



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 930-2015**

**WILKES RESERVOIR NORTH CELL REHABILITATION**

## TABLE OF CONTENTS

### PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	4
Form G1: Bid Bond and Agreement to Bond	9
Form G2: Irrevocable Standby Letter of Credit and Undertaking	11

### PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Mandatory Bidder's Conference	1
B4. Site Investigation	1
B5. Enquiries	2
B6. Confidentiality	3
B7. Addenda	3
B8. Substitutes	3
B9. Bid Components	4
B10. Bid	5
B11. Prices	5
B12. Disclosure	6
B13. Qualification	6
B14. Bid Security	7
B15. Opening of Bids and Release of Information	8
B16. Irrevocable Bid	8
B17. Withdrawal of Bids	8
B18. Evaluation of Bids	9
B19. Award of Contract	9

### PART C - GENERAL CONDITIONS

C0. General Conditions	1
------------------------	---

### PART D - SUPPLEMENTAL CONDITIONS

#### General

D1. General Conditions	1
D2. Definitions	1
D3. Scope of Work	1
D4. Contract Administrator	2
D5. Contractor's Supervisor	2
D6. Ownership of Information, Confidentiality and Non Disclosure	2
D7. Notices	3
D8. Furnishing of Documents	3
D9. Cooperation With Others	3

#### Submissions

D10. Criminal Record Search Certificate and Public Verification Check	4
D11. Authority to Carry on Business	4
D12. Safe Work Plan	4
D13. Insurance	5
D14. Performance Security	6
D15. Subcontractor List	6
D16. Detailed Work Schedule	6
D17. Request for Information and Non-Conformance Reports	12
D18. Construction Method Statement	8

#### Schedule of Work

D19. Commencement	9
D20. Restricted Work Hours	9
D21. Damage to Existing Structures and Property	9

D22. Work By Others	10
D23. Critical Dates	10
D24. Substantial Performance	10
D25. Total Performance	10
D26. Liquidated Damages	11
<b>Control of Work</b>	
D27. Job Meetings	11
D28. Prime Contractor – The Workplace Safety and Health Act (Manitoba)	11
D29. The Workplace Safety and Health Act (Manitoba) – Qualifications	11
D30. Layout of the Work	11
<b>Measurement and Payment</b>	
D31. Payment	12
<b>Warranty</b>	
D32. Warranty	12
Form H1: Performance Bond	13
Form H2: Irrevocable Standby Letter of Credit	15
Form J: Subcontractor List	17

## **PART E - SPECIFICATIONS**

<b>General</b>	
E1. Applicable Specifications and Drawings	1
E2. Reference Reports and Drawings	2
E3. Environmental Plan	3
E4. Shop Drawings	6
E5. Expedited Shop Drawings	8
E6. Verification of Weights	8
E7. Water Obtained from the City	9
E8. Security and Access to Reservoir Site	9
E9. Site Office Facilities	10
E10. Mobilization and Demobilization	11
E11. Site Works	14
E12. Structural Concrete	15
E13. Reinforcing Steel	19
E14. Removal and Replacement of Building Envelope	20
E15. Temperature Monitoring System	23
E16. Replacement of Hollow Core slabs	23
E17. Repair of Hollow Core Slabs	29
E18. Bearing Rehabilitation	31
E19. Wall Expansion Joint Replacement	37
E20. Concrete Spall Repairs	39
E21. Gel Injection at Suction Pits	41
E22. Steel Stairways	43
E23. Pile Cap F-16 Underpinning	44
E24. Cell Clean-Up	46

## **PART F - SECURITY CLEARANCE**

F1. Security Clearance	1
------------------------	---

## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 WILKES RESERVOIR NORTH CELL REHABILITATION

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, December 11, 2015.

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

### **B3. MANDATORY BIDDER'S CONFERENCE**

B3.1 Further to C3.1, the Bidder shall attend a Bidder's Conference at the Contract Administrator's office identified in D4.1. The Bidder's Conference will be held on the dates indicated in B3.1.1. Both Bidder's Conferences will be the same and the Bidder is only required to attend one of the two scheduled Bidder's Conferences. **Attendance is mandatory**, and the Bid of any Bidder not having attended one of the two Bidder's Conferences will be rejected on the basis that it is non-responsive.

B3.1.1 Bidder's Conference Dates as follows:

- (a) Bidder's Conference #1 at 10:00 a.m. on December 2, 2015.
- (b) Bidder's Conference #2 at 10:00 a.m. on December 3, 2015.

B3.1.2 Bidders are required to register for one of the above sessions a minimum of 24 hours in advance by contacting the Contract Administrator listed in D4.

B3.2 The Bidder is advised that, at the Bidder's Conference, the Contract Administrator will make a PowerPoint presentation to outline the scope of the Work. The presentation will:

- (a) Describe the Site and include photographs and videos of the interior of the Reservoir Cells taken during investigations conducted for the detailed design of the rehabilitation;
- (b) Review the Site security requirements;
- (c) Review the Site constraints including equipment restrictions in and around the Reservoir;
- (d) Review the Project schedule and proposed construction sequencing; and,
- (e) Address Bidder's questions in accordance with B3.4.

B3.3 The Bidder's Conference is the only opportunity the Bidder will have to familiarize themselves with the interior of the Cells and with key components of the proposed Work.

B3.4 The Bidder shall not be entitled to rely on any information or interpretation received at the Bidders' Conference unless that information or interpretation is provided by the Contract Administrator in writing. The Contractor is advised that only general Bidder's questions will be addressed. Requests for product substitutions, questions relating to design changes, etc. will require a formal request in writing to the Contract Administrator. The Contract Administrator's response will be issued as an Addendum.

B3.5 Minutes from the Mandatory Bidder's Conference will be issued as an Addendum.

### **B4. SITE INVESTIGATION**

B4.1 The Contract Administrator will conduct a Site Investigation tour of the Site at 11:00 a.m. on December 7, 2015.

- B4.2 Bidders are required to register for the Site Investigation **at least 24 hours** in advance by contacting the Contract Administrator identified in D4.
- B4.3 Bidders shall meet the Contract Administrator and City personnel at the Wilkes Reservoir south access gate off Willson Place at the date and time indicated in B4.1.
- B4.4 Although attendance at the Site Investigation is **not** mandatory, the City strongly suggests that Bidders attend.
- B4.5 Bidders are advised that the interior of the Reservoir Cells will not be accessible during the Site Investigation. Photographs and videos of the interior of the Cells will be presented at the Mandatory Bidder's Conferences outlined in B3.
- B4.6 The Bidder shall not be entitled to rely on any information or interpretation received at the Site Investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.
- B4.7 Bidders registered for the Site Investigation must provide the Contract Administrator identified in D4 with a Public Safety Verification search obtained not earlier than one (1) year prior to the Site Investigation.
- (a) The Public Safety Verification Check may be obtained from BackCheck by visiting <http://www.backcheck.net/cityofwinnipeg>. Note that the check will take up to 48 hours to complete. See Part F for further information.
- (b) The results of the Public Safety Verification Check must be received by the City directly through BackCheck. Bidders must set up an account with BackCheck under their company name and grant BackCheck permission to share the results of the Public Safety Verification Check with the City of Winnipeg.
- B4.8 CSA approved safety footwear and a hardhat are required for all personnel attending the Site Investigation.
- B4.9 Bidders will not be allowed to take pictures at the Site Investigation. The Bidder may request pictures of specific areas from the Contract Administrator. The pictures will then be issued to all the Bidders registered for the Site Investigation.
- B4.10 Bidders are advised that Site access is restricted and access to view the Site can only be made under supervision of the City or the Contract Administrator at the City's authorization.

## **B5. ENQUIRIES**

- B5.1 All enquiries shall be directed to the Contract Administrator identified in D4. If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.
- B5.2 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.
- B5.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.
- B5.4 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B5 unless that response or interpretation is provided by the Contract Administrator in writing.

## **B6. CONFIDENTIALITY**

- B6.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:
- (a) was known to the Bidder before receipt hereof; or
  - (b) becomes publicly known other than through the Bidder; or
  - (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.
- B6.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

## **B7. ADDENDA**

- B7.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B7.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B7.2.1 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>
- B7.2.2 The Bidder is responsible for ensuring that he/she 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.
- B7.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B8. SUBSTITUTES**

- B8.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B8.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B8.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B8.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
  - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
  - (c) identify any anticipated cost or time savings that may be associated with the substitute;
  - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;

- (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B8.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B8.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B8.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B8.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B8.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B18.
- B8.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B8.10 Notwithstanding B8.2 to B8.9, and in accordance with B9.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B18.1(a).

## **B9. BID COMPONENTS**

- B9.1 The Bid shall consist of the following components:
  - (a) Form A: Bid;
  - (b) Form B: Prices;
  - (c) Bid Security
    - (i) Form G1: Bid Bond and Agreement to Bond, or  
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or  
a certified cheque or draft;
- B9.2 Further to B9.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B8.
- B9.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B9.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B9.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.

- B9.5 Bidders are advised not to include any information/literature except as requested in accordance with B9.1.
- B9.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B18.1(a).
- B9.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B9.8 Bids shall be submitted to:  
The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1

**B10. BID**

- B10.1 The Bidder shall complete Form A: Bid, making all required entries.
- B10.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
  - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
  - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
  - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B10.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B10.2.
- B10.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B10.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
  - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
  - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
  - (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B10.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B10.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

**B11. PRICES**

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

- B11.1.1 Notwithstanding C12.2.3(c), prices on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.
- B11.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B11.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B11.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

## **B12. DISCLOSURE**

- B12.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.
- B12.2 The Persons are:
- (a) N/A

## **B13. QUALIFICATION**

- B13.1 The Bidder shall:
- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.
- B13.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>
- B13.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
- (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba); and
- (d) upon request of the Contract Administrator, obtain Security Clearances in accordance with PART F - Security Clearance.
- B13.4 The Bidder shall provide, in his/her Bid:
- (a) provide project profiles for projects completed by the Bidder that demonstrate the Bidder's ability to successfully carry out work that is similar in nature, scope and value to that proposed for this Project.

- B13.5 Further to B13.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:
- (a) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (b) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>).
- B13.6 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.
- B13.7 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

#### **B14. BID SECURITY**

- B14.1 The Bidder shall provide bid security in the form of:
- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
  - (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
  - (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.
- B14.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.
- B14.1.2 All signatures on bid securities shall be original.
- B14.1.3 The Bidder shall sign the Bid Bond.
- B14.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B14.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.
- B14.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B14.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B14.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B14.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

#### **B15. OPENING OF BIDS AND RELEASE OF INFORMATION**

B15.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.

B15.1.1 Bidders or their representatives may attend.

B15.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B14 will not be read out.

B15.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the 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/default.stm>

B15.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) 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/default.stm>

B15.4 The Bidder is advised that any information contained in any Bid 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.

#### **B16. IRREVOCABLE BID**

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

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

#### **B17. WITHDRAWAL OF BIDS**

B17.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B17.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B17.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B17.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

(a) retain the Bid until after the Submission Deadline has elapsed;

- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B17.1.3(b), declare the Bid withdrawn.

B17.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B16.2 shall be liable for such damages as are imposed upon the Bidder 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, including the right to retain the Bidder's bid security.

## **B18. EVALUATION OF BIDS**

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

- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B13 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B8.

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

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

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

B18.4.1 Further to B18.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

## **B19. AWARD OF CONTRACT**

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

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

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

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

- B19.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B18.
- B19.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.
- B19.4 As noted in D3 and identified in Form B: Prices, the Work of Stage 2 will be contingent upon approval of sufficient funding in the 2017 Capital Budget. If the Capital Budget approved by Council does not include sufficient funding for the Work, the City shall have the right to eliminate all or any portion of Stage 2 Work, without penalty, in accordance with D3.

## PART C - GENERAL CONDITIONS

### C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](http://www.winnipeg.ca/matmgt/gen_cond.stm)
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

## PART D - SUPPLEMENTAL CONDITIONS

### GENERAL

#### D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Construction*, these Supplemental Conditions are applicable to the Work of the Contract.

#### D2. DEFINITIONS

D2.1 When used in this Bid Opportunity:

- (a) "**Reservoir or Wilkes Reservoir**" means the Wilkes Reservoir facility generally defined as the area within the perimeter security fencing bound as follows:
  - (i) Hurst Way to the north;
  - (ii) Hurst Way to the east;
  - (iii) Willson Place / Edderton Avenue to the south; and,
  - (iv) The Winnipeg Soccer Complex to the west.
- (b) "**North Cell**" means the North Cell of the Wilkes Reservoir facility which is further divided into the West and East Cells;
- (c) "**West Cell**" means the West Cell of the Wilkes Reservoir North Cell bound by grid lines A-N and 1-9 shown on the Drawings; and,
- (d) "**East Cell**" means the East Cell of the Wilkes Reservoir North Cell bound by grid lines A-N and 9-19 as shown on the Drawings.

#### D3. SCOPE OF WORK

D3.1 The Work to be done under the Contract shall consist of the rehabilitation of the Wilkes Reservoir North Cell.

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

D3.2.1 Stage 1 – Rehabilitation of the West Cell:

- (a) Removal and replacement of the Reservoir building envelope;
- (b) Supply and installation of temperature monitoring system;
- (c) Hollow core slab rehabilitation;
- (d) Bearing replacement;
- (e) Wall expansion joint repairs;
- (f) Concrete spall repairs;
- (g) Grout injection at suction pits;
- (h) Installation of alternating tread steel stairs into reservoir; and,
- (i) Cell cleaning.

D3.2.2 Stage 2 – Rehabilitation of the East Cell:

- (a) Removal and replacement of the reservoir building envelope;
- (b) Supply and installation of temperature monitoring system;
- (c) Hollow core slab rehabilitation;
- (d) Bearing replacement;
- (e) Wall expansion joint repairs;
- (f) Concrete spall repairs;

- (g) Grout injection at suction pits;
- (h) Installation of alternating tread steel stairs into reservoir;
- (i) Underpinning of pile cap F-16; and,
- (j) Cell cleaning.

D3.3 The City currently does not have sufficient approved funding in the Capital Budget for Stage 2 of the Work, but is anticipating receiving notification about funding from City Council by late mid-December 2015. Stage 2 of the Work is contingent upon City Council approving sufficient funding.

D3.3.1 Further to C7.1, if notice of sufficient funding is not received, the City shall have the right to eliminate all or any portion of Stage 2, and the Contract Price will be reduced accordingly.

D3.3.2 Further to C7.5, C7.5.1, and C7.6, a reduction in the Contract Price pursuant to D3.3.1 shall not be considered in calculating the aggregate reduction in the Contract Price for purposes of C7.5.

D3.3.3 If all or any portion of Stage 2 is eliminated pursuant to D3.3.1, the time periods stipulated in D24 for Substantial Performance of the Work and in D25 for Total Performance of the Work will be reduced proportionally by the Contract Administrator acting reasonably.

#### **D4. CONTRACT ADMINISTRATOR**

D4.1 The Contract Administrator is Dillon Consulting Limited, represented by:

Sital Rihal, M.Eng., P.Eng.  
Project Manager  
1558 Willson Place  
Winnipeg, Manitoba R3T 0Y4  
Telephone No. 204 453-2301  
Facsimile No. 204 452-4412  
Email srihal@dillon.ca

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

D4.3 Bids Submissions must be submitted to the address in B9.8.

#### **D5. CONTRACTOR'S SUPERVISOR**

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

D5.2 At least two (2) Business Days prior to commencement of any Work on the Site, the Contractor shall provide the Contract Administrator with a phone number where the supervisor identified in D5.1 or an alternate can be contacted twenty-four (24) hours a day to respond to an emergency.

#### **D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE**

D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

- D6.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;
- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
  - (b) the Contract, all deliverables produced or developed; and
  - (c) any statement of fact or opinion regarding any aspect of the Contract.
- D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

## **D7. NOTICES**

- D7.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.
- D7.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D7.3, D7.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D3.2.2(a).1.
- D7.3 Notwithstanding C21., all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:
- The City of Winnipeg  
Chief Financial Officer  
Facsimile No.: 204 949-1174
- D7.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:
- The City of Winnipeg  
Legal Services Department  
Attn: Director of Legal Services  
Facsimile No.: 204 947-9155
- D7.5 **Bids Submissions** must be submitted to the address in B9.8

## **D8. FURNISHING OF DOCUMENTS**

- D8.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him/her at cost.

## **D9. COOPERATION WITH OTHERS**

- D9.1 The Contractor's attention is directed to the fact that other Contractors, the personnel of Utilities, and the staff of the City may be working within the Site. The activities of these agencies may coincide with the Contractor's execution of the Work, and it will be the Contractor's responsibility to cooperate to the fullest extent with other personnel working in the area, and such cooperation is an obligation of the Contractor under the terms of this Contract.
- D9.2 The Contractor is advised that the following work may be occurring at or in the vicinity of the project Site:
- (a) General maintenance and operational work within and in the vicinity of the Reservoir.
  - (b) Wilkes Reservoir B Pit Rehabilitation (currently scheduled for March 2016).

- (c) Waverley Underpass Construction.
- (d) Southwest Transitway Phase 2 Construction.

