



THE CITY OF WINNIPEG

REQUEST FOR PROPOSAL

RFP NO. 515-2015

ARC FLASH HAZARD ANALYSIS

TABLE OF CONTENTS

PART A - PROPOSAL SUBMISSION

Form A: Proposal	1
Form B: Prices	3
Form C: Experience of Bidder and Subcontractor	7
Form D: Experience of Key Personnel	9

PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	1
B5. Confidentiality	2
B6. Addenda	2
B7. Substitutes	2
B8. Proposal Submission	3
B9. Proposal	4
B10. Prices	5
B11. Experience of Bidders and Subcontractors (Section C)	6
B12. Experience of Key Personnel Assigned to the Project (Section D)	7
B13. Project Understanding and Methodology (Section E)	8
B14. Project Schedule (Section F)	9
B15. Disclosure	10
B16. Eligibility	10
B17. Qualification	10
B18. Opening of Proposals and Release of Information	11
B19. Irrevocable Offer	11
B20. Withdrawal of Offers	11
B21. Interviews	12
B22. Negotiations	12
B23. Evaluation of Proposals	12
B24. Award of Contract	13

PART C - GENERAL CONDITIONS

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

PART D - SUPPLEMENTAL CONDITIONS

General

D1. General Conditions	1
D2. Background	1
D3. Scope of Services	2
D4. Definitions	3
D5. Contract Administrator	3
D6. Ownership of Information, Confidentiality and Non Disclosure	4
D7. Notices	4

Submissions

D8. Authority to Carry on Business	4
D9. Safe Work Plan	4
D10. Insurance	5
D11. Subcontractor List	5

Control of Work

D12. Commencement	5
D13. Orders	6
D14. Records	6
D15. The Workplace Safety and Health Act (Manitoba) – Qualifications	6

D16. Invoices	6
D17. Payment	7
D18. Warranty	7
Form J: Subcontractor List	8

PART E - SPECIFICATIONS

General

E1. Existing NEWPCC Electrical Distribution	1
E2. Redeveloped NEWPCC Distribution	1
E3. Abbreviations	2
E4. Standards	2
E5. Scope of Work	3
E6. General Requirements	3
E7. Short-Circuit Analysis with Protective Device Evaluation	5
E8. Protective Device Coordination Study	5
E9. Arc Flash Hazard Analysis	7
E10. Submittals	8
E11. Labelling equipment	9
E12. estimate Requirements for Each Assignment	10

APPENDICES

Appendix A - Applicable Drawings	1
----------------------------------	---

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 ARC FLASH HAZARD ANALYSIS

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 P.M Winnipeg time, September 10th, 2015.

B2.2 Proposals determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.

B2.3 The 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 from 9:00 AM on August 28th, 2015 to provide Bidders access to the NEWPCC Site.

B3.1.1 Bidders are requested to register for the Site Investigation by contacting the Contract Administrator identified in D5.

B3.1.2 Registration requests shall identify the Bidder, their contact information, and names of intended attendees. Subcontractors shall also be identified along with their intended attendees.

B3.1.3 Bidders are to meet at the reception area of the NEWPCC located at 2230 Main St.

B3.1.4 Bidder are required to provide their own Personal Protective Equipment (PPE); at a minimum hard hat, safety footwear, safety glasses and flashlights.

B3.2 The Bidder is advised that the site has a number of unique pieces of electrical equipment and cable routing scenarios for which the successful Contractor will be responsible for documenting and modelling. A review of these unique site conditions is considered to be beneficial.

B3.3 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.

B3.4 The Bidder is responsible for determining:

- (a) the location of any equipment and cable routing which is required for the modelling of the Arc-Flash Hazards for the NEWPCC;
- (b) all matters concerning access to the Site, power supplies, location of existing services, utilities or materials necessary for the completion of the Work; and
- (c) all other matters which could in any way affect his/her Proposal or the performance of the Work.

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D5.1.

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

- B4.3 If the Bidder is unsure of the meaning or intent of any provision therein, the Bidder should request clarification as to the meaning or intent prior to the Submission Deadline.
- B4.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Request for Proposal will be provided by the Contract Administrator to all Bidders by issuing an addendum.
- B4.5 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Request for Proposal will be provided by the Contract Administrator only to the Bidder who made the enquiry.
- B4.6 All correspondence or contact by Bidders with the City in respect of this RFP must be directly and only with the Contract Administrator. Failure to restrict correspondence and contact to the Contract Administrator may result in the rejection of the Bidders Proposal Submission.
- B4.7 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. CONFIDENTIALITY

- B5.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:
- (a) was known to the Bidder before receipt hereof; or
 - (b) becomes publicly known other than through the Bidder; or
 - (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.
- B5.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

B6. ADDENDA

- B6.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Request for Proposal, or clarifying the meaning or intent of any provision therein.
- B6.2 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.
- B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B6.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 9 of Form A: Proposal. Failure to acknowledge receipt of an addendum may render a Proposal non-responsive.

B7. SUBSTITUTES

- B7.1 The Work is based on the Personnel, Software, Materials and methods specified in the Request for Proposal.

- B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B7.3 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.
- B7.4 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 Personnel, Software, Materials or methods as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract.
- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B23.
- B7.9 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.
- B7.10 Notwithstanding B7.2 to B7.9 and in accordance with, deviations inconsistent with the Request for Proposal document shall be evaluated in accordance with B23.1(a).

B8. PROPOSAL SUBMISSION

- B8.1 The Proposal shall consist of the following components:
- (a) Form A: Proposal;
 - (b) Form B: Prices;
- B8.2 The Proposal should also consist of the following components:

- (a) Experience of Bidder and Subcontractors (Section C) in accordance with B11;
 - (b) Experience of Key Personnel Assigned to the Project (Section D), in accordance with B12;
 - (c) Project Understanding and Methodology (Section E) in accordance with B13; and
 - (d) Project Schedule (Section F) in accordance with B14.
- B8.3 Further to B8.1 all components of the Proposal shall be fully completed or provided in the order indicated, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Proposal.
- B8.4 Further to B8.2, all components of the Proposal should be fully completed or provided in the order indicated, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Proposal.
- B8.5 Bidders should submit one (1) unbound 8.5" x 11" original (marked "original") including drawings and six (6) copies (copies can be in any size format) for sections identified in B8.1 and B8.2.
- B8.6 Proposal format, including type of binding, number of pages, size of pages and, font, etc., will not be regulated, except that the Proposal should be presented in the Sections identified above. Bidders are encouraged to use their creativity to submit a Proposal which provides the requested information for evaluation and other information which illustrates the strength of their team.
- B8.7 Bidders are advised that inclusion of terms and conditions inconsistent with the Request for Proposal, will be evaluated in accordance with B23.1(a).
- B8.8 The Proposal shall be submitted enclosed and sealed in an envelope/package clearly marked with the RFP number and the Bidder's name and address.
- B8.9 Proposals submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B8.10 Proposals shall be submitted to:
The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1
- B8.11 Any cost or expense incurred by the Bidder that is associated with the preparation of the Proposal shall be borne solely by the Bidder.

B9. PROPOSAL

- B9.1 The Bidder shall complete Form A: Proposal, making all required entries.
- B9.2 Paragraph 2 of Form A: Proposal shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
 - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
 - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
 - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B9.2.1 If a Proposal is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

- B9.3 In Paragraph 3 of Form A: Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Proposal.
- B9.4 Paragraph 11 of Form A: Proposal shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
 - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
 - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
 - (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B9.4.1 The name and official capacity of all individuals signing Form A: Proposal should be printed below such signatures.
- B9.5 If a Proposal 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 Proposal and the Contract, when awarded, shall be both joint and several.

