D3. DEFINITIONS

D3.1 When used in this RFP:

- (a) "Consultant" and "Owner's Advocate" means the Person undertaking the performance of Services under the terms of the Contract.
- (b) "DB" means Design Builder.

- (c) "FAT" means Factory Acceptance Testing.
- (d) "FRS" means Functional Requirements Specification.
- (e) "GWWD" means Greater Winnipeg Water District.
- (f) "HMI" means Human Machine Interface.
- (g) "HVAC" means Heating, Ventilation and Air Conditioning.
- (h) "I/O" means Inputs/Outputs.
- (i) "IP" means Internet Protocol.
- (j) "LCP" means Local Control Panel.
- (k) "MCC" means Motor Control Centre.
- (l) "Native Format" means the original format from which a Deliverable was generated (e.g. MS Word, MS Excel, AutoCAD etc.).
- (m) "OA" means Owner's Advocate.
- (n) "O&M" means Operation and Maintenance.
- (o) "PDF" means Portable Document Format.
- (p) "P&ID" means Process and Instrumentation Drawings.
- (q) "PLC" means Programmable Logic Controller.
- (r) "PPLC" means Pump Programmable Logic Controller.
- (s) "Project Manager" means the Project Manager identified in D2.
- (t) "RDS" means Regional Water Distribution System.
- (u) "Regional SCADA" means the Regional Water Distribution System SCADA system.
- (v) "RFI" means Request for Information.
- (w) "RFP" means Request for Proposal.
- (x) "RFQ" means Request for Qualification.
- (y) "SAT" means Site Acceptance Testing.
- (z) "SCADA" means Supervisory Control and Data Acquisition.
- (aa) "SPLC" means Station Programmable Logic Controller.
- (bb) "UPS" means Uninterruptable Power Supply.
- (cc) "UV" means Ultraviolet.
- (dd) "WAN" means Wide Area Network.
- (ee) "WBS" means Work Breakdown Structure.
- (ff) "WTP" means Winnipeg Water Treatment Plant.

#### **D4. BACKGROUND**

##### **D4.1 General**

D4.1.1 The City of Winnipeg's Regional Water Distribution System (RDS) is comprised of the Shoal Lake Intake Facility, the Aqueduct from Shoal Lake to the Deacon Reservoir, the Winnipeg WTP, the Deacon Booster Pumping Station, the Deacon Chemical Feed Facility, two (2) Branch Aqueducts that deliver water to in-town reservoirs at each of the three (3) Regional Pumping Stations (McPhillips, MacLean and Hurst), and the Tache Booster Pumping Station.

D4.1.2 The system is controlled by PLCs at each facility, and SCADA/Human Machine Interface (HMI) systems as described in more detail below.

##### **D4.2 SCADA Systems**

D4.2.1 There are a number of distinct SCADA/HMI systems currently used for control and monitoring of the potable water supply system, as described in D4.2.2 through D4.2.10.

#### D4.2.2 Regional Water Distribution System SCADA (Regional SCADA) System

##### (a) Overview

- (i) The Regional SCADA is a Telvent SCADA system.
- (ii) The Regional SCADA system was originally installed in 1993, and upgraded in 2006. Additionally, the primary servers and control workstations were relocated from McPhillips Control Centre to the WTP in 2010, and a Disaster Recovery Control Centre was added at McPhillips Control Centre at the same time.
- (iii) The Regional SCADA system operates with a distributed client/server architecture, and provides full redundancy down to the pumping station level.
- (iv) The Regional SCADA system controls and monitors the following Sites:
  - ◆ Deacon Booster Pumping Station;
  - ◆ Deacon Chemical Feed Facility and Reservoir (WTP Site);
  - ◆ Shoal Lake Intake Facility and Aqueduct (monitoring only);
  - ◆ Three (3) in-town Regional Pumping Stations and Reservoirs (McPhillips, MacLean and Hurst);
  - ◆ Tache Booster Pumping Station; and
  - ◆ In-town pressure points (monitoring only).

##### (b) Communication

- (i) The Regional SCADA system supports communication redundancy between Sites:
  - ◆ A Shaw T1 backbone serves as the primary communication channel between the WTP, the Regional Pumping Stations and Tache Booster Pumping Station.
  - ◆ In-town pressure points are polled over a radio communications network using a licensed radio band. Communications to Regional Pumping Stations and Tache Booster Pumping Station will also fail over to this radio link in the event that the Shaw T1 connection fails.
  - ◆ Data replication between the primary servers at the WTP and the Disaster Recovery Control Centre servers at McPhillips Control Centre occurs over the City's corporate wireless local area network, while polling occurs over the Shaw T1 network. In the event of a failure of the Shaw T1 link, polling also fails over to the City's corporate wireless network.
  - ◆ A fibre ring connects Deacon Booster Pumping Station and Deacon Chemical Feed Facility to the primary servers at the WTP.
- (ii) Redundant communication paths are critical to continuous operation and monitoring of the City's water supply system during a failure of one communication path.

##### (c) Hardware and Software

- (i) The Regional SCADA system is running an outdated version of Telvent's OASyS DNA software (version 7.4). Most hardware in the system is original to the 2006 upgrade, using Windows Server 2003 and Windows XP operating systems - both of which have passed the extended support date offered by Microsoft. As such, the Regional SCADA system needs to be upgraded.

#### D4.2.3 WTP SCADA

##### (a) Overview

- (i) The WTP SCADA is a Wonderware SCADA system.
- (ii) The WTP SCADA system was installed in 2009 to control and monitor processes local to the WTP. This system operates with redundant application object and inputs/outputs (I/O) servers, a single historian, redundant terminal

servers hosting several thin client operator interface sessions, and three (3) engineering stations.

- (b) Communication
  - (i) All servers and workstations are connected via a fibre ring local to the WTP campus. Additionally, the two (2) redundant application object and I/O servers are connected by a point-to-point redundancy management channel.
- (c) Hardware and Software
  - (i) The WTP SCADA system has been kept up-to-date by City staff who have performed software upgrades as newer releases have become available, and hardware and operating system upgrades to avoid obsolescence of the installed system. The currently installed software is Wonderware System Platform 2014 R2 Patch 01. Servers are using the Windows Server 2008 R2 operating system.

#### D4.2.4 Allen Bradley RSView System

- (a) The Allen Bradley RSView system controls and monitors the ultraviolet (UV) treatment system located in the Deacon Booster Pumping Station.
- (b) The Allen Bradley RSView system will be phased out, with its functionality being incorporated into the WTP SCADA system by City staff.

#### D4.2.5 Standalone RSView HMI located at the WTP Generator Building

- (a) The standalone RSView HMI is used for local control of the emergency generators at the WTP.
- (b) The functionality of the standalone RSView HMI is duplicated in the WTP SCADA system.
- (c) The standalone RSView HMI will continue to be used as it is.

#### D4.2.6 Citect HMI and GE QuickPanel HMIs at the Shoal Lake Intake Facility

- (a) The Citect HMI and the GE QuickPanel HMIs are used to monitor:
  - (i) Shoal Lake Intake Facility
  - (ii) Aqueduct Solar sites
- (b) The Citect HMI and the GE QuickPanel HMIs have been identified as requiring upgrading, and are discussed in Appendix B.

#### D4.2.7 Standalone Wonderware InTouch HMIs located at the WTP

- (a) The standalone Wonderware InTouch HMIs control and monitor the ozone and sodium hypochlorite generation systems.
- (b) The standalone Wonderware InTouch HMIs will continue to be used as they are, or will be ported into the WTP SCADA system by City staff.

#### D4.2.8 Standalone Magelis HMI displays located at the WTP and Deacon Booster Pumping Station

- (a) The standalone Magelis HMI displays are used for local control of Deacon booster pumps 1 and 2, ozone power distribution units, polymer and dissolved air floatation systems, and WTP potable water pumps.
- (b) The standalone Magelis HMI displays will continue to be used as they are.

#### D4.2.9 Standalone AutomationDirect HMI

- (a) The Standalone AutomationDirect HMI is used for local control of the WTP diesel refuel system.
- (b) The Standalone AutomationDirect HMI will continue to be used as it is.

#### D4.2.10 Standalone Pro-face HMIs

- (a) The standalone Pro-face HMIs are used for local control of each of the six (6) UV reactors at Deacon Booster Pumping Station.
- (b) The standalone Pro-face HMIs will continue to be used as they are, or may be upgraded as part of a separate project.

#### D4.3 PLCs

D4.3.1 The PLCs used within the Regional Pumping Stations, the Deacon and Tache Booster Pumping Stations, and the Shoal Lake Intake Facility are Modicon Compact PLCs with PC-A984-145 and PC-A984-E255 processors. These processors were removed from active sale on December 30, 2003 and the production of the complete line of Compact PLCs was stopped on June 30, 2006.

D4.3.2 Appendix B describes the PLCs in use at the Regional and Booster Pumping Stations and the Shoal Lake Intake Facility. Additional details are also included in SNC-Lavalin Inc.'s Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report listed in Appendix C.

#### D4.4 Relevant Reports and Reference Drawings

D4.4.1 Refer to Appendix D for a listing of relevant reference drawings which are available electronically by request to the Project Manager.

- (a) The Proponent will be required to sign a non-disclosure agreement prior to receiving the drawings. Appendix E includes a sample non-disclosure agreement.

D4.4.2 A number relevant reports for the Regional SCADA upgrade, PLC replacement and power reliability upgrades are available as described in D4.4.3 through D4.4.6. These documents are listed in Appendix C - Relevant Documents and are available in electronic Portable Document Format (PDF) by request to the Project Manager.

- (i) The Proponent will be required to sign a non-disclosure agreement prior to receiving the report(s). Appendix E includes a sample non-disclosure agreement.

#### D4.4.3 Power Reliability Study

- (a) In 2005, the City retained SNC-Lavalin Inc. to assess the risks associated with the electric power supply at each of the City's water pumping stations based on a greater frequency of service interruption that had been encountered over the past 10 to 15 years.
- (b) During the course of the project, numerous risks and weaknesses associated with the configuration of the pumping and ancillary equipment were also discovered and it was determined that a number of reliability upgrades were required at the pumping stations.
- (c) The final report "Water Pumping Stations Power Reliability Study" (issued in 2008) included recommendations to improve the reliability of the pumping stations including addressing PLC logic deficiencies, alarm handling, and station reliability issues.

#### D4.4.4 PLC Replacement and Power Reliability Upgrades Preliminary Design

- (a) In 2012, SNC-Lavalin Inc. was retained by the City to provide professional consulting services for the predesign of the PLC replacement and power reliability upgrades project.
- (b) The final report "Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report" (issued in 2013) recommended the complete replacement of the Modicon Compact PLCs, the HMIs at the Shoal Lake Intake Facility and the Bently Nevada 3300 Series machinery monitoring systems. Further, the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report recommended upgrading the local control system communication network to an Ethernet based network.
- (c) The proposed control system architecture included:

- (i) Redundant Modicon Quantum Unity processors as the Station Master PLCs to provide immediate and uninterrupted hot-standby failover in the event of a Station Master PLC fault while not relying on customized logic to do so;
  - (ii) Ethernet based Modbus/TCP communications protocol for PLC to PLC communication. This would allow direct SCADA to PLC communication without the need for protocol converters and bridges and would accommodate future network expansions to incorporate “smart” Ethernet based devices such as smart transmitters, valve actuators and Motor Control Centres (MCCs);
  - (iii) Fault tolerant bi-directional ring based communication between PLCs using the Rapid Spanning Tree Protocol.
- (d) Due to existing program inefficiencies and logic deficiencies, and as a new PLC programming software would be used (Unity Pro), Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report recommended that a complete rewrite of the PLC program code be undertaken.
- (e) The Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report also recommended a number of upgrades to address station reliability issues (as identified in SNC-Lavalin Inc.’s 2008 Power Reliability Study).

#### D4.4.5 SCADA System Upgrade Study

- (a) Dillon Consulting Ltd. performed a Regional SCADA upgrade study in 2014/15, comparing Telvent (now Schneider Electric) OASyS DNA and Wonderware upgrade paths, including a lifecycle cost analysis.
- (b) The final report “Regional Water Distribution SCADA System Upgrade Study” (issued in 2015) recommended integration with the existing Wonderware WTP SCADA system as the preferred upgrade path for the Regional SCADA system.

