Appendix D

Transformers

THE CITY OF WINNIPEG

TENDER

TENDER NO. 929-2024

SUPPLY OF TRANSFORMERS

TABLE OF CONTENTS

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Supply of Transformers

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, December 3, 2024.

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

B3. ENQUIRIES

B3.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

B3.2 If the Bidder finds errors, discrepancies or omissions in the Tender, 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.

B3.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Tender will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B3.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Tender will be provided by the Contract Administrator only to the Bidder who made the enquiry.

B3.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

B3.6 Any enquiries concerning submitting through MERX should be addressed to:
MERX Customer Support
Phone: 1-800-964-6379
Email: merx@merx.com

B4. CONFIDENTIALITY

B4.1 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.

B4.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Tender to the media or any member of the public without the prior written authorization of the Contract Administrator.

B5. ADDENDA

B5.1 The Contract Administrator may, at any time prior to the Submission deadline, issue addenda correcting errors, discrepancies or omissions in the Tender, or clarifying the meaning or intent of any provision therein.

B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.

B5.3 Addenda will be available on the MERX website at www.merx.com.

B5.4 The Bidder is responsible for ensuring that they have received all addenda and is advised to check the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B5.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid/Proposal. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B5.6 Notwithstanding B3, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D4.

B6. SUBSTITUTES

B6.1 The Work is based on the materials, equipment, methods and products specified in the Tender.

B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.

B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:

(a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the material, equipment, method or product as either an approved equal or alternative;

(b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;

(c) identify any anticipated cost or time savings that may be associated with the substitute;

(d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract;

(e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract.

B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in their sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.

B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.

B6.6.1 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 they wish to inform.

B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base their 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 B16.

B6.9 No later claim by the Contractor for an addition to the price(s) because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID SUBMISSION

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

(a) Form A: Bid/Proposal;

(b) Form B: Prices;

B7.2 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.

B7.3 The Bid shall be submitted electronically through MERX at www.merx.com.

B7.3.1 Bids will **only** be accepted electronically through MERX.

B7.4 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B16.1(a).

B8. BID

B8.1 The Bidder shall complete Form A: Bid/Proposal, making all required entries.

B8.2 Paragraph 2 of Form A: Bid/Proposal shall be completed in accordance with the following requirements:

(a) if the Bidder is a sole proprietor carrying on business in their own name, their 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 their own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Bid/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 13 of Form A: Bid/Proposal shall be signed in accordance with the following requirements:

(a) if the Bidder is a sole proprietor carrying on business in their 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 their duly authorized officer or officers;

(d) if the Bidder is carrying on business under a name other than their own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid/Proposal should be entered below such signatures.

B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

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

B9.1.1 Prices on Form B: Prices shall include:

(a) duty;

(b) freight and cartage;

(c) Provincial and Federal taxes [except the Goods and Services Tax (GST) which shall be extra where applicable] and all charges governmental or otherwise paid; and

(d) profit and all compensation which shall be due to the Contractor for the Work and all risks and contingencies connected therewith.

B9.1.2 Prices on Form B: Prices shall not include Environmental Handling Charges (EHC) or fees, which shall be extra where applicable.

B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B9.4 The Bidder shall enter the Total Bid Price from Form B: Prices into the Total Bid Price field in MERX.

B9.5 Bidders are advised that the calculation indicated in B16.4 will prevail over the Total Bid Price entered in MERX.

B10. DISCLOSURE

B10.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B10.2 The Persons are:

(a) N/A

B11. CONFLICT OF INTEREST AND GOOD FAITH

B11.1 Further to C3.2, Bidders, by responding to this Tender, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B11.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:

(a) other commitments;

(b) relationships;

(c) financial interests; or

(d) involvement in ongoing litigation;

that could or would be seen to:

(i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or

(ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;

(e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of their participation in the Tender process or the Work; or

(f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

B11.3 In connection with their Bid, each entity identified in B11.2 shall:

(a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;

(b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and

(c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B11.4 Without limiting B11.3, the City may, in their sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in their sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in their sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

B11.5 Without limiting B11.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in their sole discretion:

(a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of their employees proposed for the Work;

(b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in their sole discretion, determines cannot be avoided or mitigated;

(c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B11.4 to avoid or mitigate a Conflict of Interest; and

(d) disqualify a Bidder if the Bidder, or one of their employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

B11.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in their sole discretion.

B12. QUALIFICATION

B12.1 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;

(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.

B12.2 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, Purchasing Division website at https://www.winnipeg.ca/matmgt/Templates/files/debar.pdf

B12.3 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;

(c) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba); and

(d) have completed the Accessible Customer Service online training required by the Accessibility for Manitobans Act (AMA) (see B12.4 and D5).

B12.4 Further to B12.3(d), the Bidder acknowledges they and all Subcontractors have obtained training required by the Accessibility for Manitobans Act (AMA) available at Accessibility Training for anyone that may have any interaction with the public on behalf of the City of Winnipeg.