B10. PRICES

- B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B10.2 The Bidder shall utilize and submit Form B: Prices, making all required entries to summarize their Price proposal for the proposed Services. The Bidder shall be responsible to verify and ensure the correctness of the associated submittals.
- B10.2.1 The Form B: Prices comprises of the following tables:
- (a) Summary of Prices;
 - (b) Details of Prices (Phase 1);
 - (c) Details of Prices (Phase 2); and
 - (d) Hourly Prices for Assignment Work.
- B10.2.2 Further to B10.3.1 the Bidder shall incorporate all overhead costs and disbursements into
- (a) A Fixed price for phase I
 - (b) Hourly prices for phase II
- B10.3 The Bidder shall submit a Fixed Price for D3.1(a) as described in Scope of Services and as listed in Form B: Prices (Phase 1):
- B10.3.1 In addition to the Form B: Prices, proposals shall also include a detailed breakdown of the Fixed Price in matrix format for all disciplines according to the Scope of Services. Details shall include as a minimum:
- (a) the work activities of the proposed Services organized by Bidder, partners, or Subcontractors;
 - (b) the respective number of hours per work activity per task per each proposed individual;
 - (c) name and role of proposed individuals;
 - (d) the respective service description, engineering discipline or management function as applicable;
 - (e) the applicable hourly rates (hourly rates shall include all disbursements); and

- (f) The fixed price for the complete Phase 1 work.
- B10.4 The Bidder shall submit a Time Based Price for D3.1(b) Phase 2 work as described in the Scope of Services and as listed in Form B: Prices. For bid purposes assume that:
- (a) There will be ten Assignments per year for the years 2016 through 2020 inclusive, with the basis of the individual Assignments being the provided example for Indicative Pricing;
- B10.4.1 Notwithstanding C7, the City does not guarantee the number or scope of Assignments per year. The number of Assignments stated in B10.4 is for evaluation purposes only.
- B10.4.2 In addition to the Form B: Prices, proposals shall **also** include a detailed breakdown of the Time Based Prices in matrix format for all disciplines according to the Scope of Services. Details shall include as a minimum:
- (a) the work activities of the proposed Services organized by Bidder, partners, or Subcontractors;
- (b) the respective number of hours per work activity per task per each proposed individual;
- (c) name and role of proposed individuals;
- (d) the respective engineering discipline or management function as applicable; and
- (e) the applicable hourly rates (hourly rates shall include all disbursements).
- B10.5 Adjustments to Prices will only be considered based on increases and decreases to the Scope of Services. The City will not consider an adjustment to the Prices based on:
- (a) increases to hourly rates.
- (i) Proposal shall identify and detail all rate escalations including salary adjustments.
- (ii) The total Price in the Proposal shall include all escalations.
- B10.6 If the City requires services in addition to B10.4(a), the rates to be used will be based on the rates provided in the Bidder's proposal.
- B10.7 Notwithstanding C11, Prices submitted on Form B shall not include the Goods and Services Tax (GST) or Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.
- B10.8 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).
- B11. EXPERIENCE OF BIDDERS AND SUBCONTRACTORS (SECTION C)**
- B11.1 The Bidder should provide the experience of their firm and that of their Subcontractors in Form C: Experience of Bidder and Subcontractors as described in this Section and as listed in Form C: Experience of Bidder and Subcontractors.
- B11.2 The Bidder shall provide a total of three (3) projects in providing :
- (a) Data Gathering (Document review and Onsite);
- (b) Short Circuit Analysis ;
- (c) Protective Device Coordination;
- (d) Arc-Flash Hazard Analysis; and
- (e) Contract administration services.
- B11.2.1 If more than three (3) projects are submitted for B11 and/or included in Form C, only the first three (3) referenced projects in Form C will be evaluated.
- B11.2.2 Technical details of the projects should be included for comparison to the proposed work.
- B11.3 For each project listed in B11.2, the Bidder should submit:

- (a) description of the project; (Include Software Used)
- (b) role of the Contractor;
- (c) project's original contracted price and final price;
- (d) Study schedule (anticipated Project schedule and actual project delivery schedule);
- (e) project owner;
- (f) reference information (two current names with telephone numbers per project).

B11.3.1 Where applicable, information should be separated into Bidder and Subcontractor project listings.

B11.4 The Proposal should include general firm profile information, including years in business, average volume of work, number of employees and other pertinent information for the Bidder and all Subcontractors.

B12. EXPERIENCE OF KEY PERSONNEL ASSIGNED TO THE PROJECT (SECTION D)

B12.1 The Bidder should submit the experience of the Key Personnel assigned to this Project as described in this Section and in Form D: Experience of Key Personnel.

B12.1.1 Multiple key personnel positions may be assigned to one individual

- (a) Separate forms are still required for each Key Personnel position.
- (b) Bidders are required to identify the experience for each position assigned to each Key Personnel.

B12.2 The Bidder should identify the following Key Personnel for the Services detailed in the Scope of Services.

- (a) Arc flash software Modeller;
- (b) Field personnel; and
- (c) Electrical Engineer

B12.2.1 The Bidder is responsible for ensuring they have adequate staff for the successful delivery of the Project.

B12.3 Using Form D: Experience of Key Personnel, the Bidder should indicate the experience of the Key Personnel indicated in B12.2 as follows:

- (a) proposed role and responsibilities for the arc flash hazard analysis project;
- (b) core capabilities and/or technical skills;
- (c) educational background, degrees, professional recognitions, job title and years of experience Arc Flash Hazard Analysis work and years of experience with existing employer ;
- (d) a total of two (2) comparable projects substantially completed in the last ten (10) years, in which they have played a similar role as proposed for this Project. For each project provide the following:
 - (i) Role of the person on the project. Emphasize roles which are similar to those proposed for this project.
 - (i) Arc flash software Modeller shall document their demonstrated experience in modelling arc flash analysis with SKM software.
 - (ii) The Field personnel shall document their demonstrated experience in gathering site information.
 - (iii) The electrical engineer shall document their experience as a registered professional engineer licenced in Manitoba with demonstrated experience in reviewing, approving and including stamping and sealing arc flash hazard analysis reports.

- (ii) Where applicable identify tasks which were completed include;
 - (i) Document Gathering and Review
 - (ii) Site Visit and Equipment Verification
 - (iii) Modeling within SKM Power*Tools® (SKM) and how challenges may be addressed
 - (iv) Preparation of the Short Circuit Analysis and Protective device evaluation
 - (v) Preparation of Protective Device Coordination Study
 - (vi) Preparation of Arc Flash Hazard Analysis
 - (vii) Compilation and finalization of the draft and final report and
 - (viii) Application of CSA Compliant Labelling.
 - (iii) Project name and owner;
 - (iv) Description of project;
 - (v) Responsibilities and achievements; and
 - (vi) Reference information should be two current names (from the project owner) with telephone numbers per project.
 - (i) References will be used to confirm the information provided.
 - (ii) Incorrect or out of date contact information may negatively impact the evaluation.
 - (e) Other required information as indicated in Form D.
- B12.3.1 If more than two (2) projects are included in Form D, only the first two (2) projects for each Key Personnel position will be evaluated.
- B12.3.2 If a key person is assigned multiple key positions, a Form D for each position must be completed. The comparable projects may be different for each position.
- B12.3.3 The Contractor shall conduct the Arc Flash Hazard Analysis under the supervision and approval of an APEGM registered Professional Electrical Engineer with a minimum of five (5) years' experience in performing and interpreting power system studies including Arc Flash Hazard studies. The final report and drawings shall be stamped and sealed by the Professional Electrical Engineer.

B13. PROJECT UNDERSTANDING AND METHODOLOGY (SECTION E)

- B13.1 The Bidder should describe their approach to overall team formation for the entire project, coordination of team members and why the City should select your team. Supporting documents should include:
- (a) An organizational chart identifying the Key Personnel in B12.2 and additional personnel proposed by the Bidder; and
 - (b) Personnel job functions
- B13.2 Describe how the Bidder intends to manage this project during the performance of the Scope of Services addressing:
- (a) Resource Loading
 - (b) Timely response to City requests
 - (c) Communications with the City
 - (d) Quality management – how the bidder intends to carry out quality assurance and quality control specifically for this project
 - (e) Cost management – how the Bidder intends to control their costs during the project
 - (f) Schedule management – How the bidder intends to manage their schedule with respect to Phase 1 and Phase 2 of the project
- B13.3 The Bidder should address how they intend to carry out the Scope of Services as follows

- (a) Describe and outline how the following tasks will be carried out:
 - (i) Document Gathering and Review
 - (ii) Site Visit and Equipment Verification
 - (iii) Modeling within SKM and how challenges may be addressed
 - (iv) Preparation of the Short Circuit Analysis and Protective device evaluation
 - (v) Preparation of Protective Device Coordination Study
 - (vi) Preparation of Arc Flash Hazard Analysis
 - (vii) Compilation and finalization of the draft and final report and
 - (viii) Application of CSA Compliant Labelling.
- (b) Describe and outline how the preparation of multiple redundant configuration schemes for the NEWPCC site will be addressed during the Phase 1 work.
- (c) Describe and outline how the Bidder proposes to outline Scope for Phase 2 work at;
 - (i) SEWPCC;
 - (ii) WEWPCC;
 - (iii) Additional work at the NEWPCC; and
 - (iv) Sewage and drainage pumping stations throughout the City.
- (d) Describe the collaborative process/method to be used by the Key Personnel of the team in the various phases of the Project.
- (e) Describe the activities and services to be provided by the City.
- (f) Describe the information required by the Bidder to better understand the project requirements.
- (g) Provide rationale to support the number of hours assigned by the Bidder in the Form B: Prices and the Bidder's Price matrix.