#### D4.4.6 Fast Restart Preliminary Design

- (a) In 2015, Stantec Consulting Ltd. was retained by the City to provide professional consulting services for the preliminary design of a fast restart operating mode to address further issues identified in the 2008 Water Pumping Stations Power Reliability Study that were not included in the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report.
- (b) Stantec Consulting Ltd. produced the report “City of Winnipeg Water Pumping Stations, Fast Restart Analysis and Recommendations” in 2016.
- (c) The City of Winnipeg Water Pumping Stations, Fast Restart Analysis and Recommendations report recommended motor testing and measurement to determine thermal characteristics of the electric motors at the Regional Pumping Stations, replacement of motor protection relays installed in the electric motors, installation of stator winding resistance temperature devices at the MacLean and Hurst Regional Pumping Stations and changes to PLC logic in conjunction with the upgrades recommended in SNC-Lavalin Inc.’s Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report.

### D5. SCOPE OF SERVICES

D5.1 The City intends to procure the Regional SCADA system upgrade, PLC replacement and power reliability upgrades using the design-build method. As part of this process, the City requires the Services of a Professional Engineering Consultant to be the Owner’s Advocate (OA) during the design and construction of the Regional SCADA system upgrade, PLC replacement and power reliability upgrades.

D5.2 The OA shall provide the following Services as detailed in D5.4 to D5.10:

- (a) Project Management
- (b) Preliminary Design

- (c) Procurement
- (d) Contract Administration:
  - (i) Non-Resident Engineering Services
  - (ii) Resident Engineering Services
  - (iii) Commissioning Services
- (e) Post Construction

D5.3 Contract Administration Services and Post Construction Services shall only proceed at the City's sole discretion.

D5.4 Project Management

D5.4.1 This phase shall include all Project Management activities required to carry out the Scope of Services.

D5.4.2 The OA's Project Manager shall be the prime contact with the City's Project Manager for the duration of the Project.

D5.4.3 The OA shall:

- (a) Direct and coordinate efforts of the OA's team to achieve the specific Project goals and objectives and to meet the City's requirements;
- (b) Provide advice, engineering Services, consultation, and oversight with respect to the Scope of Services;
- (c) Effectively oversee the design-build project in accordance with the Design Builder's (DB) contract documents and subsequent approved modifications;
- (d) Carry out its Services without relieving the DB of their contractual and other legal obligations;
- (e) Request or coordinate the request of existing construction, as-built and/or record drawings;
- (f) Coordinate the DB's work with the City's operations staff or representative; and
- (g) Coordinate with the City's Project Manager to ensure that all City stakeholders (Legal Services, Materials Management, Water Services, Information Systems and Technology, Engineering Services, Insurance etc.) are afforded ample opportunity for input and review throughout the provision of the Services.

D5.4.4 The OA's Project Manager shall be directly responsible for:

- (a) Managing the Project in accordance with the project management plan described in D5.4.5;
- (b) Organising, chairing, providing minutes and agenda for monthly Project status meetings and presentations during the Preliminary Design and Procurement phases of the Project;
- (c) Liaising with the Project Manager on a weekly basis to provide Project status;
- (d) Submitting bi-weekly work plans during Contract Administration and Post Construction Services. The work plans shall indicate expected hours, personnel and tasks for the upcoming two (2) week period for the OA's personnel. No work shall proceed without the Project Manager's approval;
- (e) Submitting monthly performance reports. The reports should consist of a maximum of two (2) pages and include the following as a minimum:
  - (i) Work carried out in the previous month, including person-hours worked;
  - (ii) Work in progress;
  - (iii) Work anticipated for the following month, including projected person-hours;
  - (iv) Variances against baselines for scope, schedule, and cost;
  - (v) Percentage completion of the overall Project and per phase;

- (vi) Description, action and mitigation of extreme and high risk(s);
  - (vii) Information request for the following month;
  - (viii) Issues to date;
  - (ix) Schedule and quality performance; and
  - (x) Modifications to the project management plan (described in D5.4.5).
- (f) Coordinating access to McPhillips, MacLean and Hurst Regional Pumping Stations, Tache and Deacon Booster Pumping Stations, Deacon Chemical Feed Facility, the WTP, Shoal Lake Intake Facility, and McPhillips Control Centre through the Project Manager or delegate during the Preliminary Design and Procurement Phases; and
- (g) Submitting cash flow forecast to the Project Manager at the onset of the Project and then semi-annually (March and September).
- (i) This shall reflect cost to date as well as revised forecast.
  - (ii) Forecasts shall include both the OA's fees and the DB's fees.
  - (iii) Forecasts shall be presented by calendar year during the Fixed Fee period and in a monthly format during the Time-Based Fee period.
  - (iv) The cash flow format shall be presented in a format agreed to by the City.
- (h) Submit monthly s-curve with corresponding explanation.

#### D5.4.5 Project Management Plan

- (a) The OA shall submit a project management plan three (3) weeks after Project award.
- (b) The project management plan shall be specific to the OA's Scope of Services for the Regional SCADA system upgrade, PLC replacement and power reliability upgrades.
- (c) The plan shall include details for Preliminary Design and Procurement Services and initial planning for Contract Administration and Post Construction Services. More detailed planning for Contract Administration and Post Construction Services shall be submitted following the award of the design-build contract.
- (d) The plan shall include the following at a minimum:
- (i) Scope
    - ◆ Include the information required in B12.
    - ◆ Provide a Deliverable based 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, % completion of design, posting to Materials Management site, etc.).
  - (ii) Budget
    - ◆ Include the information required in B9.
    - ◆ Include a description of the processes used to carry out earned value analysis such that the OA and design-build projects' performance can be measured against scope, schedule and cost baselines.
  - (iii) Schedule
    - ◆ Include the information required in B13.
    - ◆ The approved schedule will be used as the Project baseline.
  - (iv) Quality Management
    - ◆ Describe the quality management system used to address quality planning, quality assurance and quality control.
    - ◆ Include design review and approval processes addressing:
      - Engineering practice reviews;
      - Inter-discipline coordination;
      - Design verification / peer review;
      - Operability and maintainability review;
      - Constructability and cost reviews;

- Design certification; and
- City reviews.
- (v) Human Resources
  - ◆ Describe the team organization and management approach.
  - ◆ Include an organizational chart.
- (vi) Communication
  - ◆ Describe communication interfaces (organizational, technical and interpersonal) and the roles and responsibilities of each stakeholder.
  - ◆ Outline information needs, timeline for obtaining information and the method the information will be provided.
  - ◆ 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 various City stakeholders as applicable.
  - ◆ Describe the objectives, timing and frequency of Project meetings, workshops and presentations.
  - ◆ Describe the processes for tracking and monitoring Project documents through creation, checking, review, comment, verification, certification and approval processes.
- (vii) Risk Management
  - ◆ Develop a 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.
  - ◆ Outline process for updating the risk management plan in various phases of the Project.
- (viii) Change Control
  - ◆ Describe the integrated change control process for both the OA's Scope of Services and the design-build contract.
  - ◆ Identify and include the documents, tracking system and approval processes necessary to authorize change to the assignment.
- (ix) Health, Safety and Security
  - ◆ Include a Health and Safety Plan (which will be updated as needed throughout the Project) specific to the OA's Scope of Services.
  - ◆ Describe the OA's plan to obtain and renew the security clearances outlined in PART E - Security Clearance through to the completion of the OA's Scope of Services.
- (x) Close Out
  - ◆ Prepare a list of closure activities and actions for each phase of the OA's Scope of Services.

#### D5.4.6 Project Management Deliverables

- (a) The following Deliverables shall apply to the Project Management phase of the work:
  - (i) Project management plan with updates at the completion of Preliminary Design, and prior to the commencement of Contract Administration Services;
  - (ii) Agenda, PowerPoint presentation slides and meeting minutes during the Preliminary Design and Procurement Phases;
  - (iii) Bi-weekly work plans during the Time-Based Fee period of the work listed in D5.2;
  - (iv) Monthly performance reports;
  - (v) Cash flow forecasts.

- (b) Draft copies of the project management plan shall be provided in Native Format and PDF while final copies shall be submitted as PDF and one (1) hardcopy.
- (c) Draft and final copies of the agenda, meeting minutes, presentation slides, cash flow forecast, and monthly performance reports shall be provided in Native Format and PDF.
- (d) Bi-weekly work plans shall be provided by email to the Project Manager.
- (e) Documents to be presented or reviewed in a meeting shall be issued a minimum of three (3) weeks prior to the presentation unless otherwise stated in the Scope of Work. Comments and/or decisions made at the applicable meeting shall be incorporated into the documents and shall be re-issued for approval.

#### D5.4.7 Project Management Meetings

- (a) Throughout the Project, the OA shall meet with City's Advisory Committee for the Project to discuss findings and obtain input from City personnel. Meeting minutes are to be provided within one week of the meeting date.
- (b) The OA shall hold with the City a minimum of:
  - (i) One (1) formal Project initiation meeting (held at the WTP);
  - (ii) Monthly Project status meetings during the Preliminary Design and Procurement phases.

#### D5.5 Preliminary Design

##### D5.5.1 General

- (a) The OA shall prepare a Preliminary Design report for the Project.
  - (i) The OA shall prepare a Preliminary Design for the Regional SCADA upgrade which shall be included in the Preliminary Design report.
  - (ii) Preliminary design work has previously been completed for the PLC replacement, fast restart and power reliability upgrades as outlined in D5.5.4. The Preliminary Design report shall incorporate into the body of the report all previous preliminary design work including any required updates or changes including those described in F3.4 and F3.5. The objective is to have all Preliminary Design information included in one comprehensive document (the Preliminary Design report).
- (b) All work is to be completed in accordance with the current versions of the following City of Winnipeg Standards:
  - (i) The City of Winnipeg Water & Waste Department Electrical Design Guide;
  - (ii) The City of Winnipeg Water & Waste Department Water and Wastewater Treatment Process – Drawing Standard; and
  - (iii) The City of Winnipeg Water & Waste Department Identification Standard.
    - ◆ 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) The Preliminary Design report shall provide technical performance elements (performance requirements, performance criteria, performance specification and/or prescriptive specification). These elements shall include but are not necessarily limited to:
  - (i) Standards and minimum requirements for equipment and the works;
  - (ii) Equipment lists and requirements, criteria and/or specifications;
  - (iii) Minimum sizes, quality, installation requirements, requirements for major equipment, the volume of the building, major architectural elements, the required performance of civil, structural, mechanical, plumbing, fire protection, electrical and other systems;
  - (iv) Quality requirements, quality checklists, expectations, tolerances, standards and work performance measurements;

- (v) Clearly defined commissioning activities and expectations, including training requirements and submittals; and
- (vi) Performance based and prescribed criteria for the construction project, including:
  - ◆ Interior space requirements;
  - ◆ Material quality standards;
  - ◆ Schematic layouts;
  - ◆ Preliminary design criteria of the project;
  - ◆ Testing requirements (including software simulation requirements for testing of the new PLC logic). As it is anticipated that there could be significant differences in the scope of what is included in each bidder's proposed software simulation, the OA shall define software simulation requirements in such a way that bids can be accurately compared and evaluated. See F3.4.5 for further detail;
  - ◆ Commissioning requirements.
- (d) The Preliminary Design report shall include a critical path schedule for the Regional SCADA upgrade, PLC replacement and power reliability upgrades covering the design-build project from detailed design to turnover.
  - (i) The level of detail shall be such that it clearly conveys the significant activities related to the various Project components with their inter-dependencies.
  - (ii) The schedule shall be configured suitable for use by Microsoft® Office Project.
- (e) The Preliminary Design report shall include a class 3 cost estimate for the Regional SCADA upgrade, PLC replacement and power reliability upgrades covering the design-build project from detailed design to turnover. The cost estimate shall include all costs associated with the upgrades including, but not limited to, professional engineering fees, direct and indirect contractor or supplier costs, contingency and taxes. A cost breakdown shall be included that will allow the examination of total cost for each project component (Regional and WTP SCADA, PLC replacement and power reliability upgrades). The cost estimate shall be completed using the latest version of the City's Basis of Estimate template. The Basis of Estimate template is available on the City Asset Management Program page at The City of Winnipeg, Corporate Finance, Infrastructure Planning Division website <http://winnipeg.ca/finance/infrastructureplanning/camp.stm#4> . The cost estimate shall be determined using the American Association of Cost Engineering International Recommended Practices 17R-97 and 18R-97. This estimate is a prerequisite to issuing the design-build RFP.
- (f) The OA shall update the project management plan described in D5.4.5 based on the final Preliminary Design report.