## SUBMISSIONS

### D10. CRIMINAL RECORD SEARCH CERTIFICATE AND PUBLIC VERIFICATION CHECK

- D10.1 All personnel working on-Site, including Subcontractors, are required to obtain a Criminal Record Search Certificate and Public Safety Verification Check, as outlined in Part F. The Contractor shall submit copies of the Criminal Record Search Certificates and Public Safety Verification Checks for all personnel, including Subcontractors, who will be working on-Site to the Contract Administrator at least three (3) Business Days prior to commencement of the Works.
- D10.2 After commencement of the Works, the Contractor shall submit copies of the Criminal Record Search Certificates and Public Safety Verification Checks to the Contract Administrator for any personnel not identified in the original submission outlined in D10.1 who require access to the Site at least one (1) Business Day prior to accessing the Site.
- D10.3 Notwithstanding D10.1, personnel who are solely dropping off or picking up materials or equipment, with the Contract Administrator's approval, are not required to obtain Criminal Record Search Certificates and Public Safety Verification Checks **provided that the individual is escorted at all times by the Contractor's supervisor or a designated person. The individual shall remain within 5 m of his vehicle at all times while within the secure fenced area of the Reservoir.** The Contract Administrator may, at his discretion, require that all personnel working on-Site, including delivery personnel, obtain the clearances outlined in D10.1 without exception.
- D10.4 Notwithstanding D10.1, personnel who are solely within the fenced laydown area are not required to obtain Criminal Record Search Certificates and Public Safety Verification Checks **provided that the individual will not be entering the secured portion of the Reservoir Site through the north gate of the laydown area.**

### D11. AUTHORITY TO CARRY ON BUSINESS

- D11.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

### D12. SAFE WORK PLAN

- D12.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D12.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Safety/default.stm>
- D12.3 Notwithstanding B13.5 at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

## **D13. INSURANCE**

- D13.1 The City shall provide and maintain the following owner controlled project insurance coverage to remain in place at all times during the performance of the Work:
- (a) Broad form builder's risk insurance including testing and commissioning, insuring 100% of the contract price written in the name of the City and the Contractor. The Contractor shall be responsible for deductibles up to \$50,000 maximum of any one loss except for \$100,000 for flood and water damage losses;
  - (b) Wrap-up liability insurance in an amount of no less than ten million dollars (\$10,000,000) inclusive per occurrence and ten millions dollars ( \$10,000,000) general aggregate, covering bodily injury, personal injury, property damage, sudden and accidental pollution liability and products and completed operations consistent with industry standard insurance policy wordings. Wrap up liability insurance to also include evidence of contractual liability and cross liability clauses;
    - (i) The Contractor shall be responsible for deductibles up to \$50,000 maximum of any one loss;
    - (ii) The City of Winnipeg will carry such insurance to cover the Owner, Contractor and all consultants and sub-contractors as insured's. Provision of this insurance by the City of Winnipeg is not intended in any way to relieve the Contractor from his obligations under the terms of the Contract. Specifically, losses relating to deductibles for insurance, as well as losses in excess of limits of coverage and any risk of loss that is not covered under the terms of the insurance provided by the City of Winnipeg remains with the Contractor;
    - (iii) Wrap-up liability insurance shall be maintained from the date of the commencement of the Work until the date of Total Performance of the work and shall include an additional twenty four (24) months completed operation coverage which will take affect after Total Performance.
  - (c) The City of Winnipeg shall provide certified copies of policies to the Contractor upon written request.
- D13.2 The Contractor shall provide and maintain the following insurance coverage at all times during the performance of the work:
- (a) General liability in an amount of no less than five million (\$5,000,000) inclusive per occurrence limit for bodily injury, personal injury, property damage non-owned automobile liability and products and completed operations consistent with industry standard insurance policy wordings with a minimum five million (\$5,000,000) general aggregate.
  - (b) Automobile liability insurance for licensed automobiles used for or in connection with the Work in the amount of no less than five million dollars (\$5,000,000).
  - (c) Contractors Pollution Liability (CPL) insurance in the amount of at least two million dollars (\$2,000,000) per occurrence and two million dollars (\$2,000,000) aggregate insuring against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder performed by the Contractor, its agents, representatives, employees or subcontractors. Coverage to include clean-up costs, diminution in value; and natural resource damages and consistent with industry standard insurance policy wordings.
- D13.3 Deductibles shall be borne by the Contractor.
- D13.4 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.
- D13.5 The Contractor shall not cancel, or cause any such policy or policies to lapse without a minimum thirty (30) days prior written notice to the City.

- D13.6 The Contractor shall provide the Contract Administrator with evidence of insurance at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of the Contract. The evidence shall be in a form of a certificate of insurance and must be satisfactory to the City Solicitor.
- D13.7 All policies shall be in a form satisfactory to the City of Winnipeg and shall be kept in full force during the Work and throughout the warranty period.
- D13.8 The Contractor shall require each of its sub-contractors to provide comparable insurance to that set forth under D13.2.
- D13.9 All parties covered under the wrap up insurance shall continue to carry general liability for two (2) years (or warranty period) whichever is greater.

#### **D14. PERFORMANCE SECURITY**

- D14.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
  - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
  - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D14.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D14.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

#### **D15. SUBCONTRACTOR LIST**

- D15.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at or prior to a pre-construction meeting, or at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.

#### **D16. DETAILED WORK SCHEDULE**

- D16.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.
- D16.2 The detailed work schedule shall consist of the following:
- (a) a critical path method (C.P.M.) schedule for the Work;
  - (b) a Gantt chart for the Work based on the C.P.M. schedule; or
  - (c) a daily manpower schedule for the Work;
- all acceptable to the Contract Administrator.

- D16.3 Further to D16.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path.
- (a) Stage 1 – West Cell
    - (i) Site mobilization;
    - (ii) Construct temporary access to reservoir;
    - (iii) Remove existing roof pavers and insulation;
    - (iv) Remove existing wall envelope;
    - (v) Clean beam ends;
    - (vi) Install new bearing plates and bearing pads;
    - (vii) Repair existing beam spalls;
    - (viii) Repair designated existing hollow core roof slabs;
    - (ix) Replace designated existing hollow core roof slabs;
    - (x) Installation of new roof envelope;
    - (xi) Installation of new wall envelope;
    - (xii) Completion of miscellaneous interior works;
    - (xiii) Interior clean-up required for disinfection;
    - (xiv) Miscellaneous exterior site work;
    - (xv) Demobilization; and
    - (xvi) Stage 1 completion date.
  - (b) Stage 2 – East Cell
    - (i) Site mobilization;
    - (ii) Construct temporary access to reservoir;
    - (iii) Remove existing roof pavers and insulation;
    - (iv) Remove existing wall envelope;
    - (v) Clean beam ends;
    - (vi) Install new bearing plates and bearing pads;
    - (vii) Repair existing beam spalls;
    - (viii) Repair designated existing hollow core roof slabs;
    - (ix) Replace designated existing hollow core roof slabs;
    - (x) Installation of new roof envelope;
    - (xi) Installation of new wall envelope;
    - (xii) Completion of miscellaneous interior works;
    - (xiii) Interior clean-up required for disinfection;
    - (xiv) Miscellaneous exterior site work;
    - (xv) Demobilization; and
    - (xvi) Stage 2 completion date
  - (c) Substantial Performance
  - (d) Total Performance.
- D16.4 Further to D16.2(b), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.
- D16.5 Further to D16.2(c), the daily manpower schedule shall list the daily number of individuals on the Site for each trade.
- D16.6 Update the Detailed Work Schedule to reflect actual progress on a regular basis. Update the schedule at least once every two (2) weeks and as requested by the Contract Administrator.

- D16.7 The Contractor shall keep a copy of the Gantt chart schedule on-Site for tracking progress and updating on a daily basis.
- D16.8 Following submission of the Detailed Work Schedule, but prior to the commencement of any Works, the Contractor shall attend a scheduling meeting with the Contract Administrator and the City. The Contract Administrator will advise the Contractor of the meeting time and location. The purpose of this meeting will be to review the Contractor's schedule and to address any scheduling concerns that may arise during review of the schedule. The Contractor shall not be permitted to commence any Works unless the Contract Administrator is satisfied with the Contractor's understanding of the scheduling requirements and is satisfied that the proposed schedule can reasonably be followed to complete the Works within the Project time constraints.

## **D17. CONSTRUCTION METHOD STATEMENT**

- D17.1 The Contractor shall provide the Contract Administrator with a detailed Construction Method Statement at least three (3) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.
- D17.2 The Construction Method Statement shall:
- (a) List the proposed construction equipment to be used including:
    - (i) Make/model and year.
    - (ii) Proposed Works to be completed by the specific piece of equipment.
    - (iii) Means of power for the equipment (battery, gas, diesel, etc.).
    - (iv) Means of providing access to the location in which the equipment is required.
    - (v) Equipment operating weight and dimensions including wheel or track base, track length or axle spacing, track widths or wheel configurations.
    - (vi) Payload weights (axle loading).
    - (vii) Load distributions in the intended operating configuration.
  - (b) Indicate proposed haul routes, laydown areas, lifting and loading locations, and construction sequencing;
  - (c) Include a crane operation plan providing erection details and procedures for any cranes utilized for the Works. Operation plan shall include crane operating load capacities and restrictions. Cranes are not to be moved while loaded.
  - (d) Generally describe the construction methods that the Contractor will employ to complete the Works; and,
  - (e) Address any other requirements listed herein.
- D17.3 Any piece of equipment or construction method identified in the Construction Method Statement that does not conform to the equipment restrictions within the Site, as deemed by the Contract Administrator, will not be permitted to be used.
- D17.4 The Contractor shall be aware that the equipment identified on the Construction Method Statement proposed to complete the Works shall meet the Construction Procedure Restrictions provided on the Drawings.
- D17.5 The Contractor shall not commence construction until the Construction Method Statement has been reviewed and accepted by the Contract Administrator.
- D17.6 The Contractor shall ensure that all work crew members understand and observe the requirements of these work procedures and constraints. Prior to commencement of on-site work, the Contractor shall jointly conduct an orientation meeting with the Contract Administrator with all superintendents, foremen and heavy equipment operators to make all workers on-Site fully cognizant of the limitations of loading on Reservoir infrastructure, such as piping, the ramifications of inadvertent damage to Reservoir infrastructure, the constraints associated with

work at the Project Site and the specific details of the Construction Method Statement in instances where a Construction Method Statement is in effect.

## **SCHEDULE OF WORK**

### **D18. COMMENCEMENT**

- D18.1 The Contractor shall not commence any Work until he/she is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.
- D18.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
    - (i) the criminal record search certificates and public verification checks specified in D10
    - (ii) evidence of authority to carry on business specified in D11;
    - (iii) evidence of the workers compensation coverage specified in C6.15;
    - (iv) the Safe Work Plan specified in D12;
    - (v) evidence of the Insurance specified in D13;
    - (vi) the Performance Security specified in D14;
    - (vii) the Subcontractor List specified in D15;
    - (viii) the Detailed Work Schedule and schedule review meeting specified in D16;
    - (ix) the Construction Method Statement specified in D17;
    - (x) the completion and acceptance by the City and the Contractor of the preconstruction photographic record specified in D20; and,
    - (xi) the Environmental Protection Plan specified in E3.
  - (b) The Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- D18.3 In addition to the requirements outlined in D18.2, the Contractor shall not commence any Work within, or on top of, the Reservoir Cells until the respective Reservoir Cell has been emptied and the City has provided written confirmation permitting commencement of Works.
- D18.4 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.
- D18.5 The City intends to award this Contract by March 29, 2016.
- D18.5.1 If the actual date of award is later than the intended date, the dates specified for Commencement, Critical Dates, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

### **D19. RESTRICTED WORK HOURS**

- D19.1 Further to clause 3.10 of CW 130, the Contractor shall require written permission forty-eight (48) hours in advance from the Contract Administrator for any work to be performed between 2000 hours and 0700 hours, or on Saturdays, Sundays, Statutory Holidays and or Civic Holidays.

### **D20. DAMAGE TO EXISTING STRUCTURES AND PROPERTY**

- D20.1 Further to Section 3.13 of CW 1130 of the General Requirements, special care shall be taken to avoid damage to the Reservoir, existing adjacent structures and properties during the course of Work.
- D20.2 The Contractor is advised that at the project stages identified in D20.2.1, the Contract Administrator will, in the presence of the Contractor, develop a Pre-Construction Site Record. The Pre-Construction Site Record will be a record of the project Site conditions by means of photographs or other documentation or media. This record will be shared with the Contractor

and the City, and will require signatures from the Contract Administrator, the City and the Contractor indicating acceptance of the preconstruction site conditions prior to commencing the Works.

D20.2.1 Pre-Construction Site Record Stages

- (a) Prior to commencing Stage 1 Works in Spring 2016; and,
- (b) Prior to commencing Stage 2 Works in Spring 2017.

D20.3 Any damage caused by the Contractor or his Subcontractors to any part of the Reservoir, or to the adjacent structures of properties shall be promptly repaired by the Contractor at his own expense to the satisfaction of the Contract Administrator. Prior to Total Performance of the Project, the Contractor, the City and the Contract Administrator will review the Pre-Construction Site Record and ensure that the Site has been restored to its preconstruction state. Any remaining damage shall be repaired by the Contractor at his own expense to the satisfaction of the Contract Administrator.

**D21. WORK BY OTHERS**

D21.1 The Contractor is advised that the laydown area shown on the Drawings has already been constructed by others under the City of Winnipeg Bid Opportunity 711-2015.

D21.2 The City of Winnipeg will secure a building permit for the rehabilitation prior to the Contractor commencing any Work on-Site.

**D22. CRITICAL DATES**

D22.1 The Contractor shall achieve the Critical Dates of the Work in accordance with the following requirements:

- (a) Completion of **Stage 1** by **October 31, 2016**.
- (b) Completion of **Stage 2 (Substantial Performance)** by **October 31, 2017**.

D22.2 The Critical Dates identified in D22.1 are the dates in which the reservoir cells **have been cleaned, accepted by and turned over to, the City of Winnipeg for disinfection** in addition to the completion of the other work items associated with each Stage.

**D23. SUBSTANTIAL PERFORMANCE**

D23.1 The Contractor shall achieve Substantial Performance by **October 31, 2017**.

D23.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D23.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

**D24. TOTAL PERFORMANCE**

D24.1 The Contractor shall achieve Total Performance by **November 15, 2017**.

D24.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D24.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

#### **D25. LIQUIDATED DAMAGES**

D25.1 If the Contractor fails to achieve Critical Dates, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

- (a) Stage 1 – Critical Date listed in D22.1(a) – Five Thousand dollars (\$5000);
- (b) Stage 2 – Critical Date / Substantial Performance listed in D22.1(b) / D23.1 – Five Thousand dollars (\$5000);
- (c) Total Performance – Ten Thousand dollars (\$10,000).

D25.2 The amounts specified for liquidated damages in D25.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.

D25.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

#### **CONTROL OF WORK**

##### **D26. JOB MEETINGS**

D26.1 Regular weekly job meetings will be held at the Contract Administrator's Site Office. These meetings shall be attended by a minimum of one (1) representative of the Contract Administrator, one (1) representative of the City and one (1) representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D26.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

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

D27.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

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

D28.1 Further to B13.5, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B13.5.

##### **D29. LAYOUT OF THE WORK**

D29.1 The Contractor shall be responsible for the true and proper laying out of the Work and for the correctness of the location, levels, dimensions, and alignment of all aspects of the Work. He shall provide all required instruments and competent personnel for performing all layouts.

- D29.2 The Contract Administrator shall be notified at least one (1) Working Day prior to any Work being commenced in order to have the option to check and review all elevations and layouts at his discretion.
- D29.3 The Contractor shall carefully protect and preserve all benchmarks, pins, stakes, and other items of the basic data supplied by the Contract Administrator. Any such benchmarks, pins, or stakes removed or destroyed by the Contractor, without the consent of the Contract Administrator, shall be replaced by the Contract Administrator at the expense of the Contractor.
- D29.4 The Contractor shall arrange and carry on his Work so as not to conflict with the collection of any data in anyway by the Contract Administrator. The Contractor shall adjust Work and/or remove any interference as directed by the Contract Administrator at the expense of the Contractor.

### **D30. REQUEST FOR INFORMATION AND NON-CONFORMANCE REPORTS**

- D30.1 For all Request for Information (RFI's) and Non-Conformance Report (NCR's) submissions, the Contractor shall assume a minimum of forty-eight (48)-hour response time will be required per submission.
- D30.2 The Contractor shall not undertake work associated with these submissions until the Contract Administrator review is completed and responded to in writing.

### **MEASUREMENT AND PAYMENT**

#### **D31. PAYMENT**

- D31.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

### **WARRANTY**

#### **D32. WARRANTY**

- D32.1 Warranty is as stated in C13.
- D32.2 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.
- D32.3 Notwithstanding C13.2, if any law of Manitoba or of the jurisdiction in which the Work was manufactured requires, or if the manufacturer provides, a longer warranty period or a warranty which is more extensive in its nature, then the provisions of such law or manufacturer's warranty shall apply.
- D32.4 Notwithstanding D32.2, the warranties for the following items shall be as indicated in the Specifications:
- (a) Supply and application of EPDM roofing membrane in accordance with E14 and Supplemental Architectural Specifications Section 07 53 23.
  - (b) Metal roof and wall panels in accordance with E14.
  - (c) Bearings in accordance with E18.

**FORM H1: PERFORMANCE BOND**  
(See D14)

KNOW ALL MEN BY THESE PRESENTS THAT

\_\_\_\_\_ ,  
(hereinafter called the "Principal"), and

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

\_\_\_\_\_ dollars (\$\_\_\_\_\_)

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

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

BID OPPORTUNITY NO. 930-2015

WILKES RESERVOIR NORTH CELL REHABILITATION

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

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

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

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

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

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

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ .

SIGNED AND SEALED  
in the presence of:

\_\_\_\_\_  
(Witness as to Principal if no seal)

\_\_\_\_\_  
(Name of Principal)

Per: \_\_\_\_\_ (Seal)

Per: \_\_\_\_\_

\_\_\_\_\_  
(Name of Surety)

By: \_\_\_\_\_ (Seal)  
(Attorney-in-Fact)

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT  
(PERFORMANCE SECURITY)**  
(See D14)

\_\_\_\_\_  
(Date)

The City of Winnipeg  
Legal Services Department  
185 King Street, 3rd Floor  
Winnipeg MB R3B 1J1

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 930-2015  
WILKES RESERVOIR NORTH CELL REHABILITATION

Pursuant to the request of and for the account of our customer,

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

\_\_\_\_\_ Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

\_\_\_\_\_  
(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

All demands for payment shall specifically state that they are drawn under this Standby Letter of Credit.

Subject to the condition hereinafter set forth, this Standby Letter of Credit will expire on

\_\_\_\_\_  
(Date)

It is a condition of this Standby Letter of Credit that it shall be deemed to be automatically extended from year to year without amendment from the present or any future expiry date, unless at least 30 days prior to the present or any future expiry date, we notify you in writing that we elect not to consider this Standby Letter of Credit to be renewable for any additional period.

This Standby Letter of Credit may not be revoked or amended without your prior written approval.

This credit is subject to the Uniform Customs and Practice for Documentary Credit (2007 Revision), International Chamber of Commerce Publication Number 600.

