



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 834-2008

**WINNIPEG WATER TREATMENT PROGRAM – SUPPLY AND INSTALLATION OF
TELEPHONE AND DATA SYSTEMS**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 WINNIPEG WATER TREATMENT PROGRAM – SUPPLY AND INSTALLATION OF TELEPHONE AND DATA SYSTEMS

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, March 26, 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 C3.1, the Contract Administrator or an authorized representative will be available at the Site in the Consultant Office Trailer from 11:00 a.m. to 12:00 noon on March 12, 2009 to provide Bidders access to the Site, located at Lot 57082, Provincial Road 207, RM of Springfield, Manitoba.

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

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 notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.

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

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

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

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 internet site at <http://www.winnipeg.ca/matmgt>.
- B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division internet site for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.2.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 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 Plant, Materials and methods 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 five (5) 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 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.
- 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 shall 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 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.
- B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B14.1(a).

B7. BID COMPONENTS

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid; and
 - (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.
- 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.
- B7.8.2 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 10 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;
- (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.

B8.4.2 All signatures shall be original.

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 the lump sum price in Canadian funds for the Work on Form B: Prices.

B9.1.1 Notwithstanding C12.2.3(c), the price on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B9.2 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; 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 internet site 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);
 - (d) have a structured cabling industry affiliation in accordance with article 1.2 of Section 16755.
- B10.4 Further to B10.3(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/Subcontractors has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:
- (a) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association or by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or
 - (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.)
- 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) 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 internet site 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 internet site 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 9 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 9 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 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.
- 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 10 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 10 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 there from (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 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 lump sum price shown on Form B: Prices.
- B14.4.1 If there is any discrepancy between the lump sum price written in figures and the lump sum price written in words, the price written in words shall take precedence.

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, the City will issue a Purchase Order to the successful Bidder in lieu of the execution of a Contract.
- B15.5 The Contract, as defined in C1.1, in its entirety shall be deemed to be incorporated in and to form a part of the Purchase Order notwithstanding that it is not necessarily attached to or accompany said Purchase Order.

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 internet site at 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. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the supply and installation of WTP Facility telephone and data systems.

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

(a) The supply and installation of telephone and data systems as specified in Part E.

D2.3 Wiring methods used in the Work shall be consistent with existing City wiring methods unless otherwise indicated in the Specifications.

D2.4 The excavation required to install the buried conduit between the surge tower and VC-4 (pursuant to clause 1.1.2.5 for Section 16755) shall be performed using vacuum excavation methods. The Contractor shall supply and install sand bedding for the conduit and backfill using City supplied material that is stockpiled on Site.

D2.5 The City will arrange and pay for Manitoba Telephone System to connect MTS services at the service entrance backboards in the WTP and DBPS and at the pedestal. At the request of the Contract Administrator the Contractor shall assist in coordinating the provision of MTS work as specified in clause 1.1.6 of Section 16755.

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

(a) **Award Authority** means the authority having the jurisdiction to award the Contract according to the City's by-laws, policies or procedures

(b) **Business Day** means any Calendar Day, other than a Saturday, Sunday, or a Statutory or Civic Holiday

(c) **Submission Deadline** and **Time and Date Set for the Final Receipt of Bids** mean the time and date set out in the Bidding Procedures for final receipt of Bids

(d) **Acceptable Shop Drawings** means all required Shop Drawings have been reviewed by the Contract Administrator and have been annotated and stamped as "reviewed" or "reviewed as modified" in accordance with Section 01300 of this Bid Opportunity

(e) **CSA** means Canadian Standards Association

(f) **City Supplied Equipment** means equipment purchased by the City under a separate contract which is supplied into the care and custody of the Contractor for installation under this Contract

(g) **Contract Work Schedule** means a Gantt Chart developed by the Contractor developed using the critical path method which shows the proposed progress of the major items of work which are to be performed under this Contract

(h) **DBPS** means Deacon Booster Pumping Station

(i) **EEMAC** means Electrical and Electronic Manufacturer Association of Canada

(j) **ISA** means the Instrumentation Systems and Automation Society

- (k) **ISO** means International Organization for Standardization
 - (l) **Manufacturer** means the person, partnership or corporation responsible for the manufacture and fabrication of equipment supplied by the Contractor for the completion of the Work
 - (m) **Manufacturer's Representative** means a trained serviceman empowered by the Manufacturer to provide installation, testing, and commissioning assistance to the Contractor in his performance of those functions
 - (n) **O&M** means operation and maintenance
 - (o) **Record Drawings** means a minimum of one (1) complete set of Contract Documents and Acceptable Shop Drawings maintained at the Contractor's Site office on which the Contractor clearly shall clearly record in red pencil all Addenda, Change Orders, Field Instructions, and other revisions or as-built conditions which deviate from the original Contract Documents or Certified Shop Drawings
 - (p) **RWPS** means raw water pumping station
 - (q) **Substantial Performance** shall have the meaning attributed to it in the Builders' Liens Act (Manitoba), or any successor legislation thereto
 - (r) **TPSH** means twisted pair shielded cable
 - (s) **ULC** means Underwriter's Laboratories of Canada
 - (t) **WTP** means the Winnipeg Water Treatment Plant and includes the structure and all equipment and materials supplied and installed into the building, under multiple construction contracts, including portions of the Work provided under this Contract
 - (u) **WTP Facility** means the Winnipeg Water Treatment Plant and all ancillary support facilities located on the Site identified in E3.3, including all structures, equipment and materials supplied and installed into the buildings, under multiple construction contracts, including portions of the Work provided under this Contract
- D3.2 The definitions of technical terms, abbreviations, and symbols will be those of the American Society for Testing and Materials, Canadian Standards Association and the applicable Codes and Standards. In the event of a dispute, the Contract Administrator's decision will be final.
- D3.3 The Manufacturer and Manufacturer's Representative are not parties to this Contract. All work required from the Manufacturer and Manufacturer's Representative shall be provided and coordinated by the Contractor.
- D4. CONTRACT ADMINISTRATOR**
- D4.1 The Contract Administrator is AECOM Canada Projects (CM) Ltd., represented by:
Bill Richert, P. Eng.
1479 Buffalo Place
Winnipeg, MB
R3T 1L7
e-mail: bill.richert@aecom.com
Telephone No. (204) 986-6053
Facsimile No. (204) 986-8393
- 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.

D5. CONTRACTOR'S SUPERVISOR

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

D6. NOTICES

D6.1 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.

D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3, D6.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D4.1.

D6.3 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

D6.4 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 address or facsimile number:

The City of Winnipeg
Internal Services Department
Legal Services Division
Attn: City Solicitor
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1
Facsimile No.: (204) 947-9155

SUBMISSIONS

D7. AUTHORITY TO CARRY ON BUSINESS

D7.1 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.

D8. WORKERS COMPENSATION

D8.1 The Contractor shall be registered with the Workers Compensation Board of Manitoba, shall provide and maintain Workers Compensation coverage throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D9. SAFE WORK PLAN

- D9.1 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.
- D9.2 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 internet site at <http://www.winnipeg.ca/matmgt>.