B14. PROJECT SCHEDULE (SECTION F)

- B14.1 Bidders should present a carefully considered Critical Path Method schedule using Microsoft Project or similar project management software, complete with resource assignments (key designers), durations (weekly timescale) and milestone dates or events.
- (a) The schedule should address the requirement of the Scope of Services for only Phase 1 of the project.
 - (b) The Bidder's schedule should include critical dates for review and approval processes by the City and other organizations anticipated during the arc flash hazard analysis
 - (c) A minimum of three (3) weeks should be allowed for City review of the Bidder's deliverables.
- B14.2 The Project Schedule presented should be for Phase 1 – NEWPCC work only and should have at least the following items identified, and any additional details deemed relevant by the Contractor:
- (a) Project Award Date
 - (b) Document Review Period
 - (c) Site Visit / Verification Period
 - (d) Modelling and analysis period
 - (e) Draft Report Period.
 - (f) Draft Report Submission Date
 - (g) Draft Report Review Meeting
 - (h) Draft Report Review Period
 - (i) Final Report Submission Date

- (j) Arc-Flash Warning Label Application

B14.3 It is anticipated that performance of all of Phase 1 – Arc-Flash Hazard Analysis for the NEWPCC in its existing condition may be performed in a period of four (4) months after the Contract award.

B15. DISCLOSURE

B15.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. No additional material available as a result of contact with these Persons is listed below.

B15.2 The Persons are:

- (a) Celco Controls
- (b) HB Construction Ltd.

B16. ELIGIBILITY

B16.1 As a result of their involvement in the Project, Kontzamanis Graumann Smith MacMillan Inc. (Operating as KGS Group), VWNA (Winnipeg) Inc. (Veolia) or their affiliates are not eligible to participate as a Contractor, or Subcontractor, in the Arc Flash Hazard Analysis RFP (515-2015).

B17. QUALIFICATION

B17.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Bidder does not carry on business in Manitoba, in the jurisdiction where the Bidder does carry on business; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.

B17.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>

B17.3 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;
- (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);

B17.4 Further to B17.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
- (b) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
- (c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>).

B17.5 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.

B17.6 The Bidder shall provide, on the request of the City, full access to any of the Bidder's equipment and facilities to confirm, to the City's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B18. OPENING OF PROPOSALS AND RELEASE OF INFORMATION

B18.1 Proposals will not be opened publicly.

B18.2 After award of Contract, the names of the Bidders and the Contract amount of the successful Bidder will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B18.3 To the extent permitted, the City shall treat all Proposal Submissions as confidential, however the Bidder is advised that any information contained in any Proposal may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B18.4 Following the award of Contract, a Bidder will be provided with information related to the evaluation of his/her submission upon written request to the Contract Administrator.

B19. IRREVOCABLE OFFER

B19.1 The Proposal(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 10 of Form A: Proposal.

B19.2 The acceptance by the City of any Proposal shall not release the Proposals of the other responsive Bidders and these Bidders shall be bound by their offers on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any offer shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 10 of Form A: Proposal.

B20. WITHDRAWAL OF OFFERS

B20.1 A Bidder may withdraw his/her Proposal without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B20.1.1 Notwithstanding C22.5, the time and date of receipt of any notice withdrawing a Proposal shall be the time and date of receipt as determined by the Manager of Materials.

B20.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Proposal or the Bidder's authorized representatives named in Paragraph 11 of Form A: Proposal, and only such person, has authority to give notice of withdrawal.

B20.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Proposal until after the Submission Deadline has elapsed;
- (b) open the Proposal to identify the contact person named in Paragraph 3 of Form A: Proposal and the Bidder's authorized representatives named in Paragraph 11 of Form A: Proposal; and
- (c) if the notice has been given by any one of the persons specified in B20.1.3(b), declare the Proposal withdrawn.

B20.2 A Bidder who withdraws his/her Proposal after the Submission Deadline but before his/her offer has been released or has lapsed as provided for in B19.2 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.

B21. INTERVIEWS

B21.1 The Contract Administrator may, in his/her sole discretion, interview Bidders during the evaluation process.

B22. NEGOTIATIONS

B22.1 The City reserves the right to negotiate details of the Contract with any Bidder. Bidders are advised to present their best offer, not a starting point for negotiations in their Proposal Submission.

B22.2 The City may negotiate with the Bidders submitting, in the City's opinion, the most advantageous Proposals. The City may enter into negotiations with one or more Bidders without being obligated to offer the same opportunity to any other Bidders. Negotiations may be concurrent and will involve each Bidder individually. The City shall incur no liability to any Bidder as a result of such negotiations.

B22.3 If, in the course of negotiations pursuant to B22.2 or otherwise, the Bidder amends or modifies a Proposal after the Submission Deadline, the City may consider the amended Proposal as an alternative to the Proposal already submitted without releasing the Bidder from the Proposal as originally submitted.

B23. EVALUATION OF PROPOSALS

B23.1 Award of the Contract shall be based on the following evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Request for Proposal or acceptable deviation therefrom: (pass/fail)
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B16: (pass/fail)
- (c) Total Bid Price;
 - (i) Fixed Price (Phase 1) 20%
 - (ii) Time Based Prices (Phase 2) 20%
- (d) Experience of Bidder and Subcontractor; (Section C) 10%
- (e) Experience of Key Personnel Assigned to the Project; (Section D) 20%
- (f) Project Understanding and Methodology (Section E) 20%
- (g) Project Schedule. (Section F) 10%

- B23.2 Further to (a), the Award Authority may reject a Proposal as being non-responsive if the Proposal is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Proposal, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.
- B23.3 Further to (b), the Award Authority shall reject any Proposal submitted by a Bidder who does not demonstrate, in his/her Proposal or in other information required to be submitted, that he/she is responsible and qualified.
- B23.4 Further to B23.1(c), Prices will be evaluated based on Total Fixed Prices and Total Estimated Time Based Prices submitted.
- B23.4.1 Prices appearing to be inappropriately proportioned within or between the Fixed Prices may be determined to be non-responsive and rejected by the Award Authority in its sole discretion acting reasonably.
- B23.4.2 Prices appearing to be inappropriately proportioned within or between the Time Based Prices may be determined to be non-responsive and rejected by the Award Authority in its sole discretion acting reasonably.
- B23.4.3 Prices, hours and Hourly Rates appearing to be inappropriately proportioned between the Fixed Prices and Time based Prices may be determined to be non-responsive and rejected by the Award Authority in its sole discretion acting reasonably.
- B23.4.4 The Award Authority may evaluate any proposal for reasonability of estimated effort for the sample project. A proposal may be determined to be non-responsive and rejected if estimates appear to be inappropriately low in the sole discretion of the Award Authority acting reasonably.
- B23.5 Further to B23.1(d), Experience of Bidder and Subcontractors will be evaluated considering the information provided in B11.
- B23.6 Further to B23.1(e), Experience of Key Personnel Assigned to the Project will be evaluated considering the experience and qualifications of the Key Personnel and Subcontractor personnel on Projects of comparable size and complexity considering the information provided in B12.
- B23.7 Further to B23.1(f), Project Understanding and Methodology will be evaluated considering your firm's understanding of the City's Project, project management approach and team organization considering the information provided in B13.
- B23.8 Further to B23.1(g), Project Schedule will be evaluated considering the Bidder's ability to comply with the requirements of the Project for Phase 1 considering the information provided in B14.
- B23.9 Notwithstanding B23.1(d) to B23.1(g), where Bidders fail to provide a response to B8.2(a) to B8.2(d), the score of zero may be assigned to the incomplete part of the response.
- B23.10 This Contract will be awarded as a whole.
- B23.11 If, in the sole opinion of the City, a Proposal does not achieve a pass rating for (a) and (b), the Proposal will be determined to be non-responsive and will not be further evaluated.
- B23.12 If a Proposal does not achieve 50% of the total points for B23.1(d) to B23.1(g), the Proposal may not be evaluated further.