\_\_\_\_\_  
(Name of bank or financial institution)

Per: \_\_\_\_\_  
(Authorized Signing Officer)

Per: \_\_\_\_\_  
(Authorized Signing Officer)

**FORM J: SUBCONTRACTOR LIST**  
 (See D15)

WILKES RESERVOIR NORTH CELL REHABILITATION

<u>PORTION OF THE WORK</u>	<u>SUBCONTRACTOR(S)</u>	
	<b>Supply</b>	<b>Placement/Installation</b>
Site Offices and Washroom Facilities _____		
Security Services _____		
Removal of Existing Building Envelope _____		
Supply New EPDM Membrane _____		
Install New EPDM Membrane _____		
Supply Metal Roof/Wall Panels _____		
Install Metal Roof/Wall Panels _____		
Temperature Monitoring System _____		
Supply/Install New Hollow Core Slabs _____		
Repair of Existing Hollow Core Slabs _____		
Steel Bearing Plates _____		
Elastomeric Bearing Pads _____		
Temporary Jacking and Shoring _____		
Installation of Bearing Assemblies _____		
Wall Expansion Joint Replacement _____		
Concrete Spall Repairs _____		
Gel Injection at Suction Pits _____		
Supply/Install Steel Stairways _____		
Pile Cap F-16 Underpinning _____		
Cell Clean-up _____		

## PART E - SPECIFICATIONS

### GENERAL

#### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm> .

E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 The following Supplemental Architectural Specifications are applicable to the Work:

<u>Specification No.</u>	<u>Specification Title</u>
Section 02 41 16	Structure Selective Demolition
Section 05 50 00	Metal Fabrications
Section 06 10 00	Rough Carpentry
Section 07 21 13	Board Insulation
Section 07 27 00	Air Barriers
Section 07 41 13	Metal Roof Panels
Section 07 42 13	Metal Wall Panels
Section 07 53 23	Ethylene Propylene Diene Monomer Roofing (EPDM)
Section 07 92 00	Joint Sealants

E1.4 The following Drawings are applicable to the Work:

<u>Sheet No.</u>	<u>Drawing No.</u>	<u>Drawing Name/Title</u>
<b>General</b>		
1 of 47	1-0650R-D0002-001	Cover Sheet and Drawing Index
2 of 47	1-0650R-D0003-001	Abbreviations, General Notes, Construction and Scheduling Restrictions
3 of 47	1-0650R-G0001-001	Existing Site Plan
4 of 47	1-0650R-G0002-001	Overall Staging Plan
5 of 47	1-0650R-G0003-001	Stage 1 West Cell – Construction Staging Schedule for Major Items of Work
6 of 47	1-0650R-G0004-001	Stage 2 East Cell – Construction Staging Schedule for Major Items of Work
<b>Civil</b>		
7 of 47	1-0650R-C0004-001	Limits of Crane Pad Area and Miscellaneous Site Work
<b>Structural</b>		
8 of 47	1-0650R-S0001-001	Stage 1 West Cell – Footing and Main Floor Repair Plan, Area “A”
9 of 47	1-0650R-S0002-001	Stage 1 West Cell – Footing and Main Floor Repair Plan, Area “C”
10 of 47	1-0650R-S0003-001	Stage 2 East Cell – Footing and Main Floor Repair Plan, Area “B”
11 of 47	1-0650R-S0004-001	Stage 2 East Cell – Footing and Main Floor Repair Plan, Area “D”

12 of 47	1-0650R-S0005-001	Concrete Repairs – Sections and Details, Sheet 1 of 2, Construction Procedure Notes
13 of 47	1-0650R-S0005-002	Concrete Repairs – Sections and Details, Sheet 2 of 2, Construction Procedure Notes
14 of 47	1-0650R-S0006-001	Concrete Floor Replacement Details
15 of 47	1-0650R-S0007-001	Footing and Wall Joint Replacement – Sections and Details
16 of 47	1-0650R-S0008-001	Overall Stair Access Plans – Stair Access General Notes
17 of 47	1-0650R-S0009-001	Stair Access Platforms – Sections, Sheet 1 of 3
18 of 47	1-0650R-S0009-002	Stair Access Platforms – Sections, Sheet 2 of 3
19 of 47	1-0650R-S0009-003	Stair Access Platforms – Sections, Sheet 3 of 3
20 of 47	1-0650R-S0010-001	Stage 1 West Cell – Bearing Pad Replacement Plan, Area “A”
21 of 47	1-0650R-S0011-001	Stage 1 West Cell – Bearing Pad Replacement Plan, Area “C”
22 of 47	1-0650R-S0012-001	Stage 2 East Cell – Bearing Pad Replacement Plan, Area “B”
23 of 47	1-0650R-S0013-001	Stage 2 East Cell – Bearing Pad Replacement Plan, Area “D”
24 of 47	1-0650R-S0014-001	Stage 1 West Cell – Bearing Plate Replacement Plan, Area “A”
25 of 47	1-0650R-S0015-001	Stage 1 West Cell – Bearing Plate Replacement Plan, Area “C”
26 of 47	1-0650R-S0016-001	Stage 2 East Cell – Bearing Plate Replacement Plan, Area “B”
27 of 47	1-0650R-S0017-001	Stage 2 East Cell – Bearing Plate Replacement Plan, Area “D”
28 of 47	1-0650R-S0018-001	Bearing Plate Mark P-1 Sections and Details – Construction Procedures
29 of 47	1-0650R-S0019-001	Bearing Plate Mark P-2 Sections and Details – Construction Procedures
30 of 47	1-0650R-S0020-001	Bearing Plate Mark P-3 Sections and Details – Construction Procedures
31 of 47	1-0650R-S0021-001	Bearing Plate Mark P-4 Sections and Details – Construction Procedures
32 of 47	1-0650R-S0022-001	Bearing Plate Mark P-5 Sections and Details – Construction Procedures
33 of 47	1-0650R-S0023-001	Stage 1 West Cell – Hollow Core Replacement Plan, Area “A”
34 of 47	1-0650R-S0024-001	Stage 1 West Cell – Hollow Core Replacement Plan, Area “C”
35 of 47	1-0650R-S0025-001	Stage 2 East Cell – Hollow Core Replacement Plan, Area “B”
36 of 47	1-0650R-S0026-001	Stage 2 East Cell – Hollow Core Replacement Plan, Area “D”
37 of 47	1-0650R-S0027-001	Hollow Core Repairs and Replacement, Details and Sections

### Architectural

38 of 47	1-0650R-B0001-001	Stage 1 West Cell – Roof Envelope Rehabilitation Plan, Area “A”
39 of 47	1-0650R-B0002-001	Stage 1 West Cell – Roof Envelope Rehabilitation Plan, Area “C”
40 of 47	1-0650R-B0003-001	Stage 2 East Cell – Roof Envelope Rehabilitation Plan, Area “B”
41 of 47	1-0650R-B0004-001	Stage 2 East Cell – Roof Envelope Rehabilitation Plan, Area “D”
42 of 47	1-0650R-B0005-001	Roof and Wall Envelope Sections and Details, Sheet 1 of 3
43 of 47	1-0650R-B0005-002	Roof and Wall Envelope Sections and Details, Sheet 2 of 3
44 of 47	1-0650R-B0005-003	Roof and Wall Envelope Sections and Details, Sheet 2 of 3
45 of 47	1-0650R-B0006-001	Entrance Building Envelope Replacement and Roof Panel Plan – Sections and Construction Procedures

### Mechanical

46 of 47	1-0650R-M0001-001	Temperature Monitoring Location Plan and General Notes
47 of 47	1-0650R-M0002-001	Temperature Monitoring Section and Details

## E2. REFERENCE REPORTS AND DRAWINGS

- E2.1 The following reports and drawings are available for viewing at the office of the Contract Administrator:
- (a) Wilkes Reservoir North Cell Condition Assessment Part I – Assessment Report – Final Report. Dillon Consulting Limited, July 2014.
  - (b) Wilkes Reservoir North Cell Condition Assessment Part II – Inspection Data and Report – Final Report. Dillon Consulting Limited, August 2014.

(c) Existing Record Drawings of the North Cell construction and rehabilitation.

E2.2 Drawings of the Wilkes Reservoir North Cell Rehabilitation - Construction of Laydown Area (from Bid Opportunity No. 711-2015) are contained in Appendix A, and are supplied for information purposes only.

### **E3. ENVIRONMENTAL PLAN**

E3.1 The Contractor shall be aware that the Wilkes Reservoir facility is for potable water supply and no contamination by fuel, chemicals, etc. shall be permitted at any time. Fuels, chemicals, or any other hazardous substances which may compromise the safety of the potable water supply shall not be stored outside of the area designated by the Contract Administrator.

E3.2 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the environmental protection measures as herein specified.

#### **E3.3 Submittals**

(a) Environmental Protection Plan including:

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

- E3.4 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:
- (a) Workplace Hazardous Material Information System (Hazardous Product Act and Canada Labour Code);
  - (b) Canadian Environmental Protection Act;
  - (c) Canadian Environmental Assessment Act;
  - (d) Transportation of Dangerous Goods Act;
  - (e) Manitoba Environmental Act;
  - (f) The Manitoba Nuisance Act N120;
  - (g) The Public Health Act c.P210;
  - (h) Manitoba Dangerous Goods, Handling, and Transportation Act;
  - (i) The Workplace Safety and Health Act W210; and
  - (j) Current applicable associated regulations.
- E3.5 The Contractor is advised that the following environmental protection measures apply to the Work.
- E3.5.1 Materials Handling and Storage
- (a) Construction materials shall not be stored within 5 m of existing pipe centerlines.
- E3.5.2 Fuel Handling and Storage
- (a) The Contractor shall abide by the regulations of Manitoba Environment for handling and storage of fuel products.
  - (b) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.
  - (c) Fuels, lubricants, and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.
  - (d) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
  - (e) Products transferred from fuel storage area(s) to specific work sites shall not exceed the daily usage requirement.
  - (f) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheets of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill.
  - (g) The area around storage sites and fuel lines shall be distinctly marked and kept clear of snow and debris to allow for routine inspection and leak detection.
  - (h) A sufficient supply of materials such as absorbent material and plastic oil brooms, to clean-up minor spills shall be stored nearby on-Site. The Contractor shall ensure that additional material can be made available on short notice.
  - (i) Where stationary equipment is required to be erected on or within the reservoir dikes, equipment shall be staged on impermeable containment membrane or containment pans of sufficient volume to contain all hazardous fuels and liquids plus a safety factor of fifty percent (50%).
  - (j) Fuelling of stationary equipment shall be completed with portable tanks containing only enough fuel to fill equipment.
- E3.5.3 Waste Handling and Disposal
- (a) The construction area shall be kept clean and orderly at all times during and at completion of construction.

- (b) At no time during construction shall personal or construction waste be permitted to accumulate for more than one (1) day at any location on the construction site, other than at a dedicated storage areas as may be approved by the Contract Administrator.
- (c) Indiscriminate dumping, littering, or abandonment shall not take place.
- (d) Equipment shall not be cleaned near the Reservoir.

#### E3.5.4 Dangerous Goods/Hazardous Waste Handling and Disposal

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

#### E3.5.5 Fires

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

#### E3.5.6 Emergency Spill Response

- (a) The Contractor shall ensure that due care and caution is taken to prevent spills.
- (b) The Contractor shall report all major spills of petroleum products or other hazardous substances with the potential for impacting the environment and threat to human health and safety, including contamination of potable water, to the Contract Administrator and Manitoba Environment, immediately after occurrence of the environmental accident, by calling the twenty-four (24)-hour emergency telephone number 204-945-4888.
- (c) The Contractor shall designate a qualified supervisor as the on-site emergency response coordinator for the project. The emergency response coordinator shall have the authority to redirect manpower in order to respond in the event of a spill.
- (d) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-site emergency response coordinator:
  - (i) Notify emergency-response coordinator of the accident:
    - ◆ Identify exact location and time of accident
    - ◆ Indicate injuries, if any
    - ◆ Request assistance as required by magnitude of accident (Manitoba Environment twenty-four (24)-hour Spill Response Line 204-945-4888, Winnipeg Police Service, Winnipeg Fire Paramedic Service, company backup)
  - (ii) Assess situation and gather information on the status of the situation noting:
    - ◆ Personnel on-Site
    - ◆ Cause and effect of spill
    - ◆ Estimated extent of damage
    - ◆ Amount and type of material involved
    - ◆ Proximity to critical Reservoir infrastructure and other waterlines
  - (iii) If safe to do so, try to stop the dispersion or flow of spill materials:
    - ◆ Approach from upwind
    - ◆ Stop or reduce leak if safe to do so
    - ◆ Dike Spill material with dry, inert absorbent material or dry clay soil or sand
    - ◆ Prevent spill material from entering Reservoir infrastructure and utilities by diking
    - ◆ Prevent spill material from entering drainage manholes and other openings by covering with rubber spill mats or diking

- (iv) Resume any effective action to contain, clean-up, or stop the flow of the spilled product.
- (e) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to the Manitoba Environment according to The Dangerous Goods and Transportation Act Environmental Accident Report Regulation 439/87.

#### E3.5.7 Controlled Products

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

### **E4. SHOP DRAWINGS**

#### E4.1 Description

E4.1.1 This Specification provides instructions for the preparation and submission of shop drawings.

- (a) The term ‘Shop Drawings’ means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, including Site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the Work; and,
- (b) Submit specified Shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be shown on all submissions for Contract Administrator review.

#### E4.2 Shop Drawings

E4.2.1 Original Drawings shall be prepared by Contractor, Subcontractor, supplier, distributor or manufacturer to illustrate appropriate portion of Work including fabrication, layout, setting or erection details as specified in appropriate sections.

E4.2.2 Shop Drawings for the following components shall bear the seal of a Professional Engineer registered in the Province of Manitoba and shall be signed and dated by the Engineer:

- (a) Design and installation of crane pads/mats for all crane works in accordance with D17 and E11.
- (b) Supply and installation of the EPDM roofing membrane in accordance with E14 and Supplemental Architectural Specifications Section 07 53 23.
- (c) Supply and installation of the metal roof panels in accordance with E14 and Supplemental Architectural Specifications Section 07 41 13.
- (d) Supply and installation of the metal wall panels in accordance with E14 and Supplemental Architectural Specifications Section 07 42 13.
- (e) Supply and installation of the temperature monitoring system in accordance with E15.
- (f) Fabrication, delivery and erection of new hollow core slabs in accordance with E16.
- (g) Design, supply, fabrication and assembly of all temporary shoring and jacking frames in accordance with E18.
- (h) Supply and installation of elastomeric bearings in accordance with E18.
- (i) Design, supply, fabrication and installation of steel stairways in accordance with E23.
- (j) Supply, fabrication and installation of steel stairway supports in accordance with E23.

E4.2.3 Notwithstanding, and in addition to E4.2.2, Shop Drawings shall also be submitted for the following components:

- (a) Supply of all reinforcing steel in accordance with E13, E16.7, E17, E20, E21 and E23 for all work activities involving the use of reinforcing steel.
- (b) Supply and installation of miscellaneous metal fabrications and galvanized HSS sleepers in accordance with E14 and Supplemental Architectural Specifications Section 05 50 00.
- (c) Any special joint details for installation of air barrier in accordance with E14 and Supplemental Architectural Specifications Section 07 27 00.
- (d) Repair of the hollow core slabs in accordance with E17.
- (e) Supply and installation of galvanized steel bearing plates and column shim plates in accordance with E18.
- (f) Supply and installation of the replacement wall expansion joint assembly in accordance with E19.

#### E4.3 Contractor's Responsibilities

- (a) Review Shop Drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.
- (b) Verify:
  - (i) Field Measurements;
  - (ii) Field Construction Criteria; and,
  - (iii) Catalogue numbers and similar data.
- (c) Coordinate each submission with requirements of Work and Contract Documents. Individual Shop Drawings will not be reviewed until all related drawings are available.
- (d) Notify Contract Administrator, in writing at time of submission, of deviations from requirements of Contract Documents.
- (e) Responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review of submission, unless Contract Administrator gives written acceptance of specified deviations.
- (f) Responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
- (g) Make any corrections required by the Contract Administrator and resubmit corrected copies of Shop Drawings. Direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Contract Administrator on previous submission.
- (h) After Contract Administrator's review and return of copies, distribute copies to Subcontractors and others as appropriate.
- (i) Maintain one (1) complete printed paper set of reviewed Shop Drawings, filed by Specification Section Number, at the Site of the Work for use and reference of the Contract Administrator and Subcontractors.

#### E4.4 Submission Requirements

- (a) Schedule submissions at least fourteen (14) Calendar Days before dates reviewed submissions will be needed, and allow for a fourteen (14) Calendar Day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
- (b) Submit PDF copies of Shop Drawings.
- (c) Accompany submissions with transmittal/cover letter containing:
  - (i) Date
  - (ii) Project title and Bid Opportunity number
  - (iii) Contractor's name and address
  - (iv) Number of each Shop Drawing, product data and sample submitted

- (v) Specification Section, Title, Number and Clause
- (vi) Drawing Number and Detail / Section Number
- (vii) Other pertinent data
- (d) Submissions shall include:
  - (i) Date and revision dates
  - (ii) Project title and Bid Opportunity number
  - (iii) Name of:
    - (i) Contractor
    - (ii) Subcontractor
    - (iii) Supplier
    - (iv) Manufacturer
    - (v) Detailer (if applicable)
  - (iv) Identification of product or material
  - (v) Relation to adjacent structure or materials
  - (vi) Field dimensions, clearly identified as such
  - (vii) Specification section name, number and clause number or drawing number and detail / section number
  - (viii) Applicable standards, such as CSA or CGSB numbers
  - (ix) Contractor's stamp, initialled or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents

#### E4.5 Other Considerations

- (a) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
- (b) Material and equipment delivered to the Site of the Works will not be paid for at least until pertinent Shop Drawings have been submitted and reviewed.
- (c) Incomplete Shop Drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.
- (d) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions and review of Shop Drawings.