B12.5 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.

B12.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B13. OPENING OF BIDS AND RELEASE OF INFORMATION

B13.1 Bids will not be opened publicly.

B13.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated and pending review and verification of conformance with requirements) will be available on the MERX website at www.merx.com.

B13.3 After award of Contract, the name(s) of the successful Bidder(s) and their Contract amount(s) will be available on the MERX website at www.merx.com.

B13.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

B13.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to

Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

B14. IRREVOCABLE BID

B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B14.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly formed and the contract securities have been furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B15. WITHDRAWAL OF BIDS

B15.1 A Bidder may withdraw their Bid without penalty at any time prior to the Submission Deadline.

B16. EVALUATION OF BIDS

B16.1 Award of the Contract shall be based on the following bid evaluation criteria:

(a) compliance by the Bidder with the requirements of the Tender, or acceptable deviation therefrom (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to B6;

B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.

B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in their Bid or in other information required to be submitted, that they are qualified.

B16.4 Further to B16.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B16.4.1 Further to B16.1(a), in the event that a unit price is not provided on Form B: Prices, the City may determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B16.4.2 Bidders are advised that the calculation indicated in B16.4 will prevail over the Total Bid Price entered in MERX.

B16.5 This Contract will be awarded as a whole.

B17. AWARD OF CONTRACT

B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B17.2 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 qualified, and the Bids are determined to be responsive.

B17.2.1 Without limiting the generality of B17.2, 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 their own forces;

(d) only one Bid is received; or

(e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B17.3 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.

B17.4 Further to Paragraph 7 of Form A: Bid/Proposal and C4, the City may issue an award letter to the successful Bidder.

B17.4.1 Following issuance of the Award Letter a document package comprising the Contract Documents will be provided to the successful Bidder electronically.

B17.5 Following the award of contract, a Bidder will be provided with information related to the evaluation of their Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

C0.1 The *General Conditions for the Supply of Goods* (Revision 2020-01-31) are applicable to the Work of the Contract.

C0.1.1 The *General Conditions for the Supply of Goods* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Purchasing Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm

C0.2 A reference in the Tender to a section, clause or subclause with the prefix "**C**" designates a section, clause or subclause in the *General Conditions for Supply of Goods*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of supply of two (2) 1MVA, 4160V / 347-600V and two (2) 1MVA, 4160V / 277-480V transformers.

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

(a) Supply of two (2) 4160V / 347-600V and two (2) 4160V / 277-480V transformers, complete with all appurtenances;

(b) Installation assistance, start-up, testing and operations and maintenance (O&M) manuals and complete with shop drawings; and

(c) Training, spare parts and special tools required for maintenance.

D3. DEFINITIONS

D3.1 When used in this Tender:

(a) ” **Supply Chain Disruption** ” means an inability by the Contractor to obtain goods or services from third parties necessary to perform the Work of the Contract within the schedule specified therein, despite the Contractor making all reasonable commercial efforts to procure same. Contractors are advised that increased costs do not, in and of themselves, amount to a Supply Chain Disruption.

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is AECOM Canada Ltd., represented by:

Saro Boghosian, P.Eng.
Senior Electrical Engineer

Telephone No.: +1 431 294 3473
Email Address: Saro.Boghosian@aecom.com

D5. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

D5.1 The Accessibility for Manitobans Act (AMA) imposes obligations on The City of Winnipeg to provide accessible customer service to all persons in accordance with the Customer Service Standard Regulation (“CSSR”) to ensure inclusive access and participation for all people who live, work or visit Winnipeg regardless of their abilities.

D5.1.1 The Contractor agrees to comply with the accessible customer service obligations under the CSSR and further agrees that when providing the Goods or Services or otherwise acting on the City of Winnipeg’s behalf, shall comply with all obligations under the AMA applicable to public sector bodies.

D5.1.2 The accessible customer service obligations include, but are not limited to:

(a) providing barrier-free access to goods and services;

(b) providing reasonable accommodations;

(c) reasonably accommodating assistive devices, support persons, and support animals;

(d) providing accessibility features e.g., ramps, wide aisles, accessible washrooms, power doors and elevators;

(e) inform the public when accessibility features are not available;

(f) providing a mechanism or process for receiving and responding to public feedback on the accessibility of all goods and services; and

(g) providing adequate training of staff and documentation of same.

D6. UNFAIR LABOUR PRACTICES

D6.1 Further to C3.2, the Contractor declares that in bidding for the Work and in entering into this Contract, the Contractor and any proposed Subcontractor(s) conduct their respective business in accordance with established international codes embodied in United Nations Universal Declaration of Human Rights (UDHR) https://www.un.org/en/about-us/universal-declaration-of-human-rights International Labour Organization (ILO) https://www.ilo.org/global/lang--en/index.htm conventions as ratified by Canada.

