



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 923-2008**

**SUPPLY, INSTALLATION AND COMMISSIONING OF BUTTERFLY VALVE  
ACTUATORS**

## TABLE OF CONTENTS

### PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	3

### PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	1
B5. Addenda	2
B6. Substitutes	2
B7. Bid Submission	3
B8. Bid	4
B9. Prices	4
B10. Qualification	5
B11. Opening of Bids and Release of Information	6
B12. Irrevocable Bid	6
B13. Withdrawal of Bids	6
B14. Evaluation of Bids	7
B15. Award of Contract	7

### PART C - GENERAL CONDITIONS

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

### PART D - SUPPLEMENTAL CONDITIONS

#### General

D1. General Conditions	1
D2. Scope of Work	1
D3. Definitions	1
D4. Contract Administrator	1
D5. Notices	2

#### Submissions

D6. Authority to Carry on Business	2
D7. Insurance	2

#### Schedule of Work

D8. Commencement	3
D9. Delivery	3
D10. Liquidated Damages	3

#### Measurement and Payment

D11. Payment	4
D12. Payment Schedule	4

#### Warranty

D13. Warranty	4
---------------	---

### PART E - SPECIFICATIONS

#### General

E1. Applicable Specifications and Drawings	1
E2. Goods	1
E3. Shop Drawings	1
E4. Electric Valve Actuators	3
E5. Inspection of Installation of Butterfly Valve Actuators	10
E6. Operation and Maintenance Manuals Including Spare Parts Lists	11
E7. Training	12

**PART F - FORMS**

Index to Forms	1
Form 200: Certificate of Equipment Delivery	2
Form 201: Certificate of Instruction	3
Form 202: Certificate of Satisfactory Installation	4
Form 203: Certificate of Equipment Satisfactory Performance	5
Form 204: Certificate of Training	6

## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 SUPPLY, INSTALLATION AND COMMISSIONING OF BUTTERFLY VALVE ACTUATORS

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, January 21, 2009.

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. SITE INVESTIGATION**

B3.1 Further to C3, the Contract Administrator or an authorized representative will be available January 13, 2009 to provide Bidders access to the Site(s). The Bidder is advised that the equipment to be supplied for this Bid Opportunity will be installed at two specific sites. The Site Investigation will commence at Branch II Aqueduct Interconnector valve chamber at the northeast corner of Bishop Grandin and Lagimodiere Blvd. from 9:00 AM to 10:00 AM, and then proceed to the valve chamber at MacLean Pumping Station at the intersection of Marion Street and Lagimodiere Blvd., from 10:15 to 11:15.

B3.2 The Bidder is advised that the equipment to be supplied for this Bid Opportunity is for the retrofit of existing large diameter butterfly valves. Interested suppliers will have an opportunity to view the proposed installation(s) to satisfy themselves of mounting configurations and space requirements for the proposed equipment.

B3.3 The Bidder is advised that the valve chambers are Confined Entry locations. Persons wishing to enter the chambers will be required to supply all necessary personal protective safety equipment, including body harness, hard hats, and safety boots. The City of Winnipeg will provide a retrieval hoist, lighting, and gas detector. Personnel attending the site shall be properly trained in Confined Space entry in accordance with Manitoba legislation and their individual company policy.

B3.4 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. ENQUIRIES**

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

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

B4.3 If the Bidder is unsure of the meaning or intent of any provision therein, the Bidder should request clarification as to the meaning or intent prior to the Submission Deadline.

B4.4 Responses to enquiries which, in the sole judgment of the 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.

- B4.5 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.
- B4.6 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.
- B4.7 Bidders shall note that the offices of the Contract Administrator identified in D4.1 will be closed from December 25, 2008 to January 4, 2009 inclusive.

## **B5. ADDENDA**

- B5.1 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.
- B5.2 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.
- B5.2.1 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>
- B5.2.2 The Bidder is responsible for ensuring that he 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.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 9 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B6. SUBSTITUTES**

- B6.1 The Work is based on the materials, equipment, methods and products specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least seven (7) Business Days prior to the Submission Deadline.
- B6.4 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 material, equipment, method or product 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 Contract;
  - (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 Contract.

- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his 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.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his 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 B14.
- B6.9 No later claim by the Contractor for an addition to the price(s) because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.7, deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B14.1(a).

## **B7. BID SUBMISSION**

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 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.
- B7.4 The Bid Submission may be submitted by mail, courier or personal delivery, or by facsimile transmission.
- B7.5 If the Bid Submission is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address, and shall be submitted to:
- The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg, MB R3B 1J1
- B7.5.1 Samples or other components of the Bid Submission 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 Submission.

- B7.6 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.7 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 B14.1(a).
- B7.8 If the Bid Submission is submitted by facsimile transmission, it shall be submitted to (204) 949-1178.
- B7.8.1 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time.
- B7.9 Bids submitted by internet electronic mail (e-mail) will not be accepted.

**B8. BID**

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.
- B8.2 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 own name, his 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 own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 11 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 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 own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B8.5 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.

**B9. PRICES**

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.1.1 Prices on Form B: Prices shall include:

- (a) duty;
- (b) freight and cartage;
- (c) Provincial and Federal taxes [except the Goods and Services Tax (GST) and Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable] and all charges governmental or otherwise paid;
- (d) profit and all compensation which shall be due to the Contractor for the Work and all risks and contingencies connected therewith.

B9.2 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.

B9.3 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.