D10. INSURANCE

- D10.1 The City will provide and maintain the following Project Insurance Coverages:
- (a) Builder's Risk Insurance in the amount of one hundred percent (100%) of the total project cost.
 - (i) The Contractor shall be responsible for deductibles up to \$25,000.00 maximum of any one loss.
 - (b) Wrap-Up Liability Insurance in an amount of no less than 10 million dollars (\$10,000,000.00)
 - (i) The Contractor shall be responsible for deductibles up to \$25,000.00 maximum of any one loss.
 - (c) The City of Winnipeg will carry such insurance to cover all parties engaged in the Work in this Contract. 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.
- D10.2 The Contractor shall provide and maintain the following insurance coverage at all times during the performance of the Work:
- (a) Automobile liability insurance for owned and non-owned automobiles used for or in connection with the work in the amount of at least two million dollars (\$2,000,000.00).
 - (i) Deductibles shall be borne by the Contractor;
 - (ii) The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator;
 - (iii) The Contractor shall provide the Contract Administrator with evidence of insurance of the policy at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.
- D10.3 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator.

D11. PERFORMANCE SECURITY

- D11.1 If the Contract Price exceeds twenty-five thousand dollars (\$25,000.00), 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.

D11.1.1 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.

D11.2 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 Purchase Order and prior to the commencement of any Work on the Site.

D12. DETAILED PRICES

D12.1 The Contractor shall provide the Contract Administrator with a detailed price breakdown in a format acceptable to the Contract Administrator at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13. SUBCONTRACTOR LIST

D13.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.

D14. DETAILED WORK SCHEDULE

D14.1 The Contract Administrator has developed a Project Master Schedule for the work. This schedule will be available in the offices of the Contract Administrator and will be updated as required as the Work progresses.

D14.2 The Contractor shall, within fifteen (15) Business Days of award of Contract, prepare a detailed Contract Work Schedule for his work based on a critical path method (CPM) approach.

D14.3 The schedule shall conform to the Project Master Schedule and show, in a clear graphical manner, through the use of Gantt charts, in a maximum of weekly stages, the proposed progress of the main items, structures and subtrades of the Contract and indicate the labour, construction crews, Plant and equipment to be employed. Indicate the delivery date of major pieces of equipment to be supplied. The schedule shall be predicated on the completion of all work on or before the date of Substantial Performance.

D14.4 The Contract Work Schedule shall be updated as the Work requires and submitted to the Contract Administrator.

D14.5 Upon acceptance by the Contract Administrator, distribute copies of the revised schedule to Subcontractors and other concerned parties.

D14.6 The Contractor shall instruct recipients to report to the Contractor immediately any problems anticipated by the timetable shown in the Contract Work Schedule.

D14.7 While it is intended that the Contractor shall be allowed, in general, to carry on the Contract in accordance with such general plans as may appear to him to be most desirable, the Contract Administrator, at his discretion, may direct the order in which, and points at which, parts of the Work shall be undertaken.

- D14.8 This control shall be exercised in the interests of the City so that the work or other contractors who may be working on the Site may be coordinated with the Work on this Contract. A program of work will be drawn up and agreed to before the commencement of the Contract.
- D14.9 The Contract Administrator shall be notified immediately when the work under the Contract Work Schedule will adversely affect the work of other contractors and the critical path of the Project Master Schedule as the work under the Contractor's Contract Work Schedule is an integral part of the Project Master Schedule.
- D14.10 The Contractor shall be familiar with all other Contract Work Schedules as contracted by the City with other contractors and the critical path of the Project Master Schedule.

D15. SECURITY CLEARANCE

- D15.1 Each individual proposed to perform Work under the Contract shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his place of residence.
- D15.2 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 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.
- D15.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person, will not be permitted to perform any Work.
- D15.4 Any Criminal Record Search Certificate obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified. Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform any Work.

SCHEDULE OF WORK

D16. COMMENCEMENT

- D16.1 The Contractor shall not commence any Work until he is in receipt of a Purchase Order from the Award Authority authorizing the commencement of the Work.
- D16.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D7;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D9;
 - (iv) evidence of the insurance specified in D10;
 - (v) the performance security specified in D11;
 - (vi) the detailed price breakdown specified in D12;
 - (vii) the Subcontractor list specified in D13;
 - (viii) the detailed work schedule specified in D14; and
 - (ix) the security clearances specified in D15.
 - (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.

D17. SCHEDULE RESTRICTIONS

- D17.1 The City will supply and install the 200 pair Cat 3 cable from the pedestal to the WTP electrical room no. 1 no earlier than May 31, 2009.
- D17.2 The relocation of existing City equipment from VC-4 and the communication trailer shall be performed so that existing services are down for no more than one 24 hour period.

D18. CRITICAL STAGES

- D18.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
- (a) June 12, 2009: Relocation and re-activation of radio repeat equipment from VC-4 to the DBPS telephone room and from the communication trailer to the DBPS telephone room as specified in clause 1.1.2 (and sub-clauses) of Section 16755.
 - (b) June 12, 2009: Telephones available for City use in the Control Room shown on drawing WA-E0603.

D19. SUBSTANTIAL PERFORMANCE

- D19.1 The Contractor shall achieve Substantial Performance by July 31, 2009.
- D19.2 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.
- D19.3 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.

D20. TOTAL PERFORMANCE

- D20.1 The Contractor shall achieve Total Performance by August 15, 2009.
- D20.2 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.
- D20.3 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.

D21. LIQUIDATED DAMAGES

- D21.1 If the Contractor fails to achieve critical stages, Substantial Performance or Total Performance in accordance with the Contract by the day fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:
- (a) City Supplied Equipment relocated in accordance with D18.1(a) and telephone service in the control room in accordance with D18.1(b) – two thousand, six hundred dollars (\$2,600.00);
 - (b) Substantial Performance – two thousand, six hundred dollars (\$2,600.00);

(c) Total Performance – six hundred dollars (\$600).

D21.2 The amount specified for liquidated damages in D21.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.

D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

D22. JOB MEETINGS

D22.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D22.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D23. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D23.1 AECOM Canada Projects (CM) Ltd. 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).

D23.2 As Prime Contractor, AECOM Canada Projects (CM) Ltd. will administer a Safety and Health Management Plan. Compliance with this Plan will be mandatory for all personnel on the construction site and orientation of all staff by the Prime Contractor's Safety Officer will be required.

D23.3 The Water Treatment Program Project Safety and Health Management Plan is available on the City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt/projects>.

MEASUREMENT AND PAYMENT

D24. PAYMENT

D24.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

D25. PAYMENT SCHEDULE

D25.1 Further to C12, payment shall be in accordance with the following payment schedule:

- (a) The lump sum price in Form B: Prices will be paid on the basis of monthly progress estimates in accordance with C12 and the detailed price breakdown prepared pursuant to D12.

WARRANTY

D26. WARRANTY

D26.1.1 Warranty is as stated in C13.