#### D5.5.2 Security

- (a) All new devices connected to the PLC or SCADA networks shall be industrially hardened devices, where possible.
- (b) Project design shall conform with the recommended cybersecurity practices and controls described in the American Water Works Association Process Control System Security Guidance for the Water Sector.

#### D5.5.3 Regional SCADA System Upgrade

- (a) The Preliminary Design of the Regional SCADA system upgrade shall use as its basis the Regional Water Distribution SCADA System Upgrade Study prepared by Dillon Consulting Ltd. (listed in Appendix C).
- (b) In addition to the general requirements listed in D5.5.1, the Preliminary Design report shall address the items described in D5.5.3(c) to D5.5.3(i).
- (c) Physical Space

- (i) Identify physical space for new server equipment racks in the WTP primary and backup server rooms and the McPhillips Control Centre server room.
- (d) Uninterruptable Power Supply (UPS) Capacity
  - (i) Investigate UPS capacity and existing load at each facility, along with the anticipated load of additional hardware to be installed.
  - (ii) Identify any facilities where the existing UPS may be insufficiently sized to provide adequate power to both existing hardware and new hardware, as both will be run in parallel and be connected to UPS during commissioning.
- (e) Hardware and Software
  - (i) Develop the hardware specification including, but not limited to, servers, workstations, disk arrays, monitors and network equipment to be added or upgraded as part of the SCADA upgrade.
  - (ii) Refer to section 4.1.1 and 4.1.2 of the Regional Water Distribution SCADA System Upgrade Study Final Report listed in Appendix C for proposed server, workstation and storage array hardware and proposed virtualization software.
    - ◆ Upgrades to the HMI in the Shoal Lake Intake Facility control room were not included in the scope of the Regional Water Distribution SCADA System Upgrade Study Final Report. However, the scope of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report included HMI upgrades to both the panel mounted and desktop HMIs in the Shoal Lake control room. Refer to F3.4.2(f) for further detail. The upgrades to the Shoal Lake Intake Facility HMIs are included in scope of the Regional SCADA system upgrade and shall be included in the OA's Preliminary Design.
- (f) Network Architecture
  - (i) Monitor and record current network bandwidth utilization on the Shaw T1 Wide Area Network (WAN) and the City's 54 megabyte per second wireless corporate WAN over a 24 hour period.
  - (ii) Determine if existing bandwidth will be sufficient for the proposed increase in network traffic, and propose a solution if the currently available bandwidth is deemed to be insufficient.
  - (iii) Finalize the network architecture, including Internet Protocol (IP) addressing and routing (refer to Appendix A of the Regional Water Distribution SCADA System Upgrade Study Final Report).
  - (iv) Provide network architecture Drawings detailing:
    - Server and workstation equipment to be installed at each location. Note that it is anticipated that additional thin client workstations will be required, along with an increase in licence count. Consultation with City staff will be required to finalize the location and number of thin clients.
    - Primary and backup communications links between all Sites, including remote pressure monitoring sites and the Shoal Lake Intake Facility.
    - Network addressing at each Site. Note that the City is in the process of assigning a new subnet at each physical location, so consultation with City staff will be required to finalize IP addressing and routing information.
  - (v) Provide an IP address list summarizing all networked equipment on the RDS network, including, but not limited to all servers, workstations, network attached storage, PLCs, remote I/O nodes, switches and routers, digital bridges, intelligent MCCs, UPSs, and printers.
    - The format for the IP address list will be provided by City staff.
- (g) Wonderware Conversion

- (i) Assemble a detailed I/O list and interface mapping for the RDS PLCs.
  - (ii) Determine and specify all required Wonderware application objects for the RDS including naming convention, field I/O, scripting of data access servers, graphics, and associated pop-up screens.
  - (iii) Specify all required operational screens and pop-ups.
  - (iv) Specify reporting functions, based on current reports generated by the Regional SCADA system (scheduled and ad-hoc).
  - (v) Specify required custom applications or scripting to replace the custom applications currently running as part of the Telvent installation.
  - (vi) Specify a domain controller and Active Directory based security to allow user access to view, configure or modify templates and application objects using the WTP network domain controller as a starting point. Access to the system shall be password controlled and system usage shall be logged to file. Access control shall apply to all aspects of the SCADA system including databases, files, program codes and system maintenance tools. System users shall be assigned to one or more groups, and the system administrator shall control and modify the access rights for each group. Preliminary access levels shall be as follows:
    - ◆ View only
    - ◆ Remote Site operator
    - ◆ Operator normal functionality level
    - ◆ Operations/maintenance supervisors level
    - ◆ Administrator
- (h) Business Portal
- (i) Specify a read-only access business portal for the upgraded SCADA.
  - (ii) The business portal shall include:
    - ◆ A Wonderware information server on a segregated network (demilitarized zone). The demilitarized zone subnet for the existing Regional SCADA can be used to provide the segregated network.
    - ◆ A second virtual historian to store a subset of data from the primary historian. The second historian will be used to minimize primary historian impacts during large data requests from business users. City staff to specify subset data to be stored on the second historian.
  - (iii) The business portal shall provide:
    - ◆ View-only rights to SCADA screens (web-based).
    - ◆ The ability to trend and extract data in a usable format (e.g. save or copy/paste data into a spreadsheet).
    - ◆ Reports that are automatically generated by SCADA and emailed to business users.
  - (iv) Firewalls for the business portal shall be developed by the OA with the City's Information Systems & Technology staff and SCADA administrators.
- (i) Submittals, Testing, Commissioning and Implementation
- (i) Determine design-build submittal requirements including:
    - ◆ schedule,
    - ◆ construction specifications and drawings,
    - ◆ detailed design notes package and calculations,
    - ◆ shop drawings,
    - ◆ historical data migration plan,
    - ◆ inspection and test plans,
    - ◆ commissioning plan,

- ◆ changeover/implementation plan,
  - ◆ operation and maintenance (O&M) manuals,
  - ◆ training materials,
  - ◆ warranty management plan,
  - ◆ spare parts list and
  - ◆ as-built drawings.
- (ii) Propose FAT and Site Acceptance Testing (SAT) procedures and submittal documentation.
- (iii) Investigate and make recommendations on a high level commissioning plan that would allow the new SCADA system to run alongside the existing Regional and WTP SCADA systems in order to verify the new system's configuration, communication and displays, while still allowing operation of the RDS and WTP with the existing SCADA systems. Consideration shall be given to:
- ◆ minimizing the impact to network communications while both the new and existing systems are operating simultaneously;
  - ◆ allowing read-only verification of I/O on the new system prior to allowing commands or setpoints to be issued from the new system, including any measures that may be put in place to prevent unintentional commands or setpoints from being issued; and
  - ◆ integrating this plan into the overall changeover/implementation plan to be developed by the DB (refer to F3.6).
- (iv) Investigate and make recommendations on a high level changeover/implementation plan encompassing the constraints and considerations identified in F3.6.

#### D5.5.4 PLC Replacement and Power Reliability Upgrades

- (a) The Preliminary Design report shall address the items identified in D5.5.4(b) to D5.5.4(f).
- (b) Preliminary Design for the PLC replacement and power reliability upgrades was completed by SNC-Lavalin Inc. in 2013, as documented in the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report (refer to Appendix C).
- (i) The OA shall review the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report for completeness. Note that some items that were unclear or undecided after the completion of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report are discussed in more detail in F3.4. These items shall be included in the Preliminary Design report to be prepared by the OA.
- (ii) The OA shall identify to the City any items that were, in the opinion of the OA, omitted from, or otherwise not adequately addressed in the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report.
- (iii) Upon the City's review of the items identified in D5.5.4(b)(ii), the City shall advise the OA of any resulting changes to the scope of work to be included in the design-build RFP.
- (c) Hardware
- (i) Further to D5.5.4(a), the OA shall confirm the PLC replacement hardware selection.
- ◆ As per the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report, Schneider Electric Modicon products are the recommended PLC hardware.

- ◆ The OA shall consider whether new product lines that have become available since the preliminary design report was issued may be better alternatives for PLC hardware.
  - ◆ The OA shall consider the product life cycle of the hardware proposed in the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report. If the proposed hardware line is nearing the end of production or will otherwise not be supported by the manufacturer for the expected life of the hardware, alternate hardware shall be proposed.
  - ◆ Final hardware selection will be subject to approval by the City.
- (ii) Upon the City's review of the items identified in D5.5.4(c)(i), the City shall advise the OA of any resulting changes to the scope of work to be included in the design-build RFP.
- (d) Tache Booster Pumping Station Pump Panels
- (i) Further to D5.5.4(a), the OA shall evaluate the current state and configuration of the three (3) existing pump panels in Tache Booster Pumping Station, and make recommendations on any upgrades or improvements that could be realized as part of this Project.
  - (ii) Upon the City's review of the items identified in D5.5.4(d)(i), the City shall advise the OA of any resulting changes to the scope of work to be included in the design-build RFP.
- (e) Fast Restart
- (i) Further to D5.5.4(a), preliminary design work was completed by Stantec Consulting Ltd. in 2016, as documented in the City of Winnipeg – Water Pumping Stations, Fast Restart Analysis and Recommendations Preliminary Design Report.
    - ◆ The City of Winnipeg – Water Pumping Stations, Fast Restart Analysis and Recommendations Preliminary Design Report addressed additional issues that were identified in the Water Pumping Stations Power Reliability Study but not covered by the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report.
    - ◆ The OA shall identify to the City any items that were, in the opinion of the OA, omitted from, or otherwise not adequately addressed in the City of Winnipeg – Water Pumping Stations, Fast Restart Analysis and Recommendations Preliminary Design Report.
  - (ii) Further to Section 6.2.1 of the City of Winnipeg – Water Pumping Stations, Fast Restart Analysis and Recommendations Preliminary Design Report, the OA shall retain a qualified motor specialist to conduct electric motor testing and measurement. Testing shall be conducted on all motor types in use at the City's Regional Pumping Stations. Where there are two (2) or more motors from the same manufacturer that differ only in serial number, then the same data can be used for all motors in that group. A total of six (6) motors will require testing. The electric motor testing shall include:
    - ◆ Gathering data on starting currents, running currents, thermal performance and voltage sag ride-through performance.
    - ◆ Observing pump operation and determining short start duration, low starting load, controlled ambient temperature, internal air flow while motors are running, and the slow load changes experienced by the motors.
    - ◆ Conducting bearing testing and vibration analysis.
  - (iii) Using the information obtained during the motor testing described in D5.5.4(e)(ii) the OA shall determine cooling time constants for the motors.

- (iv) The OA shall provide recommendations for motor refurbishment based on electric motor testing and indicate priority of refurbishment for each motor. Recommendations shall include consideration of:
    - ◆ Comparison of refurbishment costs to motor replacement costs.
    - ◆ Costs for motor removal, transport and re-installation.
    - ◆ Costs to install resistance temperature devices where not already installed.
  - (v) The OA shall review available data from installed power quality meters at the MacLean Regional Pumping Station in conjunction with logged data from the Regional SCADA system. The review shall:
    - ◆ Determine the minimum voltage sag which kicks out the electric motors based on historic data.
    - ◆ Determine what maximum voltage sag the station is currently capable of riding through.
    - ◆ Consider the previously completed preliminary design work for fast restart, power reliability upgrades and motor testing and analysis and provide recommendation for voltage sag ride through and recommended upgrades.
  - (vi) Based on the review of the previous design work, the motor testing and analysis conducted by the OA and discussion with the City, the OA shall specify (as required) motor refurbishment or replacement requirements (including installation of resistance temperature devices), motor protection relays and settings, and required changes to PLC logic.
  - (vii) The OA shall document the analysis and findings of items D5.5.4(e)(i) through D5.5.4(e)(vi) in the Preliminary Design report.
  - (viii) Upon the City's review of the items identified in D5.5.4(e)(i) through D5.5.4(e)(vi), the City shall advise the OA of any resulting changes to the scope of work to be included in the design-build RFP.
- (f) Submittals, Testing and Commissioning
- (i) Determine design-build submittal requirements including:
    - ◆ schedule,
    - ◆ construction specifications and drawings,
    - ◆ detailed design notes package and calculations,
    - ◆ shop drawings,
    - ◆ Functional Requirements Specification (FRS)
    - ◆ software simulation specification and test plan,
    - ◆ inspection and test plans,
    - ◆ commissioning plan,
    - ◆ changeover/implementation plan,
    - ◆ O&M manuals,
    - ◆ training materials,
    - ◆ warranty management plan,
    - ◆ spare parts list,
    - ◆ updated electrical and control records for the Shoal Lake Intake Facility (see F7.2), and
    - ◆ as-built drawings.
  - (ii) Propose FAT and SAT procedures and submittal documentation.
  - (iii) Investigate and make recommendations on a high level commissioning plan.