B9.4 Prices from Non-Resident Bidders are subject to a Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

## **B10. QUALIFICATION**

B10.1 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, or if the Bidder does not carry on business in Manitoba, in the jurisdiction where the Bidder does carry on business; 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.

B10.2 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>

B10.3 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);

B10.4 The Bidder shall be prepared to submit, within three (3) business days of a request by the Contract Administrator, the following technical data for determination that all equipment offered complies with the Specifications described in Part E. The Bidder shall also provide the following specific information:

- (a) The name and model number for all butterfly valve actuators listed in Form B: Prices and also listed in further detail in Specifications Part E.

B10.5 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.

B10.6 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.

### **B11. OPENING OF BIDS AND RELEASE OF INFORMATION**

B11.1 Bids will not be opened publicly.

B11.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements or evaluated prices) 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>

B11.3 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>

B11.4 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.

### **B12. IRREVOCABLE BID**

B12.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 10 of Form A: Bid.

B12.2 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 for the time period specified in Paragraph 10 of Form A: Bid.

### **B13. WITHDRAWAL OF BIDS**

B13.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B13.1.1 Notwithstanding C21, 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.

B13.1.2 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 11 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B13.1.3 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 11 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B13.1.3(b), declare the Bid withdrawn.

B13.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B12.2 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.

## **B14. EVALUATION OF BIDS**

B14.1 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 therefrom (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B6;

B14.2 Further to B14.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.

B14.3 Further to B14.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid or in other information required to be submitted, that he is responsible and qualified.

B14.4 Further to B14.1(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.

B14.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

B14.4.2 Further to B14.1(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.

B14.5 This Contract will be awarded as a whole.

## **B15. AWARD OF CONTRACT**

B15.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B15.2 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.

B15.2.1 Without limiting the generality of B15.2, 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.

B15.3 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 B14.

B15.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his Bid upon written request to the Contract Administrator.

- B15.4 Notwithstanding C4 and Paragraph 6 of Form A: Bid, the City will issue a purchase order to the successful Bidder in lieu of the execution of a Contract.
- B15.5 The Contract Documents, as defined in C1.1(n) (ii), in their entirety shall be deemed to be incorporated in and to form a part of the purchase order notwithstanding that they are not necessarily attached to or accompany said purchase order.

## **PART C - GENERAL CONDITIONS**

### **C0. GENERAL CONDITIONS**

- C0.1 The *General Conditions for the Supply and Delivery of Goods* (Revision 2008 05 26) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for the Supply and Delivery of Goods* 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 Supply of Goods*.

## PART D - SUPPLEMENTAL CONDITIONS

### GENERAL

#### D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for the Supply and Delivery of Goods*, these Supplemental Conditions are applicable to the Work of the Contract.

#### D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the supply, delivery, field testing (if required), and commissioning of actuators for replacement or installation on existing butterfly valves.

D2.2 The major components of the Work are as follows:

- (a) Supply and delivery of one (1) electric valve actuator for the replacement of an existing electric actuator on a 1350 millimetre butterfly valve at the MacLean Pumping Station site (LAV1).
- (b) Supply and delivery of three (3) electric valve actuators for retrofit onto existing manual quarter turn gear boxes, including two (2) 1650 millimetre and one (1) 1350 millimetre butterfly valves at Branch II Aqueduct Inter-connector site.
- (c) Field testing and inspection of installation and commissioning.

#### D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) **ANSI** means American National Standards Institute.
- (b) **ASME** means American Society of Mechanical Engineers.
- (c) **ASTM** means American Society for Testing and Materials.
- (d) **AWWA** means American Water Works Association.
- (e) **CSA** means Canadian Standards Association.
- (f) **IEC** means International Electrotechnical Commission.
- (g) **ISO** means International Organization for Standardization.
- (h) **NACE** means National Association of Corrosion Engineers.
- (i) **NEMA** means National Electrical Manufacturers Association.
- (j) **NSF** means National Sanitation Foundation.
- (k) **SAE** means Society of Automotive Engineers.

D3.2 Notwithstanding C1.1, when used in this Bid Opportunity:

- (a) "**Installation Contractor or Installer**" means the General Contractor retained by the Owner, under a separate contract, to install the equipment supplied under this contract.

#### D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is UMA Engineering Ltd. doing business as AECOM, represented by:

Marvin McDonald, C.E.T.

Senior Project Coordinator  
1479 Buffalo Place  
Winnipeg, MB R3T 1L7  
Telephone No.: (204) 284-0580  
Facsimile No.: (204) 475-3646

## **D5. NOTICES**

- D5.1 Notwithstanding C21.3, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following address or facsimile number:

The City of Winnipeg  
Chief Financial Officer  
Administration Building, 3rd Floor  
510 Main Street  
Winnipeg MB R3B 1B9  
Facsimile No.: (204) 949-1174

## **SUBMISSIONS**

### **D6. AUTHORITY TO CARRY ON BUSINESS**

- D6.1 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.