FORM H1: PERFORMANCE BOND
(See D11)

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. 834-2008

WINNIPEG WATER TREATMENT PROGRAM – SUPPLY AND INSTALLATION OF TELEPHONE AND DATA SYSTEMS

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 D11)

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 834-2008

WINNIPEG WATER TREATMENT PROGRAM – SUPPLY AND INSTALLATION OF TELEPHONE
AND DATA SYSTEMS

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 (1993 Revision), International Chamber of Commerce Publication Number 500.

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

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 internet site at <http://www.winnipeg.ca/matmgt>.
- 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 are applicable to the Work:

| <u>Specification No.</u> | <u>Specification Title</u> |
|--------------------------|----------------------------|
|--------------------------|----------------------------|

| | |
|-------|-----------------------------------|
| 01300 | Submittals |
| 01730 | Operation and Maintenance Manuals |
| 16755 | Data and Voice Systems |

| <u>Consultant</u> | <u>City Drawing No.</u> | <u>Drawing Name/Title</u> |
|-------------------|-------------------------|---------------------------|
|-------------------|-------------------------|---------------------------|

| <u>Drawing No.</u> | <u>City Drawing No.</u> | <u>Drawing Name/Title</u> |
|--------------------|-------------------------|--|
| CM G001 | | Construction Site Layout |
| WA-E0601 | 1-0601A-A-E0601-001-00D | Telephone and Data – Administration Area – Second Floor Plan |
| WA-E0602 | 1-0601A-A-E0602-001-00D | Telephone and Data – Administration Area – Third Floor Plan |
| WA-E0603 | 1-0601A-A-E0603-001-00D | Telephone and Data – Administration Area – Third Floor Plan |
| WB-E0601 | 1-0601A-B-E0601-001-00D | Telephone and Data – Overall Building – Lower Level Plan |
| WB-E0611 | 1-0601A-B-E0611-001-00D | Telephone and Data – Overall Building – First Floor Plan |
| WB-E0621 | 1-0601A-B-E0621-001-00D | Telephone and Data – Overall Building – Second Floor Plan |
| WB-E0631 | 1-0601A-B-E0631-001-00D | Telephone and Data – Overall Building – Third Floor Plan |
| WM-E0600 | 1-0601A-M-E0600-001-00D | Telephone and Data – Site Plan |

E2. OFFICE AND SITE FACILITIES

- E2.1 The City will not provide facilities for an on Site Office or construction power. Unless otherwise specified, the Contractor shall provide facilities for his own use including communication.
- E2.2 With reference to drawing CM G001, the City will provide to the Contractor without cost:
- (a) Onsite washroom and toilet facilities with non-potable water supply;
- E2.3 The City will provide to the Contractor without cost:
- (a) 120V power from convenience receptacles supplied and installed by other contractors.
- E2.4 The Contractor may arrange for additional facilities with the approval of the Contract Administrator and at the Contractor's expense.

E3. SITE ROADS AND WORK SITE ACCESS

- E3.1 The Contractor shall have access to the Site on Business Days between 08:00 and 17:00 unless otherwise approved by the Contract Administrator.
- E3.2 Access to the work site is restricted and cooperation with other contractors on Site is necessary in the best interest of all parties.
- E3.3 The Site is located on Provincial Road 207, 3.2 km north of Highway 1 in Dugald, Manitoba.
- E3.3.1 The Site address is PR 207, Lot 57082, Dugald, Manitoba.
- E3.4 Provincial Road 207 north of the GWWD rail crossing is a Class B1 road and is subject to load restrictions which will affect the maximum weight of individual deliveries. The approximately 3.2 km of PR 207 between the entrance to the Site and Highway 1 is a TAC Route.
- E3.5 Maintenance and upkeep of the noted roads is the shared responsibility of all contractors who use the roads, including the Contractor.
- E3.6 Construction and removal, if necessary, of any additional access roads is the responsibility of this Contractor.

E4. SANITATION FACILITY

- E4.1 Portable toilets may be provided by the Contractor. Any portable toilet shall be cleaned on a weekly basis and provided with regular maintenance as required to ensure proper operation.
- E4.2 Portable toilets shall be located in an area acceptable to the Contract Administrator.

E5. WASTE CONTAINER

- E5.1 A waste container to dispose of garbage produced from the Site shall be provided by the Contractor. It shall be located in a safe, convenient location, and be emptied as necessary by the Contractor. The provision, maintenance and removal of a waste container shall be considered a subsidiary obligation of the Contractor

E6. CONDITION, PROTECTION OF, AND ACCESS TO THE AQUEDUCT

- E6.1 Condition of the Aqueduct
- E6.1.1 The Aqueduct is constructed of reinforced concrete and in some areas, contains numerous cracks. The Aqueduct, therefore, shall be considered as a fragile structure. All work procedures conducted by the Contractor on and/or near the Aqueduct shall be well planned and executed to ensure that the Aqueduct is not subjected to construction related loads, including excessive vibrations and concentrated or asymmetrical lateral loads.
- E6.2 Protection of the Aqueduct
- E6.2.1 Contractors working in the vicinity of the aqueduct shall ensure that:
- (a) Equipment shall only be permitted to cross the Aqueduct at designated bridge crossing locations and shall come to a complete stop before crossing.
 - (b) Granular material, construction material, soil or other material shall not be stockpiled on the Aqueduct or within 10 metres of the Aqueduct centreline.
 - (c) Construction practices shall not subject the Aqueduct arch to asymmetrical loading at any time.
 - (d) Construction practices or procedures at or near the Aqueduct shall not impart excessive vibration loads on the Aqueduct and/or cause settlement of the subgrade below the Aqueduct.

E6.2.2 It is the Contractors' responsibility to ensure that all work crew members understand, observe, and work to the requirements of Specifications.

E6.3 Equipment Restrictions

E6.3.1 Equipment must cross the Aqueduct in a responsible and careful manner (i.e. slowly).

E6.3.2 Loads for Highway No. 207 shall be limited to the weight restrictions in place for the road unless otherwise permitted.

E7. ENVIRONMENTAL PROTECTION

E7.1 The Contractor shall be aware that the Aqueduct is for potable water supply and no contamination by fuel, chemicals, etc. shall be permitted at any time. Fuels or chemicals shall not be stored within 30 metres of the Aqueduct.

E7.2 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.

E7.3 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:

E7.3.1 Federal

- (a) Canadian Environmental Protection Act (CEPA) c.16
- (b) Transportation of Dangerous Goods Act and Regulations c.34

E7.3.2 Provincial

- (a) The Dangerous Goods Handling and Transportation Act D12
- (b) The Endangered Species Act E111
- (c) The Environment Act c.E125
- (d) The Fire Prevention Act F80
- (e) The Manitoba Nuisance Act N120
- (f) The Public Health Act c.P210
- (g) The Workplace Safety and Health Act W120
- (h) Current applicable associated regulations.
- (i) The Fisheries Act
- (j) The Migratory Birds Act
- (k) The Historic Resources Act
- (l) Drinking Water Safety Act

E7.3.3 The Contractor is advised that the following environmental protection measures apply to the Work.