B24. AWARD OF CONTRACT

- B24.1 The City will give notice of the award of the Contract, or will give notice that no award will be made.

- B24.2 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 Proposals are determined to be responsive.
- B24.2.1 Without limiting the generality of B24.2, 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 Proposal is received; or
 - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.
- B24.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the most advantageous offer.
- B24.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Proposal upon written request to the Contract Administrator.
- B24.4 Notwithstanding C4 and Paragraph 6 of Form A; Proposal, the City may issue a purchase order to the successful Bidder in lieu of the execution of a Contract.
- B24.5 The Contract Documents, as defined in C1.1(n)(ii), in their entirety shall be deemed to be incorporated in and to form a part of the purchase order notwithstanding that they are not necessarily attached to or accompany said purchase order.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Supply of Services* (Revision 2007 04 12) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Supply of Services* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm
- C0.1.2 A reference in the Request for Proposal to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Supply of Services*
- C0.1.3 Further to C0, nothing herein is intended nor shall be construed as creating any exclusive arrangement with the Bidder/Contractor or Proponent (whichever applies). The contract awarded shall not restrict the City of Winnipeg from acquiring similar, equal or like goods and/or services from other entities or sources.
- C0.1.4 Further to C0, the terms of agreement of the contract awarded may be revised on a yearly basis. The contract may be terminated if the revised terms are unreasonable and non-negotiable between the City and the Bidder/Contractor or Proponent (whichever applies) in the sole discretion of the City of Winnipeg.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. BACKGROUND

D2.1 The City has a number of sewage treatment plants and pumping stations which require Arc-Flash Hazard Analysis. There is major work planned for the NEWPCC and the City would like to have an immediate study completed on this site before major work begins.

D2.2 The City wishes to engage, via a standing offer arrangement, a firm with Arc Flash Hazard Analysis expertise to analyze arc flash hazard at various sites. As Arc Flash Hazard Analysis is a major ongoing component of City operational requirements, it is seen as beneficial to arrange for a standing offer to provide these services on an as required basis for the three (3) sewage treatment plants, sewage pumping stations and drainage pumping stations..

D2.3 The results of the analysis will be used to improve design where practical, inform construction, maintenance and operating personnel of the available arc energy at all required electrical equipment, and improve the ability of personnel to mitigate serious injury when used in conjunction with personal protective equipment and safe work procedures.

D2.4 As the City manages a number of sites, it is desired to have a single Arc-Flash Specialist to perform the studies in a standard and comprehensive manner.

D2.5 The current need for a complete study at the NEWPCC in its existing condition forms the basis of Phase 1 of the Work and will be bid with a fixed Price.

D2.6 Future work, which could be at the NEWPCC, SEWPCC, WEWPCC or any one of the City's sewage and drainage pumping stations is considered Phase 2 of the Work and will be on an "as required basis", based on the hourly prices outlined in Form B - Prices.

D2.7 The Contractor shall note the following:

- (a) The SEWPCC is currently undergoing major upgrade and may require a study to be completed for the entire facility near the end of the first five year contract period.
- (b) The WEWPCC currently has up to date Arc Flash Hazard Analysis information. No major work is anticipated at this time in the Contract Period.
- (c) The NEWPCC has two major projects which will use the Arc-Flash Hazard Analysis information provided by the Contractor. The work for these major projects will include some Arc Flash Hazard Analysis reports which are currently outside the scope of the Work. When site upgrade projects at the NEWPCC are complete, it is anticipated that the Contractor will be engaged to align the study information with the City standard product being developed.
- (d) It is anticipated that once underway there will be approximately ten (10) or more Arc-Flash Hazard Analysis Assignments per year for sewage and drainage pumping stations around the City.

D2.8 Assignments under this standing offer will be provided by the City to the successful Contractor to provide a schedule and cost estimate prior to commencement of the Work.

D2.9 It is anticipated that the successful Contractor will maintain up to date Arc-Flash Hazard Analysis Models and reports on this Project.

D3. SCOPE OF SERVICES

- D3.1 The Work to be done under the Contract shall be in two parts and consist of
- (a) Phase 1: Arc flash hazard analysis at the NEWPCC as detailed in Part E. Major Components include:
 - (i) Document gathering and review;
 - (ii) Site visit and equipment verification;
 - (iii) Preparation of redundant configuration schemes;
 - (iv) Modeling within SKM;
 - (v) Preparation of the Short Circuit Analysis and Protective device evaluation;
 - (vi) Preparation of Protective Device Coordination Study;
 - (vii) Preparation of Arc Flash Hazard Analysis;
 - (viii) Compilation and finalization of the draft and final report;
 - (ix) Application of CSA Compliant Labelling.
 - (b) Phase 2: Arc flash hazard analysis work for multiple sites for the period from January 2016 until December 2020, with the option of one (1) mutually agreed upon five (5) year extensions as detailed in Part E.
 - (i) The City may negotiate the extension option with the Contractor within sixty (60) Calendar Days prior to the expiry date of the Contract. The City shall incur no liability to the Contractor as a result of such negotiations.
 - (ii) Changes resulting from such negotiations shall become effective on January 1 of the respective year. Changes to the Contract shall not be implemented by the Contractor without written approval by the Contract Administrator.
 - (iii) All Work performed under Phase 2 of this contract will be carried out on an Assignment basis.
 - (iv) For Bid evaluation purposes, a sample site has been provided to allow for representative pricing. Work at the sample site will include:
 - (i) Document gathering and review;
 - (ii) Site visit and equipment verification;
 - (iii) Modeling within SKM;
 - (iv) Preparation of the Short Circuit Analysis and Protective device evaluation;
 - (v) Preparation of Protective Device Coordination Study;
 - (vi) Preparation of Arc Flash Hazard Analysis;
 - (vii) Compilation and finalization of the draft and final report;
 - (viii) Application of CSA Compliant Labelling.
- D3.2 The Work indicated in D3.1 shall be done on an "as required" basis during the term of the Contract with the exception of D3.1(a) which shall be carried out on or before four (4) months after project award. It is anticipated that the City will attempt to distribute the workload of upcoming assignments to allow even loading where possible.
- D3.2.1 The type and quantity of Work to be performed under this Contract shall be as authorized from time to time by the City's Contract Administrator, Project Manager and/or Users.
- D3.2.2 Subject to C6.4, the City shall have no obligation under the Contract to purchase any quantity of any item in excess of its actual operational requirements.
- D3.3 The Services required under this Contract shall consist of undertaking arc flash hazard analysis studies at the NEWPCC, SEWPCC, and WEWPCC as well as various sewage and drainage pumping stations.
- (a) The work will require a cost estimate and schedule for each assignment.
 - (b) The major components of the Work are as follows:

- (i) Site investigation and document review of existing drawings to confirm and collect all required data;
- (ii) Preparation of redundant configuration schemes (Where applicable);
- (iii) Preparation of a complete SKM Model;
- (iv) Preparation of the Short Circuit Analysis and Protective device evaluation;
- (v) Preparation of Protective Device Coordination Study;
- (vi) Preparation of Arc Flash Hazard Analysis;
- (vii) Update or preparation of Single Line Diagrams for the Facility as required;
- (viii) Preparation of recommendations to improve coordination and mitigate arc-flash hazards (Report shall identify As-found and proposed conditions);
- (ix) Compilation of Draft Report;
- (x) Presentation of Draft Results (Where warranted);
- (xi) Update of report if Recommendations are undertaken;
- (xii) Application of Arc Flash Hazard labelling;
- (xiii) Delivery of up-to-date arc flash software model(s) and source and PDF versions of all deliverables;
- (xiv) The Contractor shall conduct the Arc Flash Hazard Analysis under the supervision and approval of an APEGM registered Professional Electrical Engineer with a minimum of five (5) years' experience in performing and interpreting power system studies including Arc Flash Hazard studies. The final report and drawings shall be stamped and sealed by the Professional Electrical Engineer.
- (xv) All final deliverables shall be under seal of an Engineer registered and in good standing with APEGM.