- ◆ The commissioning plan will be integrated into the overall changeover/implementation plan to be developed by the DB (refer to F3.6).
- (iv) Investigate and make recommendations on a high level changeover/implementation plan encompassing the constraints and considerations identified in F3.6.

#### D5.5.5 Preliminary Design Deliverables and Meetings

- (a) Deliverables and meetings associated with the Preliminary Design for the Regional SCADA upgrade and PLC replacement and power reliability upgrades are as follows:
  - (i) 66% Complete Preliminary Design Report:
    - ◆ Submit one (1) electronic copy of the draft Preliminary Design report - 66% complete, in Native Format (e.g. Microsoft Word).
    - ◆ Allow a minimum four (4) weeks for review of the 66% complete draft Preliminary Design report.
    - ◆ Conduct formal presentation and technical review meeting of the 66% Preliminary Design report to review all City comments. Meeting to be held at OA's office, if OA is located in Winnipeg.
  - (ii) 99% Complete Preliminary Design Report:
    - ◆ Submit one (1) electronic copy of the draft Preliminary Design report – 99% complete, in Native Format (e.g. Microsoft Word).
    - ◆ Allow a minimum four (4) weeks for review of the draft Preliminary Design report by City staff.
    - ◆ Conduct a formal presentation and technical review meeting of the 99% Preliminary Design report to review all City comments. Meeting to be held at OA's office, if OA is located in Winnipeg.
  - (iii) Final Preliminary Design Report:
    - ◆ Incorporate all City review comments into the final report.
    - ◆ Submit six (6) hard copies and one (1) electronic PDF copy of the final Preliminary Design report that addresses the City's review comments.
  - (iv) Updated project management plan upon the finalization of the Preliminary Design report.

#### D5.6 Procurement

##### D5.6.1 General

- (a) The Regional SCADA upgrade, PLC replacement and power reliability upgrades will be undertaken using a design-build delivery method.
- (b) The procurement process for the design-build work shall consist of an RFQ and an RFP which shall be included in a Design Build Agreement.
  - (i) The City intends to prequalify proponents in the RFQ stage.
  - (ii) Up to three (3) prequalified proponents will then be invited to submit proposals in the RFP stage.
- (c) A general description of the design-build scope of work is included in PART F - and shall be further developed into the RFP and required design-build technical elements by the OA during the provision of Procurement Services.
- (d) The OA shall prepare tender packages (RFQ and RFP documents) that include a general description of the proposed upgrade, preselected vendors/equipment, drawings, required design-build technical elements (performance requirements, performance criteria, performance specification and/or prescriptive specification), to provide sufficient information for design-build proponents to prepare responses to the RFQ and RFP.
  - (i) Performance elements shall include the following criteria:

- ◆ Management – this shall include design and construction quality assurance and quality control, safety, logistics management, personnel qualifications, qualifications and past performance of organizations and detailed project execution plans;
  - ◆ Submittal requirements;
  - ◆ Schedule – including design and construction schedules and the type of schedule criteria; and
  - ◆ Technical performance elements – as indicated in Preliminary Design report see D5.5.1(c)).
- (e) The OA shall use the City's RFQ and design-build RFP templates and expand upon them as required.
- (f) The OA shall define critical stages for the design-build contract, in consultation with the City and considering the constraints described in F3.6.2(f).
- (i) As part of this process, the OA shall confirm that the project schedule developed during the Preliminary Design phase is realistic.
- (g) The OA shall define warranty requirements for the design-build contract, in consultation with the City.
- (i) The warranty period for each facility shall be tied to the critical stages as per D5.6.1(f).
- (h) The OA shall consider the Builders' Liens Act of Manitoba in the procurement of design-build services.
- (i) The OA shall meet with various City stakeholders (Legal Services, Materials Management, Water Services, Information Systems and Technology, Engineering Services, Insurance etc.) to finalize the procurement documents.
- (j) All tender packages shall be prepared and posted in accordance with the City of Winnipeg Materials Management Division requirements.

#### D5.6.2 RFQ

- (a) The OA's Scope of Services during the RFQ process shall include but is not limited to the following:
- (i) Prepare the RFQ, including all supporting documents, for posting on the City's website.
    - ◆ The City shall define financial qualifications for inclusion in the RFQ.
  - (ii) In consultation with the City, provide an RFQ evaluation process and guideline which includes but is not limited to;
    - ◆ Evaluation plan;
    - ◆ Responsibilities of the Project team including the OA's Evaluation Coordinator. The Evaluation Coordinator shall not be part of the RFQ or RFP Evaluation Team. The Evaluation Coordinator shall accept Requests for Information (RFIs), shall remove all information that may identify the originating proponent and shall coordinate technical response to the RFIs and issuance of addenda.
    - ◆ Procedures and agreements for confidentiality and conflict of interest;
    - ◆ Individual evaluations and consensus scoring;
    - ◆ Evaluation worksheets;
    - ◆ Interview processes;
    - ◆ Communications;
    - ◆ Notification of proponents; and
    - ◆ Debriefing of proponents.
  - (iii) Incorporate City comments on the RFQ evaluation process and guideline.

- (iv) Submit the draft RFQ, including all supporting documents, in the format specified in D5.6.4(b).
- (v) Allow a minimum three (3) weeks for review of the draft RFQ documents.
- (vi) Conduct a technical review meeting of the draft RFQ documents to review all City comments.
- (vii) Incorporate all City review comments into the final RFQ.
- (viii) Submit the final RFQ that addresses the City's review comments, in the format specified in D5.6.4(c).
- (ix) Prepare an RFI framework.
- (x) Incorporate City comments on the RFI framework.
- (xi) Accept, coordinate and provide responses to RFIs submitted by the design-build proponents.
- (xii) Prepare addenda.
- (xiii) Coordinate, conduct and document pre-bid meetings and Site tours for the design-build proponents.
- (xiv) Attend the City's RFQ evaluation training (one half day).
- (xv) Participate with the City in evaluating the RFQ submittals and shortlisting to a maximum of three (3) design-build proponents.
  - ◆ The OA shall not participate in the RFQ financial evaluation process.

### D5.6.3 RFP and Design Build Agreement

- (a) The OA's Scope of Services during the RFP process shall include but is not limited to the following:
  - (i) Confirm that the pre-bid estimate developed during the Preliminary Design phase is accurate (see D5.5.1(e)).
  - (ii) Prepare the RFP, including all supporting documents, for posting on the City's website.
  - (iii) Provide input into the Design Build Agreement to be developed by Legal Services. The OA should anticipate significant consultation and coordination with Legal Services to develop the Design Build Agreement.
  - (iv) Develop required design-build technical elements to be incorporated into the Design Build Agreement (to be developed by Legal Services). The OA should anticipate significant consultation and coordination with Legal Services to define required design-build technical elements.
    - ◆ Draft required design-build technical elements shall be reviewed by the Water and Waste in advance of Legal Services. The OA shall address all Water and Waste comments prior to Legal Services' review. The OA shall address all Legal Services comments on required design-build technical elements.
  - (v) In consultation with the City, provide an RFP evaluation process and guideline document which includes but is not limited to;
    - ◆ Evaluation plan;
    - ◆ Responsibilities of the Project team (including the OA's Evaluation Coordinator as described in D5.6.2(a)(ii));
    - ◆ Procedures and agreements for confidentiality and conflict of interest;
    - ◆ Individual evaluations and consensus scoring;
    - ◆ Evaluation worksheets;
    - ◆ Interview processes;
    - ◆ Communications;
    - ◆ Notification of proponents; and
    - ◆ Debriefing of proponents.

- (vi) Incorporate City comments on the RFP evaluation process and guideline.
- (vii) Submit the draft RFP and draft required design-build technical elements, including all supporting documents, in the format specified in D5.6.4(b).
- (viii) Allow a minimum of three (3) weeks for review of the draft RFP documents and required design-build technical elements.
- (ix) Conduct a technical review meeting of the draft RFP documents and required design-build technical elements to review all City comments.
- (x) Incorporate all City review comments into the final RFP and required design-build technical elements.
- (xi) Submit the final RFP and required design-build technical elements that address the City's review comments, in the format specified in D5.6.4(c).
- (xii) Prepare an RFI framework, including consideration of general RFIs and commercially confidential RFIs.
- (xiii) Incorporate City comments on the RFI framework.
- (xiv) Accept, coordinate and provide responses to RFIs submitted by the design-build proponents.
  - ◆ RFIs to be coordinated through the OA's Evaluation Coordinator described in D5.6.2(a)(ii).
- (xv) Prepare addenda.
- (xvi) Coordinate, conduct and document pre-bid meetings and Site tours for each of the preselected design-build proponents.
- (xvii) Coordinate, attend, participate, and provide minutes and technical guidance at the commercially confidential meetings to be held with preselected design-build proponents.
  - ◆ Commercially confidential meetings will be held separately for the Design Build Agreement (commercial issues) and project design (technical issues).
- (xviii) Review with the City, the design-build proponents' submittal(s) following the commercially confidential meetings and provide written feedback to design-build proponents on the submittals' compliance with required design-build technical elements outlined in the Design Build Agreement.
- (xix) Review and recommend design-build proponents' written requests for equals/alternatives.
- (xx) Attend the City's RFP evaluation training (one half day).
- (xxi) Participate with the City in evaluating the RFP submittals and the selection of the successful design-build proponent. The final selection of the design-build proponent will be the responsibility of the City;
  - ◆ The OA's evaluation shall include review of the design-build proposal for compliance with the RFP on technical merits and costs.
- (xxii) Review and recommend for City approval the Design Build Agreement revisions and final RFP that incorporates addenda, contract negotiations, amendments and accepted alternatives before the design-build contract is awarded.
- (xxiii) Prepare and submit a bid evaluation report on the compliance of each proposal, technical merits and costs with respect to the design-build RFP.
- (xxiv) Assist in preparing debriefing reports and debriefing of design-build proponents.
- (xxv) Update the project management plan described in D5.4.5 following the award of the design-build contract.

#### D5.6.4 Procurement Services Deliverables

- (a) The major Deliverables associated with the Procurement Services includes but is not limited to the following:
  - (i) Pre-bid estimate for the design-build contract;

- (ii) RFQ documents, including response to RFIs and addenda, for the design-build contract;
  - (iii) RFQ RFI framework;
  - (iv) RFQ evaluation process and guideline document;
  - (v) RFQ evaluation;
  - (vi) RFP documents, including response to RFIs and addenda for the design-build contract and required design-build technical elements for inclusion in the Design Build Agreement;
  - (vii) RFP RFI framework;
  - (viii) RFP evaluation process and guideline document;
  - (ix) Meeting minutes for commercially confidential meetings (both commercial and technical issues) with preselected design-build proponents;
  - (x) Written feedback for preselected design-build proponents on compliance with the required design-build technical elements following commercially confidential meetings.
  - (xi) Bid evaluation report for the design-build contract;
  - (xii) Debriefing reports for design-build proponents; and
  - (xiii) Updated project management plan described in D5.4.5 following the award of the design-build contract.
- (b) Draft documents shall be provided in Native Format (e.g. Microsoft Word, Microsoft Excel).
- (c) Final documents shall be provided in PDF format; and one (1) unbound and six (6) bound hardcopies.