E7.3.4 Materials Handling and Storage

- (a) Construction materials shall not be stored within ten (10) metres of the Aqueduct centerline without the approval of the Contract Administrator.

E7.3.5 Fuel Handling and Storage

- (a) The Contractor shall abide by the requirements of Manitoba Conservation storage and handling of Petroleum Products and Allied Products Regulations 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 the fuel storage area(s) to specific work sites shall not exceed the daily usage requirement.
- (f) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheet of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill. No repairs within 30 m of aqueduct or watercourse will be permitted.
- (g) Refuelling of mobile equipment and vehicles shall take place at least 30 m from a watercourse.
- (h) 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.
- (i) A sufficient supply of materials, such as absorbent material and plastic oil booms, 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. All refuelling vehicles shall be equipped with a spill response kit.

E7.3.6 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 day at any location on the construction site, other than at a dedicated storage area as may be approved by the Contract Administrator.
- (c) Indiscriminate dumping, littering, or abandonment shall not take place.
- (d) No on-site burning of waste is permitted.
- (e) Equipment shall not be cleaned within 30 m of watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.

E7.3.7 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 and meet training requirements for these Regulations.

E7.3.8 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 to the Contract Administrator and Manitoba Conservation, immediately after occurrence of the environmental accident, by calling the 24-hour emergency telephone phone 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. (Should include reference to a site-specific Emergency Response Plan and Environmental Protection Plan.)

- (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 Conservation 24-hour Spill Response Line (204) 945-4888, RCMP (Oakbank Detachment) (911), City of Winnipeg Fire Department (911), Springfield Ambulance (911), company backup, contact Contract Administrator.
 - (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 waterways and the Aqueduct
 - (iii) If safe to do so, try to stop the dispersion or flow of spill material:
 - approach from upwind
 - stop or reduce leak if safe to do so
 - dyke spill material with dry, inert sorbent material or dry clay soil or sand
 - prevent spill material from entering waterways and utilities by dyking
 - prevent spill material from entering Aqueduct manholes and other openings by covering with rubber spill mats or dyking
 - (iv) Resume any effective action to contain, clean up, or stop the flow of the spilled product.

E7.4 The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to the Manitoba Conservation according to The Dangerous Goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.

E8. SITE RESTORATION

E8.1 The Contractor shall remove the temporary Site office and storage facilities prior to Total Performance.

E8.2 The Contractor will be responsible for grounds restoration, as determined necessary by the Contract Administrator.

E8.3 The Contractor will be responsible for any damage caused by his forces on roadways or accesses.

E9. RECORD DRAWINGS

E9.1 The Contractor shall keep one (1) complete set of white prints at their Site office, including all Addenda, Change Orders, Field Instructions, and other revisions for the purposes of Record Drawings. As the Work proceeds, the Contractor shall clearly record in red pencil all as-built conditions which deviate from the original Contract documents.

- E9.2 The Record Drawings shall be available for review by the Contract Administrator upon request at any time during the performance of the Work.
- E9.3 Prior to achieving Substantial Performance, the Contractor shall submit the Record Drawings prepared to the Contract Administrator for his review and use. If, in the opinion of the Contract Administrator, the Record Drawings are incomplete or inaccurate, the Record Drawings will be returned to the Contractor and the Contractor shall revise and resubmit the Record Drawings at his cost.
- E9.4 Substantial Performance cannot be achieved without the submission of Record Drawings that are acceptable to the Contract Administrator.

E10. MATERIAL SAFETY DATA SHEETS

- E10.1 The Contractor shall provide the Contract Administrator with one (1) copy of Material Safety Data Sheets (MSDS's) for all products to used in the performance of the Work at least two (2) Business Days prior to bringing such materials to Site or as otherwise specified in the Contract Documents.
- E10.2 Throughout the term of the Contract, the Contractor shall provide the Contract Administrator with revisions or updates of the MSDS's as soon as may be reasonably possible

SUBMITTALS

1. SHOP DRAWINGS

1.1 General

- .1 Arrange for the preparation of clearly identified Shop Drawings as specified or as the Contract Administrator may reasonably request. Shop Drawings are to clearly indicate materials, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of the Work. Where articles or equipment attach or connect to other articles or equipment, clearly indicate that all such attachments and connections have been properly coordinated, regardless of the trade under which the adjacent articles or equipment will be supplied and installed. Shop Drawings are to indicate their relationship to design Drawings and Specifications. Notify the Contract Administrator of any deviations in Shop Drawings from the requirements of the Contract Documents to allow the Contract Administrator to assess the deviations.
- .2 Where all or part of the Shop Drawings are to be prepared under the stamp and seal of a Professional Engineer registered in the Province of Manitoba, the Contract Administrator will limit that review to an assessment of the completeness of the part of the submission so stamped and sealed.

1.2 Electrical and Controls Installation Information

- .1 Key information will be taken from Shop Drawings to prepare electrical and instrumentation Drawings and/or layout Drawings, control schematics, and interconnection wiring diagrams.

1.3 Submission Requirements

- .1 Coordinate each submission with requirements of the Work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Accompany all submissions with a transmittal letter, in duplicate, containing:
 - .1 Date
 - .2 Project title and Bid Opportunity number
 - .3 Contractor's name and address
 - .4 Specification Section number for each submittal
 - .5 Submittal number and revision number in the following format:
 - .1 834-2008 - Spec Section # - Submittal # - Revision # (e.g. 834-2008-16755-001-1)
 - .2 The first submittal is numbered 1 with sequential numbering after that for revisions
 - .6 Identification and quantity of each Shop Drawing product
 - .7 Equipment tag number
 - .8 Other pertinent data
- .3 Submissions shall include:

SUBMITTALS

- .1 Date and revision dates
- .2 Project title and number
- .3 Name, email address and address of:
 - .1 Contractor
 - .2 Manufacturer
- .4 Contractor's stamp, signed by Contractor's authorized representative, certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 As required in the specifications, the seal and signature of a Professional Engineer registered in the Province of Manitoba.
- .4 Details of appropriate portions of work as applicable:
 - .1 Fabrication
 - .2 Layout showing dimensions including identified field dimensions and clearances
 - .3 Setting or erection details
 - .4 Capacities
 - .5 Performance characteristics
 - .6 Standards
 - .7 Operating weight
 - .8 Wiring diagrams
 - .9 Single line and schematic diagrams
 - .10 Method of control of equipment and its communication with the City's SCADA system

1.4 Drawings

- .1 Original Drawings or modified standard Drawings provided by the Contractor to illustrate details of portions of Work which are specific to project requirements.
- .2 Maximum sheet size: 850 x 1050 mm.
- .3 Submit digital (pdf) copies of Shop Drawings. The Contract Administrator will return one copy with comments transcribed.
- .4 Cross-reference Shop Drawing information to applicable portions of the Contract Documents.

SUBMITTALS

- .5 Include reviewed Shop Drawings in all O&M Manuals.