### **D7. INSURANCE**

- D7.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg and AECOM Canada Ltd. added as an additional insured; such liability policy to also contain a cross-liability clause, non-owned automobile liability and products and completed operations cover, to remain in place at all times during the performance of the Work;
  - (b) if required, automobile liability insurance for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00), to remain in place at all times during the performance of the Work;
- D7.2 Deductibles shall be borne by the Contractor.
- D7.3 The Contractor shall provide the Contract Administrator with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4 for the return of the executed Contract.
- D7.4 The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

## **SCHEDULE OF WORK**

### **D8. COMMENCEMENT**

- D8.1 The Contractor shall not commence any Work until he is in receipt of a notice of award from the City authorizing the commencement of the Work.
- D8.2 The Contractor shall not commence any Work until:
- (a) the Contract Administrator has confirmed receipt and approval of:
    - (i) evidence of authority to carry on business specified in D6;
    - (ii) evidence of the workers compensation coverage specified in C6.16, and
    - (iii) evidence of the insurance specified in D7;
  - (b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.

### **D9. DELIVERY**

- D9.1 Goods shall be delivered by the delivery schedule noted below, f.o.b. destination, freight prepaid to 552 Plinguet street, Winnipeg, Manitoba:
- (a) Three (3) actuators for retrofit of existing butterfly valves at the Branch II Interconnector valve chamber site by May 15, 2009.
  - (b) One (1) actuator for replacement of existing actuator at the MacLean Pumping Station site by June 1, 2009.
- D9.2 The City intends to issue a notice of Award or purchase order no later than February 1, 2009. In the event that the notice of Award is not issued by this date, the dates specified in D9.1 will be adjusted by an equivalent number of Calendar Days until such a time as the notice of Award is issued.
- D9.3 The Contractor shall confirm each delivery with the Contract Administrator or his/her designate, at least two (2) Business Days before delivery.
- D9.4 Goods shall be delivered between 8:30 a.m. and 4:30 p.m. on Business Days.
- D9.5 The Contractor shall off-load goods as directed at the delivery location.

### **D10. LIQUIDATED DAMAGES**

- D10.1 If the Contractor fails to achieve delivery of the goods within the time specified in D9.1 Delivery, the Contractor shall pay the City five hundred dollars (\$500.00) per Calendar Day for each and every Calendar Day until the goods have been delivered.
- D10.2 The amount specified for liquidated damages in D10.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Delivery by the day fixed herein for same.
- D10.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## **MEASUREMENT AND PAYMENT**

### **D11. PAYMENT**

D11.1 Further to C10, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

### **D12. PAYMENT SCHEDULE**

D12.1 Further to C10, payment shall be in accordance with the following payment schedule:

- (a) Supply and Delivery in accordance to D9, seventy-five percent (75%) of Bid Price for each specific Supply and Delivery item in Form B: Prices. Note that the Form 200 - Certificate of Equipment Delivery must be executed for each actuator by the Contractor prior to issuance of payment.
- (b) Satisfactory on-site testing and commissioning, twenty-five percent (25%) of Bid Price for each specific Supply and Delivery item in Form B: Prices. Note that the Form 203 - Certificate of Equipment Satisfactory Performance must be executed for each actuator by the Contractor prior to issuance of payment.

## **WARRANTY**

### **D13. WARRANTY**

D13.1 Warranty is as stated in C11.

## **PART E - SPECIFICATIONS**

### **GENERAL**

#### **E1. APPLICABLE SPECIFICATIONS AND DRAWINGS**

- E1.1 These Specifications shall apply to the Work.
- E1.2 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B6.

#### **E2. GOODS**

- E2.1 The Contractor shall supply electric actuators for butterfly valves in various sizes in accordance with the requirements hereinafter specified.
- E2.2 Electric Actuators shall be in accordance with the latest version of AWWA Standard C540 or as specified herein.
- E2.3 Electric Actuators are scheduled to be installed on the following:
  - (a) Replacement – onto existing Limitorque gear assembly for a 1350mm (54 inch) Darling Pelton Valve in a valve chamber at the MacLean Pumping Station site.
  - (b) Installation – onto existing manual gear operators for 1350mm (54 inch) and 1650mm (66 inch) Rodney Hunt butterfly valves at the Branch II Aqueduct Interconnector Valve Chamber on Lagimodiere Boulevard and Bishop Grandin Boulevard.
- E2.4 Inspection of installation in accordance with the requirements hereinafter specified.

#### **E3. SHOP DRAWINGS**

- E3.1 Description
  - (a) This Specification shall revise, amend, and supplement the requirements of CW 1100 of the City of Winnipeg's Standard Construction Specifications.
    - (i) The term 'shop drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, which are to be provided by the Contractor to illustrate details of a portion of the Work.
    - (ii) The Contractor shall submit specified shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be show on all submissions for Engineering review.
  - (b) Shop Drawings
    - (i) Original drawings are to be prepared by the Contractor, Subcontractor, Supplier, Distributor, or Manufacturer, which illustrate appropriate portion of Work; showing fabrication, layout, setting, or erection details as specified in appropriate sections.
  - (c) Contractor's Responsibilities
    - (i) Review shop drawings, product data, and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.
    - (ii) Verify:
      - (a) Field measurements
      - (b) Field construction criteria
      - (c) Catalogue numbers and similar data