D4. DEFINITIONS

D4.1 When used in this Request for Proposal:

- (a) "**Assignment**" means a written scope of work developed by the City outlining the requirements for a particular arc flash analysis the City wishes the Contractor to undertake.
- (b) "**Engineering Subcontractor**" means the firm responsible for the engineering portion of the work where the Contractor is not directly providing the engineering portion of the work, but is subcontracting this portion.;
- (c) "**NEWPCC**" means the City's North End Sewage Treatment Plant located at address 2230 Main Street, Winnipeg, Manitoba, R2V 4T8.
- (d) "**SEWPCC**" means the City's South end Sewage Treatment Plant located at address 100 Ed Spencer Drive, Winnipeg, Manitoba, R2N 4G3.
- (e) "**WEWPCC**" means the City's West End Sewage Treatment Plant located at address 7744 Wilkes Avenue, Headingley, Winnipeg, Manitoba, R4H 1B8.

D5. CONTRACT ADMINISTRATOR

D5.1 The Contract Administrator is KGS Group, represented by:

Adam Pawlikewich, P. Eng
Senior Supervising Electrical Engineer

Telephone No. (204) 896-1209

Facsimile No. (204) 896-0754

D5.2 Before commencement of Work, the City will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D5.3 Bids Submissions must be submitted to the address in B8.10.

D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

- D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.
- D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.
- D6.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;
- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
 - (b) the Contract, all deliverables produced or developed;
 - (c) any statement of fact or opinion regarding any aspect of the Contract.
- D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

D7. NOTICES

- D7.1 Notwithstanding C22.3, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:
- The City of Winnipeg
Chief Financial Officer
Facsimile No.: 204 949-1174
- D7.2 **Bids Submissions** must be submitted to the address in B8.10.

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

- D8.1 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.
- D8.2 The Contractor or the Engineering subcontractor shall have a valid Certificate of Authorization and be registered with the Association of Professional Engineers and Geoscientists of Manitoba (APEGM)

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 website at <http://www.winnipeg.ca/matmgt/safety/default.stm>

D10. INSURANCE

- D10.1 The Contractor and engineering Subcontractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance covering bodily injury or property damage, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured. Such liability policy to also contain a cross-liability clause, blanket contractual, employees as additional insureds, employer's liability, non-owned automobile liability and products and completed operations cover, to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Service. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;
- D10.2 The Contractor or Engineering Subcontractor, whichever is responsible for the engineering portion of the Work, shall provide and maintain the following insurance
- (a) Professional errors and omissions liability insurance in an amount not less than \$500,000 per claim and \$1,000,000 in the aggregate. Such insurance shall remain in force for the duration of the Project and for twelve (12) months after total performance.
- D10.3 Deductibles shall be borne by the Contractor.
- D10.4 All insurance, which the Contractor and/or its engineering Subcontractor is required to obtain with respect to this Contract, shall be with insurance companies registered and licensed in the Province of Manitoba.
- D10.5 The Contractor shall provide the City with a certificate(s) of insurance for itself and for all of its Subcontractors, in a form satisfactory to the City Solicitor, 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. Such certificates shall state the exact description of the Services and provide for written notice in accordance with D9.5.
- D10.6 The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.
- D10.7 The City shall have the right to alter the limits and/or coverages as reasonably required from time to time during the continuance of this agreement.

D11. SUBCONTRACTOR LIST

- D11.1 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.
- D11.2 All Subcontractors performing major components of the work shall be identified in the Proposal.

CONTROL OF WORK

D12. COMMENCEMENT

- D12.1 The Contractor shall not commence any Work until he/she is in receipt of a notice of award from the City authorizing the commencement of the Work.
- D12.2 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 D8;
 - (ii) evidence of the workers compensation coverage specified in C6.14;
 - (iii) the Safe Work Plan specified in D9;
 - (iv) evidence of the insurance specified in D10;
 - (v) the Subcontractor list specified in D11; and
- (b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.
- (c) the Contractor has provided a minimum of seven (7) Working Days notice for required access to the Site.

D12.3 The Contractor shall commence the Work appropriate to the assignment within seven (7) Working Days of receipt of the notice of award.

D12.4 The Contractor shall notify the City of all equipment which may require shut-down for inspection. All equipment shut-down periods shall be kept to a minimum. Any equipment shut-downs which cannot be accommodated by the City will have estimated values presented by the Contractor for use in the model. Where possible the City will also provide any known existing data.

D13. ORDERS

D13.1 The Contractor shall provide a local Winnipeg telephone number or a toll-free telephone number at which orders for service may be placed.

D13.2 Where urgent work is required, it shall be based on an Assignment

D14. RECORDS

D14.1 The Contractor shall keep detailed records of the services supplied under the Contract.

D14.2 The Contractor shall record, as a minimum, for each item listed on Form B: Prices:

- (a) user name(s) and addresses;
- (b) order date(s);
- (c) service date(s);
- (d) description and quantity of services provided.

D14.3 The Contractor shall provide the Contract Administrator with a copy of the records for each quarter year within fifteen (15) Calendar Days of a request of the Contract Administrator.

D15. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

D15.1 Further to B17.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B17.4. Measurement and Payment.

D16. INVOICES

D16.1 Further to C11, the Contractor shall submit an invoice for each portion of Work performed to:

The City of Winnipeg
Corporate Finance - Accounts Payable
4th Floor, Administration Building, 510 Main Street
Winnipeg MB R3B 1B9

Facsimile No.: 204 949-0864

Email: CityWpgAP@winnipeg.ca

D16.2 Invoices must clearly indicate, as a minimum:

- (a) the City's purchase order number;
- (b) date of delivery;
- (c) delivery address;
- (d) type and quantity of work performed;
- (e) the amount payable with GST and MRST shown as separate amounts;
- (f) the Contractor's GST registration number.

D16.3 The City will bear no responsibility for delays in approval of invoices which are improperly submitted.

D16.4 Bids Submissions must be submitted to the address in B8.10.

D17. PAYMENT

D17.1 Further to C11, payment shall be in Canadian funds net thirty (30) Calendar Days after receipt and approval of the Contractor's invoice.

D17.2 Further to C11, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

D18. WARRANTY

D18.1 Warranty is as stated in C12 and is applicable to any labelling provided as part of the Work