1.5 Product Data

- .1 Product Data; Manufacturer's catalogue sheets, brochures, literature, performance charts, and diagrams used to illustrate standard manufactured products.
- .2 Submit twelve (12) copies of product data.
- .3 Sheet size: 215 x 280 mm.

1.6 Procedure and Routing

- .1 The Contractor shall provide a pdf version of the Shop Drawings and corresponding submittal forms to the Contract Administrator via email for review. Each submittal shall have a unique number. These electronic files shall be named according to Section 01300 - Submittals, Clause 1.3.2.5.1. and be complete with the information specified in Clause 1.3 Submission Requirements.
- .2 When the total size of the email is greater than 5 MB, the Contractor shall post the pdf version of the Shop Drawings and submittal transmittal form(s) to an accessible place on the internet (provided by the Contract Administrator) and an e-mail notification is to be sent to all parties listed above when posting is complete.
- .3 The routing and the names of individuals responsible for receiving submittals will be identified by the Contract Administrator at the pre-construction meeting held pursuant to D4.2.
- .4 Upon review of the Shop Drawings, the Contract Administrator will e-mail the pdf version of the annotated Shop Drawings and corresponding transmittal form(s) to the Contractor. When the total size of the email is greater than 5 MB, the Contract Administrator will post the pdf version of the Shop Drawings and corresponding transmittal form(s) to the same accessible place on the internet and an e-mail notification will be sent to the Contractor. Two (2) printed copies of the reviewed Shop Drawings will be sent back to the Contractor.

1.7 Shop Drawing Review

- .1 Shop Drawing review by the Contract Administrator is solely to ascertain conformance with the general design concept. Responsibility for the approval of detail design inherent in Shop Drawings rests with the Contractor and review by the Contract Administrator shall not imply such approval.
- .2 Review by the Contract Administrator shall not relieve the Contractor of his responsibility for errors or omissions in Shop Drawings or for proper completion of the Work in accordance with the Contract Documents.
- .3 Shop Drawings will be returned to the Contractor with one of the following notations:
 - .1 When stamped "REVIEWED", distribute additional copies as required for execution of the Work.

SUBMITTALS

- .2 When stamped "REVIEWED AS MODIFIED", ensure that all copies for use are modified and distributed, same as specified for "REVIEWED".
- .3 When stamped "REVISE AND RE-SUBMIT", make the necessary revisions, as indicated, consistent with the Contract Documents and submit again for review.
- .4 When stamped "NOT REVIEWED", submit other drawings, brochures, etc., for review consistent with the Contract Documents.
- .5 Only Shop Drawings bearing "REVIEWED" or "REVIEWED AS MODIFIED" shall be used on the Work unless otherwise authorized by the Contract Administrator.
- .4 After submittals are stamped "REVIEWED" or "REVIEWED AS MODIFIED", no further revisions are permitted unless re-submitted to the Contract Administrator for further review.
- .5 Any adjustments made on Shop Drawings by the Contract Administrator are not intended to change the Contract Price. If it is deemed that such adjustments affect the Contract Price, clearly state as such in writing prior to proceeding with fabrication and installation of Work.
- .6 Make changes in Shop Drawings which the Contract Administrator may require consistent with Contract Documents. When re-submitting, notify the Contract Administrator in writing of any revisions other than those requested by the Contract Administrator.
- .7 Shop Drawings indicating design requirements not included in the Contract Documents require the seal of a Professional Engineer registered in the Province of Manitoba. If requested, submit engineering calculations for review, sealed by a Professional Engineer.

1.8 Operating and Maintenance Manuals

- .1 Refer to Section 01730 – Operations and Maintenance Manuals.

END OF SECTION

OPERATION AND MAINTENANCE MANUALS

1. DESCRIPTION

- .1 This Section supplements the requirements for the provision of O&M Manuals as described in Section 01300 – Submittals.
- .2 Furnish complete operations manuals and maintenance information as specified in this Section for installation, check-out, operation, maintenance, and lubrication requirements for each unit of mechanical, electrical, and instrumentation equipment or system and each instrument.
- .3 Customize the operations manuals and maintenance information to describe the equipment actually Supplied and Installed. Do not include extraneous data for models, options, or sizes not Supplied and Installed (cross out or remove if required). When more than one model or size of equipment type is furnished, show the information pertaining to each model, option, or size.
- .4 Assemble, coordinate, bind, and index required data into an O&M Manual.
- .5 Three (3) draft copies of the manuals shall be submitted a minimum of sixty (60) days prior to Substantial Performance of the Work for review and comments. A maximum of eight (8) weeks after review, five (5) copies of the final manuals shall be supplied.
- .6 In addition to the five (5) hard copies, submit an electronic version of the O&M Manual.
- .7 Materials: Label each Section with tabs protected with celluloid covers, fastened to hard paper dividing sheets.
- .8 Type lists and notes.
- .9 Drawings, diagrams and Manufacturer's literature must be legible. Drawings larger than 280 x 430 mm must be folded and placed inside plastic pockets.

2. OPERATION AND MAINTENANCE MANUAL CONTENTS AND ORGANIZATION

- .1 Provide the Manufacturer's standard O&M manuals for the equipment or instruments supplied. If the Manufacturer's standard manuals do not contain all the required information, provide the missing information in supplementary documents and Drawings inserted behind appropriate tabs in the manual binder.
- .2 When more than one (1) piece of identical equipment or instruments are supplied, provide only one (1) set of operations manuals.
- .3 One (1) set of operations manuals may be provided when more than one (1) piece of similar equipment or instruments are supplied, such as different sizes of the same model, and all similar pieces are covered in the same standard Manufacturer's O&M manual.
- .4 When similar equipment or instruments are provided by the same Manufacturer, but are not covered in the same standard Manufacturer's O&M manual, their specific manuals may be bound in the same 3-ring binder. Separate specific manuals with tab dividers labelled with the appropriate equipment numbers.

OPERATION AND MAINTENANCE MANUALS

- .5 Provide a cover sheet, bound as the first page of each manual, with the following information:
 - .1 Contract name and number.
 - .2 Equipment number or, if more than one (1) piece of equipment is provided, equipment numbers for equipment or instruments covered by the manual. Include functional description of equipment after each number.
- .6 Provide a table of contents listing the contents of the manual and identifying where specific information can be located.
- .7 Insert the specific information described below in the O&M manuals in a format similar to that listed:
 - .1 Tab 1 – General Information
 - .1 Functional title of the system, equipment, material, or instrument.
 - .2 Relevant Specification Section number and Drawing reference.
 - .3 Address and telephone number of the Manufacturer and the nearest Manufacturer's Representative.
 - .2 Tab 2 - Equipment Data
 - .1 Insert Specification Section and completed Equipment and Instrumentation Data sheets for equipment supplied. Attach all Addenda, Change Orders, and change directives that refer to that specific item of equipment.
 - .3 Tab 3 – Operation Information
 - .1 Include the Manufacturer's recommended step-by-step procedures for starting and stopping under normal and emergency operation. Include all specified modes of operation including recommended operation after the assembly or equipment has been in long-term storage.
 - .2 Provide control diagrams with data and information to explain operation and control of systems and specific equipment. Identify normal operating setpoints and alarm conditions.
 - .3 Provide technical information on all alarms and monitoring devices provided with the equipment.
 - .4 Provide troubleshooting information. Clearly identify which problems to look for and how to solve them.
 - .4 Tab 4 - Technical Data
 - .1 Insert Manufacturer's Technical Specification and data sheets.