#### D5.6.5 Procurement Services Meetings

- (a) The meetings associated with the Procurement Services includes but is not limited to the following:
- (i) Technical review meeting of the draft RFQ documents to review all City comments. Meeting to be held at OA's office, if OA is located in Winnipeg;
  - (ii) RFQ pre-bid meeting(s) and Site tour(s);
    - ◆ Site tours for all design-build proponents are anticipated to occur over two (2) full days with the first day allocated to tour all relevant in-town facilities and the second day allocated to tour the Shoal Lake Intake Facility.
  - (iii) City's RFQ evaluation training (one half day of training);
  - (iv) RFQ submission review and evaluation meeting(s).
  - (v) Technical review meeting of the draft RFP documents and required design-build technical elements to review all City comments. Meeting to be held at OA's office, if OA is located in Winnipeg;
  - (vi) Meetings with Legal Services during the development of the Design Build Agreement and required design-build technical elements.
  - (vii) RFP pre-bid meeting(s) and Site tours;
    - ◆ Site tours for all design-build proponents are anticipated to occur over two (2) full days with the first day allocated to tour all relevant in-town facilities and the second day allocated to tour the Shoal Lake Intake Facility.
  - (viii) Commercially confidential meetings;
    - ◆ Two (2) rounds of full day meetings to be held with each pre-selected DB proponent during the RFP process for commercial issues.
    - ◆ Two (2) rounds of full day meetings to be held with each pre-selected DB proponent during the RFP process for technical issues.

- ◆ Each round of meetings for each proponent will be approximately six (6) weeks apart.
- (ix) Proponents' submittal review meeting with the City following the commercially confidential meetings;
- (x) City's RFP evaluation training (one half day of training);
- (xi) RFP submission review and evaluation meeting(s).
- (xii) Design-build proponent debriefing meetings as required.

#### D5.7 Contract Administration - Non-Resident Engineering Services

D5.7.1 Proposals shall include a minimum of 565 hours for Non-Resident Engineering Services.

#### D5.7.2 Project Schedule and Budget Management

- (a) Monitor and report on the progress of construction and commissioning activities in relation to established schedule and budget.
- (b) Provide to the City a complete current report on the Project status (as outlined in D5.4.4(e)) on a monthly basis or more frequently if found necessary.
  - (i) Monthly report to include a current update of expenditures and revised contract-end cost estimate with explanation and justification of any significant variation from the preceding contract-end cost estimate.

#### D5.7.3 Quality Management and Change Control

- (a) Review the DB's design and ensure conformity with the Project requirements and budget and administer contract changes.
- (b) Prior to construction, prepare and submit a written and photographic record of the physical condition of the work area, existing facilities, and structures sufficient to equip the City 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.
- (c) Review and provide recommendations for requests for alternate materials and methods. No alternates shall be approved without written authorization from the City.
- (d) Identify to the City the impact of proposed changes (on time, quality, cost, scope, risk and human resources), so that the City may make well-informed decisions whether or not to proceed with the proposed changes.
- (e) Review, comment, approve, or reject, specifications and drawings for proposed DB scope changes.
- (f) Review and report to the City regarding laboratory, shop and other tests conducted on materials and/or equipment placed or installed by the DB to ensure conformance with the approved project criteria, drawings and specifications.
- (g) Provide technical assistance in development of tie-in protocols, phasing and inspections.

#### D5.7.4 Submittals

- (a) Review and accept submittals supplied by the DB to ensure that the submittals are in conformance with the approved project criteria and design-build contract. Submittals shall include, but are not necessarily limited to:
  - (i) Schedule
  - (ii) Construction drawings and specifications
  - (iii) Detailed design notes package and calculations
  - (iv) Shop drawings
    - ◆ Shop drawings are to be reviewed by the OA and accepted prior to the installation of the equipment.
    - ◆ Submit one (1) hardcopy and one (1) electronic PDF copy of all final shop drawings.

- (v) Historical data migration plan
  - (vi) Functional requirements specification (FRS)
  - (vii) Software simulation specification and test plan
  - (viii) Inspection and test plans
  - (ix) Commissioning plan
  - (x) Implementation/changeover plan
  - (xi) O&M manuals
  - (xii) Training materials
  - (xiii) Warranty management plan
  - (xiv) Spare parts list
  - (xv) Updated electrical and control records for the Shoal Lake Intake Facility (as described in F7.1)
  - (xvi) As-built drawings
- (b) Coordinate, consolidate and remove duplication on City and OA's comments for the DB's submittals.

#### D5.7.5 Communication and Meetings

- (a) Consult with and advise the City during the Contract Administration Phase.
- (b) Provide interpretation of technical aspects of the DB contract.
- (c) Coordinate with responsible parties in resolution of issues.
- (d) Provide adequate and timely direction to OA field personnel.
- (e) Review and respond to DB requests for information.
- (f) Prepare as required field instructions, clarifications and directives.
- (g) Attend and review meeting minutes for pre-construction meeting, on-Site or off-Site design review meetings and weekly construction/progress meetings.
  - (i) These meetings shall include representatives of the DB and the City.
  - (ii) The DB shall arrange, chair and prepare meeting minutes for these meetings.
- (h) The OA shall attend the following meetings in-person:
  - (i) One (1) pre-construction meeting
  - (ii) Four (4) detailed design review meetings
  - (iii) Four (4) construction/progress meetings
    - ◆ The OA shall participate in all additional construction progress meetings, but may choose to participate via conference call or video conference.
- (i) Furnish the City with a copy of all correspondence relating directly or indirectly to the Project, originating from or distributed to, parties external to the OA, immediately following receipt or dispatch of same by the OA.

#### D5.7.6 Health, Safety and Security

- (a) Review, in conjunction with the City the DB's safe work plans.
- (b) Monitor compliance with National Building Code of Canada, National Fire Code of Canada, Manitoba Building Code, the DB's safe work plans and other regulations.

D5.7.7 All Deliverables associated with Non-Resident Engineering Services shall be provided in Native Format and PDF; and in six (6) hardcopies, unless otherwise specified.

#### D5.8 Contract Administration - Resident Engineering Services

##### D5.8.1 Inspection, Testing and Acceptance

- (a) Keep a continuous record of Project activities including but not limited to weekly reports, photographic record of construction work and equipment, working days, teleconferences, emails, inspections and observations sufficient to equip the City 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.

- (b) Provide Site inspection Services to ensure that installation and tie-ins to the existing system are carried out in conformance with the design, drawings and specifications.
  - (i) Proposals shall include a minimum of 300 hours Site inspection time, based on an estimated 30 Site inspection visits.
- (c) Provide Site inspections by lead designers at appropriate points of construction (included in the 300 hours of Site inspection time).
- (d) Witness FAT to ensure that the DB is completing the acceptance tests appropriately.
  - (i) Proposals shall include a minimum of 400 hours for FAT.
  - (ii) Proposals shall include a budget of \$40,000 for travel expenses for the purposes of attending FAT. This travel allowance shall not be used for any travel expenses not directly related to FAT.
  - (iii) Travel expenses must be approved in advance by the Project Manager as described in D1.4.6(a)(i).
- (e) Where FAT or SAT results indicate an issue, coordinate with the DB to resolve the issue.
- (f) Perform a detailed inspection of the Project with the DB and the City prior to commencement of substantial performance and prior to total performance. Provide written itemized deficiency list or appropriate recommendation of acceptance of the constructed or partially constructed Project.
- (g) Inspect the completed installation to ensure conformance with the design drawings, including labeling and identification.
- (h) Prepare and submit Certificates of Substantial Performance, Total Performance and Acceptance.
- (i) Review "as-built" drawings submitted by DB and confirm drawings accurately represent the as-constructed project and meet the required drawing standards.
- (j) Proposals shall include a minimum of 100 hours for Resident Engineering Services in addition to the Site inspection and FAT hours.

#### D5.8.2 Communication and Meetings

- (a) Promptly report to the City upon any significant and unusual circumstances.
- (b) Attend, contribute to and review meeting minutes prepared by the DB for weekly progress meetings with the DB and the City.

#### D5.8.3 Measurement and Payment

- (a) Prepare, certify and submit progress estimates to the City for payment to the DB for construction performed in accordance with the drawings and specifications.
- (b) Act as Payment Certifier and administer all contracts as required under the Builder's Liens Act of Manitoba.

D5.8.4 All Deliverables associated with this phase shall be provided in Native Format and PDF; and in six (6) hardcopies, unless otherwise specified.

#### D5.9 Contract Administration – Commissioning Services

D5.9.1 This Project is expected to be commissioned in phases. The OA's work shall apply to all phases.

D5.9.2 The OA shall:

- (a) consult with and advise the City during commissioning;
- (b) oversee the development of the commissioning plan;

- (c) oversee the implementation of the commissioning requirements and the DB's commissioning plan;
- (d) coordinate commissioning activities with City personnel and DB staff;
- (e) provide full time Site inspection during commissioning work;
  - (i) Proposals shall include a minimum of 750 hours on-Site commissioning time, based on an estimated 25 commissioning Site visits. Commissioning Site visits are anticipated to span multiple days.
- (f) log all commissioning issues and provide weekly briefing to the City's Project Manager summarizing commissioning status, and indicating where City's response is required;
- (g) review the training plan and training materials that have been provided by the DB in accordance with the commissioning plan;
- (h) not be required to attend formal off-Site training classes provided by equipment manufacturers or software integrators; and
- (i) review DB commissioning submissions.

D5.9.3 All Deliverables associated with this phase shall be provided in Native Format and PDF; and in six (6) hardcopies, unless otherwise specified.

#### D5.10 Post Construction

D5.10.1 Proposals shall include a minimum of 200 hours for Post Construction Services.

D5.10.2 The Post Construction Services shall consist of one-year warranty Services tied to critical stages for each facility, unless otherwise specified by the OA as detailed in D5.6.1(g).

D5.10.3 The warranty Services shall include but are not limited to the following:

- (a) Confirm and ensure complete turnover of project documents (shop drawings, as-built drawings, design notes and calculations etc.) to the City by the DB and that documents are in conformance with the design-build contract.
- (b) Provide inspection Services, at the request of the City, during the warranty period of the DB contract and to advise the City in writing of any deficiencies and the proposed resolution of the deficiencies. Upon approval of the City, provide the DB appropriate notice to correct the deficiencies.
- (c) Determine if corrective work is part of DB's warranty;
- (d) Liaise and coordinate with the DB to repair defective work.
  - (i) The DB shall provide 24-hour, seven (7) days a week, on-call technical support and corrective maintenance as per F7.1.
- (e) Conduct inspection and approval of warranty work;
- (f) Issue instructions for correction of deficiencies;
- (g) Review updates to O&M manuals and resolve deficiencies;
- (h) Respond to requests of the City related to the project;
- (i) Provide a detailed inspection of the Project with the DB and the City prior to the end of the design-build warranty period and provide to the City in written form associated itemized deficiency list or appropriate recommendation of acceptance of the DB contract work.

### D6. GENERAL REQUIREMENTS

D6.1 The OA 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 Association of Professional Engineers and Geoscientists of the Province of Manitoba.

- (i) All final documents irrespective of the level of design shall have an engineer's seal.
- (b) 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 personnel engaged by the OA and accepted by the City.
- (c) Progress estimates, completion certificates and other reports related to the technical aspects of this Project, must be endorsed by the OA in a manner acceptable to the City.

D6.2 The OA shall comply with current versions of City of Winnipeg standards as listed in D5.5.1(b).

D6.2.1 The OA shall request clarification from the Project Manager should undefined identification requirements be encountered

D6.2.2 The Project Manager shall be notified of conflict between the documents for resolution.

D6.3 Shoal Lake Intake Facility Staffhouse Accommodations

D6.3.1 Accommodations are available at no cost to the OA in the Staffhouse located at the Shoal Lake Intake Facility at Indian Bay (Shoal Lake). The Intake and Staffhouse 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 OA include sleeping quarters, dining room, recreation area, and washroom/shower facilities.

D6.3.2 The City will provide at no cost to the OA accommodations in the Staffhouse for up to eight (8) OA personnel and if required, a designated area for the location of an OA supplied bunkhouse to house additional personnel.

- (a) The OA shall not have unlimited or exclusive use of the Staffhouse.
- (b) The Staffhouse may be used to accommodate City or other Contract personnel in addition to the OA's personnel.
- (c) The City reserves the right to reassign OA room allocations within the Staffhouse to accommodate other personnel as required.

D6.3.3 The OA shall be responsible for all food, meal preparation and housekeeping associated with the use of the Staffhouse. Appendix F includes the housekeeping requirements for the Staffhouse.

D6.3.4 The City will provide at no cost to the OA toilet paper, paper towels and bedding.

D6.3.5 The OA shall provide all cleaning supplies for use in the Staffhouse.

D6.3.6 The OA will be responsible for all other personal incidentals including towels, soap, shampoo, toothpaste, toothbrushes etc.