### **E5. EXPEDITED SHOP DRAWINGS**

- E5.1 In order to expedite Shop Drawings with critical timeliness, the Lowest Responsive Bidder will be permitted, after receiving written approval from the Contract Administrator, to arrange for the preparation of Shop Drawings for the following items with critical timelines:
  - (a) All items requiring Shop Drawings listed in E4.
- E5.2 If Award is made to the Lowest Responsive Bidder, then no specific payment for the preparation of Shop Drawings will be made.
- E5.3 If no contract is awarded, then the City of Winnipeg will pay the requested Bidder up to a maximum of fifteen thousand dollars (\$15,000.00) for the complete set of requested submissions noted above, for the preparation and delivery of Shop Drawings. Delivery of the Shop Drawings to the City and payment of the above amounts will constitute full and final consideration of each party to the other, and neither party will have any further liability to the other with respect to this Bid Opportunity.

### **E6. VERIFICATION OF WEIGHTS**

- E6.1 All material which is paid for on a weight basis shall be weighed on a scale certified by Consumer & Corporate Affairs, Canada.

- E6.1.1 All weight tickets shall have the gross weight and the time and date of weighing printed by an approved electro/mechanical printer coupled to the scale.
- E6.1.2 The tare weight and net weight may either be hand written or machine printed. All weights, scales and procedures shall be subject to inspection and verification by the Contract Administrator. Such inspection and verification may include, but shall not be limited to:
- (a) Checking Contractor's scales for Consumer & Corporate Affairs certification seals.
  - (b) Observing weighing procedures.
  - (c) Random checking of either gross or tare weights by having such trucks or truck/trailer(s) combinations as the Contract Administrator shall select weighed at the nearest available certified scale.
  - (ii) Checking tare weights shown on delivery tickets against a current tare.
- E6.1.3 No charge shall be made to The City for any delays or loss of production caused by such inspection and verification.
- E6.2 The Contractor shall ensure that each truck or truck/trailer(s) combination delivering material which is paid for on a weight basis carries a tare not more than one (1) month old.
- E6.2.1 The tare shall be obtained by weighing the truck or truck/trailer(s) combination on a certified scale and shall show:
- (a) Upon which scale the truck or truck/trailer(s) combination was weighed.
  - (b) The mechanically printed tare weight.
  - (c) The license number(s) of the truck and trailer(s).
  - (d) The time and date of weighing.

## **E7. WATER OBTAINED FROM THE CITY**

- E7.1 Further to Clause 3.7 of CW-1120, the Contractor shall pay for all costs, including sewer charges, associated with obtaining water from the City in accordance with the Waterworks and Sewer By-laws.

## **E8. SECURITY AND ACCESS TO RESERVOIR SITE**

- E8.1 Description
- E8.1.1 This Section describes the security requirements and access restrictions at the Wilkes Reservoir facility.
- E8.1.2 The Wilkes Reservoir facility is a critical component of the City of Winnipeg Water Supply System. Work at, and in close proximity to the Reservoir and surrounding piping shall be undertaken with an abundance of caution.
- E8.2 General Consideration for Work Within the Wilkes Reservoir Facility
- E8.2.1 The Wilkes Reservoir facility contains numerous water conduits that are critical components of the City of Winnipeg Water Supply. Work around any of these pipelines shall be well planned and executed to ensure that the pipelines are not subjected to construction related loads, including excessive vibrations and concentrated or asymmetrical lateral loads during backfill placement.
- E8.2.2 Under no circumstances will traffic or equipment be permitted on the buried Wilkes Reservoir structure, embankment slopes, or adjacent valve chambers unless stated otherwise in the Specifications.
- E8.2.3 Employees of the Contractor or any Subcontractor that fail to comply with the conditions for working at the Site shall be promptly removed from the Site.

- E8.2.4 The Contractor shall obtain the security clearances specified in D10. Any personnel not meeting the requirements of D10 shall be promptly removed from the Site and not allowed to return to the Site until the requirements of D10 have been satisfied.
- E8.2.5 The main access to the Reservoir shall be through the laydown area. A manual vehicle access gate is provided on the south side of the laydown area for access from Willson Place. A manual vehicle access gate and a manual pedestrian access gate is provided on the north side for access into the secured area of the Reservoir.
- E8.3 Keys and Access to Reservoir
- E8.3.1 The Contractor will be issued keys for access to Site under the following conditions:
- (a) The Contractor shall provide the name and contact information for the person in charge and responsible for the Site.
  - (b) The Contractor is to coordinate with the City of Winnipeg on the number of keys that will be required for the Contractor's employees and Subcontractors.
  - (c) The Contractor is to return all keys prior to Substantial Performance (Stage 2 Critical Date). On return of all keys including damaged keys, a ten thousand dollar (\$10,000.00) holdback will be released. The Contractor is advised that the holdback will **not** be released after the completion of Stage 1.
  - (d) The Contractor is to immediately report any lost keys and return any damaged or non-functioning keys for replacement.
- E8.4 Site Security
- E8.4.1 The Contractor shall provide a security guard stationed at the north access gate of the laydown area off Willson Place during working hours. The guard shall be from a bonded security company and shall be responsible for validating the security clearances of all personnel accessing the Site.
- E8.4.2 The Contractor shall be responsible for providing all facilities, including shelter and toilet facilities, as required for the security personnel.
- E8.4.3 The Contractor is required to take measures necessary to secure the Work areas when the Work areas are vacated. When security personnel and crews are not within visual range of Reservoir access gates, the gates shall be closed and locked.
- E8.4.4 On a daily basis during the course of Work, the Contractor shall communicate with the **City of Winnipeg Deacon Control Centre at 204-986-4781** at the beginning of working hours and at the end of working hours, as to the status of the Site security, and in particular, when the Contractor staff leaves the Site.
- E8.4.5 The Contractor is not required to provide security services when not on-Site.
- E8.5 Measurement and Payment
- E8.5.1 Security and Access to Reservoir Site will be considered incidental to E10 "Mobilization and Demobilization" and no additional measurement or payment will be made.

## E9. SITE OFFICE FACILITIES

- E9.1 The Contractor shall supply office facilities meeting the following requirements for the duration of the project:
- (a) The field office shall be for the exclusive use of the Contract Administrator.
  - (b) The building shall be located in the designated location within the laydown area as shown on the Drawings.
  - (c) The building shall have a minimum floor area of 25 m<sup>2</sup>, a height of 2.4 m with two (2) windows for cross ventilation and a door entrance with a suitable lock.

- (d) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between 16-18°C or 24-25°C.
- (e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.
- (f) The building shall be equipped with one telephone and two separate land lines for the telephone and a facsimile machine.
- (g) The building shall be equipped with dedicated high-speed internet service, through DSL, cable or other as accepted by the Contract Administrator.
- (h) The building shall be furnished with two desks, one table 3 m x 1.2 m, one drafting table, one four drawer legal size filing size filing cabinet with lock, and a minimum of ten (10) chairs
- (i) The building shall be equipped with small fridge, microwave, water cooler with disposable cups and coffee maker.
- (j) A portable toilet shall be located near the field office building. The toilet shall have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.
- (k) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each site meeting. The Contract Administrator may request additional cleaning when he/she deems it necessary.

E9.2 The site office facilities shall be located at the Site within one (1) week of the Contractor mobilizing to the Site.

E9.3 The Contractor shall be responsible for all installation and removal costs, all operating costs including coordination, hook-up and operating costs of any utilities, and the general maintenance of the office facilities.

E9.4 Measurement and Payment

E9.4.1 Site office facilities will be considered incidental to E10 "Mobilization and Demobilization" and no additional measurement or payment will be made.

## **E10. MOBILIZATION AND DEMOBILIZATION**

E10.1 Description

E10.1.1 This Specification shall cover all operations relating to the mobilization and demobilization of the Contractor to the Site, as specified herein.

E10.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all works hereinafter specified.

E10.2 Scope of Work

E10.2.1 The Work under this Specification shall include but not be limited to:

- (a) Obtaining security clearances for all personnel working on-Site in accordance with D10.
- (b) Pre-Construction Record Meetings in accordance with D20.
- (c) Security services at the laydown area north gate during work hours in accordance with E8.
- (d) Mobilizing and demobilizing on-site Work facilities.
- (e) Supply and installation of temporary snow fence.

- (f) Supply, set up, and removal of site office facilities as specified in E9.
- (g) Supply and installation of temporary works to allow access for personnel and materials/equipment into the cells.
- (h) Supply and installation of protection measures for sensitive Reservoir infrastructure.
- (i) Utility locates.
- (j) Cell cleaning prior to disinfection.
- (k) Restoration of existing facilities and other miscellaneous site work not covered in E11.

### E10.3 References

- E10.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
- (a) City of Winnipeg's Specification CW-1120 (latest edition) – Existing Services, Utilities and Structures.
  - (b) City of Winnipeg's Specification CW-1130 (latest edition) – Site Requirements.
  - (c) City of Winnipeg's Specification CW-3550 (latest edition) – Chain Link and Drift Control Fence.
  - (d) D10 Criminal Record Search Certificate and Public Verification Check
  - (e) D20 Damage to Existing Structures and Property
  - (f) E8 Security and Access to Reservoir Site
  - (g) E9 Site Office Facilities

### E10.4 Materials

- E10.4.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification. All materials are to be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.
- E10.4.2 All materials supplied under this Specification shall be of a type approved by the Contract Administrator and shall be subject to inspection and testing by the Contract Administrator.
- E10.4.3 The Contractor's Site supervisor is required to carry, at all times, a cellular telephone, with voice mail.
- E10.4.4 The Contractor shall provide suitable portable toilet facilities on-Site for his use. The Wilkes Reservoir Pumping Station will not be available for washroom use.
- E10.4.5 This section also includes travel and accommodation, set-up and demobilization of Site offices, storage conveniences and other temporary facilities, construction plant, and other items not required to form part of the permanent works and not covered by other prices.

### E10.5 Equipment

- E10.5.1 All equipment shall be of a type acceptable to the Contract Administrator, shall conform to any requirements listed in these Specifications or on the Drawings for the type of work being performed, and shall be kept in good working order.

### E10.6 Temporary Snow Fence

- E10.6.1 The Contractor shall install temporary snow fencing, otherwise known as drift control fencing, in accordance with CW-3550 along the east side of the 1500 mm dia. by-pass pipe. The purpose of the snow fence is to ensure that personnel and equipment maintain a safe working distance from the 1500 mm dia. by-pass pipe. The snow fence shall run parallel with the by-pass pipe from the laydown area to the northern limits of the existing chain link fence.
- E10.6.2 The snow fencing shall be installed a minimum of 5 m to the east side of the 1500 mm dia. by-pass pipe centreline.

- E10.6.3 The Contractor shall install temporary snow fencing around utilities and other critical Reservoir infrastructure components as directed by the Contract Administrator.
- E10.6.4 The Contractor will not be permitted to commence any other Work activities until the snow fence is in place.
- E10.6.5 The Contractor shall ensure that the snow fence remains in a good, working condition throughout the Works and shall immediately repair any damage to the temporary security fence upon discovery of damage.
- E10.7 Protection Measures for Sensitive Reservoir Infrastructure
- E10.7.1 The Wilkes Reservoir facility contains numerous pieces of infrastructure that are critical components of the City of Winnipeg Water Supply. Work at the Reservoir shall be well planned and executed to ensure that any structurally sensitive infrastructure, such as buried piping, is not subjected to construction related loads, including excessive vibrations and asymmetrical lateral loads.
- E10.7.2 The Contractor shall protect the sensitive components in strict accordance with the Drawings. Generally, the components requiring protection include, but are not limited to:
- (a) Existing reservoir equipment hatch covers;
  - (b) Cell interface separation wall;
  - (c) Suction intakes;
  - (d) Floor drains; and,
  - (e) Any other components indicated on the Drawings or as directed by the Contract Administrator.
- E10.7.3 All materials and protection systems installed shall be removed as part of the final clean-up unless they are to form a part of the permanent Work.
- E10.8 Personnel / Equipment / Material Access into Reservoir Cells
- E10.8.1 Personnel access into the Reservoir Cells shall be provided with scaffolding at the locations designated on the Drawings. The Contractor shall be responsible for ensuring that the scaffolding stairway meets all applicable Workplace Health and Safety requirements.
- E10.8.2 The Contractor shall supply and install temporary equipment access hatch covers, scaffolding stairway, timber frame flooring and enclosures at the scaffolding stairway location, and any other temporary items indicated on the Drawings.
- E10.8.3 Equipment and material access into the Reservoir Cells shall be solely through the equipment access hatches in accordance with the Drawings.
- E10.8.4 The Contractor may provide access holes through hollow core slabs to be replaced or strengthened for running power, air hoses, etc. in accordance with the Drawings. The Contractor shall submit the locations of all proposed access holes to the Contract Administrator for approval prior to constructing any access holes on-Site.
- E10.9 Utility Locates
- E10.9.1 The Contractor shall be responsible for contacting the appropriate Utility Authorities to locate all utilities prior to commencing any excavation works, or any other works that may potentially damage buried utilities.
- E10.9.2 The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations, as determined by the Contract Administrator.
- E10.10 Restoration of Existing Facilities

E10.10.1 Upon completion of the Work and demobilization, the Contractor shall restore the Site in accordance with D20. The Contractor shall be fully responsible to restore the project Site to the original, documented conditions prior to construction, unless as approved by the Contract Administrator.

#### E10.11 Quality Control

##### E10.11.1 Inspection

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

##### E10.11.2 Access

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

#### E10.12 Measurement and Payment

E10.12.1 Mobilization and demobilization will not be measured and will be paid for at the Contract Lump Sum Price for "Mobilization and Demobilization", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E10.12.2 Mobilization and demobilization will be paid for at a percentage of the Contract Lump Sum Price, measured as specified herein. These percentages shall be as follows:

- (a) 30% when the Contract Administrator is satisfied that construction has commenced.
- (b) 30% at the Stage 1 Critical Date.
- (c) 30% at the Stage 2 Critical Date/Substantial Performance.
- (d) 10% upon completion of the Project.

### **E11. SITE WORKS**

#### E11.1 Description

E11.1.1 This Specification shall cover all operations related to the miscellaneous site works specified herein and shown on the Drawings.

E11.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all site works as hereinafter specified.

#### E11.2 Scope of Work

E11.2.1 The Work under this Specification shall include, but not be limited to:

- (a) Design, supply, and installation of all crane pads necessary to complete the works.
- (b) Removal of timber crane mats off-Site upon the completion of all crane works.

- (c) Supply and installation of separation geotextile fabric at the designated granular disposal area.
- (d) Disposal of the granular material from all crane mat construction at the designated granular disposal area shown on the Drawings.

### E11.3 References

- E11.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
  - (a) City of Winnipeg's Specification CW-3130 (latest edition) – Supply and Installation of Geotextile Fabrics.
  - (b) D17 Construction Method Statement.

### E11.4 Submittals

- E11.4.1 The Contractor shall submit Shop Drawings sealed, signed and dated by a Professional Engineer licensed to practice in the Province of Manitoba for all crane pads necessary to complete the works in accordance with D17 and E4/E5.

### E11.5 Equipment

- E11.5.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

### E11.6 Measurement and Payment

- E11.6.1 Site works will be considered incidental to E10 "Mobilization and Demobilization" and no additional measurement or payment will be made.

## **E12. STRUCTURAL CONCRETE**

### E12.1 Description

- E12.1.1 This Specification outlines the requirements for any structural concrete to be used in the Works unless specified otherwise.

### E12.2 References

- E12.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
  - (a) ASTM C131/C131M – Standard Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - (b) ASTM C260/C260M – Standard Specification for Air-Entraining Admixtures for Concrete.
  - (c) ASTM C494/C494M – Standard Specification for Chemical Admixtures for Concrete.
  - (d) ASTM C1017/C1017M – Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
  - (e) CAN/CSA A23.1 – Concrete Materials and Methods of Concrete Construction.
  - (f) CAN/CSA A3000 – Cementitious Materials Compendium.

### E12.3 Submittals

#### E12.3.1 Concrete Mix Design

- (a) The Contractor shall submit a concrete mix design statement to the Contract Administrator that reflects the specified performance properties of the concrete. The mix design statement shall contain all the information as outlines on the concrete mix design statement as shown on the Manitoba Ready Mix Concrete Association website ([www.mrmca.com](http://www.mrmca.com)). In addition, the mix design statement must indicate the expected

method of placement (buggies, chute, or pump) methods are to be used; the method of placement must include a clear description of the pumping methods (line, vertical drop, length of hose, etc.).

- (b) The Supplier shall submit directly, in confidence, to the City of Winnipeg, the concrete mix designs for the concrete type specified herein. The purpose of this confidential submission will be for record keeping purposes and may be used as information related to supplementary testing and investigation of suspected defective concrete. The City of Winnipeg will advise the Supplier if the information needs to be released to third parties. The concrete mix design shall contain a description of the constituents and proportions, and at the minimum the following:
- (i) Cementitious content in kilograms per cubic metre or equivalent units, and type of cementitious materials;
  - (ii) Designated size, or sizes, of aggregates, and the gradation;
  - (iii) Aggregate source location(s);
  - (iv) Weights of aggregates in kilograms per cubic metre or equivalent units. Mass of aggregates is saturated surface dry basis;
  - (v) Maximum allowable water content in kilograms per cubic metre or equivalent units and the water/cementitious ratio;
  - (vi) The limits for slump;
  - (vii) The limits for air content; and,
  - (viii) Quantity of other admixtures.
- (c) The concrete mix design statement must be received by the Contract Administrator a minimum of ten (10) Business Days prior to the scheduled commencement of concrete placement. The concrete mix design must be received by the City of Winnipeg a minimum of five (5) Business Days prior to the scheduled commencement of concrete placement.
- (i) The mix design statement shall also include the expected slump measurement. The tolerances for acceptance of slump measurements in the field, by the Contract Administrator, shall be in accordance to CAN/CSA A23.1 Clause 4.3.2.3.2.
  - (ii) Any change in the constituent materials of any approved mix design shall require submission of a new concrete mix design statement, mix design, and mix design test data. If, during the progress of the Work, the concrete supplied is found to be unsatisfactory for any reason, including poor workability, the Contract Administrator may require the Contractor to make any necessary adjustments and associated resubmissions.

#### E12.4 Materials

E12.4.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

#### E12.4.2 Handling and Storage of Materials

- (a) All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CAN/CSA A23.1.

#### E12.4.3 Testing and Approval

- (a) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.

- (b) All materials shall be approved by the Contract Administrator at least seven (7) days before any construction is undertaken. If, in the opinion of the Contract Administrator, such materials in whole or in part, do not conform to the Specifications detailed herein or are found to be defective in manufacture or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

#### E12.4.4 Cement

- (a) Cement shall be Type HS or HSb, high-sulphate-resistant hydraulic cement, conforming to the requirements of CAN/CSA A23.1.