- (iii) Coordinate each shop drawing submission with the requirements of the Work and Contract Documents. Shop drawings of separate components of a larger system will not be reviewed until all related drawings are available.
  - (iv) Notify Contract Administrator, in writing at time of shop drawing submission, of deviations from requirements of Contract Documents.
  - (v) Responsibility for deviations in shop drawing submission from requirements of Contract Documents is not relieved by the Contract Administrator's review of submission, unless the Contract Administrator gives written acceptance of specified deviations.
  - (vi) Responsibility for errors and omissions in the shop drawing submission is not relieved by the Contract Administrator's review of the submittals.
  - (vii) The Contractor shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of shop drawings. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Contract Administrator on the previous submission.
  - (viii) After the Contract Administrator has reviewed and returned the copies, distribute the copies to sub-trades as appropriate.
  - (ix) Maintain one (1) complete set of reviewed shop drawings, filed by Specification Section Number, at the Site for use and reference by the Contract Administrator and Subcontractors.
- (d) Submission Requirements
- (i) Schedule shop drawing 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.
  - (ii) Submit five (5) paper prints of shop drawings. The Contractor is advised that the Contract Administrator will retain three (3) copies of all submittals and return two (2) copies to the Contractor.
  - (iii) Accompany shop drawing submissions with a transmittal letter containing:
    - (a) Date
    - (b) Project title and Bid Opportunity number
    - (c) Contractor's name and address
    - (d) Number of each shop drawing, product data, and sample submitted
    - (e) Specification Section, Title, Number, and Clause
    - (f) Drawing Number and Detail/Section Number
    - (g) Other pertinent data
  - (iv) Shop drawing submissions shall include:
    - (a) Date and revision dates.
    - (b) Project title and Bid Opportunity number.
    - (c) Name of:
      - (i) Contractor
      - (ii) Subcontractor
      - (iii) Supplier
      - (iv) Manufacturer
      - (v) Separate detailer when pertinent
    - (d) Identification of product of material.

- (e) Relation to adjacent structure or materials.
- (f) Field dimensions, clearly identified as such.
- (g) Specification section name, number and clause number or drawing number and detail/section number.
- (h) Applicable standards, such as CSA or CGSB numbers.
- (i) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements, and compliance with Contract Documents.

(e) Other Considerations

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

E3.2 Measurement and Payment

- E3.2.1 Preparation and submittal of Shop Drawings will be included in the Contract Work and no additional payment will be made for such work.

**E4. ELECTRIC VALVE ACTUATORS**

E4.1 Description

- (a) This specification shall cover the design and manufacture of electric actuators for butterfly valves to be supplied under this Contract. This specification is supplementary to and shall be read together with the latest revision of AWWA Standard C540, "Power-Actuating Devices for Valves and Sluice Gates".
- (b) All electric actuators to be supplied under this Contract shall be designed and manufactured by a company having at least five (5) years prior experience in manufacturing these types of products in the size and to the pressure ratings as those specified herein.
- (c) All technologies and devices used in the actuator shall have a minimum of five (5) years of commercial operating experience for that specific manufacturer. This is to include torque and position sensing, lubrication, and electrical compartment design.

E4.2 Design Requirements

E4.3 Acceptable Products

- (a) Electric valve actuators shall be:
  - (i) Branch II Valve Chamber - Rotork IQ Range
  - (ii) MacLean LAV1 - Limitorque "L120" Series
  - (iii) Or Approved Equal in accordance with B6.



- (b) The motor shall be of a design that allows for electrical and mechanical disconnection without disturbing the gear case or valve position. Electrical and mechanical disconnection of the motor should be possible without draining the lubricant from the actuator gear case. Plugs and sockets shall not be acceptable as a means of electrical connection for the motor.
- (c) The actuator shall include circuitry to ensure the motor runs with the correct rotation for the required direction of operation with either phase sequence of the 3-phase power supply.

#### E4.3.5 Motor Protection

- (a) Protection shall be provided for the motor as follows:
  - (i) The motor shall be de-energized in the event of a stall, when attempting to unseat a jammed valve.
  - (ii) Motor temperature shall be sensed by a thermostat to protect against overheating.
  - (iii) Single phasing protection.
  - (iv) Instantaneous reversal protection whereby an automatic time delay circuit limits the current surges when the actuator is signalled to instantaneously reverse direction.

#### E4.3.6 Integral Starter and Transformer

- (a) The reversing starter, control transformer, and local controls shall be integral with the valve actuator, suitably housed to prevent breathing and condensation built-up. For ON/Off service, the starter shall be an electromechanical type or solid state type suitable for sixty (60) starts per hour, and of rating appropriate to motor size. The controls supply transformer shall be fed from two (2) of the incoming three (3) phases. It shall have the necessary tappings and be adequately rated to provide power for the following functions:
  - (i) 120V AC energization of the contactor coils
  - (ii) 24V DC output where required for remote controls
  - (iii) Supply for all the internal electrical circuits
- (b) The primary and secondary windings shall be protected by easily replaceable fuses.
- (c) The reversing motor controller shall consist of separate contactors for controlling valve movement in either the opening or closing direction. Each contactor shall be either magnetic or solid state, full voltage across-the-line type, sized to suit the motor power rating. They shall also provide low voltage and thermal overload protection by means of three bi-metallic or melting alloy elements which shall be correctly related to the motor nameplate full load current and temperature rise of the motor. The contactors shall be of robust construction with double break contacts, requiring a minimum of maintenance and being easily replaceable. Mechanical and electrical interlocks shall be provided.

#### E4.3.7 Gearing

- (a) The actuator gearing shall be totally encased in an oil filled or sealed gear case complete with fill and drain taps, suitable for operation at any angle. All gearing shall be of hardened steel alloy and alloy bronze construction with machine cut teeth. Thrust bearings of the ball or roller type shall be provided at the base of the operator. The gear case shall be designed to be opened for inspection or repair without releasing the stem thrust or taking the valve out of service.