D6.3.7 A safety orientation will be provided by the Intake Foreman in accordance with Appendix F.

D6.4 Operation of Staffhouse at Shoal Lake Intake Facility - Person in Charge

D6.4.1 If arrangements are made for personnel to stay at the Staffhouse at Indian Bay, the OA shall designate a "Person in charge". This Person shall ensure that all OA personnel follow all Staffhouse and railway rules in effect for the duration of the Contract. As soon as the "Person in charge" becomes aware of a breach in rules, or is informed of same by railway or Intake staff, the "Person in charge" shall immediately rectify the condition.

D6.4.2 The "Person in charge" shall clearly instruct the group as to the rules 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 rules may also result in ejection from the premises. The rules in effect at this time are attached in Appendix F for reference and are posted in the Staffhouse.

- D6.4.3 Alcoholic beverages and other intoxicating substances are not to be consumed or carried outside the Staffhouse. Drunkenness on City of Winnipeg property is prohibited at all times.
- D6.4.4 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”.
- D6.5 Use of GWWD Railway
- D6.5.1 Access to and from the Shoal Lake Intake Facility is via the GWWD railway.
- D6.5.2 All non-City of Winnipeg personnel will be required to sign the GWWD railway Waiver Form included in Appendix F prior to GWWD railway use
- D6.5.3 One track car unit is available to transport up to ten (10) of the OA’s personnel to and from the work area at Mile 82.44 (approximately eight (8) km east of East Braintree, MB) at no cost to the OA. Only one (1) track car unit is permitted to be used at any given time for the purposes of transporting the OA’s personnel.
- D6.5.4 Transportation of the OA’s personnel will be provided such that there is no interference with GWWD railway staff duties during normal working hours (0800 to 1630 hours, Monday to Friday).
- D6.5.5 Arrangements for transportation of OA’s personnel shall be made through the Project Manager no later than 1500 hours at least forty eight (48) hours prior to the requested date of travel.

## **D7. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE**

- D7.1 The Contract, all Deliverables produced or developed, and information provided to or acquired by the OA are the property of the City and shall not be appropriated for the OA’s own use, or for the use of any third party.
- D7.2 The OA shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Project Manager.
- D7.3 The following shall be confidential and shall not be disclosed by the OA to the media or any member of the public without the prior written authorization of the Project Manager;
- (a) information provided to the OA by the City or acquired by the OA during the course of the Work;
  - (b) the Contract, all Deliverables produced or developed; and
  - (c) any statement of fact or opinion regarding any aspect of the Contract.
- D7.4 An OA who violates any provision of D7 may be determined to be in breach of Contract.

## **SUBMISSIONS PRIOR TO START OF SERVICES**

### **D8. AUTHORITY TO CARRY ON BUSINESS**

- D8.1 The OA 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 OA does not carry on business in Manitoba, in the jurisdiction where the OA does carry on business, throughout the term of the Contract, and shall provide the Project Manager with evidence thereof upon request.

### **D9. INSURANCE**

- D9.1 The OA shall procure and maintain, at its own expense and cost, insurance policies with limits no less than those shown below.

- D9.2 As a minimum, the OA 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 OA 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, OA'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 OA 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.
- D9.2.1 The OA'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.
- D9.3 The policies required in D9.2(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.
- D9.4 The OA shall require each of its Subconsultants to provide comparable insurance to that set forth under D9.2(a).
- D9.5 The OA shall provide the Project Manager with a certificate(s) of insurance for itself and for all of its Subconsultants, 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 D9.10.
- D9.6 The OA 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.
- D9.7 All insurance, which the OA 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.
- D9.8 If the OA fails to do all or anything which is required of it with regard to insurance, the City may do all that is necessary to affect and maintain such insurance, and any monies expended by the City shall be repayable by and recovered from the OA.
- D9.9 The failure or refusal to pay losses by any insurance company providing insurance on behalf of the OA or any Subconsultants shall not be held to waive or release the OA or Subconsultants from any of the provisions of the insurance requirements or this Contract. Any insurance deductible maintained by the OA or any Subconsultants under any of the insurance policies is

solely for their account and any such amount incurred by the City will be recovered from the OA as stated in D9.8.

- D9.10 The OA 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

### D10. COMMENCEMENT

- D10.1 The OA shall not commence any Services until it is in receipt of a notice of award from the City authorizing the commencement of the Services.

- D10.2 The OA 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 D8;
  - (ii) evidence of the insurance specified in D9; and
  - (iii) security clearances specified in E1.
- (b) the OA has attended a meeting with the Project Manager, or the Project Manager has waived the requirement for a meeting.

- D10.3 The City intends to award this Contract by **February 24, 2017**.

### D11. CRITICAL STAGES

- D11.1 The OA shall achieve critical stages of the Services for this Contract in accordance with the following requirements:

- (a) submission of the final Project management plan as described in D5.4.5 shall be no later than **8 weeks** following Project award.
- (b) submission of the final Preliminary Design report as described in D5.5 shall be no later than **5 months** following Project award.
- (c) submission of the final RFQ documents as described in D5.6, shall be no later than **9 months** following Project award.
- (d) submission of the final RFP documents as described in D5.6, shall be no later than **23 months** following Project award.

- D11.2 The OA's ability to meet the Project's critical stages shall be a factor in deciding if Contract Administration Services, Post Construction Services and their associated Project Management Services shall proceed as outlined in B23.5.

## PART E - SECURITY CLEARANCE

### E1. SECURITY CLEARANCE

- E1.1 Each individual proposed to perform Work under the Contract within the City facilities shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his place of residence and Public Safety Verification Checks.
- (a) Any cost or expense incurred by the Proponent or OA that is associated with obtaining the required security clearances shall be borne solely by the Proponent or OA.
- E1.2 A Criminal Record Search Certificate can be obtained from one of the following;
- (a) a police service having jurisdiction at his/her place of residence.
- (i) the original Criminal Record Search Certificate (Form P-253) 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 Criminal Record Search Certificate (Form P-253) to the Project Manager, or
- (b) using Sterling Talent Solutions, Proponents will need to setup 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>  
The Criminal Record Search Certificate must be received by the City directly through Sterling Talent Solutions;
- (i) Proponents or OA must set up an account with Sterling Talent Solutions under their company name and grant Sterling Talent Solutions permission to share the Criminal Record Search Certificate with the City of Winnipeg;
- (ii) Proponents or OA will then be contacted by Sterling Talent Solutions with instructions on how to complete the Criminal Record Search Certificate; and
- (iii) if additional assistance is required to obtain the Criminal Record Search Certificate, the Proponents or OA may contact the following Sterling Talent Solutions representative:  
Linda Ferens;  
email: [linda.ferens@sterlingts.com](mailto:linda.ferens@sterlingts.com)  
phone: (204) 999-0912; or
- (c) filling out the Core of Commissionaires (Manitoba Division) form which can be obtained by visiting: <https://www.commissionaires.ca/en/manitoba/home> .
- E1.3 Public Safety Verification Checks may be obtained from Sterling Talent Solutions as follows:
- (a) the Public Safety Verification Checks can be obtained from Sterling Talent Solutions, Proponents or OA will need to setup a Sterling Talent Solutions account prior to requesting individual background checks. This process should be done 72hrs 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> .  
The results of the Public Safety Verification Check must be received by the City directly through Sterling Talent Solutions.
- (i) Proponents or OA must set up an account with Sterling Talent Solutions under their company name and grant Sterling Talent Solutions permission to share the Criminal Record Search Certificate with the City of Winnipeg;
- (ii) Proponents or OA will then be contacted by Sterling Talent Solutions with instructions on how to complete the Public Safety Verification Check; and
- (iii) if additional assistance is required to obtain the Public Safety Verification Check, the Proponents or OA may contact the following Sterling Talent Solutions representative:

Linda Ferens;  
email: [linda.ferens@sterlingts.com](mailto:linda.ferens@sterlingts.com)  
phone: (204) 999-0912

- E1.4 Prior to the award of Contract, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the OA shall supply the Project Manager with a Criminal Record Search Certificate and a Public Safety Verification Check obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform the Work.
- E1.5 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate or a Public Safety Verification Check indicates any convictions or pending charges related to property offences or crimes against another Person will not be permitted to perform any Work.
- E1.6 Any Criminal Record Search Certificate and Public Safety Verification Check obtained thereby 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 Criminal Records Search Certificate or Public Safety Verification Check. Any individual who fails to provide a satisfactory Criminal Record Search Certificate or Public Safety Verification Check as a result of a repeated criminal records search will not be permitted to continue to perform any Work.

## **PART F - DESIGN BUILDER'S SCOPE OF WORK**

### **F1. GENERAL**

- F1.1 The following is a high level scope of work for the design-builder and shall be further developed by the OA during the provision of Procurement Services.
- F1.2 The work to be done under the design-build RFP shall consist of the design, procurement, installation and commissioning of all necessary equipment and materials for the Regional SCADA upgrade, PLC replacement and power reliability upgrades.
- F1.3 The DB's scope of work will be conducted in phases. Work for the different phases may occur separately or concurrently, provided the City's schedule and submission requirements are satisfied. The phases are as follows and as discussed in F2 to F7:
- (a) Project Management Phase;
  - (b) Detailed Design Phase including construction drawings, specifications for major components and installation specifications inclusive of City design standards;
  - (c) Procurement Phase including preparation and submission of required vendor submittals such as shop drawings, test plans etc.;
  - (d) Construction Phase including preparation and submission of required construction submittals (such as construction materials, work plans etc.);
  - (e) Commissioning Phase including pre-verification and testing plans for individual systems, commissioning plans for the overall system and training of City staff; and
  - (f) Post Construction Phase including warranty period.

### **F2. PROJECT MANAGEMENT PHASE**

#### **F2.1 General**

- F2.1.1 The DB shall be responsible for all project management activities required throughout the project to carry out the scope of work including:
- (a) Tracking the project schedule and budget;
  - (b) Directing and coordinating efforts of the DB's team to achieve the objectives of the project and to meet the City's requirements and standards; and
  - (c) Managing the project according to the DB's project management plan.

#### **F2.2 Project Management Plan**

- F2.2.1 The DB shall prepare and submit a detailed project management plan following the award of the design-build contract and prior to the start of work. The project management plan shall be specific to the DB's scope of services for the Regional SCADA, PLC replacement and power reliability upgrades with updates during the project (to be specified by the OA) and shall include the following:
- (a) Detailed plans for detailed design and procurement phases;
  - (b) Preliminary plans for construction, commissioning and post construction phases;
  - (c) Process for updating and submitting the risk register, which shall be used to document and update risk in various phases of the project;
  - (d) List of project deliverables;
  - (e) A detailed project schedule with tasks separated into their respective project phases; and
  - (f) Health and safety management plan.

### **F3. DETAILED DESIGN PHASE**

#### **F3.1 General**

- F3.1.1 The DB shall prepare a detailed design for the Regional SCADA upgrade, PLC replacement and power reliability upgrades.
- (a) The detailed design shall be based on the Preliminary Design report as described in D5.5.
- F3.1.2 The DB shall follow City requirements for drawings, equipment identification and tagging etc. City specific design guidelines and standards will be provided in the design-build RFP.

#### **F3.2 Security**

- F3.2.1 All new devices connected to the PLC or SCADA networks shall be industrially hardened devices, where possible.
- F3.2.2 Project design shall conform with the recommended cybersecurity practices and controls described in the American Water Works Association Process Control System Security Guidance for the Water Sector.

#### **F3.3 Regional SCADA Upgrade**

- F3.3.1 Wherever practical, object templates from the existing WTP SCADA system shall be re-used in the programming of the Regional SCADA system.
- F3.3.2 Server, workstation and storage hardware to be supplied shall be approved by the City and in accordance with the City's current contracts for supply of computer equipment.
- F3.3.3 Historical Data Migration Plan
- (a) Detailed design shall include development of a migration plan for porting historical data from the existing Telvent Regional SCADA system to the upgraded SCADA system.
    - (i) The Telvent Regional SCADA system stores instantaneously collected historical data in a binary large object database format within the structured query language server historical databases. This data must be extracted prior to converting it to a format suitable for storage in the upgraded Wonderware SCADA system.
    - (ii) Summarized data (hourly, daily, monthly and yearly) and historical events are stored in database tables that will not require any extra data extraction steps, but will still need to be converted to a format suitable for storage in the Wonderware system.
    - (iii) The data migration plan shall consider and make recommendations on how to perform both the data extraction and data migration from the Telvent system to the upgraded Wonderware SCADA system.