PART E - SPECIFICATIONS

GENERAL

E1. EXISTING NEWPCC ELECTRICAL DISTRIBUTION

- E1.1 Refer to Appendix A for single line diagrams representing the existing NEWPCC distribution.
- E1.2 The existing power to the NEWPCC is provided by Manitoba Hydro via two 66 kV wood pole transmission lines sourced from Manitoba Hydro's Rosser Station; one identified as Fernbank, the other identified as Storie Road. Both wood pole lines are part of a 66 kV ring feeder with both sides originating in the Rosser Substation. Two service points are tapped from this ring feeder.
- E1.3 The current supply configuration consists of a Manitoba Hydro owned switchyard with two 66 kV / 4.16 kV, 7.5 MVA oil filled transformers. The transformers and switchyard are approximately 50 years old. The secondary connection consists of 2 cable potheads providing the transition from the above ground transformer secondary terminals to the underground cables feeding a line-up of 4.16 kV metal enclosed switchgear in the main electrical room of the Grit Building adjacent to the switchyard.
- E1.4 The switchgear is arranged with two main incoming circuit breakers and a bus tie to facilitate connection to the other supply line in the event of a single line outage. Each switchgear assembly associated with each main breaker provides feeders to the various principal areas of the plant and the split bus architecture incorporates a level of redundancy via the tie breaker and dual feeder arrangement. Manitoba Hydro owned secondary revenue metering is incorporated into the 4.16 kV switchgear line-up.
- E1.5 The total load on the plant in the past was typically within the rating of one of the 66 kV, 7.5 MVA transformers. The 2007 addition of the UV disinfection facility necessitated the addition of a third transformation, due to the added load which exceeded the existing transformer ratings. This addition occurred in 2005 and required the installation of a single distribution supply centre (DSC) transformation rated at 66 kV / 4.16 kV, 5 MVA. The connection on the 66 kV incoming line was performed via a tie-tap arrangement on the overhead Fernbank R-84 main line with associated primary fused disconnect.
- E1.6 In accordance with Manitoba Hydro standard policy, the new installation was equipped with primary metering. The secondary switchgear was integrated into the existing 4.16 kV line-up and included a tie breaker scheme to replicate the split bus arrangement utilized throughout the existing plant.
- E1.7 Bulk power distribution throughout the existing plant is performed at 4.16 kV. The main building pumping facility utilizes 4.16 kV directly to power the large raw sewage pumps. The balance of the loads throughout the plant is powered at 600 volts, or at 120 / 208 / 240 volts. Transformations are provided at the main drop points (Main Building, Dewatering, Secondaries, Digesters, Reactors, UV Disinfection) throughout the plant to convert from 4.16 kV to the desired utilization voltage.

E2. REDEVELOPED NEWPCC DISTRIBUTION

- E2.1 The specific scheme to redevelop the NEWPCC plant is under development and will not be finalized for some time. It will however continue to have two 66 kV service points with multiple transformers at the 66 kV level to either / and 4.16 kV and 12.47 kV distribution voltage levels. This redevelopment is currently independent of this Work.
- E2.2 It is expected that the Contractor will complete the Arc-Flash Hazard Analysis and have the SKM model and associated items available for use by the City. The City expects to require updates to the model by other parties during the construction work. On completion of the

construction at the site, the City may also issue an Assignment to the Contractor to redevelop the Arc-Flash Hazard analysis

E3. ABBREVIATIONS

- (a) ANSI American National Standards Institute
- (b) APEGM Association of Professional Engineers and Geoscientists of Manitoba
- (c) ATS Automatic Transfer Switch
- (d) CEA Canadian Electricity Association
- (e) CEC Canadian Electrical Code
- (f) CSA Canadian Standards Association
- (g) CT Current Transformer
- (h) IEEE Institute of Electrical and Electronics Engineers
- (i) MH Manitoba Hydro
- (j) MCC Motor Control Centre
- (k) NEC National Electrical Code
- (l) NFPA National Fire Protection Association
- (m) NEWPCC North End Water Pollution Control Centre
- (n) OSHA Occupational Safety and Health Association
- (o) PPE Personal Protective Equipment
- (p) PT Potential Transformer
- (q) SKM SKM Power*Tools®

E4. STANDARDS

E4.1 The Contractor shall ensure that all calculations, analyses, and recommendations for the Work meet the requirements of the latest following industry standards or City Standards.

CSA C22.1	Canadian Electrical Code, Part I – Safety Standard for Electrical Installations (CEC)
CSA Z462	Workplace Electrical Safety (Z462)
IEEE 1584	Guide for Performing Arc–Flash Hazard Calculations (IEEE 1584)
IEEE 141	IEEE Recommended Practice for Electric Power Distribution for Industrial Plants (IEEE 141, or the Red Book)
IEEE 241	IEEE Recommended Practice for Electric Power Systems in Commercial Buildings (IEEE 241, or the Grey Book)
IEEE 242	IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (IEEE 242, or the Buff Book)
IEEE 399	Recommended Practice for Industrial and Commercial Power System Analysis (IEEE 399, or the Brown Book)
IEEE 551	IEEE Recommended Practice for Calculating Short–Circuit Currents in Industrial & Commercial Power Systems (IEEE 551, or the Violet Book)
IEEE 1015	Recommended Practice For Applying Low Voltage Circuit Breakers Used in Industrial and Commercial Power Systems (IEEE 1015, or the Blue Book)
ANSI / IEEE C37.10	IEEE Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis (IEEE C37.10)

ANSI / IEEE C37.13	IEEE Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures (IEEE C37.13)
City of Winnipeg Document CD-RC-PC-01	Winnipeg Sewage Treatment Program Technical Document Numbering System
City of Winnipeg Document PG-RC-PC-05	Winnipeg Sewage Treatment Program Non-Technical Document Name Standard The Manitoba Electrical Code

E5. SCOPE OF WORK

- E5.1 The electrical distribution to be studied will be outlined by the City in each specific Assignment.
- (a) For the Phase 1 portion of the work, the Scope of Services for the Price provided will be based on a complete Study of the NEWPCC in its existing condition.
 - (b) For Phase 2, for each Assignment, The City will typically provide the following:
 - (i) The anticipated Services required, if they deviate from those outlined in this section.
 - (ii) Current software data and output for the appropriate sewage treatment plants, sewage and drainage pumping stations reflecting the studies and information gathered and processed to date. Initial Assignments will not have this data.
 - (iii) Single Line Diagrams showing the configuration to be studied
 - (iv) Where applicable, Thevenin equivalent circuit for the utility system at the service point. Studies for facilities with Medium Voltage rated incoming services shall not have the incoming service modelled as an Infinite bus.
 - (v) Other information as required by the Contractor, if available, for completion of the analysis
 - (vi) Site access for data collection and verification.
- E5.1.1 Sections E6 to E11 applies to Phases 1 and 2 of the work.

E6. GENERAL REQUIREMENTS

- E6.1 As part of any Arc Flash Hazard analysis assignment, the Contractor shall include a short-circuit analysis with protective device evaluation, and a protective device coordination study. A single-line diagram of the system shall be produced showing the results of the analysis. Upon completion, the Contractor shall submit a draft and final report detailing the findings.
- E6.2 The analysis shall include all AC electrical equipment rated 120/208 Volt and higher. This criterion is more stringent than the Standards covering the Arc flash Hazard Analysis and shall be used by the Contractor to define the scope of study.
- E6.3 The Contractor shall also carry out the analysis of DC equipment using DC incident energy calculations found in Annex D.5 of standard Z462-15: Workplace Electrical Safety or the newer version updated and adopted by the City over the course of this assignment.
- E6.4 The Contractor shall coordinate with the City to acquire details required to complete the Work. The Contractor shall perform a document review of available documents and drawings prior to formally verifying all documentation on site.
- E6.5 The Contractor shall arrange through the Contract administrator before traveling to each site to acquire the necessary data required to complete the study.
- E6.6 For existing distribution, the Contractor shall verify all equipment nameplates & ratings, protection device settings, cables lengths & types, and other relevant details on-site to verify accuracy of the City's drawings and previous arc flash hazard analysis studies forwarded to the Contractor. The final report shall include a list of missing or unverified equipment information and a list of assumptions.

- E6.7 For analyzing proposed new work and estimating the Assignment, the Contractor may rely on the single line diagram and equipment and cable sizes and lengths given in the specific Assignment. If the Assignment includes existing equipment as well, the Contractor shall verify this component as well, as described in the previous paragraph.
- E6.8 The Contractor shall conduct the Arc Flash Hazard Analysis under the supervision and approval of an APEGM registered professional electrical engineer with a minimum of five (5) years' experience in performing and interpreting power system studies including Arc Flash Hazard studies. The final report and drawings shall be stamped and sealed by the Professional electrical engineer.
- E6.9 The Contractor shall perform the system model and analysis detailed herein using the most current SKM Systems Analysis software. Where the City has existing studies in its records using SKM software the Contractor shall incorporate and consolidate these SKM models into its model. The Contractor shall be responsible for verification of any existing models turned over for use.
- E6.10 The Contractor shall use actual conductor impedances if known. If actual values are not known, typical conductor impedance values shall be obtained from manufacturer for the given configuration, or calculated from the given materials, geometry and configuration used. Any information from manufacturers or calculated values shall be supplied as information with the final report.
- E6.11 Where arc flash hazards are high, review and recommend, as appropriate, the use of maintenance settings for protection to reduce arc flash hazard when work is performed on the equipment. The Contractor shall provide the following:
- (a) Calculation methods and assumptions
 - (b) Selected base per unit quantities
 - (c) Single-line diagram of each system configuration being evaluated
 - (d) Tabulations of calculated quantities
 - (e) Results, conclusions, and recommendations
- E6.12 The Contractor shall calculate the maximum available arc flash energy at the following locations. This is a non-exhaustive list. Refer to CSA Z462 Electrical Workplace Safety for more detail.
- (a) Switchgear
 - (b) Distribution switchboards and panel boards
 - (c) MCCs
 - (d) Disconnect Switches
 - (e) Standby Generators
 - (f) Manual Transfer Switches
 - (g) Automatic Transfer Switches
 - (h) Busway and Splitters
 - (i) Motor Starters
 - (j) Power Factor Correction Equipment
 - (k) All Medium Voltage Equipment
 - (l) Primary and Secondary Transformer Connection Cubicles
 - (m) Other significant locations throughout the system as identified by the Contractor or the City
- E6.13 Each time the SKM Systems Analysis software is updated by SKM, the Arc Flash Specialist shall update his master model for each facility under Assignment to the latest model of software.