#### E4.3.8 Manual Operation

- (a) Motorized actuators shall be provided with a handwheel, which shall not rotate during motor operation. The handwheel shall be made of cast iron or aluminum with the

word "OPEN" and a directional arrow cast in relief on the rim. Spinners shall be provided on the handwheels. The handwheel operation shall be accomplished by a declutch lever, capable of lockout by padlock. The handwheel shall disengage automatically from the operating mechanism once the motor is capable of operation. The handwheel shall be located sufficiently away from the valve flanges, housings, etc. such that personnel will not hit their knuckles on any of these obstructions when using the handwheel.

- (b) The handwheel shall be positioned on the operating floor as indicated in 0 above.
- (c) The handwheel shall be sized to allow one man operation with a maximum rim pull of 356 Newtons (eighty (80) ft. lbs.) at maximum torque conditions.
- (d) Clockwise operation of the handwheel shall give closing movement of the valve unless otherwise stated in this specification.

#### E4.3.9 Drive Bushing

- (a) The actuator shall be furnished with an easily detachable drive bushing for machining to suit the valve stem or gearbox input shaft. The drive bushing shall be positioned in the base of the actuator to facilitate the valve stem extensions.
- (b) Thrust bearings, when housed in a separate thrust base, should be of the sealed-for-life type.

#### E4.3.10 Turns Limit and Torque Limit Switches for Electromechanical Type

- (a) Position limit switches shall be provided and set to stop the motion of the valve when it reaches the fully open and fully closed position. In addition, torque limiting switches shall be provided for open and close position as well to prevent damage to the operating mechanism in the case of torque overload. The torque switch shall be fitted with a mechanical interlock to prevent torque trip on valve opening. Provision shall be made for four extra limit switches, adjustable to any valve position.
- (b) Switch design shall permit visual verification of switch position without disassembly.
- (c) Switch contact rating on inductive circuits shall be 600 Volts AC power, per NEMA standard ICS 2-125 heavy duty.
- (d) Torque protection reset shall not allow repeated starting in the same direction when control signal is maintained.
- (e) The Manufacturer's Representative shall field check the calibrations and settings of the limit and torque switches after installation, in the presence of the Contract Administrator.
- (f) Torque and turns limitation to be adjustable as follows:
  - (i) Position setting range: 0.5 to 100,000 turns, with resolution to 15° of actuator output.
  - (ii) Torque setting: 40% to 100% rated torque.
  - (iii) Torque sensing shall be by purely electrically or electronically methods. Extrapolation of torque from mechanically measured motor speed will not be acceptable due to response time.
  - (iv) "Latching" shall be provided for the torque sensing system to inhibit torque off during unseating or during starting in mid-travel against high inertia loads.

#### E4.3.11 Turns Limit and Torque Limit Switches for Solid State Type

- (a) Torque and turns limitation to be adjustable as follows:
  - (i) Position setting range: 2.5 to 100,000 turns, with resolution to 15° of actuator output.
  - (ii) Torque setting: 40% to 100% rated torque.

- (iii) Torque sensing shall be by purely electrically or electronically methods. Extrapolation of torque from mechanically measured motor speed will not be acceptable due to response time.
- (iv) "Latching" shall be provided for the torque sensing system to inhibit torque off during unseating or during starting in mid-travel against high inertia loads.

#### E4.3.12 Remote Valve Position Indication

- (a) Four contacts shall be provided to indicate open position, close position, remote selected, and thermostat tripped.
- (b) Contacts to be rated at 5A, 250 VAC, 30V DC.

#### E4.3.13 Local Position Indication

- (a) The actuator shall incorporate an illuminated, mechanical dial indicator or digital readout to show continuous movement from fully open to fully closed in 1% increments. The digital display shall be maintained even when the power to the actuator is isolated.
- (b) The local display shall be large enough to be viewed from a distance of 1.83 metres when the actuator is powered up.

#### E4.3.14 Push Buttons and Selector Switches

- (a) Each actuator shall be complete with a local Open-Stop-Close push-button station with external Red-Open, Green-Closed indicating lights and a Local-Off-Remote selector switch padlockable in any one of the following three positions:
  - (i) Local Control Only
  - (ii) Off (No Electrical Operation)
  - (iii) Remote Control plus Local Stop Only
- (b) It shall be possible to select maintained or non-maintained local control.
- (c) The local controls shall be arranged so that the direction of valve travel can be reversed without the necessity of stopping the actuator.

#### E4.3.15 Controls

- (a) The internal control and monitoring circuits shall operate at nominal 24 volts DC with interposing relays to energize the 120 volts AC contactor coil circuits (where employed). All necessary transformers shall be provided.
- (b) The necessary wiring and terminals shall be provided in the actuator for the following control functions:
- (c) Additional geared limit switch closed when valve fully open.
- (d) Additional geared limit switch closed when valve fully closed.
- (e) Removable links for substitution by external interlocks to inhibit valve opening and/or closing.
- (f) Control Method:
  - (i) Open and Close maintained.
- (g) Selection of maintained or push-to-run control for modes a) and b) above shall be provided by links.
- (h) The internal circuits associated with the control and monitoring functions shall be designed to withstand simulated lightning impulses of up to 1 kilovolt.