#### **F3.4 PLC Replacement and Power Reliability Upgrades**

- F3.4.1 Control system upgrades at the McPhillips, MacLean, and Hurst Regional Pumping Stations, Tache Booster Pumping Station, Deacon Booster Pumping Station, Deacon Chemical Feed Facility, and Shoal Lake Intake Facility are described in sections 2.0 through 2.9 of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report. Control system upgrades include, but are not necessarily limited to:
- (a) PLC hardware upgrades, including location-specific design considerations;
  - (b) PLC network upgrades;
  - (c) Shoal Lake HMI replacement;
  - (d) Bently Nevada monitoring system upgrades;
  - (e) Consideration of future system requirements, and;

- (f) PLC logic rewrite.

#### F3.4.2

Further to F3.4.1, note the following additional information regarding specific sections of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report pertaining to the control system upgrades:

- (a) Section 2.1.3.5.3 – Detailed design shall investigate whether the negative portion of the existing current range of any of the currently installed analog output modules is used, in order to confirm that the BMX AMO 0210 analog output module is an appropriate replacement for existing modules. If it is determined that the BMX AMO 0210 analog output model is not appropriate, provide recommendation for an appropriate replacement module.
  - (i) The investigation and findings shall be documented in a Technical Memorandum.
- (b) Section 2.1.4.6 - Detailed design shall include a detailed review of the option to convert PLC D21 to a Station Master PLC.
  - (i) It is expected that a detailed changeover procedure will be developed as part of the detailed design, if conversion of PLC D21 to a Station Master PLC is recommended. Approval from the City will be required prior to proceeding with the conversion of PLC D21 to a Station Master PLC.
  - (ii) The review and findings shall be documented in a Technical Memorandum.
- (c) Section 2.1.4.7 – The City's preferred option for replacement of the existing Modicon Quantum 140-113 series PLC in the Deacon Chemical Feed Facility is to convert it to a remote I/O drop, as logic in this PLC is limited to chemical control and can be incorporated into the Station Master PLC.
- (d) Section 2.1.4.8.10 -The existing Modicon Compact A984-145 series PLC in the Acid Building (PLC 25) at the Shoal Lake Intake Facility shall be converted to a remote I/O rack with programming logic incorporated into the new Station Master PLC.
- (e) Section 2.3.1.2 – The City has opted not to remove the HMI panels at the residences, and will not pursue a mobile alert system at this time. No further investigation of a mobile alert system shall be included in the scope of work.
- (f) Section 2.3.2 – It is desired to keep both a panel mounted HMI and a desktop HMI in the control room at the Shoal Lake Intake Facility to provide redundancy.
  - (i) The scope of work shall include supply of a standalone Wonderware InTouch desktop HMI. Detailed design shall include:
    - ◆ Hardware specification of the desktop PC. The specified hardware shall be approved by the City and in accordance with the City's current contracts for supply of computer equipment
    - ◆ Specification of software requirements. The HMI shall use the latest version of Wonderware InTouch; the detailed design shall investigate whether a local historian will be required, and will investigate and select the required licensing level based on existing and anticipated future tag count.
    - ◆ Programming of the desktop HMI shall not be included in the scope of work. City staff will program the standalone Wonderware HMI.
  - (ii) The scope of work shall include supply of a panel mounted HMI. Detailed design shall include:
    - ◆ Hardware specification of the panel mounted HMI.
    - ◆ Software specification for the panel mounted HMI. It is expected the control room panel HMI will use the same software as either the desktop HMI or the residence HMIs.
    - ◆ Programming of the panel mounted HMI shall not be included in the scope of work. City staff will program the panel mounted HMI.
- (g) Section 2.4.4 – The DB shall prepare a cost benefit analysis of all options presented in the Regional Water Supply PLC Replacement & Power Reliability Upgrades

Preliminary Design Report as replacements for the currently installed Bently Nevada monitoring system (specifically, Bently Nevada 3500 Encore Series, Bently Nevada 3500 Series, and Emerson CSI Machinery Health Monitors).

- (i) Include as part of the analysis appropriate predictive monitoring options not listed above.
- (ii) The City shall provide input into the criteria used to evaluate machinery monitoring system replacement options.
- (iii) Document the cost benefit analysis in a Technical Memorandum.

#### F3.4.3 Provisions for Other Future Projects

- (a) The following items are not described in the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report, but shall be considered in the scope of work for the design-build RFP:
  - (i) A new chlorination, de-chlorination system and copper ion system are planned at the Shoal Lake Intake Facility. The existing chlorine gas and de-chlorination systems will be decommissioned.
    - ◆ Instrumentation and control devices for these planned systems including PLCs or remote I/O racks and programming logic shall be provided by others.
    - ◆ Design of the Station Master PLC undertaken as part of the design-build project shall consider these future projects and sufficient capacity shall be provided in the Station Master PLC to accommodate these future systems.
  - (ii) A number of water control and structural modifications at the Shoal Lake Intake Facility shall be completed by others.
    - ◆ The intake stop logs will be replaced with a conventional sluice gate.
    - ◆ The low lift pump inlet chamber stop logs will be replaced with a manually operated chamber gate.
    - ◆ Intake channel separation gates will be installed.
    - ◆ The intake level transmitters will be upgraded to electronic transmitters and electronic level transmitters will be added in the second intake channel.
    - ◆ Hydrogen and oxygen gas leak detectors will be installed in the Gatehouse.
    - ◆ Additional work including structural maintenance, bar screen replacement and rake rebuild will be undertaken.
    - ◆ Provisions in programming logic and capacity in the I/O racks shall be provided to accommodate additional devices as part of the design-build project.
  - (iii) A number of Heating, Ventilation and Air Conditioning (HVAC) upgrades will be undertaken at the Shoal Lake Intake Facility by others.
    - ◆ Any required modifications to the existing HVAC instrumentation and controls including programming logic shall be completed by others.
    - ◆ Detailed design for the design-build project shall include a review of the need for any additional capacity in the Station Master PLC and/or I/O racks to accommodate these upgrades.
  - (iv) The domestic water pumps shall be replaced at the Shoal Lake Intake Facility by others.
    - ◆ Capacity shall be provided in the remote I/O rack (proposed to replace Modicon Compact A984-145 series PLC 31) to accommodate additional devices as part of the detailed design.
    - ◆ Programming logic and any new instrumentation and control devices beyond the remote I/O rack will be provided by others.

- (v) The Engine Shed at the Shoal Lake Intake Facility shall be replaced in the future by others.
  - ◆ The relocation of the remote I/O base, radio systems, UPS and fibre optic termination cabinet located in the Engine Shed shall be completed by others.
- (vi) Chlorination system upgrades at the McPhillips, MacLean and Hurst Regional Pumping Stations are planned.
  - ◆ Instrumentation and control devices for the chlorination system upgrades including PLCs or remote I/O racks and programming logic shall be provided by others.
  - ◆ Design of the Station Master PLCs undertaken as part of the design-build project shall consider these future upgrades and sufficient capacity shall be provided in the Station Master PLCs to accommodate these future upgrades.
- (vii) Upgrades to the UV system at the WTP will be undertaken by others in 2017.
  - ◆ Instrumentation and control devices for the UV system upgrades including PLCs or remote I/O racks and programming logic shall be provided by others.
- (viii) MCC replacement and electrical upgrades at the McPhillips Regional Pumping Station, expected to begin in 2017.
- (ix) Structural/architectural, mechanical, electrical, instrumentation and control upgrades at the Tache Booster Pumping Station, expected to begin in 2020.

#### F3.4.4 PLC Programming

- (a) The DB shall prepare a detailed FRS for each facility, including all new and existing processes controlled by the PLCs, and incorporating all logic changes as described in F3.4.4(c). The FRS shall include a control narrative, logic diagrams, alarm list, control setpoints and logic permissives for each device.
- (b) The DB shall completely rewrite the PLC program code based on the FRS using Unity Pro software.
  - (i) Wherever practical, existing function blocks from the current WTP PLC programs shall be used in the PLC logic rewrite.
  - (ii) Wherever possible, the program for any PLC that communicates with SCADA shall maintain the same addressing for any registers or coils that interface directly with SCADA, so as to minimize the amount of modification to the SCADA system by City staff.
    - ◆ The currently installed Regional SCADA system (Telvent OASyS DNA) does not support bit-wise writes to registers. If the PLC upgrades are to occur prior to SCADA upgrades, PLC programming shall take into account the inability of the Regional SCADA system to perform bit-wise writes to registers.
  - (iii) All PLC programs shall include detailed embedded comments, explaining each logic segment.
    - ◆ Where applicable, embedded comments shall refer to the appropriate section of the FRS.
- (c) The rewrite of PLC program code shall address all of the logic deficiencies identified in the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report. Refer to section 3.1 of the report for further detail.
  - (i) Further to Section 3.1.5 of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report, the City has opted not to implement the suggested logic change to McPhillips overnight mode. As such, the DB shall remove all logic related to overnight mode at McPhillips, MacLean and Hurst Regional Pumping Stations as part of the PLC program code rewrite.

- (ii) Further to Section 3.1.11 of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report, the DB shall segregate alarms related to power failures into critical and non-critical alarms, where critical alarms require a local reset and non-critical alarms may be reset remotely. Consultation with City staff will be required in the creation of these lists.
  - ◆ Alarms caused by another alarm condition during a power failure shall be masked.
  - ◆ Detailed design shall consider whether alarms should be masked in the PLC logic or by the SCADA system.
  - ◆ The selected method of masking alarms shall be subject to approval by the City.

#### F3.4.5 Software Simulation

- (a) The DB shall develop a specification for software simulation, along with a test plan for extensive testing of the new PLC logic prior to any modifications being performed at site. The specification and test plan shall be subject to the OA and City's approval, and shall include, at a minimum:
  - (i) Alarm testing;
  - (ii) Software interlock testing;
  - (iii) Pump sequencer simulation;
  - (iv) Discharge pressure control simulation;
  - (v) Station fault/emergency simulation, specifically any condition that will trigger an emergency shutdown of an entire station; and
  - (vi) Device trip points.

#### F3.4.6 Power Reliability Upgrades

- (a) Detailed design for the power reliability upgrades shall address station reliability issues identified in the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report. Refer to section 3.2 of the report for greater detail.
- (b) Note the following additional information regarding specific sections of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report:
  - (i) Section 3.2.1 – Detailed design shall proceed with the option of three (3) discharge header pressure transmitters – one (1) dedicated for each discharge header segment, plus one (1) that is normally connected to both segments but that can be isolated from one (1) header or the other during maintenance activities. When the two (2) sides of the header have not been isolated from each other, the PLC logic shall use a voting strategy to determine discharge pressure. When the header is split, a duty/standby arrangement shall be used.
  - (ii) Section 3.2.2 – The City has opted not to implement the recommendation for emergency stop buttons to be installed for pumps at all stations, therefore this work shall not be included in the design-build scope of work.
  - (iii) Section 3.2.3 – The scope of work shall include provision to incorporate a station flood switch test mode in the PLC and SCADA as a means to test the station flood sensors without affecting station operation.
  - (iv) Section 3.2.5 – Detailed design shall proceed with the option of utilizing a single duty table that encompasses both normal and power fail operating modes, as described in this section of the Regional Water Supply PLC Replacement & Power Reliability Upgrades Preliminary Design Report.
  - (v) Section 3.2.6 - The City has opted not to implement the recommendations made in section 3.2.6 regarding load ratio controllers and load to speed Converters, therefore this upgrade shall not be included in the design-build scope of work.

### F3.5 Fast Restart

F3.5.1 The detailed design for fast restart shall use the recommendations included in the Preliminary Design report to be prepared by the OA as its basis.

### F3.6 Implementation/Changeover Plan

F3.6.1 As part of the Detailed Design Phase, the DB shall prepare for review, comment and approval by the OA and City a detailed implementation/changeover plan for the project prior to the start of the Procurement or Construction Phases.