#### E12.4.5 Concrete

- (a) The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this specification. Ready mix concrete shall have the following minimum properties in accordance with CAN/CSA A23.1.
  - (i) Class of Exposure: S-1
  - (ii) Compressive Strength @ 56 days = 35 MPa
  - (iii) Water / Cementing Materials Ratio = 0.4
  - (iv) Air Content: Category 2 per Table 4 of CAN/CSA A23.1 (4-7%)
  - (v) Cement – shall be as specified in E12.4.4.
- (b) Mix design for ready mix concrete shall be submitted to Contract Administrator at least two (2) weeks prior to concrete placing operations.
- (c) The workability of each concrete mix shall be consistent with the Contractor's placement operations.
- (d) The temperature of the concrete shall be between 15°C and 25°C at discharge. Temperature requirements for concrete containing silica fume shall be between 10°C and 18°C at discharge unless otherwise approved by the Contract Administrator.
- (e) Concrete materials susceptible to frost damage shall be protected from freezing.

#### E12.4.6 Coarse Aggregate

- (a) The Contractor shall be responsible for testing the coarse aggregates to establish conformance to these specifications, and the results of these tests shall be provided to the Contract Administrator if requested. All aggregates shall comply with CAN/CSA A23.1.
- (b) The maximum nominal size of coarse aggregate shall be sized to suit the Contractor's mix design. Gradation shall be in accordance with CAN/CSA A23.1, Table 11, Group 1. The coarse aggregate shall satisfy the Standard Requirements specified in CAN/CSA A23.1, Table 12, "Concrete Exposed to Freezing and Thawing".
- (c) Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter or other injurious substances. Coarse aggregate shall be clean and free from alkali, organic or other deleterious matter; and shall have an absorption not exceeding 2.25%.
- (d) The aggregate retained on the 5 mm sieve shall consist of clean, hard, tough, durable, angular particles with a rough surface texture, and shall be free from organic material, adherent coatings of clay, clay balls, and excess of thin particles or any other extraneous material.
- (e) Coarse aggregate when tested for abrasion in accordance with ASTM C131 shall not have a loss greater than thirty percent (30%).
- (f) Tests of the coarse aggregate shall not exceed the limits for standard for requirements prescribed in CAN/CSA A23.1, Table 12, for concrete exposed to freezing and thawing.

#### E12.4.7 Fine Aggregate

- (a) The Contractor shall be responsible for testing the fine aggregates to establish conformance to these specifications, and the results of these tests shall be provided to the Contract Administrator if requested. All aggregates shall comply with CAN/CSA A23.1.
- (b) Fine aggregate shall meet the grading requirements of CAN/CSA A23.1, Table 10, Gradation FA1.
- (c) Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam, or other deleterious substances.
- (d) Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CAN/CSA A23.1, Table 12.

#### E12.4.8 Cementing Materials

- (a) Cementing materials shall conform to the requirements of CAN/CSA A3001.
- (b) Silica Fume
  - (i) Should the Contractor choose to include silica fume in the concrete mix design, it shall not exceed eight percent (8%) by mass of cement.
- (c) Fly Ash
  - (i) Fly ash shall be Type C1 or Type F and shall not exceed twenty-five percent (25%) by mass of cement.
- (d) Cementitious materials shall be stored in a suitable weather-tight building that shall protect these materials from dampness and other destructive agents. Cementitious materials that have been stored for a length of time resulting in the hardening or formation of lumps shall not be used in the Work.

#### E12.4.9 Admixtures

- (a) Air entraining admixtures shall conform to the requirements of ASTM C260.
- (b) Chemical admixtures shall conform to the requirements of ASTM C494 or C1017 for flowing concrete.
- (c) All admixtures shall be compatible with all other constituents. The addition of calcium chloride, accelerators, and air-reducing agents will not be permitted, unless otherwise approved by the Contract Administrator.
- (d) Appropriate low range water reducing and/or superplasticizing admixtures shall be used in concrete containing silica fume. Approved retarders or set controlling admixtures may be used for concrete containing silica fume.

#### E12.4.10 Water

- (a) Water used for mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. It shall be equal to potable water in physical and chemical properties.

#### E12.4.11 Concrete Supply

- (a) Concrete shall be proportioned, mixed, and delivered in accordance with the requirements of CAN/CSA A23.1, except that the transporting of ready mixed concrete in non-agitating equipment will not be permitted unless prior written approval is received from the Contract Administrator.
- (b) Unless otherwise directed by the Contract Administrator, the discharge of ready mixed concrete shall be completed within ninety (90) minutes after the introduction of the mixing water to the cementing materials and aggregates.
- (c) The Contractor shall maintain all equipment used for handling and transporting the concrete in a clean condition and proper working order.

#### E12.5 Quality Control

- E12.5.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.
- E12.5.2 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

### **E13. REINFORCING STEEL**

#### **E13.1 Description**

- E13.1.1 This Specification outlines the requirements for any reinforcing steel to be used in the works unless specified otherwise.

#### **E13.2 References**

- E13.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
- (a) CAN/CSA G30.18 – Carbon Steel Bars for Concrete Reinforcement.
  - (b) Reinforcing Steel Institute of Canada (RSIC), Manual of Standard Practice.

#### **E13.3 Submittals**

- E13.3.1 The Contractor shall submit Shop Drawings (including bar lists) in accordance with E4/E5 and the latest edition of the Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada (RSIC) for any works requiring reinforcing.

#### **E13.4 Materials**

- E13.4.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.
- E13.4.2 Handling and Storage of Materials
- (a) All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CAN/CSA A23.1.
- E13.4.3 Testing and Approval
- (a) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.
  - (b) All materials shall be approved by the Contract Administrator at least seven (7) days before any construction is undertaken. If, in the opinion of the Contract Administrator, such materials in whole or in part, do not conform to the Specifications detailed herein or are found to be defective in manufacture or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.
- E13.4.4 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.
- E13.4.5 Reinforcing steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.
- E13.4.6 All reinforcing steel shall conform to the requirements of CAN/CSA Standard G30.18, Grade 400 W, Carbon Steel Bars for Concrete Reinforcement.

### E13.5 Quality Control

- E13.5.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.
- E13.5.2 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

## E14. REMOVAL AND REPLACEMENT OF BUILDING ENVELOPE

### E14.1 Description

- E14.1.1 This Specification shall cover all operations related to the removal and disposal of the existing building envelope and the supply, fabrication, delivery, and placement of the new reservoir building envelope as specified herein and as shown on the Drawings.
- E14.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

### E14.2 Scope of Work

- E14.2.1 The Work under this Specification shall include, but not be limited to:
- (a) Removal of the existing paving slabs, rigid insulation, protection board and ethylene propylene diene monomer (EPDM) membrane.
  - (b) Supply and installation of new roofing membrane and insulation and all associated hardware.
  - (c) Supply and installation of metal roof panels including all sleepers, supports, anchors, and any other hardware necessary for panel installation.
  - (d) Supply and installation of metal wall panels including all sleepers, supports, anchors, and any other hardware necessary for panel installation.
  - (e) Coring of roof panels for survey point access.

### E14.3 References

- E14.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
- (a) CAN/CSA – G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
  - (b) CAN/CSA G 164, Hot Dip Galvanizing of Irregularly Shaped Articles.
  - (c) D18 Construction Method Statement.
  - (d) Supplemental Architectural Specifications Section 02 41 16 Structure Selective Demolition.
  - (e) Supplemental Architectural Specifications Section 05 50 00 Metal Fabrications.
  - (f) Supplemental Architectural Specifications Section 07 21 13 Board Insulation.
  - (g) Supplemental Architectural Specifications Section 07 27 00 Air Barriers.
  - (h) Supplemental Architectural Specifications Section 07 53 23 Ethylene Propylene Diene Monomer (EPDM) Roofing Membrane.

#### E14.4 Equipment

E14.4.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

#### E14.5 Submittals

##### E14.5.1 EPDM Membrane

(a) Submittals for ethylene propylene diene membrane (EPDM) shall conform to the requirements of Supplemental Architectural Specifications Section 07 53 23.

##### E14.5.2 Metal Fabrications

(a) Submittals for drip plates and rods shall conform to the requirements of Supplemental Architectural Specifications Section 05 50 00.

(b) The Contractor shall submit shop drawings for all HSS galvanized steel sleepers to the Contract Administrator for approval.

##### E14.5.3 Board Insulation

(a) Submittals for board insulation shall conform to the requirements of Supplemental Architectural Specifications Section 07 21 13.

##### E14.5.4 Air Barriers

(a) Submittals for air barriers shall conform to the requirements of Supplemental Architectural Specifications Section 07 27 00.

##### E14.5.5 Metal Roof Panels

(a) Submittals for metal roof panels shall conform to the requirements of Supplemental Architectural Specifications Section 07 41 13.

(b) Notwithstanding and in addition to Supplemental Architectural Specifications Section 07 41 13, the Shop Drawings for the metal roof panels shall be stamped, signed, and dated by a Professional Engineer registered or licensed to work in the Province of Manitoba.

##### E14.5.6 Metal Wall Panels

(a) Submittals for metal wall panels shall conform to the requirements of Supplemental Architectural Specifications Section 07 42 13.

(b) Notwithstanding and in addition to Supplemental Architectural Specifications Section 07 42 13, the Shop Drawings for the metal wall panels shall be stamped, signed, and dated by a Professional Engineer registered or licensed to work in the Province of Manitoba.

#### E14.6 Materials

##### E14.6.1 EPDM Membrane

(a) Supply of ethylene propylene diene membrane (EPDM) shall conform to the requirements of Supplemental Architectural Specifications Section 07 53 23.

##### E14.6.2 Metal Fabrications

(a) Supply and fabrication of drip plates and rods shall conform to the requirements of Supplemental Architectural Specifications Section 05 50 00.

(b) HSS steel sleepers shall be in accordance with the latest edition of CAN/CSA G40.21, Grade 350W and hot-dip galvanized after fabrication in accordance with CAN/CSA G164 to a minimum zinc retention of 610 g/m<sup>2</sup>.

##### E14.6.3 Board Insulation

(a) Supply of board insulation shall conform to the requirements of Supplemental Architectural Specifications Section 07 21 13.

- E14.6.4 Air Barriers
- (a) Supply of air barriers shall conform to the requirements of Supplemental Architectural Specifications Section 07 27 00.
- E14.6.5 Metal Roof Panels
- (a) Supply of metal roof panels shall conform to the requirements of Supplemental Architectural Specifications Section 07 41 13.
- E14.6.6 Metal Wall Panels
- (a) Supply of metal wall panels shall conform to the requirements of Supplemental Architectural Specifications Section 07 42 13.
- E14.7 Construction Methods
- E14.7.1 Removal and replacement of building envelope shall be performed in strict accordance with the procedures specified on the Drawings.
- E14.7.2 EPDM Membrane
- (a) Installation of ethylene propylene diene membrane (EPDM) shall conform to the requirements of Supplemental Architectural Specifications Section 07 53 23.
- E14.7.3 Board Insulation
- (a) Installation of board insulation shall conform to the requirements of Supplemental Architectural Specifications Section 07 21 13.
- E14.7.4 Air Barriers
- (a) Installation of air barriers shall conform to the requirements of Supplemental Architectural Specifications Section 07 27 00.
- E14.7.5 Metal Roof Panels
- (a) Installation of metal roof panels shall conform to the requirements of Supplemental Architectural Specifications Section 07 41 13.
- E14.7.6 Metal Wall Panels
- (a) Installation of metal wall panels shall conform to the requirements of Supplemental Architectural Specifications Section 07 42 13.
- E14.8 Warranty
- E14.8.1 EPDM Membrane
- (a) Warranty for supply and application of the ethylene propylene diene membrane (EPDM) shall conform to the "Warranty" requirements of Supplemental Architectural Specifications Section 07 53 23.
- E14.8.2 Metal Roof/Wall Panels
- (a) Notwithstanding, and in addition to, Supplemental Architectural Specifications Section 07 41 13 and Section 07 42 13, the panel Manufacturer shall, at a minimum, provide a written Warranty as follows:
    - (i) Coating performance – minimum of twenty-five (25)-year Warranty.
    - (ii) Thermal performance – minimum of twenty-five (25)-year Warranty.
    - (iii) Structural performance – minimum of twenty-five (25)-year Warranty.
  - (b) The written Warranty shall cover, but not be limited to, any defects attributable to defective materials affecting the performances identified in E14.8.2(a)(i) to E14.8.2(a)(iii) for the respective specified Warranty period from the date of issue of the Certificate of Total Performance.

- (c) The metal roof/wall panel installer shall, at a minimum, provide a written Warranty against defects attributable to faulty installation for a period of five (5) years from the date of issue of the Certificate of Total Performance.

#### E14.9 Measurement and Payment

- E14.9.1 Removal and Replacement of Building Envelope will not be measured and will be paid for at the Contract Lump Sum Price for "Removal and Replacement of Building Envelope", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

### **E15. TEMPERATURE MONITORING SYSTEM**

#### E15.1 Description

- E15.1.1 This Specification shall cover all operations related to the supply of all material, labour, plant and equipment required to complete the temperature monitoring system as specified on the Drawings.

#### E15.2 Scope of Work

- E15.2.1 The Work under this Specification shall include, but not be limited to:
  - (a) Supply and installation of a temperature monitoring system.

#### E15.3 Submittals

- E15.3.1 The Contractor shall submit the following to the Contract Administrator:
  - (a) Shop drawings for all temperature monitoring system components indicating the types and locations of all equipment, sensors, etc. to be permanently installed in accordance with E4/E5. Shop drawings shall be stamped, signed, and dated by a Professional Engineer licensed to practice or work in the Province of Manitoba.
  - (b) Manufacturer specification sheets for all equipment, sensors, etc. to be permanently installed.

#### E15.4 Equipment

- E15.4.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

#### E15.5 Materials

- (a) Supply and installation of all materials shall be in accordance with the Drawings.

#### E15.6 Measurement and Payment

- E15.6.1 Temperature Monitoring System will not be measured and will be paid for at the Contract Lump Sum Price for "Temperature Monitoring System", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

### **E16. REPLACEMENT OF HOLLOW CORE SLABS**

#### E16.1 Description

- E16.1.1 This Specification shall cover all operations related to the supply of all material, labour, plant and equipment required to complete the replacement of existing reservoir roof hollow core slabs as specified on the Drawings.

#### E16.2 Scope of Work

- E16.2.1 The Work under this Specification shall include, but not be limited to:

- (a) Design, supply of all materials, fabrication, delivery and erection of prestressed hollow core slabs as shown on the Drawings including any hardware necessary for proper placement of the slabs.
- (b) Design, fabrication, and installation of a system to lift and move the existing and new hollow core slabs into and out of place.
- (c) Replacement of hollow core slabs in the West and East Cells as shown on the Drawings.
- (d) Replacement shall include, but not be limited to, cutting roof membrane to expose slab, cutting free slab marked for replacement, removing and disposing of old slab, placement of new slab and neoprene bearings, and grouting keys as shown on the Drawings.
- (e) The Contractor is advised that the number and location of hollow core slab replacements may be modified at the Contract Administrator's discretion throughout the Works.

### E16.3 References

E16.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
- (b) CAN/CSA-A23.2, Methods of Test and Standard Practices for Concrete.
- (c) CAN/CSA-A23.3, Design of Concrete Structures.
- (d) CAN/CSA-A23.4/CSA-A251, Materials and Construction/Qualification Code for Architectural and Structural Precast Concrete Products.
- (e) CAN/CSA-A3001, Cementitious Materials for Use in Concrete.
- (f) CAN/CSA G30.14, Deformed Steel Wire for Concrete Reinforcement.
- (g) CAN/CSA G30.18, Carbon Steel Bars for Concrete Reinforcement.
- (h) CAN/CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
- (i) CAN/CSA G 164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- (j) CAN/CSA G 279, Steel for Pre-stressed Concrete Tendons.
- (k) CAN/CSA W47.1, Certification of Companies for Fusion Welding of Steel.
- (l) ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished.
- (m) ASTM A496, Standard Specification for Steel Wire, Deformed for Concrete Reinforcement.
- (n) ASTM C 260, Standard Specification for Air-Entraining Admixtures for Concrete.
- (o) ASTM C 494, Standard Specification for Chemical Admixtures for Concrete.
- (p) D18 Construction Method Statement.

### E16.4 Design Requirements

E16.4.1 The replacement hollow core slabs shall meet the following requirements:

- (a) Design of precast components and connections to conform to CAN/CSA A23.3 and CPCI Design Manual, under direct supervision of a registered Professional Engineer licensed to practice in the Province of Manitoba, fully experienced in design of precast concrete structural units.
- (b) Design all members and connections including any hardware to safely support the loading requirements stated on the Drawings. Hollow core slabs shall be designed for a superimposed live load of 4.0 kPa and a superimposed dead load of 2.0 kPa.

- (c) Depth of new hollow core slabs shall match the depth of the existing hollow core slabs.

## E16.5 Submittals

### E16.5.1 Hollow Core Supply and Delivery

- (a) The Contractor shall submit the following to the Contract Administrator:
  - (i) Shop drawings shall be sealed by a Professional Engineer registered in the Province of Manitoba shall be submitted to the Contract Administrator a minimum of seven (7) days prior to hollow core fabrication.
  - (ii) Certificate of Compliance with the CPCI Precast Concrete Certification Program for Structural, Architectural and Specialty Precast Concrete Products. Proof of this certification shall be provided to the Contract Administrator.
  - (iii) Concrete mix design that meets the minimum compressive strengths ( $f'c$  and  $f'ci$ ) in accordance with this specification shall be stamped, signed and dated by a Professional Engineer licensed to practice in the Province of Manitoba. Any changes to the concrete mix design shall be reviewed by the Contract Administrator prior to the Contractor implementing the change.
  - (iv) Stressing calculations shall be stamped, signed and dated by a Professional Engineer licensed to practice in the Province of Manitoba and include the following:
    - ◆ Copies of the stressing sequence and strand elongation calculations as well as all data required for checking these calculations. Separate elongation calculations will be required for each significant variation in the Modulus of Elasticity of the strand.
    - ◆ A calibration graph for each jack, calibrated not more than 6 months prior to stressing operation.
    - ◆ The proposed sequence of stressing and destressing operations.
    - ◆ The anchorage losses experienced by the Contractor under similar loading applications, and the proposed method of measuring the anchorage losses during the stressing operation.
  - (v) A copy of the proposed "Record of Concrete Strength" and "Record of Pre-Tensioning" forms to be used by the Contractor.
  - (vi) Copies of the stress-strain curve for the prestressing steel-
  - (vii) Copies of all reports, including but not limited to: "Record of Concrete Strength" form, "Record of Pre-Tensioning" form and material quality control test results.
  - (viii) Letter of Validation from the Canadian Welding Bureau (CWB) and CWB approved welding procedures for the Contractor's miscellaneous metal supplier. The Contractor's miscellaneous metal supplier shall fulfill the requirements of CSA W47.1, Division 2.1 (minimum).
  - (ix) Loading, handling, and transportation procedures, including the proposed route and all traffic control procedures shall be stamped, signed and dated by a Professional Engineer licensed to practice in the Province of Manitoba.