E7. SHORT-CIRCUIT ANALYSIS WITH PROTECTIVE DEVICE EVALUATION

- E7.1 The Contractor shall perform a short-circuit analysis with a protective device evaluation based on the guidelines outlined in this section.
- E7.2 Calculate the short circuit momentary and interrupting duties for a three-phase bolted fault at each location as mentioned above.
- E7.3 The analysis calculation methodology shall be in accordance with the listed IEEE and ANSI C37 standards. Short-circuit calculations shall be prepared in SKM Systems Analysis software. Results of short circuit calculations shall be presented in tabular form in the final report.
- E7.4 Motor contribution shall be incorporated in determining fault levels.
- E7.5 Evaluate equipment and protective devices and compare to short-circuit ratings. Analyze adequacy of switchgear, motor control centres, load-centres, and panel board bus bars to withstand short-circuit stresses. Results of the equipment evaluation shall be presented in a tabulated form within the report.
- E7.6 Transformer design impedances shall be used when actual test impedances are not available. The short-circuit currents shall be analyzed by preparing a tabulation comparing the fault levels to the device interrupting ratings. Series rated breakers shall not be used. Include the following information in the tabulation:
- (a) Bus Identification Number
 - (b) Location identification
 - (c) Voltage
 - (d) Manufacturer and type of equipment
 - (e) Device rating
 - (f) Calculated short-circuit current
- E7.7 The Contractor shall notify the City in writing of circuit protective devices and any system component improperly rated for the calculated available fault current.
- E7.8 As part of the protective device evaluation, provide an condition assessment and remedial recommendations as required for protective devices which are in excess of 25 years old or in a deteriorated condition.
- E7.9 Results of short-circuit calculations shall be presented in tabular form in the final report.

E8. PROTECTIVE DEVICE COORDINATION STUDY

- E8.1 The Contractor shall perform a protective device coordination study based on the guidelines outlined in this section.
- E8.2 Contractor shall verify any built-in SKM device models used in the software model. Any device which is not present within the SKM library shall be modelled as a custom device as per the manufacturers most current product information for the specific device installed.
- E8.3 As found and proposed protective device coordination time-current characteristic curves (TCC) shall be displayed on log-log scale graphs.
- E8.4 Include on each TCC graph a complete title and one-line diagram with legend identifying the specific portion of the system covered and the configuration used.
- E8.5 Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.

- E8.6 For each device, report the as-found and any proposed settings. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and pick-up settings. Plot the following characteristics on the TCC graphs, as applicable:
- (a) Device identification and associated settings/size
 - (b) Voltage at which curves are plotted
 - (c) Current multiplier
 - (d) ANSI frequent fault damage curve
 - (e) Single-line for the portion of the system
 - (f) Low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands
 - (g) Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands
 - (h) Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves for both bolted and single line to ground fault conditions.
 - (i) Conductor damage curves
 - (j) Ground fault protective devices, as applicable
 - (k) Pertinent motor starting characteristics and motor damage points where applicable
 - (l) Pertinent generator short-circuit decrement curve and generator damage point
 - (m) The largest feeder circuit breaker in each motor control centre and applicable panelboard
- E8.7 Provide adequate time margins between device characteristics such that selective operation is provided, while providing proper protection. Where devices are existing, settings are to be recommended to the City and presented in the report as final only when the City has agreed to make the changes. Where changes are required, they shall be clearly identified with their corresponding labels to ensure that changes are made as the labels are applied.
- E8.8 The Contractor shall prepare coordination time-current characteristic curves to determine the required settings/sizes of the protective devices to maximize selectivity. Where devices are existing, settings are to be recommended to the City and presented in the report as final only when the City has agreed to make the changes. Where changes are required, they shall be clearly identified with their corresponding labels to ensure that changes are made as the labels are applied.
- E8.9 Where applicable, the 66 kV incoming protective devices shall be the most upstream device analyzed in a coordination study. Manitoba Hydro 66 kV feeder relay protection Time Current Curves will be required to be coordinated with Manitoba Hydro. A Manitoba Hydro contact will be provided to the Contractor by the City.
- E8.10 The time current curves for all protective devices shall be created through SKM Systems Analysis Software, but must match the most recent version of the manufacturer's product data for the actual protective devices to be installed.
- E8.11 Time-current curves shall be generated to depict coordination. In addition, protective device characteristics shall be suitably determined to suit calculated short-circuit levels at the location.
- E8.12 A narrative analysis shall accompany each coordination curve sheet and describe the coordination and protection in explicit detail. All curve sheets shall be multi-colored and multi-line type for improved clarity. Areas lacking complete coordination shall be highlighted, where the Contractor shall provide reasons for allowing the condition to remain as is or provide solutions to resolve the situation.

E9. ARC FLASH HAZARD ANALYSIS

- E9.1 The Contractor shall perform an Arc Flash Hazard Analysis based on the guidelines outlined in this section.
- E9.2 The Arc Flash Hazard Analysis shall be in line with the CSA Z462 Arc Flash Risk Assessment (Section 4.3.5)
- (a) Note that Item 4.3.5.1(a) (i) – Appropriate safety-related work practices is outside the scope of the Work and will be undertaken by the City for their own internal work practices.
 - (b) Note that the determination of the required PPE shall be strictly to meet the needs of Z462 incident energy analysis method. (4.3.5.4.2)
- E9.3 The arc flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in metric units using CSA Z462-15: Workplace Electrical Safety –Annex D
- E9.4 The flash protection boundary and the incident energy shall be calculated at all significant locations in the electrical distribution system as outlined in CSA Z462 where work could be performed on energized parts.
- E9.5 Safe working distances shall be based upon the calculated arc flash boundary as per CSA Z462. Safe working distances shall be determined for both the circumstance of the conductors exposed and the circumstance of covers closed and fully latched and bolted.
- E9.6 The short-circuit calculations and the clearing times of the phase overcurrent devices will be determined from the City's provided drawings and information, and equipment model numbers verified by the Contractor on-site.
- E9.7 The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios shall be compared and the greatest incident energy shall be uniquely reported for each equipment location.
- E9.8 All emergency and normal operating scenarios are to be analyzed. The NEWPCC has significant redundancies built into its distribution system to allow for treatment process continuity. There are many double-ended load centres with tie breakers throughout the system which normally operate with tie breakers open. Under emergency operating conditions these tie-breakers and switches can operate with the tie closed and main open. Furthermore double ended load centres are also cascaded adding further operating scenarios to be analyzed.
- E9.9 Calculations shall be performed to represent the maximum and minimum contributions of fault current magnitude for all normal and emergency operating conditions. The minimum calculation will assume that the system contribution is at a minimum and a minimum motor contribution (all motors off). Conversely, the maximum calculation will assume a maximum contribution from the system and will assume the maximum amount of motors to be operating.
- E9.10 Motor Contribution to faults shall be accounted for as follows:
- (a) All Medium voltage motors shall be individually modelled
 - (b) All 600V motors equal to or greater than 50 HP shall be modelled
 - (c) All smaller motors shall be lumped into groups feeding their nearest Panel, MCC or distribution switchgear.
- E9.11 The Contractor shall arrange to obtain the following information from Manitoba Hydro where applicable:
- (a) the minimum and maximum present and horizon fault levels for both three phase and single-line-to-ground faults for each facility to be studied. Where horizon levels are not available, infinite bus shall be assumed upstream of the transformer.
 - (b) Manitoba Hydro contact information and authorization shall be provided by the City.