F3.6.2 The detailed implementation/changeover plan shall:

- (a) be developed in a way that station operability will be maintained throughout commissioning;
- (b) include a detailed schedule including station upgrade sequence and station shutdown timing and durations;
- (c) include the timing and sequencing of the SCADA hardware and software upgrades, SCADA configuration and data migration, WTP SCADA system upgrade and migration of the RDS control from the existing Telvent system to the upgraded SCADA system, PLC hardware replacement, communications network upgrade, machinery monitoring system replacement, HMI replacement, station reliability upgrades and Regional SCADA address revisions;
- (d) detail the manual operation requirements during installation;
- (e) detail the power requirements to run new and old equipment concurrently at each facility, and provide a detailed plan for supplying power for the duration of the commissioning period where existing UPS power may be insufficient to support the additional load, as identified in the Preliminary Design report to be prepared by the OA (see D5.5.3(d));
- (f) take into account the following constraints:
  - (i) McPhillips, MacLean and Hurst Regional Pumping Stations:
    - ◆ Only one (1) Pump PLC will be allowed to be taken out of service at any given time.
    - ◆ The Station Master PLCs cannot be shut down for prolonged periods of time. Only nighttime shutdowns will be permitted. For the MacLean and Hurst Regional Pumping Stations, shutdowns will not be permitted from May to September.
  - (ii) Deacon Booster Pumping Station:
    - ◆ Only one Pump PLC will be allowed to be taken out of service at any given time.
    - ◆ The Deacon Booster Pumping Station cannot be shut down for more than 12 hours, and cannot be shut down from May to September. In addition, consecutive shutdowns must be separated by at least one week.
    - ◆ It is anticipated that the PLC replacement at the Deacon Booster Pumping Station will be performed last in the overall PLC replacement project. The Deacon Booster Pumping Station supplies all of the three (3) Regional Pumping Stations with treated water. It is therefore a singular crucial piece of the overall water supply system.
  - (iii) Deacon Chemical Feed Facility:
    - ◆ Any shutdowns shall be coordinated with City staff with adequate notice.
  - (iv) Shoal Lake Intake Facility:
    - ◆ The Shoal Lake Intake can only be accessed by rail.

- ◆ Any shutdowns shall be coordinated with City staff with adequate notice. The impact of proposed shutdowns shall be reviewed and approved by City staff prior to approving any shutdown.
- (v) Tache Booster Pumping Station:
  - ◆ It is anticipated that the PLC replacement will start at the Tache Booster Pumping Station, as the Tache Booster Pumping Station has the most flexibility in terms of shutdowns. Any shutdowns shall be coordinated with City staff with adequate notice.
- (vi) Network cables for the upgraded control system communication network must be installed and tested prior to PLC replacement to minimize the potential of extending the required shutdown period.
- (vii) Remote manual operation and monitoring of a transitioned pump must be confirmed to be functional prior to migrating any additional pumps.

### F3.7 Spare Parts

- F3.7.1 The DB shall provide a recommended spare parts list for SCADA server, PLC hardware and instrumentation and communications/networking hardware supplied as part of the DB contract, including pricing.
- (a) The spare parts list shall be individually priced with part numbers and full descriptions of each component.
  - (b) Stated prices shall be valid for one year after project total performance.
- (b) The DB shall supply all recommended spare parts.

### F3.8 Submittals

- F3.8.1 The DB shall prepare and submit the following items for review, comment and approval by the OA and City prior to the start of the Procurement or Construction Phases:
- (a) Historical data migration plan described in F3.3.3;
  - (b) Technical memoranda described in F3.4.2;
  - (c) FRS described in F3.4.4(a);
  - (d) Software simulation specification and test plan described in F3.4.5;
  - (e) Implementation/changeover plan described in F3.6;
  - (f) Spare parts list described in F3.7;
  - (g) Updated network block diagrams detailing the PLC network architecture at each facility, indicating all PLC controllers, remote I/O nodes, and major networked equipment such as intelligent MCCs;
  - (h) Updated facility Process and Instrumentation Drawings (P&ID) reflecting the PLC, equipment monitoring systems and network upgrades;
  - (i) Updated IP address list for all equipment residing on the Regional SCADA and PLC network;
  - (j) Updated I/O list documents for all PLCs;
  - (k) For each facility/remote polling station:
    - (i) Network cable routing diagrams.
      - ◆ Typical network cable routing diagrams will not be accepted.
      - ◆ The City shall supply a sample cable routing diagram to be included as a reference in the design-build RFP.
    - (ii) Instrumentation index which shall include for each instrument, if applicable:
      - ◆ Tag name;
      - ◆ Description;
      - ◆ P&ID number;

- ◆ Plan drawing number;
  - ◆ Loop number and/or loop diagram number;
  - ◆ Manufacturer and model;
  - ◆ Datasheet;
  - ◆ Power supply;
  - ◆ Calibrated range;
  - ◆ Mounting; and
  - ◆ Additional notes or comments.
- (l) Updated PLC module lists for all PLCs;
  - (m) Updated Control Panel Layouts and Bill of Materials.
    - (i) The existing Control Panel Layouts and Bill of Materials shall be updated to reflect the final materials purchased.
  - (n) Updated loop wiring diagrams for all instrumentation loops;
    - (i) Typical loop diagrams will not be accepted.
    - (ii) The City shall supply a sample loop diagram to be included as a reference in the design-build RFP.
  - (o) For each new or modified panel:
    - (i) Internal wiring diagrams;
    - (ii) Detailed internal panel layouts.
    - (iii) Typical internal wiring or internal panel layout diagrams will not be accepted.
    - (iv) The City shall supply sample internal wiring and internal panel layout diagrams to be included as references in the design-build RFP.
- F3.8.2 Construction drawings shall be submitted at the following stages for review and comment:
- (a) 60% complete,
  - (b) 90% complete and
  - (c) Final.
- F3.8.3 Specifications for all major components shall be submitted at the following stages for review and comment:
- (a) 80% complete, and
  - (b) Final.
- F3.8.4 Installation specifications shall be submitted at the following stages for review and comment:
- (a) 60% complete,
  - (b) 90% complete, and
  - (c) Final.
- F3.8.5 Final drawings, installation and component specifications must be sealed by a professional engineer registered in Manitoba.

#### **F4. PROCUREMENT PHASE**

- F4.1 As part of the procurement phase the DB shall prepare and submit the following items for review, comment and approval by the OA and City prior to the procurement of materials or equipment:
- (a) Shop drawings and product data for all equipment and materials.

## **F5. CONSTRUCTION PHASE**

- F5.1 The DB shall construct the project in conformance with the approved project criteria and design-build contract.
- F5.2 The DB shall arrange and attend regularly held on-site and off-site project review meetings. Project review meetings to include representatives of the DB, OA and City. The DB shall prepare and distribute meeting minutes for project review meetings.
- F5.3 The DB shall prepare and submit the following items for review, comment and approval by the OA and the City prior to performing any work:
- (a) Detailed work plans; and
  - (b) Inspection and test plans.
- F5.4 The DB shall develop a complete set of FAT and SAT procedures and submittal documentation.
- F5.4.1 The OA shall define the acceptance testing requirements, in consultation with City staff.
- F5.4.2 All test procedures shall be subject to approval by the City.
- F5.5 The DB shall conduct all FAT and SAT in accordance with the test procedures as per F5.3.

## **F6. COMMISSIONING PHASE**

- F6.1 As part of the commissioning phase, the DB shall prepare and submit the following items for review, comment and approval by the OA and the City prior to performing any commissioning:
- (a) Detailed pre-verification and testing plans;
  - (b) Detailed commissioning plans;
    - (i) The OA shall define the commissioning requirements in consultation with City staff.
    - (ii) The commissioning requirements and commissioning plan shall be subject to approval by the City.
    - (iii) Commissioning shall include verification of all I/O to the PLCs, PLC testing and PLC/SCADA interface testing.
  - (c) O&M manuals described in F6.3, and;
  - (d) Detailed training program described in F6.4 for all aspects of operation and maintenance of new equipment.
- F6.2 The DB shall conduct all commissioning activities in accordance with the commissioning plan as per F6.1(b).
- F6.3 O&M Manuals
- F6.3.1 The DB shall provide O&M manuals. The O&M manuals will be used as part of the training and commissioning process. The O&M manuals shall include, at a minimum:
- (a) Manufacturer's cut-sheets and/or manuals (as applicable) for all computer and networking hardware, PLC hardware, and instrumentation to be installed as part of this project;
  - (b) SCADA software manuals specific to the software installed as part of this project, including all installed modules and any custom applications.
- F6.3.2 The DB shall submit four (4) hard copies and one (1) electronic PDF copy of the "draft Operation and Maintenance Manual" for each facility.
- (a) Upon receipt of the OA and City review comments, the DB shall submit four (4) hard copies and four (4) searchable smart electronic copies of the "final Operation and Maintenance Manual" for each facility.
- F6.4 Training

- F6.4.1 The DB shall provide comprehensive training for operators, SCADA System Administrators, and Instrument Technicians.
- F6.4.2 The DB shall demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment.
- F6.4.3 Training shall include both lectures and hands on exercises.
- (a) The DB shall instruct personnel in phases of operation and maintenance using the O&M manuals as basis of instruction.
  - (b) The DB shall review the contents of the O&M manuals in detail to explain aspects of operation and maintenance.
  - (c) The DB shall prepare and insert additional data in O&M manuals when needed during instructions.
- F6.4.4 Operator training shall include, at a minimum:
- (a) User interface organization and navigation;
  - (b) Alarm recognition and acknowledgement; and
  - (c) Device controls and overrides.
- F6.4.5 SCADA System Administrator training shall include, at a minimum:
- (a) System architecture;
  - (b) System configuration, including custom object templates;
  - (c) Display building and custom user displays;
  - (d) System maintenance;
  - (e) Reporting; and
  - (f) Custom scripts and/or applications.
- F6.4.6 Instrumentation Technician training shall include, at a minimum:
- (a) System architecture;
  - (b) Logic overview;
  - (c) Process narrative; and
  - (d) Custom function blocks.
- F6.4.7 Training manuals shall be provided for all training.
- (a) Draft training manuals shall be reviewed by the OA and City in advance of any training occurring.
    - (i) Draft training manuals shall be submitted a minimum of 3 weeks prior to the commencement of training activities.
    - (ii) DB shall address all OA and City comments on draft training materials prior to commencement of training activities.
  - (b) Submit four (4) hard copies and one (1) searchable electronic copy of SCADA System Administrator training manuals.
  - (c) Submit (8) hard copies and one (1) searchable electronic copy of Operator training manuals.
  - (d) Submit seven (7) hard copies and one (1) searchable electronic copy of Instrumentation Technician training manuals.

## **F7. POST CONSTRUCTION PHASE**

### **F7.1 Warranty and Maintenance Support Services**

- F7.1.1 The DB shall provide warranty services as defined by the OA which are anticipated at a minimum to include 24-hour, 7 days a week, on-call technical support and corrective

maintenance during the commissioning and one (1) year warranty periods. If a problem cannot be quickly solved over the telephone or through remotely connecting in to the system, the DB shall send a qualified Person or Persons to the site of the problem within 24 hours.

F7.1.2 The DB shall provide optional pricing for a long term maintenance support agreement. This may take the form of varying levels of support offerings. The DB will elaborate on what this support consists of including response times, software updates, etc. The pricing shall be provided in the form of a yearly fee and shall be provided for the first five (5) years following expiration of the warranty period.

#### F7.2 Electrical and Control Records – Shoal Lake Intake Facility

F7.2.1 A condition assessment of the Shoal Lake Intake Facility found that a number of record drawings were out of date or changes had been made that had not been documented (as outlined in the Shoal Lake Aqueduct Intake Facility Assessment – Site Inspections and Assessment report referenced in Appendix C). The DB shall review and update as required all electrical and control records for the Shoal Lake Intake facility.

- (a) The DB shall identify all obsolete and superseded drawings, product brochures and maintenance manuals and shall relocate to suitable archive files in a separate location from active files.
- (b) The DB shall collect all known drawing revision mark-ups from the operations, equipment and maintenance files and update the respective drawings to as-built status.

#### F7.3 As-Built Drawings

F7.3.1 The DB shall prepare and submit "as-built" drawings for the project within one (1) month of the start of the warranty period for each facility.

- (a) Submit five (5) hard copies of 11 x 17 size "draft as-builts" and one (1) electronic copy of PDF and AutoCAD files.
- (b) Upon receipt of City and OA review comments submit five (5) hard copies of 11 x 17 size, one (1) hard copy of 24 x 36 size Mylar and three (3) electronic copies of PDF and AutoCAD files of "final as-builts".