### E16.5.2 Hollow Core Slab Removal and Installation System

- (a) The slab removal/installation system shall be designed by, prepared by, and bear the seal and signature of a Professional Engineer registered in the Province of Manitoba. Detailed drawings, specifications, and design notes for the removal/installation system, bearing the seal and signature of the Design Engineer shall be submitted to the Contract Administrator at least seven (7) days prior to the start of removing any hollow core slabs. The submission of the system's detailed drawings, specifications, and design notes to the Contract Administrator shall in no way relieve the Contractor of full responsibility for the design and safe and effective functioning of the system.

## E16.6 Materials

- E16.6.1 Manufacturer's specifications for the concrete for the hollow core slabs shall be strictly followed and shall supersede this Specification should any discrepancies exist.
- E16.6.2 Concrete
- (a) The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this specification. Precast concrete shall have the following minimum properties in accordance with CAN/CSA A23.1.
    - (i) Class of Exposure: C-1
    - (ii) Compressive Strength @ 28 days = 35 MPa
    - (iii) Water / Cementing Materials Ratio = 0.4
    - (iv) Air Content: Category 1 per Table 4 of CAN/CSA A23.1
  - (b) Mix design for ready mix concrete shall be submitted to Contract Administrator at least two (2) weeks prior to concrete placing operations.
  - (c) The workability of each concrete mix shall be consistent with the Contractor's placement operations.
  - (d) The temperature of the concrete shall be between 15°C and 25°C at discharge. Temperature requirements for concrete containing silica fume shall be between 10°C and 18°C at discharge unless otherwise approved by the Contract Administrator.
  - (e) Concrete materials susceptible to frost damage shall be protected from freezing.
- E16.6.3 Aggregate
- (a) Fine and coarse aggregate shall conform to the requirements of CSA A23.4. Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter or other injurious substances. Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam or other deleterious substances.
- E16.6.4 Admixtures
- (a) Air-entraining admixtures shall conform to the requirements of ASTM C 260.
  - (b) Chemical admixtures shall conform to the requirements of ASTM C 494.
- E16.6.5 Cementitious Materials
- (a) Cementitious materials shall conform to the requirements of CSA-A3001.
  - (b) Should the Contractor choose to include a silica fume admixture in the concrete mix design, the substitution of silica fume shall not exceed 8% by mass of cement.
  - (c) Should the Contractor choose to include fly ash in the concrete mix design, the fly ash shall be Class CI and the substitution shall not exceed 15% by mass of cement.
- E16.6.6 Prestressing Steel
- (a) Prestressing steel shall be Grade 1860 MPa low relaxation strand and shall conform to the requirements of CSA Standard G279 and this Specification.
  - (b) Size of strand, coil number, heat number and the mark of the Manufacturer shall be recorded on a tag attached securely to each reel. The tag shall also identify the strand with its own stress-strain curve.
  - (c) One stress-strain curve shall be provided by the Manufacturer for each reel.
  - (d) Should the Contract Administrator consider it necessary, approval of the prestressing strand, in addition to the requirements of CSA G279, shall be based on tests carried out by the Contractor in a testing laboratory satisfactory to the Contract Administrator. The Contractor shall test a minimum of three representative specimens of the strands to be used in the girders. The results of these tests shall be supplied to the Contract Administrator. The Contract Administrator may also require the Contractor to supply additional representative specimens for independent testing. Where the strand has

rusted in storage, the use of such material will be subject to the approval of the Contract Administrator. The Contract Administrator, at his discretion, may require physical tests at the Contractor's expense in order to determine whether the material is suitable to be used in the girder.

- (e) All strands that:
  - (i) are contaminated by substances having a deleterious effect on the steel or concrete or on the bond strength of concrete to strand or,
  - (ii) sustain physical damage,shall be replaced either by the Contractor or cleaned to the satisfaction of the Contract Administrator.
- (f) Other Materials
  - (i) Miscellaneous metal, anchor inserts and lifting devices and all other incidental materials shall be supplied as shown on the Drawings and shall be subject to the approval of the Contract Administrator.

#### E16.6.7 Bearings

- (a) The Contractor shall supply and install new neoprene bearings in accordance with the Drawings.

#### E16.7 Manufacture

##### E16.7.1 General

- (a) All precast concrete components shall be plant manufactured in accordance with the requirements of CSA A23.4 by a manufacturer currently engaged in the special process of precast and prestressed concrete work. This manufacturer shall be a registered member of the Canadian Prestressed Concrete Institute
- (b) All plant casting operations for the production of prestressed and precast concrete shall be under the direct supervision of a Registered Professional Engineer in the Province of Manitoba.
- (c) The casting operations of the manufacturer shall be continuously open to inspection by representatives of the Contract Administrator. Complete and up-to-date copies of all Shop Drawings together with a complete set of the Contract Drawings and Specifications shall be kept available for their use.
- (d) During production of the precast members, weight checks shall be carried out on completed units when requested by the Contract Administrator.
- (e) Mark each member with identifying number and date of casting.

##### E16.7.2 Tolerances

- (a) Maximum allowable manufacturing and erection tolerances are not to exceed those given in CSA A23.4.
- (b) Length of precast elements not to vary from design length by more than +/- 5 mm.
- (c) Cross-section dimensions not to vary from design dimensions by more than +/- 3 mm.
- (d) Deviations from straight lines shall not exceed 3 mm in 3 m.
- (e) Hollow core slabs not to vary by more than +/- 5 mm from true overall cross sectional shape measured by the difference in diagonal dimensions.

##### E16.7.3 Formwork

- (a) Prestressing/casting beds shall be adequately rigid to withstand prestressing forces and constructed of materials that will result in finished products conforming to the requirements stated herein and on the Drawings.

##### E16.7.4 Depositing of Concrete

- (a) The depositing of concrete in each unit shall be a single continuous complete operation so that each unit shall be monolithic without joints.

#### E16.7.5 Testing of Concrete

- (a) Concrete compressive strength requirements will consist of a minimum strength, which must be attained before various loads, or stresses are applied to the concrete. With the exception of the concrete strengths required for:
  - (i) Transfer of the pre-tensioning forces.
  - (ii) Subjecting a member to freezing temperatures.
  - (iii) Hauling and erecting a member.
- (b) All concrete shall attain the minimum strength as shown on the Drawings and as indicated in this Specification at the age of twenty-eight (28) days. The compressive strength of the concrete is to be determined in accordance with CSA Standard A23.2-2000.
- (c) The minimum number of test cylinders that a Contractor shall mould from each separately mixed batch of concrete to be placed in a member is as follows:
  - (i) Two (2) cylinders to be tested prior to the transfer of the pre-tensioning forces where applicable.
  - (ii) Three (3) cylinders for the determination of twenty-eight (28) day strength.
  - (iii) Two (2) cylinders to be tested prior to the member being hauled to the Site and erected, where applicable.
- (d) In the event that the strength of the concrete cylinder(s) tested prior to the transfer of the pre-tensioning forces is less than the strength required for transferring the pre-tensioning forces, the Contractor shall mould and test additional cylinders from each subsequent batch of concrete. The number of additional cylinders to be moulded and tested for the purpose of establishing the required concrete strength for the transfer of the pre-tensioning forces will be determined by the Contract Administrator. All test cylinders shall be cured under the same conditions as the member until such time as the steam curing or moist curing of the member has been completed.
- (e) In addition to the moulding of the specified number of test cylinders the Contractor will be required to perform the following tests on every separate batch of concrete to be placed in a member:
  - (i) slump
  - (ii) air
  - (iii) temperatureand to record the results of such tests.
- (f) The Contractor shall be responsible for maintaining an up-to-date record of all test results on a "Record of Concrete Strength" form approved by the Contract Administrator. A separate "Record of Concrete Strength" form is to be prepared for each member and the strengths of the test cylinders as well as the pertinent data are to be listed in the same order as the batches of concrete were placed in the forms. A complete set of test results is to be submitted to the Contract Administrator within seven (7) days after the date that the twenty-eight (28) day cylinders from the last member were tested. All costs involved in performing and recording the previously mentioned tests will be the responsibility of the Contractor.
- (g) The Contract Administrator at his own discretion and at the City's expense may make any other tests deemed necessary on the concrete, on the components of the concrete as well as on any finished or partially finished member. The Contractor must allow the Contract Administrator unhindered access to the concrete, concrete components and members and to also assist the Contract Administrator in carrying out any test.

#### E16.7.6 Concrete Finish

- (a) Top of hollow core slabs to be finished in conformance with the requirements of CSA A23.4 for installation of roofing systems.

#### E16.7.7 Handling, Storage and Loading

- (a) Lifting devices shall be cast into the concrete at the locations as shown on the Shop Drawings.
- (b) The lifting devices shall be of such a nature as to avoid twisting, racking, or other distortions while handling, storing, moving and erecting the hollow core slabs. The devices shall be anchored fully to the main body of concrete. The devices shown on the Drawings are minimum requirements and the Contractor shall satisfy himself as to the adequacy of the devices. The hollow core slabs shall be picked up only by the lifting devices.
- (c) The Contractor shall be responsible for storage of the hollow core slabs from the completion of their fabrication until they are required for erection. The Contractor may have to store, free of charge, all or portions of the required hollow core slabs, depending upon the actual construction progress.
- (d) During storage and hauling, the hollow core slabs shall be maintained in an upright position and shall be supported within 50 mm on the inside of the bearing area. Extreme care shall be exercised during the handling and storage of the precast slabs to avoid twisting, cracking or other distortion that may result in damage to the slabs.
- (e) The hollow core panel edges shall be adequately protected to prevent staining, chipping, or spalling of concrete.

#### E16.8 Slab Removal/Installation System

- (a) The Contractor shall be responsible for designing a system to lift and carry the hollow core slabs into and out of place in accordance with E16.5.2.

#### E16.9 Construction Methods

- E16.9.1 Replacement of hollow core slabs shall be performed in strict accordance with the replacement procedures specified on the Drawings.

#### E16.10 Measurement and Payment

- E16.10.1 Hollow core slabs identified for replacement on the Drawings, or identified for replacement on Site by the Contract Administrator, will be paid on a unit basis and paid for at the Contract Unit Price for "Items of Work" listed in E16.10.2. The amount to be paid for will be the number of hollow core slabs supplied and installed in accordance with this Specification as approved by the Contract Administrator.

#### E16.10.2 Items of Work

- (a) Hollow Core Slab Rehabilitation
  - (i) Supply New Hollow Core Slabs.
  - (ii) Install New Hollow Core Slabs.

- E16.10.3 Supplying and installing all the listed materials, concrete design requirements, equipment, construction methods, and quality control measures associated with this Specification and Drawings shall be considered incidental to the items of work listed in this Specification, unless otherwise noted herein. No measurement or payment shall be made for this Work unless indicated otherwise.

### **E17. REPAIR OF HOLLOW CORE SLABS**

#### E17.1 Description

- E17.1.1 This Specification shall cover all operations related to the repair of existing reservoir roof hollow core slabs as specified on the Drawings.

#### E17.2 Scope of Work

- E17.2.1 The Work under this Specification shall include but not be limited to:

- (a) Repair of damaged hollow core roof slabs in the West and East Cells as shown on the Drawings.
- (b) Repair procedure shall be in accordance with the Drawings.
- (c) The Contractor is advised that number and location of hollow core slabs requiring repair may be modified at the Contract Administrator's discretion throughout the Works.

### E17.3 References

E17.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
- (b) D17 Construction Method Statement.
- (c) E4 Shop Drawings.
- (d) E5 Expedited Shop Drawings.
- (e) E13 Steel Reinforcing.

### E17.4 Submittals

E17.4.1 The Contractor shall submit a shop drawing outlining the proposed repair procedure.

E17.4.2 The Contractor shall submit manufacturer's data sheets for the SCC to be used as part of this Specification.

### E17.5 Materials

E17.5.1 Self-Compacting/Consolidating Concrete (SCC)

- (a) SCC shall be Lafarge Agilia<sup>®</sup> as supplied by Lafarge Canada Inc., or equal as accepted by the Contract Administrator in accordance with B8.
- (b) At a minimum, the SCC shall meet the requirements of Table 22 of CAN/CSA A23.1 and have a minimum strength of 35 MPa at twenty-eight (28) days.

E17.5.2 Reinforcing

- (a) Reinforcing steel shall conform to the requirements of E13.

### E17.6 Construction Methods

E17.6.1 Repair of hollow core slabs shall be performed in strict accordance with the repair procedures specified on the Drawings.

### E17.7 Quality Control

E17.7.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.

E17.7.2 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

### E17.8 Measurement and Payment

E17.8.1 Hollow core slabs identified for repair on the Drawings, or identified for repair on Site by the Contract Administrator, will be paid on a unit basis and paid for at the Contract Unit Price for "Items of Work" listed in E17.8.2. The amount to be paid for will be the number of hollow

core slabs repaired in accordance with this Specification as approved by the Contract Administrator.

E17.8.2 Items of Work

- (a) Hollow Core Slab Rehabilitation
  - (iii) Repair of Existing Hollow Core Slabs.

E17.8.3 Supplying and installing all the listed materials, concrete design requirements, equipment construction methods, and quality control measures associated with this Specification and Drawings shall be considered incidental to the items of work listed in this Specification, unless otherwise noted herein. No measurement or payment shall be made for this Work unless indicated otherwise.

**E18. BEARING REHABILITATION**

E18.1 Description

E18.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the bearing rehabilitation as hereinafter specified.

E18.2 Scope of Work

E18.2.1 The Work under this Specification shall include but not be limited to:

- (a) Design and supply of temporary jacking system.
- (b) Supply and install new bearing plates.
- (c) Supply and install new column shim plates at column F-16.
- (d) Supply and install new bearing pads.

E18.3 References

E18.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) AASHTO M251 – Standard Specification for Plain and Elastomeric Bridge Bearings.
- (b) ASTM D412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
- (c) ASTM D573 – Standard Test Method for Rubber – Deterioration in an Air Open.
- (d) ASTM D624 – Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- (e) ASTM D4014 – Standard Specification for Plain and Steel-Laminated Elastomeric Bearings for Bridges.
- (f) CAN/CSA G40.21 – General Requirements for Rolled or Welded Structural Quality Steel.
- (g) CAN/CSA G164 – Hot Dip Galvanizing of Irregularly Shaped Articles.
- (h) NSF/ANSI 61 – Drinking Water System Components.
- (i) D18 Construction Method Statement.
- (j) E4 Shop Drawings.
- (k) E5 Expedited Shop Drawings.

E18.4 Submittals

E18.4.1 Temporary Jacking System

- (a) The Contractor shall submit to the Contract Administrator, at least fourteen (14) Calendar Days prior to commencement of any jacking and supporting operation, detailed plans of the Contractor's proposed jacking and supporting system, equipment and procedures. The detailed plans shall be designed by, prepared by and bear the seal of a Professional Engineer (design engineer), registered to practice in the Province of Manitoba. The detailed plans shall include, but not be limited to: type, number and location of jacks and all other equipment and structures to be used for jacking; details of standby jacking, and supporting equipment (including provisions for allowing normal expansion / contraction movements of the reservoir roof); jacking loads; support details; and procedures and sequence of work for jacking up and supporting the precast beams and transferring of load onto the bearing assemblies.
- (b) The submission of the detailed plans will in no way relieve the Contractor of the full responsibility for the design and proper operation of the jacking and supporting system. The Contractor's design engineer shall be responsible for visiting the Site as often as is necessary to inspect the jacking and supporting equipment and procedures so as to ensure that the work is carried out in accordance with the design engineer's sealed detailed plans. The Contractor shall provide the Contract Administrator with a letter bearing the seal of the design engineer, certifying after personal inspection of the work that the jacking and supporting is being carried out in accordance with the sealed detailed plans.
- (c) The jacking system shall be capable of jacking the beams simultaneously, uniformly and equally on either side of the column. The jacking system shall also be capable of releasing load, lowering the beams and transferring load to the bearings simultaneously, uniformly and equally.
- (d) The Contractor shall have adequate standby jacking and supporting equipment at the Site prior to starting any jacking in order to ensure that beam jacking and supporting is continuous, timely and achieved without interruption.
- (e) The Contractor's temporary supports shall be designed for and must be capable of allowing the normal expansion / contraction movements of the reservoir's structural components to take place while they are being used.
- (f) The shoring and jacking design shall include provision of lateral restraint to the beams.
- (g) The shoring and jacking system shall be in accordance with the notes on the Drawings.

#### E18.4.2 Bearing Plates / Column Shim Plates

- (a) The Contractor shall submit to the Contract Administrator detailed Shop Drawings for all bearing plates and shim plates in accordance with E4/E5.

#### E18.4.3 Elastomeric Bearings

- (a) The Contractor shall submit to the Contract Administrator detailed Shop Drawings for the bearings that are stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba in accordance with E4/E5.
- (b) The Contractor shall submit to the Contract Administrator documentation of all Quality Control testing undertaken for bearings as specified herein.
- (c) The Contractor shall furnish the Contract Administrator with one (1) sample "Mk. B-3" bearing pad during Stage 1 and one (1) sample "Mk. B-3" bearing pad during Stage 2. The samples will be taken at random from the bearing lots delivered to the project site.

#### E18.4.4 Epoxy Gel

- (a) The Contractor shall submit manufacturer's data sheets for the epoxy gel to be used as part of this Specification.