OPERATION AND MAINTENANCE MANUALS

- .2 Insert Manufacturer's certified performance and calibration curves for the equipment and instruments.
- .5 Tab 5 - Maintenance Information
 - .1 Include the description and schedule for all Manufacturers' recommended routine preventative maintenance procedures including specific lubrication recommendations. Indicate whether procedure is to be done daily, weekly, monthly, quarterly, semi-annually, annually, or fill in hours of operation.
- .6 Tab 6 - Maintenance Instructions
 - .1 Provide requirements to set up and check out each system for use. Include all required and recommended step-by-step inspections, lubrications, adjustments, alignments, balancing, and calibrations. Include protective device settings, warnings, and cautions to prevent equipment damage and to insure personnel safety.
 - .2 Provide Manufacturer's description of routine preventive maintenance, inspections, tests, and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair.
 - .3 Provide Manufacturer's recommendations on procedures and instructions for correcting problems and making repairs.
 - .4 Provide step-by-step procedures to isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.
 - .5 Provide step-by-step procedures and list special required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings, and adjustments required.
- .7 Tab 7 - Assembly Drawings
 - .1 Provide Drawings which completely document the equipment, assembly, subassembly, or material for which the instruction is written. Provide the following Drawings as applicable: fabrication details, wiring and connection diagrams, electrical and piping schematics, block or logic diagrams, Shop Drawings, installation Drawings, layout and dimension Drawings, and electrical component fabrication Drawings.
 - .2 Provide clear and legible illustrations, Drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number which will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies.

OPERATION AND MAINTENANCE MANUALS

.8 Tab 8 - Bills of Materials

- .1 Provide a clear, legible copy of the Bill of Materials that was shipped with the equipment. The Bill of Materials should list all equipment, instruments, components, accessories, tools, and other items that were shipped with the equipment.

.9 Tab 9 - Lubrication Data

- .1 Provide a table showing recommended lubricants for specific temperature ranges and applications.
- .2 Provide charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.
- .3 If the equipment or instrument is not lubricated, add a sheet under this Tab with the words "Not Applicable".

3. FIELD CHANGES

- .1 Following the acceptable installation and operation of an equipment item, modify and supplement the item's instructions and procedures to reflect any field changes or information requiring field data.

4. COMMISSIONING DATA

- .1 Provide in hard cover 3-ring binders for 215 x 280 mm paper labelled "Commissioning Data" one (1) copy of:
 - .1 All completed equipment testing forms.
 - .2 All completed equipment checklists and performance reports, including noise and vibration analysis, instrumentation calibration data, and all other relevant information.
 - .3 All system performance reports.

5. WARRANTIES

- .1 Provide in hard cover 3-ring binders for 215 x 280 mm paper labelled "Warranties" one (1) copy of:
 - .1 Manufacturers' standard Warrants and Guarantees. Include the name and telephone number of the contact person. Indicate the time frame of each Warrant or Guarantee on the list.

END OF SECTION

DATA AND VOICE SYSTEMS

1. SCOPE OF WORK

1.1 General

- .1 Supply and install new 24 Strand 50/125/250 μm Multi-mode fibre optic cable from DBPS to WTP Electrical Room No. 1.
 - .1 Run fibre optic cable from DBPS Control Room communications panel CP-D21A to existing data cabletrays.
 - .1 Run cable from DBPS Control Room to concrete duct bank entrance on north wall of DBPS in existing data cabletray.
 - .2 Run cable from DBPS through the designated communications conduit in the existing concrete duct bank to the Generator Building.
 - .3 Run cables through the Generator Building in the existing data cabletrays to the concrete duct bank to the WTP.
 - .4 Run cables from the Generator Building through the existing designated communications conduit in the concrete duct bank to WTP Electrical Room No. 1.
 - .5 Run fibre optic cable from the entrance to the Electrical Room No. 1 to LCP-H10A in the WTP Electrical Room No. 1 using existing cable trays where available.
 - .2 Terminate fibre optic cable in CP-D21A.
 - .3 Terminate fibre optic cable in LCP-H10A.
- .2 Relocate City WAN equipment from Communication Trailer and VC-4 to Deacon Booster Pumping Station telephone room.
 - .1 Supply and install a 120/240V, 100 amp, 12 circuit panelboard complete with 6 15A-1P circuit breakers in DBPS telephone room. This panel shall be fed from spare 70A-2P breaker in UPS Panel PNL-D19 in control room of DBPS. Conductor shall be 2/C#6 TECK cable from Panel PNL-D19 to new panel run in existing cable tray.
 - .2 Supply and install six new surface mounted duplex receptacles in DBPS telephone room as shown on Drawing. Conductors to receptacles shall be 2/C#12 TECK cable.
 - .3 Supply and install new racks as necessary for relocated equipment in DBPS telephone room.
 - .4 Supply and install antenna cable from VC-4 to DBPS using existing conduit. Supply and install coax connector ends to antenna cable. Cable to be tested prior to attempting to connect it to the existing antenna cable.
 - .5 Supply and install 4 Category 6 cables from antenna on Surge Tower to VC-4 in new conduit and to DBPS telephone room in existing conduit.

DATA AND VOICE SYSTEMS

- .6 Relocate 4 Repeater Radio Racks and UPS from valve chamber VC-4 to DBPS telephone room.
- .7 Relocate wireless bridge, firewalls, UPS and Ethernet switch from Communications Trailer to DBPS telephone room.
- .8 Connect new antenna cable to existing antenna cable and to relocated equipment.
- .9 Scheduling of equipment relocation is to be coordinated with Contract Administrator.
- .3 Supply and install new telephone termination enclosures in the following locations:
 - .1 WTP Electrical Room No. 1 – 200 port
 - .2 WTP Administration Area, third floor server room – 100 port
 - .3 WTP Administration Area, second floor location as shown on drawings – 50 port
 - .4 WTP Chemical Area, back-up server room – 50 port
 - .5 Bulk Chemical Building, second floor control room – 25 port
 - .6 Generator Building – 25 port
 - .7 Clearwell Inlet Building – 10 port
- .4 All telephone terminations enclosures are to be mounted on 20mm, painted, plywood backboard.
- .5 Provide and install surface mounted receptacles for telephone termination enclosures as shown on Drawings.
- .6 Coordinate termination of existing 200 pair telephone cable in MTS pedestal and at telephone backboard in Electrical Room No. 1 with MTS. Cable from MTS pedestal to the building is being installed under separate contract and may not be available until the end of May 2009. Confirm availability with Contract Administrator
- .7 Terminate existing 100 pair conductor to telephone terminal boxes in Electrical Room No. 1 and in WTP Administration Area, third floor server room.
- .8 Supply and install Category 3 telephone conductors as shown:

| FROM | TO | PAIRS | VIA |
|--|--|-------|----------------------------------|
| WTP 3 rd floor Server Room | WTP 2 nd floor location | 50 | Existing basket tray and conduit |
| WTP 3 rd floor Server Room | WTP Chemical area Back-up Server Room | 50 | Existing cable tray |