#### E4.3.16 Monitoring Facilities

- (a) Facilities shall be provided for monitoring actuator operation and availability as follows:

- (i) Motor (availability) relay, having one normally open contact, the relay being energized from the control transformer only when the Local/Off/Remote selector switch is in the remote position to indicate that the actuator is available for remote (control room) operation.
- (ii) Where required, it shall be possible to provide indication of thermostat trip and "Remote" selected as discreet signals.
- (iii) Provision shall be made for the addition of diagnostic module which will store and enable download of historical actuator data to permit analysis of changes in actuator or valve performance.
- (iv) Diagnostic status screens shall be provided to show multiple functions simultaneously so troubleshooting can be affected rapidly and efficiently. All diagnostic information shall be contained on no more than seven or eight (7 or 8) screens so multiple functions can be checked simultaneously.
- (v) One (1) copy of the actuator diagnostic/programming software, in a Microsoft Windows based portable computer format, shall be included with "Supply and Delivery of Modulating Valve Complete With Electric Valve Actuator" in Form B: Prices. The actuator diagnostic/programming software shall be supplied with one data communications cable for connection between the portable computer and the electric actuator.

#### E4.3.17 Wiring and Terminals

- (a) Internal wiring shall be of CSA approved insulated stranded cable of appropriate size for the control and 3-phase power. Each wire shall be clearly identified at each end. Permanent heat shrunk labelling shall be used.
- (b) The terminals shall be embedded in terminal block of high tracking-resistance compound.
- (c) The terminal compartment shall be separated from the inner electrical components of the actuator by means of a watertight 'O' ring seal.
- (d) The terminal compartment of the actuator shall be provided with a minimum of two (2) threaded cable entries.
- (e) All wiring supplied as part of the actuator shall be contained within the main enclosure for physical and environmental protection. External conduit connections between components will not be acceptable.
- (f) Control logic circuit boards and relay boards shall be mounted on plastic mounts to comply with double insulated standards. No more than a single primary size fuse shall be provided to minimize the need to remove single covers for replacement.
- (g) A durable terminal identification card showing plan of terminals shall be attached to the inside of the terminal box cover indicating:
  - (i) Serial number
  - (ii) External voltage values
  - (iii) Wiring diagram number
  - (iv) Terminal layout
- (h) The identification card shall be suitable to inscribe cable core identification alongside terminal numbers.

#### E4.3.18 Enclosure

- (a) Actuators shall be O-ring sealed, watertight to NEMA 6/IP68 as well as have an inner watertight and dustproof O-ring seal between the terminal compartment and the internal electrical elements of the actuator, fully protecting the switch mechanism, motor and all other internal electrical elements of the actuator from ingress of moisture and dust when the terminal cover is removed on site for cabling.

- (b) Actuators shall be provided with an internal motor and compartment heater.
- (c) All external fasteners shall be of stainless steel.

#### E4.4 Installation

- (a) The actuators will be installed by the Installation Contractor, in a weatherproof superstructure. The power supply and controls will be installed to the valve actuators in late Spring 2009.

#### E4.5 Start-up Kit

- (a) Each actuator shall be supplied with a start-up kit comprising installation instruction, electrical wiring diagram, and sufficient spare cover screws and seals to make good any site losses during the commissioning period.

#### E4.6 Protective Coatings

- (a) All external ferrous components including floor stands, adaptors and mounting plates, shall be painted with two coats of polyamide epoxy paint, Amerlock 400 or approved equal in accordance to B6.
- (b) Any touch-up paintwork required during installation shall be undertaken by the Installation Contractor. The touch-up paint shall be of the same colour and specifications used in the above clauses and shall be supplied by the Contractor. The Contractor shall provide a minimum of one (1) litre of paint product for this purpose.

#### E4.7 Testing

- (a) Each electric motorized actuator shall be performance tested by the manufacturer at their facilities prior to shipping. The test shall simulate a typical valve torque load from full-open to full-close and full-close to full-open. The following information shall be recorded:
  - (i) Torque at Maximum Torque Setting
  - (ii) Current at Maximum Torque Setting
  - (iii) Test Voltage and Frequency
  - (iv) Flash Test Voltage
  - (v) Actuator Output Speed and Operating Time for Full-Open to Full-Close
  - (vi) Amperage draw on motors at breakaway and normal operation.
- (b) Copies of the test reports for the above performance tests signed by the official who is responsible for the actuator assembly and testing shall be forwarded to the Contract Administrator as soon as completed.
- (c) In addition, the test reports shall include details of specification such as gear ratios for both manual and automatic drive, closing direction, wiring diagram code number, etc.
- (d) Actuators
  - (i) Electric actuators shall be tested in accordance with the latest revision of AWWA Standard C540.
  - (ii) In addition to factory inspection and the witness of tests by the Contract Administrator, the Contractor shall provide copies of the following test reports prior to delivery of the actuators:
    - a) proof-of-design test, and
    - b) performance tests.
- (e) Electric Actuators
  - (i) The City shall perform voltage, current draw, cycle speed and whatever other tests are deemed appropriate, once the actuators have been delivered to the City of Winnipeg warehouse location.

## **E5. INSPECTION OF INSTALLATION OF BUTTERFLY VALVE ACTUATORS**

### **E5.1 General**

(a) The butterfly valve actuators will be installed by the Installation Contractor forces at a later date (Spring 2009) and the Contractor will be required to provide a qualified technical representative to:

- (i) Be present at the field testing of the electric actuators.
- (ii) Inspect each actuator installation, provide any assistance necessary in setting up the actuators, instruct City personnel in the operation and maintenance of the actuators and provide a letter or Form 202: Certificate of Satisfactory Installation for each actuator.