- (b) The Contractor shall submit NSF/ANSI 61 documentation providing compliance for contact with potable water.

E18.4.5 Hi-flow Cementitious Grout

- (a) The Contractor shall submit manufacturer's data sheets for the hi-flow cementitious grout to be used as part of this Specification.
- (b) The Contractor shall submit NSF/ANSI 61 documentation providing compliance for contact with potable water.

E18.5 Materials

E18.5.1 Fabrication and Supply - Steel Bearing Plates

- (a) Steel bearing plates shall be in accordance with the latest edition of CAN/CSA G40.21, Grade 300W and hot-dip galvanized after fabrication in accordance with CAN/CSA G164 to a minimum zinc retention of 610 g/m<sup>2</sup>.

E18.5.2 Fabrication and Supply –Plain Elastomeric Bearing Pads

- (a) Bearing pads shall be plain elastomeric, homogenous fabric fiber reinforced pads (Series ER) supplied by:
  - (i) Goodco Z-Tech  
Canam Group Inc.  
807 Rue Marshall  
Laval, Quebec H7S 1J9; or,
  - (ii) Approved equivalent in accordance with B8.
- (b) Elastomer shall:
  - (i) Be neoprene or natural rubber, with a 75 +/- 5 durometer Shore A Hardness.
  - (ii) Have a minimum shear modulus (G) greater than 1.10 MPa.
  - (iii) Have a minimum ultimate compressive strength of 55 MPa.
  - (iv) Have a minimum initial cracking strain of 40%.
  - (v) Have a minimum tensile strength in accordance with ASTM D412 of 6.9 MPa.
  - (vi) Have a minimum tear strength in accordance with ASTM D624 of 70.1 N/mm
  - (vii) Have a minimum ozone resistance (tear strength) of 52.5 N/mm after 50 hours at 38°C in an ozone concentration of 80 pphm.
  - (viii) Have the following minimum heat resistances in accordance with ASTM D573:
    - ◆ 25% variation in tensile strength.
    - ◆ 25% variation in elongation.
    - ◆ 10 points maximum variation in hardness.
- (c) The overall dimensions of the bearings shall be within a tolerance of +/- 3 mm in plan and height. Other fabrication tolerances for the elastomeric pads shall be in accordance with the latest version of AASHTO M251 and ASTM D4014.
- (d) The bearing Supplier shall verify the condition of the bearings supplied to the work site.

E18.5.3 Fabrication and Supply – Steel Shim Plates

- (a) Steel shim plates and alignment pins shall be in accordance with the latest edition of CAN/CSA G40.21, Grade 300W and hot-dip galvanized after fabrication in accordance with CAN/CSA G164 to a minimum zinc retention of 610 g/m<sup>2</sup>.

E18.5.4 Epoxy Gel

E18.5.5 Epoxy gel shall be:

- (i) Sikadur<sup>®</sup> 31 Hi-Mod Gel<sup>CA</sup>  
By Sika Canada Inc.; or,
- (ii) Approved equivalent in accordance with B8.

(b) Epoxy gel shall meet the requirements of NSF/ANSI 61 unless otherwise indicated by the Contract Administrator.

E18.5.6 Hi-flow Cementitious Grout

E18.5.7 Hi-flow cementitious grout shall be:

- (i) MasterFlow® 928  
 By BASF, The Chemical Company; or,
- (ii) Approved equivalent in accordance with B8.

(b) Hi-flow cementitious grout shall meet the requirements of NSF/ANSI 61 unless otherwise indicated by the Contract Administrator.

E18.6 Equipment

E18.6.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

E18.7 Construction Methods

E18.7.1 Bearing rehabilitation shall be performed in strict accordance with the procedures specified on the Drawings.

E18.7.2 The bearing assembly components for each bearing location are provided in the following Table.

**SCHEDULE OF BEARING ASSEMBLIES**

**STAGE 1 - WEST CELL**

GRID REF	BRG TYPE	BEARING PAD		BEARING PLATE		GRID REF	BRG TYPE	BEARING PAD		BEARING PLATE	
		MK NO.	QTY	MK NO.	QTY			MK NO.	QTY	MK NO.	QTY
A 2	3	B-1	1	P-1	1	B 2	2	B-3	2	P-1	2
A 3	3	B-1	1	P-1	1	B 3	1	B-3	2	P-3	2
A 4	3	B-1	1	P-1	1	B 4	1	B-3	2	P-3	2
A 5	3	B-2	2	P-2	2	B 5	4	B-5	4	P-2	4
A 6	3	B-1	1	P-1	1	B 6	2	B-3	2	P-1	2
A 7	3	B-1	1	P-1	1	B 7	2	B-3	2	P-1	2
A 8	3	B-1	1	P-1	1	B 8	2	B-3	2	P-1	2
C 2	2	B-3	2	P-1	2	D 2	2	B-3	2	P-1	2
C 3	1	B-3	2	P-3	2	D 3	2	B-3	2	P-1	2
C 4	1	B-3	2	P-3	2	D 4	2	B-3	2	P-1	2
C 5	4	B-5	4	P-2	4	D 5	4	B-5	4	P-2	4
C 6	2	B-3	2	P-1	2	D 6	2	B-3	2	P-1	2
C 7	1	B-3	2	P-3	2	D 7	2	B-3	2	P-1	2
C 8	1	B-3	2	P-3	2	D 8	1	B-3	2	P-3	2
E 2	2	B-3	2	P-1	2	F 2	1	B-3	2	P-3	2
E 3	1	B-3	2	P-3	2	F 3	1	B-3	2	P-3	2
E 4	2	B-3	2	P-1	2	F 4	2	B-3	2	P-1	2
E 5	4	B-5	4	P-2	4	F 5	4	B-5	4	P-2	4
E 6	1	B-3	2	P-3	2	F 6	2	B-3	2	P-1	2
E 7	1	B-3	2	P-3	2	F 7	1	B-3	2	P-3	2
E 8	2	B-3	2	P-1	2	F 8	2	B-3	2	P-1	2
G 2	4	B-3	2	P-4	2	H 2	2	B-3	2	P-1	2
G 3	4	B-3	2	P-4	2	H 3	2	B-3	2	P-1	2
G 4	4	B-3	2	P-4	2	H 4	1	B-3	2	P-3	2
G 5	5	B-4	4	P-5	4	H 5	4	B-5	4	P-2	4
G 6	4	B-3	2	P-4	2	H 6	1	B-3	2	P-3	2
G 7	4	B-3	2	P-4	2	H 7	1	B-3	2	P-3	2

**SCHEDULE OF BEARING ASSEMBLIES**  
**STAGE 1 - WEST CELL**

GRID REF	BRG TYPE	BEARING PAD MK NO.	QTY	BEARING PLATE MK NO.	QTY	GRID REF	BRG TYPE	BEARING PAD MK NO.	QTY	BEARING PLATE MK NO.	QTY
G 8	4	B-3	2	P-4	2	H 8	2	B-3	2	P-1	2
J 2	1	B-3	2	P-3	2	K 2	1	B-3	2	P-3	2
J 3	2	B-3	2	P-1	2	K 3	2	B-3	2	P-1	2
J 4	2	B-3	2	P-1	2	K 4	2	B-3	2	P-1	2
J 5	4	B-5	4	P-2	4	K 5	4	B-5	4	P-2	4
J 6	2	B-3	2	P-1	2	K 6	1	B-3	2	P-3	2
J 7	2	B-3	2	P-1	2	K 7	2	B-3	2	P-1	2
J 8	2	B-3	2	P-1	2	K 8	2	B-3	2	P-1	2
L 2	2	B-3	2	P-1	2	M 2	2	B-3	2	P-1	2
L 3	1	B-3	2	P-3	2	M 3	1	B-3	2	P-3	2
L 4	2	B-3	2	P-1	2	M 4	1	B-3	2	P-3	2
L 5	4	B-5	4	P-2	4	M 5	4	B-5	4	P-2	4
L 6	2	B-3	2	P-1	2	M 6	2	B-3	2	P-1	2
L 7	1	B-3	2	P-3	2	M 7	2	B-3	2	P-1	2
L 8	2	B-3	2	P-1	2	M 8	1	B-3	2	P-3	2
N 2	3	B-1	1	P-1	1						
N 3	3	B-1	1	P-1	1						
N 4	3	B-1	1	P-1	1						
N 5	3	B-2	2	P-2	2						
N 6	3	B-1	1	P-1	1						
N 7	3	B-1	1	P-1	1						
N 8	3	B-1	1	P-1	1						

**SCHEDULE OF BEARING ASSEMBLIES**  
**STAGE 2 - EAST CELL**

GRID REF	BRG TYPE	BEARING PAD MK NO.	QTY	BEARING PLATE MK NO.	QTY	GRID REF	BRG TYPE	BEARING PAD MK NO.	QTY	BEARING PLATE MK NO.	QTY
A 10	3	B-1	1	P-1	1	B 10	2	B-3	2	P-1	2
A 11	3	B-1	1	P-1	1	B 11	2	B-3	2	P-1	2
A 12	3	B-1	1	P-1	1	B 12	2	B-3	2	P-1	2
A 13	3	B-1	1	P-1	1	B 13	2	B-3	2	P-1	2
A 14	3	B-2	2	P-2	2	B 14	4	B-5	4	P-2	4
A 15	3	B-1	1	P-1	1	B 15	2	B-3	2	P-1	2
A 16	3	B-1	1	P-1	1	B 16	2	B-3	2	P-1	2
A 17	3	B-1	1	P-1	1	B 17	2	B-3	2	P-1	2
A 18	3	B-1	1	P-1	1	B 18	2	B-3	2	P-1	2
C 10	1	B-3	2	P-3	2	D 10	1	B-3	2	P-3	2
C 11	1	B-3	2	P-3	2	D 11	1	B-3	2	P-3	2
C 12	1	B-3	2	P-3	2	D 12	2	B-3	2	P-1	2
C 13	2	B-3	2	P-1	2	D 13	2	B-3	2	P-1	2
C 14	4	B-5	4	P-2	4	D 14	4	B-5	4	P-2	4
C 15	2	B-3	2	P-1	2	D 15	2	B-3	2	P-1	2
C 16	2	B-3	2	P-1	2	D 16	1	B-3	2	P-3	2
C 17	2	B-3	2	P-1	2	D 17	2	B-3	2	P-1	2
C 18	2	B-3	2	P-1	2	D 18	2	B-3	2	P-1	2
E 10	1	B-3	2	P-3	2	F 10	2	B-3	2	P-1	2
E 11	2	B-3	2	P-1	2	F 11	2	B-3	2	P-1	2

**SCHEDULE OF BEARING ASSEMBLIES**  
**STAGE 2 - EAST CELL**

GRID REF	BRG TYPE	BEARING PAD MK NO.	QTY	BEARING PLATE MK NO.	QTY	GRID REF	BRG TYPE	BEARING PAD MK NO.	QTY	BEARING PLATE MK NO.	QTY
E 12	1	B-3	2	P-3	2	F 12	2	B-3	2	P-1	2
E 13	2	B-3	2	P-1	2	F 13	1	B-3	2	P-3	2
E 14	4	B-5	4	P-2	4	F 14	4	B-5	4	P-2	4
E 15	2	B-3	2	P-1	2	F 15	2	B-3	2	P-1	2
E 16	2	B-3	2	P-1	2	F 16	2	B-3	2	P-1	2
E 17	2	B-3	2	P-1	2	F 17	1	B-3	2	P-3	2
E 18	1	B-3	2	P-3	2	F 18	2	B-3	2	P-1	2
G 10	4	B-3	2	P-4	2	H 10	2	B-3	2	P-1	2
G 11	4	B-3	2	P-4	2	H 11	2	B-3	2	P-1	2
G 12	4	B-3	2	P-4	2	H 12	2	B-3	2	P-1	2
G 13	4	B-3	2	P-4	2	H 13	2	B-3	2	P-1	2
G 14	5	B-4	4	P-5	4	H 14	4	B-5	4	P-2	4
G 15	4	B-3	2	P-4	2	H 15	2	B-3	2	P-1	2
G 16	4	B-3	2	P-4	2	H 16	1	B-3	2	P-3	2
G 17	4	B-3	2	P-4	2	H 17	2	B-3	2	P-1	2
G 18	4	B-3	2	P-4	2	H 18	1	B-3	2	P-3	2
J 10	1	B-3	2	P-3	2	K 10	2	B-3	2	P-1	2
J 11	2	B-3	2	P-1	2	K 11	2	B-3	2	P-1	2
J 12	2	B-3	2	P-1	2	K 12	2	B-3	2	P-1	2
J 13	2	B-3	2	P-1	2	K 13	2	B-3	2	P-1	2
J 14	4	B-5	4	P-2	4	K 14	4	B-5	4	P-2	4
J 15	2	B-3	2	P-1	2	K 15	2	B-3	2	P-1	2
J 16	2	B-3	2	P-1	2	K 16	2	B-3	2	P-1	2
J 17	2	B-3	2	P-1	2	K 17	1	B-3	2	P-3	2
J 18	1	B-3	2	P-3	2	K 18	2	B-3	2	P-1	2
L 10	2	B-3	2	P-1	2	M 10	2	B-3	2	P-1	2
L 11	1	B-3	2	P-3	2	M 11	2	B-3	2	P-1	2
L 12	1	B-3	2	P-3	2	M 12	2	B-3	2	P-1	2
L 13	1	B-3	2	P-3	2	M 13	2	B-3	2	P-1	2
L 14	4	B-5	4	P-2	4	M 14	4	B-5	4	P-2	4
L 15	1	B-3	2	P-3	2	M 15	1	B-3	2	P-3	2
L 16	2	B-3	2	P-1	2	M 16	1	B-3	2	P-3	2
L 17	1	B-3	2	P-3	2	M 17	2	B-3	2	P-1	2
L 18	2	B-3	2	P-1	2	M 18	2	B-3	2	P-1	2
N 10	3	B-1	1	P-1	1						
N 11	3	B-1	1	P-1	1						
N 12	3	B-1	1	P-1	1						
N 13	3	B-1	1	P-1	1						
N 14	3	B-2	2	P-2	2						
N 15	3	B-1	1	P-1	1						
N 16	3	B-1	1	P-1	1						
N 17	3	B-1	1	P-1	1						
N 18	3	B-1	1	P-1	1						

## E18.8 Warranty

E18.8.1 Notwithstanding D32, upon installation of the bearings, the bearing Supplier shall inspect the bearings and certify in writing that the bearings have been properly installed. The Contractor shall provide a written Warranty that the bearings will perform satisfactorily within the design range of movement under the design loads for a period of five (5) years from the date of bearing installation.

## E18.9 Measurement and Payment

### E18.9.1 Supply Steel Bearing Plates

- (a) Supply Steel Bearing Plates will not be measured and will be paid for at the Contract Lump Sum Price for "Supply Steel Bearing Plates", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.
- (b) The supply and installation of the F-16 column shim plates will be considered incidental to the Contract Lump Sum Price for "Supply Steel Bearing Plates". No additional payment or compensation will be provided for this work.

### E18.9.2 Supply Elastomeric Bearing Pads

- (a) Supply Elastomeric Bearing Pads will not be measured and will be paid for at the Contract Lump Sum Price for "Supply Elastomeric Bearing Pads", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.
- (b) The supply of the sample bearing pads in accordance with E18.9.3(c) will be considered incidental to the Contract Lump Sum Price for "Supply Elastomeric Bearing Pads". No additional payment or compensation will be provided for this work.

### E18.9.3 Install Bearing Assemblies

- (a) Installation of bearing assemblies will be measured on a unit basis and paid for at the Contract Unit Price for "Items of Work", listed in E18.9.3(b). The amount to be paid for will be the total number of bearing assemblies installed in accordance with this Specification, Drawings, and accepted and measured by the Contract Administrator.
- (b) Items of Work:
  - (i) Type 1 – Interior Column Shoes.
  - (ii) Type 2 – Interior Column Plates.
  - (iii) Type 3 – Wall Seat Plates.
  - (iv) Type 4 – Double Column Plates.
  - (v) Type 5 – Quadruple Column Plates.
- (c) The design, supply, fabrication and installation of the temporary jacking and shoring systems will be considered incidental to the Contract Unit Prices for "Items of Work" listed in E18.9.3(b). No additional payment or compensation will be provided for this work.

## E19. WALL EXPANSION JOINT REPLACEMENT

### E19.1 Description

E19.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the wall expansion joint replacements as hereinafter specified.

### E19.2 Scope of Work

E19.2.1 The Work under this Specification shall include but not be limited to:

- (a) Removal of existing joint seal and/or rigid insulation.
- (b) Removal of existing joint filler.
- (c) Supply and installation of new expansion joint assembly.

### E19.3 General

E19.3.1 The replacement Wall Joint Assembly consists of the following components as shown on the Drawings:

- (a) Continuous expansion joint system (sandwiched between the concrete behind the natural rubber expansion joint).
- (b) Polyethylene joint filler.
- (c) Foam backer rod.
- (d) Natural rubber expansion joint complete with stainless steel clamp plate and anchors.

### E19.4 References

E19.4.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) NSF/ANSI 61 – Drinking Water System Components.
- (b) D17 Construction Method Statement.
- (c) E4 Shop Drawings.
- (d) E5 Expedited Shop Drawings.
- (e) E10 Mobilization and Demobilization.

### E19.5 Submittals

#### E19.5.1 Wall Joint Assembly

- (a) The Contractor shall submit shop drawings to the Contract Administrator for approval detailing the overall Wall Joint Assembly, generally described in E19.3.1, as well as the installation methods required to install the Wall Joint Assembly.

#### E19.5.2 Natural Rubber Expansion Joint

- (a) The Contractor shall submit Manufacturer's data sheets for the natural rubber expansion joint to be used as part of this Specification.
- (b) The Contractor shall submit NSF/ANSI 61 documentation providing compliance for contact with potable water.

#### E19.5.3 Continuous Expansion Joint System

- (a) The Contractor shall submit Manufacturer's data sheets for the continuous expansion joint system to be used as part of this Specification.
- (b) The Contractor shall submit NSF/ANSI 61 documentation providing compliance for contact with potable water.

### E19.6 Materials

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

#### E19.6.2 Mechanical Anchors

- (a) Mechanical anchors shall be stainless steel Hilti Kwik Bolt 3 SS304 or Approved equivalent in accordance with B8.