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| FROM | TO | PAIRS | VIA |
|--|--|-------|-----------------------------|
| WTP Chemical area Back-up Server Room | Bulk Chemical Building Control room | 25 | Existing data cable tray |
| WTP Electrical Room No. 1 | Generator Building | 25 | Existing concrete duct bank |
| Generator Building | Clearwell Inlet Building | 10 | Existing concrete duct bank |

- .9 Supply and install new Communication Panels as follows:

| Panel Name | Location | c/w Ethernet Switches | |
|------------|---|-----------------------|---|
| | | | |
| CP-P31B | WTP 3 rd floor Server Room | Business LAN | 2 |
| | | WTP SCADA | 1 |
| | | MCC SCADA | 1 |
| CP-P21B | WTP on second level platform walkway outside Admin Area | Business LAN | 2 |
| | | WTP SCADA | 2 |
| | | MCC SCADA | 1 |
| CP-H31B | WTP Chemical area Back-up Server Room | Business LAN | 1 |

- .10 Supply and install multi-mode duplex 50/125 µm fibre patch cables from existing spare FX01 terminals in CP-P31A to one switch in each of the three new communications loops.
- .11 Supply and install multi-mode duplex 50/125 µm fibre patch cables or 24 strand multi-mode duplex 50/125 µm cables as required between Ethernet switches to create three new communications loops.
- .12 With reference to the voice/data locations shown on Drawings WM-E0600, WB-E0611, WB-E0621 and WB-E0631 provide Category 6 cable to each dedicated voice outlet or voice/data outlet shown from the indicated telephone backboard and one Category 6 cable to each dedicated data or voice/data outlet from the indicated Ethernet switch. In the case of devices that require a single CAT6 for telephone or Business LAN, terminate the cable at the telephone backboard indicated for the area unless the Contract Administrator directs that it be terminated at the Business LAN Ethernet switch.
- .13 With reference to the telecommunication tray layout and voice/data outlet locations shown on Drawings WB-E0601, WB-E0602 and WB-E0603 supply and install the Category 6 telecommunication cabling specified on the drawings for different types of devices in the City supplied basket trays and J-hooks in WTP Administration Area. Terminate each cable at the telephone backboard or indicated Ethernet switch.

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- .14 Testing of installed cables.

1.2 Qualifications

- .1 The Contractor shall have a structured cabling industry affiliation such as Building Industry Consultants International (BICS), Registered Communications Distributor Designer (RCDD) and/or a structured cabling vendor certification.

2. PRODUCTS

2.1 Panelboards

- .1 Panelboards:
 - .1 Install circuit breakers in panelboards before shipment.
 - .2 In addition to CSA requirements Manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.
- .2 250V panelboards: bus and breakers rated for 10kA (symmetrical) interrupting capacity or as indicated.
- .3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.
- .4 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.
- .5 Two keys for panelboard.
- .6 Copper bus with neutral of same ampere rating as mains.
- .7 Mains: suitable for bolt-on breakers.
- .8 Trim with concealed front bolts and hinges.
- .9 Trim and door finish: baked grey enamel.

2.2 Network Cabling Termination Cabinets

- .1 Double hinged wall mounted cabinet for 19 inch rack mounted equipment.
- .2 Cabinet with window door and locking wing knobs. NEMA 4 cabinet in process areas. NEMA 12 cabinet in electrical rooms and server rooms.
- .3 Cabinet to house fibre termination panel, Cat 6 patch panel and Ethernet switches.
- .4 Provide 120 VAC duplex receptacle and power bar with minimum six outlets.
- .5 Provide horizontal wire management under each patch panel and Ethernet switch.
- .6 Provide vertical wire management on one side.

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- .7 Provide blank panels for all empty rack units.
- .8 Provide shelf 3U for mounting equipment.
- .9 Cabinet sized for 12 rack units.
- .10 Hoffman ProTek DH or approved equal.

2.3 Telephone Termination Enclosure

- .1 Supply and install telephone termination enclosures as specified in 1.1.5.
- .2 Telephone termination enclosure shall comply with UL497.
- .3 Enclosure to use bix connector input and output.
- .4 Enclosure shall include internal fuse link.
- .5 Enclosure shall utilize a double locking lid system.
- .6 Circa Telecom model 2100SB or approved equal.

2.4 Industrial Ethernet Switches

- .1 Supply and install rack mounted Ethernet Switches in separate network cabling termination cabinet where shown on the Drawings.
- .2 Switches shall comply with IEEE 802.3, 802.3u, 802.3x, 802.1D, IEC 61950-3.
- .3 Switches shall be connected in a ring topology utilizing a 100FX Multimode backbone with 2-100FX, ST connector ports installed. Switches will also require the following terminal connectors:

| | |
|----|--|
| 2 | 100FX, ST connector ports (for a total of 4) |
| 15 | 10/100 Base T(x) RJ45 ports |

- .4 Supply and install switches as required to connect to the equipment indicated in the Drawings.
- .5 Supply and install as a minimum one (1) switch in each cabinet as indicated on Drawing.
- .6 Switches shall include one (1) relay output alarm contact rated for 1A@24 VDC.
- .7 Input power shall be 120 VAC.
- .8 Switches shall be fast spanning for a sub-second recovery in a ring configuration.
- .9 Switches shall be RuggedCom RSG2100.

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2.5 Fibre Termination Panel

- .1 Supply and install a fibre termination panel loaded with 24 - ST adapters suitable for the termination of one (1) 24-strand 50/125/250 µm multi-mode fibre optic cable.
- .2 Termination panel shall be rack mounted, hinged front door and rear doors, complete with grounding kit and cable strain relief.
- .3 Install in network cabling termination cabinet.
- .4 Leviton RDP-175 or approved equal.

2.6 CAT 6 Termination Patch Panels

- .1 Supply and install CAT 6 patch panel that meets or exceeds the requirements of ANSI/TIA/EIA-568-B.2-1.
- .2 Panel to be made of 16 gauge steel and designed for use on a standard 19" rack.
- .3 Panel to be pre-loaded with CAT 6 connectors.
- .4 Use 24 or 48 port panels as appropriate.
- .5 Panel shall have the ability to allow for single port replacement of inoperative ports.

2.7 Rack:

- .1 Free-standing open, body fabricated of 2.5 mm minimum metal, equipment mounting rails fabricated of 2.0 mm minimum metal, drilled and tapped for No 10 screws, with provision to attach grounding. Designed to accept EIA standard 483 mm wide panels. ASA 61 grey colour.