E5.2 The Contractor shall attend a turn over inspection with the Contract Administrator and the Installation Contractor, at which time the care and control of the equipment will be assumed by the Installation Contractor. The Contractor shall sign Form 200 Certificate of Equipment Delivery, attached in Part F, indicating equipment has been turned over in satisfactory condition.

E5.3 Unless otherwise specifically stated in the Specifications, the Contractor shall provide, and shall allow for in his Bid, a factory-trained representative who, in conjunction with the Contract Administrator, shall give instructions regarding the installation of the equipment. The Contractor's representative shall complete Form 201 Certificate of Instruction, attached in Part F, when he is satisfied that the Installation Contractor has received adequate instruction in the installation of the Contractor's equipment. The completed Form 201 shall be submitted to the Contract Administrator prior to the commencement of equipment installation.

E5.4 The Contractor's factory-trained representative shall visit the site as required to ensure that the installation work is being performed in a proper and workmanlike manner. The Contractor's representative shall complete Form 202 Certificate of Satisfactory Installation, attached in Part F, following installation of the equipment. The completed Form 202 shall be submitted to the Contract Administrator prior to the commencement of functional testing. The Contractor shall allow for a minimum of one (1) full working day at each worksite. Additional days beyond time noted above shall be approved by Contract Administrator.

E5.5 The Contractor's representative shall be present to supervise the commissioning, initial operation, and functional testing of the equipment. The Contractor shall be required to complete Form 203 Certificate of Equipment Satisfactory Performance, attached in Part F, stating that his qualified representative has checked the installed equipment and found the equipment to be satisfactorily installed and in specified working operation. The completed Form 203 shall be received by the Contract Administrator prior to commencement of the Warranty period. The scheduling of the Contractor's factory-trained representative's visits to the site shall be to the mutual satisfaction of the Contractor and the Installation Contractor, and shall be agreed upon before the work of installing the equipment begins. The Contractor shall allow for a minimum of one (1) full working day at each worksite for commissioning, testing, and training services.

E5.6 If the Contractor is requested by the Installation Contractor or the Contract Administrator to send a representative to the jobsite to investigate or rectify a suspected fault in the equipment furnished by the Contractor but it is found that the said equipment or Contractor is not at fault, the Contractor shall be entitled to be reimbursed for all reasonable costs and expenses incurred by him in sending his representative to the jobsite, at the per diem rate listed in Form B Prices.

E5.7 Operating equipment and systems shall be performance tested by the Contractor in the presence of the Contract Administrator to demonstrate compliance with the specified operating requirements. Functional testing shall be conducted under the specified design operating conditions or under such simulated operating conditions as recommended or approved by the Contract Administrator.

E5.8 The Contractor shall provide training to City staff in accordance with Clause 0. Form 204 shall not be issued until after training has been provided to the satisfaction of the City.

E5.9 Immediately following issuance of Form 204, the City reserves the right to operate this equipment to suit system requirements.

E5.10 Measurement and Payment

(a) Measurement and payment for inspection, installation, commissioning and testing shall be at the Contract Unit Price for "Supply of Site Inspection and Commissioning Services". Payment shall be compensation in full for site time and expenses, including all travel and related expenses, for each of the two installation sites listed in Form B: Prices.

(b) Additional Site Inspection Services, as requested by the Contract Administrator, will be measured and paid on a per diem basis. Additional time required for testing, installation inspection, and commissioning required as a result of deficient work or materials attributed to supply and delivery of the equipment shall be borne by the Contractor

## **E6. OPERATION AND MAINTENANCE MANUALS INCLUDING SPARE PARTS LISTS**

E6.1 For each type of equipment, five (5) sets of Operation and Maintenance Manuals shall be submitted to the Contract Administrator for review. The Contractor shall provide these manuals ten (10) Calendar Days in advance before commencement of equipment startup and commissioning.

E6.2 All instructions in these manuals shall be in the English language to guide the City in the proper operation and maintenance of the equipment.

E6.3 Bind contents in a three (3)-"D-Ring", hard-covered, plastic-jacketed binder with full cover and spine insert. Organize contents into applicable sections of work, parallel to Specifications breakdown.

E6.4 Provide all required data in electronic format. Text documents shall be Microsoft Word or Adobe format. Drawings, scanned documents, parts lists, test forms shall be in Adobe format. If possible, documents shall be an original electronic format. Documents that require scanning shall be high quality scans and fully legible. Documents shall be submitted on a high quality compact disk. Compact disk and case shall be labeled in type, with the following;

- (a) Bid opportunity number.
- (b) Job Title.
- (c) Description of Equipment.

E6.5 In addition to information called for in the Specifications, the following shall be included:

- (a) Title sheet, labeled "Operation and Maintenance Instructions", containing project name and date.
- (b) List of contents.
- (c) Reviewed shop drawings of all equipment.
- (d) Certified factory test results.
- (e) Full description of entire mechanical system, operation, and control. Provide "as programmed" parameter list for each electric valve actuator.
- (f) Names, addresses, and telephone numbers of all major sub-contractors and suppliers.
- (g) Detailed specification and operating and maintenance instructions for all items of equipment provided including a preventative maintenance program.