#### E19.6.3 Natural Rubber Expansion Joint

- (a) The natural rubber expansion joint shall be capable of sustaining expansion and contraction movement of a minimum of 25 mm.

(b) The rubber shall be NSF/ANSI 61 compliant for contact with potable water.

E19.6.4 Continuous Expansion Joint System

(a) Continuous expansion joint system shall be:

(i) Emseal Submerseal

By Emseal Joint Systems, Ltd.; or,

(ii) Approved equivalent in accordance with B8.

(b) The continuous expansion joint system shall be NSF/ANSI 61 compliant for contact with potable water.

E19.7 Equipment

E19.7.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

E19.8 Construction Methods

E19.8.1 Wall expansion joint repairs shall be performed in strict accordance with the repair procedures specified on the Drawings.

E19.9 Quality Control

E19.9.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.

E19.9.2 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

E19.10 Measurement and Payment

E19.10.1 Wall expansion joint repairs will be measured on a unit basis and will be paid for at the Contract Unit Price for "Wall Expansion Joint Replacement", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

**E20. CONCRETE SPALL REPAIRS**

E20.1 Description

E20.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the concrete spall repairs as hereinafter specified.

E20.2 Scope of Work

E20.2.1 The Work under this Specification shall include but not be limited to:

(a) Repair of pile cap concrete spalls.

(b) Repair of beam end concrete spalls.

E20.3 References

E20.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) NSF/ANSI 61 – Drinking Water System Components.
- (b) D17 Construction Method Statement.

#### E20.4 Submittals

##### E20.4.1 Pile Cap Spall Repair Mortar

- (a) The Contractor shall submit the following pile cap spall repair mortar information to the Contract Administrator for approval at least three (3) Business Days prior to repair mortar placement.
  - (i) Product data sheet;
  - (ii) NSF/ANSI 61 documentation providing compliance for contact with potable water; and,
  - (iii) Installation procedure.

##### E20.4.2 Beam End Spall Repair Mortar

- (a) The Contractor shall submit the following beam end spall repair mortar information to the Contract Administrator for approval at least three (3) Business Days prior to repair mortar placement.
  - (i) Product data sheet;
  - (ii) NSF/ANSI 61 documentation providing compliance for contact with potable water; and,
  - (iii) Installation procedure.

#### E20.5 Materials

E20.5.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

##### E20.5.2 Repair Mortar

- (a) Pile cap concrete spall repair mortar shall be a rapid setting repair mortar and shall be:
  - (i) SikaTop® 122 Plus  
By Sika Canada Inc.; or,
  - (ii) Approved equivalent in accordance with B8.
- (b) Beam end concrete spall repair mortar shall be a non-sag vertical repair mortar and shall be:
  - (i) SikaTop® 123 Plus  
By Sika Canada Inc.; or,
  - (ii) Approved equivalent in accordance with B8.
- (c) All repair mortars shall meet the requirements of NSF/ANSI 61 unless otherwise indicated by the Contract Administrator.

#### E20.6 Equipment

E20.6.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

#### E20.7 Construction Methods

E20.7.1 Concrete spall repairs shall be performed in strict accordance with the repair procedures specified on the Drawings.

#### E20.8 Measurement and Payment

E20.8.1 Concrete spall repairs will be measured on a unit basis and paid for at the Contract Lump Sum Price for "Items of Work", listed in E20.9, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work

included in the Specifications, Drawings, and accepted and measured by the Contract Administrator.

**E20.9 Items of Work:**

- (a) Concrete Spall Repairs:
  - (i) Pile Caps.
  - (ii) Beam Ends.

**E21. GEL INJECTION AT SUCTION PITS**

**E21.1 Description**

E21.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the gel injection in the vicinity of the suction pits as hereinafter specified.

**E21.2 Scope of Work**

E21.2.1 The Work under this Specification shall include but not be limited to:

- (a) Demolition and removal of existing concrete floor slab around suction pits to permit gel injection.
- (b) Supply and injection of gel.
- (c) Replacement of concrete floor slab.

**E21.3 References**

E21.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) NSF/ANSI 61 Drinking Water System Components.
- (b) D17 Construction Method Statement.
- (c) E4 Shop Drawings.
- (d) E5 Expedited Shop Drawings.
- (e) E10 Mobilization and Demobilization.
- (f) E12 Structural Concrete.
- (g) E13 Steel Reinforcing.

**E21.4 Submittals**

**E21.4.1 Concrete Mix Design**

- (a) The Contractor shall submit a concrete mix design in accordance with E12.

**E21.4.2 Reinforcing Steel**

- (a) The Contractor shall submit Shop Drawings (including bar lists) in accordance with E4/E5 and E13.

**E21.4.3 Injection Gel**

- (a) The Contractor shall submit manufacturer's data sheets for the injection gel to be used as part of this Specification.
- (b) The Contractor shall submit NSF/ANSI 61 documentation providing compliance for contact with potable water.

**E21.5 Materials**

- E21.5.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.
- E21.5.2 Structural Concrete
- (a) Structural concrete shall conform to the requirements of E12.
- E21.5.3 Reinforcing Steel
- (a) Reinforcing steel shall conform to the requirements of E13.
- E21.5.4 Injection Gel
- E21.5.5 Injection gel shall be:
- (i) Stratathane ST-504 Vari-Gel Injection Resin  
By Strata-tech, Inc.; or,
  - (ii) SikaFix® HH+  
By Sika Canada Inc.; or,
  - (iii) Approved equivalent in accordance with B8.
- (b) Injection gel shall meet the requirements of NSF/ANSI 61 unless otherwise indicated by the Contract Administrator.
- E21.6 Equipment
- E21.6.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.
- E21.7 Construction Methods
- E21.7.1 Floor slab removal, gel injection, and floor slab replacement shall be performed in strict accordance with the repair procedures specified on the Drawings.
- E21.8 Quality Control
- E21.8.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.
- E21.8.2 The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.
- E21.9 Measurement and Payment
- E21.9.1 Equipment setup will not be measured and will be paid for at the Contract Lump Sum Price for "Items of Work", listed in E21.9.2, which price shall be payment in full for mobilizing and setting up the gel injection equipment into the Reservoir cell.
- E21.9.2 Items of Work
- (a) Gel Injection at Suction Pits
    - (i) Equipment Setup
- E21.9.3 Supply and injection of gel and removal and replacement of floor slabs will be paid on a unit basis and paid for at the Contract Unit Price for "Items of Work" listed in E21.9.4.
- E21.9.4 Items of Work
- (a) Gel Injection at Suction Pits
    - (i) Supply and Inject Gel.

(ii) Removal and Replacement of Floor Slabs.

- E21.9.5 The amount of gel injection in E21.9.4(a)(i) to be paid for will be the number of litres of undiluted, as supplied injection gel, supplied and injected in accordance with this Specification as approved by the Contract Administrator.
- E21.9.6 The amount of floor slab replacement in E21.9.4(a)(ii) to be paid for will be the number of square meters of existing floor slab removed and replaced in accordance with this Specification as approved by the Contract Administrator.
- E21.9.7 Supplying and installing all the listed materials, concrete design requirements, equipment construction methods, and quality control measures associated with this Specification and Drawings shall be considered incidental to the items of work listed in this Specification, unless otherwise noted herein. No measurement or payment shall be made for this Work unless indicated otherwise.

## **E22. STEEL STAIRWAYS**

### **E22.1 Description**

- E22.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the steel stairways and steel supports from the access building into the reservoir cells.

### **E22.2 Scope of Work**

- E22.2.1 The Work under this Specification shall include but not be limited to:
- (a) Design, supply, and installation of steel stairways including all necessary anchors and other materials required for the stair installation.
  - (b) Design, supply, and installation/placement of all structural steel and reinforced concrete for the steel stairway structures.

### **E22.3 References**

- E22.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
- (a) ASTM A276 Standard Specifications for Stainless Steel Bars and Shapes.
  - (b) NBCC 2010 – National Building Code of Canada.
  - (c) D17 Construction Method Statement.
  - (d) E4 Shop Drawings.
  - (e) E5 Expedited Shop Drawings.
  - (f) E12 Structural Concrete.
  - (g) E13 Steel Reinforcing.

### **E22.4 Submittals**

#### **E22.4.1 Steel Stairways**

- (a) The Contractor shall submit Shop Drawings stamped, signed and dated by a Professional Engineer licensed to practice or work in the Province of Manitoba in accordance with E4/E5. The shop drawings shall provide all installation details, including any miscellaneous hardware and anchorage, and installation procedures.

#### **E22.4.2 Structural Steel for Stairway Supports**

- (a) The Contractor shall submit Shop Drawings stamped, signed and dated by a Professional Engineer licensed to practice or work in the Province of Manitoba in accordance with E4/E5. The shop drawings shall provide all installation details, including any miscellaneous hardware and anchorage, and installation procedures.

E22.4.3 Concrete Mix Design

- (a) The Contractor shall submit a concrete mix design in accordance with E12.

E22.4.4 Reinforcing Steel

- (a) The Contractor shall submit Shop Drawings (including bar lists) in accordance with E4/E5 and E13.

E22.5 Design Requirements

E22.5.1 The steel stairways shall be of the alternating tread type, and shall meet the following requirements:

- (a) At a minimum, the stair treads and handrail shall be designed for the respective loads specified in the NBCC.
- (b) Notwithstanding the NBCC, the stair treads shall be capable of withstanding a concentrated load of 4.5 kN without permanent deformation.

E22.6 Materials

E22.6.1 Steel stairways

- (a) Steel stairways shall be:
  - (i) Steel Alternating Tread Stair supplied by:  
Lapeyre Stair  
P.O. Box 50699  
New Orleans, LA 70150; or,
  - (ii) Approved equivalent in accordance with B8.
- (b) All components, including the steel stairways, shall be stainless steel conforming to ASTM A276 Grade 316L.

E22.6.2 Structural Concrete

- (a) Structural concrete shall conform to the requirements of E12.

E22.6.3 Reinforcing Steel

- (a) Reinforcing steel shall conform to the requirements of E13.

E22.6.4 Structural Steel

- (a) Structural steel for stairway supports shall be stainless steel conforming to ASTM A276 Grade 316L.

E22.7 Equipment

E22.7.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

E22.8 Construction Methods

E22.8.1 Supply and installation of the steel stairways and supports shall be in strict accordance with the Supplier's specifications and with the procedures specified on the Drawings.

E22.9 Measurement and Payment

E22.9.1 Supply and installation of the steel stairways and steel supports will not be measured and will be paid for at the Contract Lump Sum Price for "Supply and Install Steel Stairways", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

**E23. PILE CAP F-16 UNDERPINNING**

E23.1 Description

E23.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the pile cap F-16 underpinning in the East Cell as hereinafter specified.

#### E23.2 Scope of Work

E23.2.1 The Work under this Specification shall include but not be limited to:

- (a) Demolition and removal of concrete floor slab surrounding pile cap.
- (b) Excavation for foundation enlargement.
- (c) Installation of new mini piles.
- (d) Supply and placement of compacted granular.
- (e) Sandblasting of sides of existing pile cap.
- (f) Supply and installation of epoxy adhesive shear dowels.
- (g) Forming expanded footing.
- (h) Supply and installation of reinforcing steel.
- (i) Supply and placement of structural concrete.

#### E23.3 References

E23.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) NSF/ANSI 61 Drinking Water System Components.
- (b) D17 Construction Method Statement.
- (c) E4 Shop Drawings.
- (d) E5 Expedited Shop Drawings.
- (e) E10 Mobilization and Demobilization.
- (f) E12 Structural Concrete.
- (g) E13 Steel Reinforcing.

#### E23.4 Submittals

##### E23.4.1 Concrete Mix Design

- (a) The Contractor shall submit a concrete mix design in accordance with E12.

##### E23.4.2 Reinforcing Steel

- (a) The Contractor shall submit Shop Drawings (including bar lists) in accordance with E4.4/E5 and E13.

##### E23.4.3 Cementitious Grout for Dowels

- (a) The Contractor shall submit Manufacturer product sheets for the proposed cementitious grout to the Contract Administrator for approval a minimum of three (3) Calendar Days prior to installation of any shear dowels; and,
- (b) NSF/ANSI 61 documentation providing compliance for contact with potable water.

#### E23.5 Materials

E23.5.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

##### E23.5.2 Structural Concrete

- (a) Structural concrete shall conform to the requirements of E12.

##### E23.5.3 Reinforcing Steel

(a) Reinforcing steel and shear dowels shall conform to the requirements of E13.

**E23.5.4 Cementitious Grout for Dowels**

- (a) Cementitious grout for dowels shall:
- (i) Meet the requirements of NSF/ANSI 61 unless otherwise indicated by the Contract Administrator.

**E23.5.5 Granular Fill**

(a) All granular backfill shall be clean and free from organic material, meeting the following gradation requirements:

CANADIAN METRIC SIEVE SIZE	PERCENT PASSING BY WEIGHT
50 000	100
20 000	75 - 100
5 000	45 - 85
2 500	35 - 55
315	15 - 35
160	5 - 20
80	0 - 7

- (b) Backfill material shall be free of frozen lumps and shall be placed and compacted in an unfrozen state. Backfill shall not be placed on frozen subsoil.
- (c) Any backfill material that does not meet the gradation requirements of this Specification shall be removed and replaced by the Contractor at his own expense, to the satisfaction of the Contract Administrator.

**E23.6 Equipment**

E23.6.1 The Contractor's equipment shall conform to the requirements of D17 and all notes shown on the Drawings.

**E23.7 Construction Methods**

E23.7.1 Pile cap underpinning shall be performed in strict accordance with the construction procedures specified on the Drawings.

**E23.8 Measurement and Payment**

E23.8.1 Underpinning will not be measured and will be paid for at the Contract Lump Sum Price for "Pile Cap F-16 Underpinning", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

**E24. CELL CLEAN-UP**

**E24.1 Description**

E24.1.1 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and clean-up the interior of each cell prior to disinfection.

**E24.2 Scope of Work**

E24.2.1 The Work to be done under this Specification shall include but not be limited to:

- (a) Thorough washing of the interior of the East and West Cells. Prior to disinfection by the City.

### E24.3 References

E24.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) NSF/ANSI 61 Drinking Water System Components.

### E24.4 General

E24.4.1 Prior to returning the Reservoir cells to operation, the interior of the cells must be thoroughly cleaned and disinfected in accordance with the City requirements. The City of Winnipeg will complete the disinfection process however the Contractor shall be responsible for thoroughly cleaning the reservoir cells prior to the disinfection process to the satisfaction of the City and the Contract Administrator.

### E24.5 Procedure

- (a) Cell clean-up should not occur prior to the successful completion and inspection of all interior Works in the cell by the Contract Administrator.
- (b) The Contractor shall wash all interior Cell surfaces by means of pressure washing, scrubbing, or any other approved washing method. Particular attention shall be given to crevices and corners or any other areas in which solid material may have collected during the Works.
- (c) All construction debris, sludge, slurry, oil, grease, or any other contaminant shall not be allowed to enter the floor drains, suction pits, any sewer lines, or any other components regularly used for the movement of potable water. All debris, sludge, slurry, oil, grease or any other contaminant shall be thoroughly removed from the interior of the Cell prior to disinfection.
- (d) During cleaning, the floor grates, suction pits, and all other components in which the cleaning waste products may enter or infiltrate shall be protected as directed on the Drawings.
- (e) The Contractor shall notify the Contract Administrator in writing once the cell interior has been thoroughly cleaned. The Contract Administrator and City staff will inspect the cell and proceed with the disinfection procedure or require the Contractor to further clean the interior surfaces if they are judged to not be sufficiently clean for disinfection. Upon completion of any further cleaning, the Contractor shall once again notify the Contract Administrator for inspection.

### E24.6 Measurement and Payment

E24.6.1 Cell clean-up will not be measured and will be paid for at the Contract Lump Sum Price for "Cell Clean-up", which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

## PART F - SECURITY CLEARANCE

### F1. SECURITY CLEARANCE

F1.1 Each individual proposed to perform Work under the Contract within City facilities shall be required to provide a Criminal Record Search Certificate and a Public Safety Verification Check as detailed below:

F1.2 Public Safety Verification Check may be obtained from BackCheck by visiting <http://www.backcheck.net/cityofwinnipeg>. The results of the Public Safety Verification Check must be received by the City directly through BackCheck.

- (a) Proponents must set up an account with BackCheck under their company name and grant BackCheck permission to share the results of the Public Safety Verification Check with the City of Winnipeg.
- (b) Proponents will then be contacted by BackCheck with instructions on how to complete the Public Safety Verification Check.
- (c) If additional assistance is required to obtain the Public Safety Verification Check, the Bidder may contact the following BackCheck Representative:

Linda Ferens  
Email: [lferens@backcheck.net](mailto:lferens@backcheck.net)  
Phone: (204) 999-0912

F1.3 The Criminal Record Search Certificate may be obtained from any of the following:

- (a) The police service having jurisdiction at the individual's place of residence;
- (b) BackCheck by visiting <http://www.backcheck.net/cityofwinnipeg>. The Criminal Record Search Certificate must be received by the City directly through BackCheck.
  - (i) Proponents must set up an account with BackCheck under their company name and grant BackCheck permission to share the Criminal Record Search Certificate with the City of Winnipeg.
  - (ii) Proponents will then be contacted by BackCheck with instructions on how to complete the Criminal Record Search Certificate.
  - (iii) If additional assistance is required to obtain the Criminal Record Search Certificate, the Bidder may contact the following BackCheck Representative:

Linda Ferens  
Email: [lferens@backcheck.net](mailto:lferens@backcheck.net)  
Phone: (204) 999-0912

- (c) The Core of Commissionaires: Forms to be completed can be found at <http://www.commissionaires.mb.ca>.

F1.4 Prior to the commencement of any Work, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a 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.

F1.5 Any individual for whom a Criminal Record Search Certificate or a Public Safety Verification Check 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.

F1.6 Any Criminal Record Search Certificate and Public Safety Verification Check obtained thereby will be deemed valid for one (1) year beyond the date which it was obtained. If the Contractor continues to perform work beyond this date, they will be required to provide the Contract Administrator with an updated Criminal Record Search Certificate and Public Safety Verification Check.

- F1.7 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 Record 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.