2.8 Receptacles

- .1 Duplex 15 ampere, 120 volt, 3 wire, ivory, U-ground, as Hubbell No. 5252, with the following features:
 - .1 Brown urea molded housing.
 - .2 Suitable for #10 AWG for back and side wiring.
 - .3 Eight back wired entrances, four side wiring screws.
 - .4 Break-off links for use as split receptacles.
 - .5 Triple wipe contacts and riveted grounding contacts.
- .2 Use sheet steel utility box cover for wiring devices installed in surface mounted utility boxes.
- .3 Protect cover plate finish with paper or plastic film until all painting and other work is finished then remove paper.

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- .4 Do not use coverplates meant for flush mounted outlet boxes on surface mounted boxes.
- .5 Mounting dimensions are to the centre of the devices. Final instructions on mounting heights shall be given by the Contract Administrator. The above shall be used as a guide, but shall be subject to final verification prior to installation.

2.9 Cabling

.1 Antenna Cable

- .1 Andrew Corporation - Heliac AVA5-50 Coaxial Cable. Connectors shall be Andrew Corporation – EZfit types 78EZNM and 78EZNF.

.2 Telephone Cabling

- .1 Category 6, 100 ohm 22-24 AWG four pair unshielded twisted pair cabling.

.3 Data Cabling

- .1 Category 6, 100 ohm 22-24 AWG four pair unshielded twisted pair cabling certified to a minimum of 250 MHz to the requirements of ANSI/TIA/EIA-568-B.2-1 (“Transmission Performance Specifications for 4-pair 100 ohm Category 6 Cabling”)

.4 Fibre Optic cabling

- .1 Supply and install break out style fibre optic cable assemblies where indicated in the Specification and Drawings.
- .2 Fibre optic cables shall be indoor/outdoor direct burial rated loose tube, rodent protected and constructed with specified quantity of 50/125/250µm multi-mode glass fibres, spiral interlocked armour, and outer polyethylene jacket. Maximum attenuation shall be 3.5/1.0 dB/km. Minimum modal bandwidth shall be 220 MHz*km
- .3 Supply and install terminations for fibre optic cables including; buffer tube fan out kits, connectors, termination/distribution panels, and wall mount enclosures.
- .4 Supply and install 50/125/250 µm multi-mode duplex fibre patch cords for inter-cabinet connections.
- .5 Number of fibres are indicated on Drawings.

3. EXECUTION

3.1 Horizontal Cabling

- .1 No horizontal cabling shall be exposed to view outside of the third floor server room and second floor electrical room.

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3.2 Telephone Cabling

- .1 There shall be no connectors in cable runs between the outlets and the termination cabinets.
- .2 Terminating method: CAT-6 socket with Blue/White on 4 & Blue on 5.
- .3 Remaining pairs left un-terminated with 100mm slack and wound back up the cable at the jack end.

3.3 Data Cabling

- .1 Always follow the Manufacturer's guidelines for minimum bend radius and tension.
- .2 There shall be no connectors in cable runs between the outlets and the switches.
- .3 No cable run may exceed 90m in length.
- .4 Terminate all wiring, including spares, incoming and outgoing, at terminal strips mounted inside the panels. Identify each terminal strip with a terminal strip number.
 - .1 Wire identification to use the connected room number/jack type with the wire's corresponding end device terminal number appended to it.
- .5 Terminating method: Cat 6 socket - Each data point should have all 4 pairs assigned and terminated as per ANSI/TIA/EIA-568-B.2-1.

3.4 Fibre Installation

- .1 Always follow Manufacturer's guidelines for minimum bend radius and tension. Bend radius shall be a minimum of 20 times the cable diameter.
- .2 When installing loose-tube cables, use a silicone injection or sealer to prevent gel migration.
- .3 All fibre installations and termination shall be performed by personnel experienced in fibre optic cable installation.
- .4 Fibre Terminations:
 - .1 Ensure that the fibres are not damaged when the buffer tubes and fibre coatings are removed.
 - .2 After the coating is removed, clean the fibre with isopropyl alcohol to ensure the fibre is clean.
 - .3 Use only high performance connectors as classified and required by TIA-568-A.

3.5 Labeling

- .1 All cables shall be labeled with machine printed, heat shrink sleeve or some other permanent marker capable of withstanding multiple pulling through raceways. Labels shall be located 0.5m from each end.

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- .2 All jack and termination patch panels shall be labeled. Contract Administrator will provide labeling information.

3.6 Sealing of Wall and Floor Openings

- .1 Seal all conduit and cable entries passing through outside walls of buildings, through partition walls separating electrical rooms from other areas, through fire separations and through floors above grade.
- .2 Seal openings after all wiring entries have been completed.
- .3 Sealing material shall be fire resistant and not contain any compounds which will chemically affect the wiring jacket or insulating material. Cable penetrations through fire separations, if required, are to be sealed. Acceptable methods are Canstrut "Fire Stop", Electrovert "Multi-Cable Transit" or Dow Corning RTV Silicone Foam.
- .4 The fire stop material shall allow for re-enterable access.

3.7 Field Test Quality

- .1 The Contractor shall visually inspect all cables, cable reels and shipping cartons to detect damage incurred during shipping and transport. Visually damaged items shall not be installed.
- .2 Cable testing shall be performed after all cables have been installed.
- .3 Telephone cables
 - .1 Test for the following:
 - .1 Continuity,
 - .2 Pair placement and polarity, and
 - .3 DC resistance.
- .4 Category 6 cables
 - .1 Test parameters for Cat 6 cables shall be as defined in TIA Cat 6 standard which refers to the ANSI/TIA/EIA-568-B.2 standard. In order to pass the test all measurements (at each frequency in the range 1 MHz through 250 MHz) shall meet or exceed the limit value determined in the above-mentioned standard.
 - .2 The test equipment shall comply with the accuracy requirements for level III field testers as defined in the TIA Cat 6 document. The Test equipment, including the appropriate interface adapter must meet the accuracy requirements. The accuracy requirements for the permanent link test configuration (baseline plus adapter contribution) are specified in Table B.2 of Annex B of the TIA Cat 6 Standard. (Table B.3 in this TIA document specifies the accuracy requirement for the Channel configuration.)
- .5 Fibre Optic

DATA AND VOICE SYSTEMS

- .1 Perform cable testing with optical time domain reflectometer instrument and provide complete detailed test report. Test all runs upon completion of permanent terminations, using instrumentation acceptable to Contract Administrator. Before commencing testing, submit sample test data sheets and information with respect to test instrumentation to be used.
 - .1 Ensure that test instrument is temperature-stabilized or is temperature-independent or temperature-compensated before commencing test.
 - .2 Test for the following:
 - Run attenuation at 850 and 1300 wavelengths.
 - Run length.

Before recording results, compare readings to predicted values based on cable specification and run length, using connector and patch cord losses as part of predicted value. Retest runs with attenuation values greater than 6.0 dB/km @ 850 nm and 4.0 dB/km @ 1300 nm
 - .3 All fibres must pass the cable testing.
- .6 Test results shall be provided to the Contract Administrator in both comma separated values (CSV) format and Microsoft Excel format.