- (h) An itemized list of spare parts recommended for five years of service, particularly those components failure of which will render the equipment supplied inoperative. Any special tools or other ancillary items necessary for commissioning and/or proper operation and maintenance shall also be listed. These prices shall be available to the City at any time prior to the issuance of the Certificate of Acceptance.
- (i) Part books that illustrate and list all assemblies, sub-assemblies, and components.
- (j) Routine test procedures for all electronic and electrical circuits.
- (k) Troubleshooting chart covering the complete controls/electrical power systems, showing description of trouble, probable cause, and suggested remedy.

E6.6 The Contractor shall modify and supplement the manual as required by the Contract Administrator. When accepted, six (6) additional copies, including electronic versions, shall be provided by the Contractor for distribution purposes. The City's staff shall be in receipt of these manuals prior to the date set out for Substantial Performance. The Contract shall not be considered complete, for the purpose of issuing a Certificate of Substantial Performance, until the above manuals have been completed and submitted to the satisfaction of the Contract Administrator.

E6.7 Measurement and Payment

- (a) Measurement and payment for operation and maintenance manuals will not be made and will be considered incidental to the price for supply and delivery of the actuators received.

## **E7. TRAINING**

E7.1 The Contractor shall include costs for providing training to City staff by a factory-trained representative on the operation and maintenance of the equipment.

E7.2 Training for the equipment shall be conducted before the operation period as described in Form 203. The training session shall be conducted on site, in conjunction with commissioning. The Contractor shall provide a qualified instructor as well as the necessary course materials.

E7.3 Training shall be provided in one session for operation and maintenance staff. The training shall cover operation and maintenance.

E7.4 Training shall be completed in conjunction with commissioning of the equipment. The Contract shall not be considered complete until the training has been provided and Form 204 has been signed.

E7.5 Measurement and Payment

- (a) Measurement and payment for training will not be made. It is to be included in the price paid for Supply of Site Inspection and Commissioning Services.

# **PART F**

# **FORMS**

## **PART F - FORMS**

### **INDEX TO FORMS**

Form 200.....	Certificate of Equipment Delivery
Form 201.....	Certificate of Instruction
Form 202.....	Certificate of Satisfactory Installation
Form 203.....	Certificate of Equipment Satisfactory Performance
Form 204.....	Certificate of Training

**FORM 200:  
CERTIFICATE OF EQUIPMENT DELIVERY**

We certify that the equipment listed below has been delivered into the care of the Installation Contractor. The equipment has been found to be in satisfactory condition and meets its Basic Design Criteria. No defects in the equipment were found.

**Project:** \_\_\_\_\_

**Item of Equipment:** \_\_\_\_\_

**Tag No.:** \_\_\_\_\_

**Reference Specification:** \_\_\_\_\_

\_\_\_\_\_  
(Authorized Signing Representative of the Installation Contractor) (Date)

\_\_\_\_\_  
(Authorized Signing Representative of the Contractor) (Date)

\_\_\_\_\_  
(Authorized Signing Representative of the Contract Administrator) (Date)

**FORM 201:  
CERTIFICATE OF INSTRUCTION**

I have completed instruction of the installation of the equipment listed below:

**Project:** \_\_\_\_\_

**Item of Equipment:** \_\_\_\_\_

**Tag No.:** \_\_\_\_\_

**Reference Specification:** \_\_\_\_\_

\_\_\_\_\_  
(Authorized Signing Representative of the Contractor) (Date)

I certify that the party responsible for the installation of the equipment listed below has received satisfactory instructions from the Contractor.

\_\_\_\_\_  
(Authorized Signing Representative of the Installation Contractor) (Date)

**FORM 202:  
CERTIFICATE OF SATISFACTORY INSTALLATION**

I have completed my check and inspection of the installation listed below and confirm that it is satisfactory and that defects have been remedied to my satisfaction except any as noted below:

**Project:** \_\_\_\_\_

**Item of Equipment:** \_\_\_\_\_

**Tag No.:** \_\_\_\_\_

**Reference Specification:** \_\_\_\_\_

**Outstanding Defects:** \_\_\_\_\_

---

(Authorized Signing Representative of the Contractor)

(Date)

**FORM 203:  
CERTIFICATE OF EQUIPMENT SATISFACTORY PERFORMANCE**

We certify that the equipment listed below has been validated and has been operated for at least seven (7) consecutive days and that the equipment operates satisfactory and meets its Basic Design Criteria. No defects in the equipment were found. The equipment is therefore classed as "conforming".

**Project:** \_\_\_\_\_

**Item of Equipment:** \_\_\_\_\_

**Tag No.:** \_\_\_\_\_

**Reference Specification:** \_\_\_\_\_

\_\_\_\_\_  
(Authorized Signing Representative of the Contractor) (Date)

\_\_\_\_\_  
(Authorized Signing Representative of the Installation Contractor) (Date)

\_\_\_\_\_  
(Authorized Signing Representative of the Contract Administrator) (Date)

**FORM 204:  
CERTIFICATE OF TRAINING**

We certify that we have received the appropriate training in the operation and maintenance of the supplied equipment in accordance with these Specifications.

**Project:** \_\_\_\_\_

**Item of Equipment:** \_\_\_\_\_

**Tag No.:** \_\_\_\_\_

**Reference Specification:** \_\_\_\_\_

\_\_\_\_\_  
(Authorized Signing Representative of the Contractor)

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

\_\_\_\_\_  
(Authorized Signing Representative of the City)

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

\_\_\_\_\_  
(Authorized Signing Representative of the Contract Administrator)

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