- E9.12 Calculations shall take into consideration the operation of any standby or co-generation generator, where applicable.
- E9.13 The Contractor shall perform additional contingency analyses at the discretion of the City.
- E9.14 The incident energy calculations shall consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators should be decremented as follows:
- (a) Fault contribution from induction motors should not be considered beyond 3-5 cycles
 - (b) If applicable, fault contribution from synchronous motors should be decayed to match the actual decrement of each as closely as possible (e.g. contributions from permanent magnet generators will typically decay from 10 per unit to 3 per unit after 10 cycles).
- E9.15 For each equipment location with a separately enclosed main device (where there is adequate separation between the line side terminals of the main protective device and the work location), calculations for incident energy and flash protection boundary shall include both the line and load side of the main breaker.
- E9.16 When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions shall be included in the fault calculation
- E9.17 The calculations at tie-breakers or other locations where two sources may contribute to an arcing fault at a common piece of equipment or switchgear cell, the arc flash energy shall be calculated based on combined contributions from both sources, regardless of the normal operating state of the device.
- E9.18 Mis-coordination should be checked amongst all devices. The calculation shall utilize the fastest device to compute the incident energy for the corresponding location.
- E9.19 The Contractor shall review existing protection settings/devices for proper coordination. The Contractor shall recommend mitigation measures to reduce the arc flash hazard as appropriate. These recommendations may include but are not limited to either equipment protection and/or improving arc flash incident energy levels by adjusting existing protection settings/devices. The corresponding incident energy levels shall be provided where improvements can be made.
- E9.20 Arc flash calculations shall be based on actual overcurrent protective device clearing time. Maximum clearing time will be capped at 2 seconds based on IEEE 1584 section B.1.2. Where it is not physically possible to move outside of the arc flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

E10. SUBMITTALS

- E10.1 At the completion of the Work as described herein, the Contractor shall submit a draft final report for review by the City. Upon City review and acceptance, the Contractor shall prepare and submit three (3) color copies of the final report. Along with hard-bound copies, the Contractor shall provide native files (Including SKM model files) and PDF files on three (3) CDs or DVDs.
- E10.2 The final report shall include the following sections:
- (a) Executive summary, which shall include a summary of any coordination issues or points of concern requiring immediate attention.
 - (b) Descriptions, purpose, basis and scope of the study.
 - (c) Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short-circuit duties.
 - (d) Protective device time versus current curves, tabulations of relay and circuit breaker trip unit settings, fuse selection.

- (e) A brief explanatory key to any curves or graphs should be provided to aid with interpretation.
- (f) Fault current calculations including a definition of terms and guide for interpretation of the computer printout.
- (g) Details of the incident energy and flash protection boundary calculations for each scenario analyzed.
- (h) Recommendations for system improvements/hazard mitigation or reduction (ie.: protection settings/devices adjustments, replacement of underrated equipment, etc.), grouped by level of effort required.
- (i) Arc Flash Hazard results table summary, which shall include:
 - (i) Location & equipment designation
 - (ii) Nominal voltage
 - (iii) Flash protection boundary
 - (iv) Incident energy
 - (v) Working distance
 - (vi) Required PPE for each hazard risk category
- (j) Single-line diagram, which shall include:
 - (i) Transformer rating, voltage ratio, impedance, and winding connection.
 - (ii) Feeder cable phase, neutral and ground sizes, length of cable, conductor material, and conduit size and type where applicable.
 - (iii) Switchgear, switchboards, panel boards, MCC's, fuses, circuit breakers, ATS's and switches continuous ratings.
 - (iv) Protective relays with appropriate device numbers, CT's and PT's with associated ratios.
- (k) Detailed legend indicating device type identification and other significant details
- (l) A list of missing or unverified equipment information and a list of assumptions.

E10.3 The Contractor shall provide five (5) data CDs with an electronic copy of the final Report and all software files generated during the performance of the Work.

E10.4 The Contractor shall provide the City with a copy of the final SKM Systems Analysis model generated for each Assignment. This update will include all work performed to date by the Contractor for each facility.

E10.5 All final reports and drawings shall be stamped and sealed by an electrical engineer registered and in good standing with the Association of Professional Engineers and Geoscientists of Manitoba (APEGM).

E11. LABELLING EQUIPMENT

E11.1 The Contractor shall make and install detailed electrical hazard warning labels on all electrical equipment covered by the Arc Flash Hazard Analysis study.

E11.2 Type and style of label shall be submitted to and approved by the City prior to generating final labels.

E11.3 Where the Arc Flash Hazard Analysis study makes recommendations to reduce the arc flash hazard, and accepting the recommendation would change the labelling, the Contractor shall coordinate with the City which label should be applied.

E11.4 Detailed electrical hazard warning shall be compliant with part Q.4 of Annex Q of standard Z462-15 and produced and installed per ANSI Z535.4.

E12. ESTIMATE REQUIREMENTS FOR EACH ASSIGNMENT

E12.1 Cost Estimate

- (a) As specific assignments in Phase 2 will be identified by the City, their Scope of Work will be released to the Contractor for response with a proposal and pricing. The Contractor shall provide the City with an estimated cost to complete the Work as described therein and a firm maximum upper limit. Cost estimates shall be based on the hourly rates submitted with this proposal.

E12.2 Schedule

- (a) The required dates the City requires the Work to be completed will be identified under each Assignment. If the Contractor is unable to complete the Work by this date, they shall propose an alternative schedule.
- (b) For each Assignment, the Contractor shall provide the City with an estimated schedule for the completion of the Work as described herein. The schedule shall include a work breakdown structure in accordance with the required deliverables

APPENDICES

APPENDIX A - APPLICABLE DRAWINGS

The following drawings are for reference and are provided as an appendix to provide a basis for the Fixed Price for Phase 1 and for the indicative Price for Phase 2. While the drawings provided are applicable to the Work, the Contractor is responsible to allocate sufficient resources for complete studies as defined in this Section:

Drawings for Phase 1 Reference – NEWPCC

Drawing Number	NEWPCC Location	Drawing Title
1-0101A-E0003-001 Rev03	Switching Diagram	4160KV- Electrical Distribution
1-0101A-E0004-001 Rev01	Switching Diagram	Electrical SLD Legends and Details
1-0101D-E0007-001 Rev01	Digesters	East Electrical Distribution Room-single line diagram
1-0101G-E0003-001 Rev07	Pre-Aeration & Grit Building	4160KV-Electrical Distribution -single Line diagram
1-0101S-E0001-001 Rev03	Secondary Clarifiers / Blower	Electrical Dist. Room-single line diagram
1-0101U-E0001-010 Rev06	UV Disinfection-Secondary Effluent	Electrical- single line diagram
1-0101U-E0013-001 Rev01	UV Disinfection	4160 KV Electrical Distribution -single line diagram
1-0101D-E0008-001 Rev01	Digesters	West Electrical Room Distribution-single line diagram
1-0101M-E0014-001 Rev04	Main Building	Single line diagram
1-0101P-E0001-001 Rev01	Primary Clarifiers	Electrical Distribution-single line diagram
1-0101R-E0001-001 Rev01	Reactors	Electrical Distribution-single line diagram
1-0101S-E0002-001 Rev01	Secondary Clarifiers	LV Electrical Distribution-single line diagram
1-0101W-E0005-001 Rev01	Dewatering	Electrical Distribution-single line diagram
1-0101S-E0003-001 Rev01	Secondary Clarifiers-Fan House	Electrical Distribution-single line diagram
1-0101B-E0001-001 Rev00	Boilers	Electrical Distribution-single line diagram

Drawings for Phase 2 Reference – Indicative Price

Drawing Number	Drawing Title
1-0116F-E001-001	Single Line Diagram – Aubrey Flood Pumping Station Sheet 1
1-0116F-E001-002	Single Line Diagram – Aubrey Flood Pumping Station Sheet 2