D6.2 The City of Winnipeg is committed and requires its Contractors and their Subcontractors, to be committed to upholding and promoting international human and labour rights, including fundamental principles and rights at work covered by ILO eight (8) fundamental conventions and the United Nations Universal Declaration of Human Rights which includes child and forced labour.

D6.3 Upon request from the Contract Administrator, the Contractor shall provide disclosure of the sources (by company and country) of the raw materials used in the Work and a description of the manufacturing environment or processes (labour unions, minimum wages, safety, etc.)

D6.4 Failure to provide the evidence required under D6.3, may be determined to be an event of default in accordance with C16.

D6.5 In the event that the City, in its sole discretion, determines the Contractor to have violated the requirements of this section, it will be considered a fundamental breach of the Contract and the Contractor shall pay to the City a sum specified by the Contract Administrator in writing ("Unfair Labour Practice Penalty"). Such a violation shall also be considered an Event of Default, and shall entitle the City to pursue all other remedies it is entitled to in connection with same pursuant to the Contract.

D6.5.1 The Unfair Labour Practice Penalty shall be such a sum as determined appropriate by the City, having due regard to the gravity of the Contractor's violation of the above requirements, any cost of obtaining replacement goods/ services or rectification of the breach, and the impact upon the City's reputation in the eyes of the public as a result of same.

D6.5.2 The Contractor shall pay the Unfair Labour Practice Penalty to the City within thirty (30) Calendar Days of receiving a demand for same in accordance with D6.5. The City may also hold back the amount of the Unfair Labour Practice Penalty from payment for any amount it owes the Contractor.

D6.5.3 The obligations and rights conveyed by this clause survive the expiry or termination of this Contract, and may be exercised by the City following the performance of the Work, should the City determine, that a violation by the Contractor of the above clauses has occurred following same. In no instance shall the Unfair Labour Practice Penalty exceed the total of twice the Contract value.

SUBMISSIONS

D7. AUTHORITY TO CARRY ON BUSINESS

D7.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly

registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D8. INSURANCE

D8.1 The Contractor shall provide and maintain the following insurance coverage:

(a) commercial general liability insurance, in the amount of at least five million dollars ($5,000,000.00) inclusive, with The City of Winnipeg, Manitoba its ministers, officers, employees and agents to be added as an additional insured; such liability policy to also contain a cross-liability clause, contractual liability clause, non-owned automobile liability and products and completed operations cover, to remain in place at all times during the performance of the Work.

(b) 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 Work. The Limit of Liability shall not be less than $5,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.

(c) Motor truck cargo insurance (trip transit) in the full replacement value of the equipment. Insurance to include coverage for loading and unloading.

D8.2 Deductibles shall be borne by the Contractor.

D8.3 All policies shall be taken out with insurers licensed to carry on business in the Province of Manitoba.

D8.4 The Contractor shall provide the Contract Administrator with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4 for the return of the executed Contract Documents, as applicable.

D8.5 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.

D8.6 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.

D9. SAFETY DATA SHEETS

D9.1 The Contractor shall provide the Contract Administrator with one (1) copy of Safety Data Sheets (SDS's) for each product to be supplied under the Contract at least two (2) Business Days prior to the commencement of Work but in no event later than the date specified in C4 for the return of the executed Contract.

D9.2 Throughout the term of the Contract, the Contractor shall provide the Contract Administrator with revisions or updates of the SDS's as soon as may be reasonably possible.

SCHEDULE OF WORK

D10. COMMENCEMENT

D10.1 The Contractor shall not commence any Work until they are in receipt of a notice of award from the City authorizing the commencement of the Work.

D10.2 The Contractor shall not commence any Work until:

(a) the Contract Administrator has confirmed receipt and approval of:

(i) evidence of authority to carry on business specified in D7;

(ii) evidence of the workers compensation coverage specified in C6.17;
(iii) evidence of the insurance specified in D8;
(iv) the Safety Data Sheets specified in D9; and
(v) the direct deposit application form specified in D17

(b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.

D11. DELIVERY

D11.1 Goods shall be delivered no later than November 1, 2025, f.o.b. destination, freight prepaid to:

(a) Winnipeg, Manitoba, Canada (Location to be determined by Installation Contractor).

D11.2 The Contractor shall confirm each delivery with the Contract Administrator or their designate, at least two (2) Business Days before delivery.

D11.3 Goods shall be delivered between 8:30 a.m. and 4:30 p.m. on Business Days.

D11.4 The Contractor shall off-load goods as directed at the delivery location. The Installation Contractor will be responsible for storage.

D12. LIQUIDATED DAMAGES

D12.1 If the Contractor fails to achieve delivery of the goods within the time specified in D11.1 the Contractor shall pay the City three thousand dollars ($3000) per Calendar Day for each and every Calendar Day until the goods have been delivered.

D12.2 The amount specified for liquidated damages in D12.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Delivery by the day fixed herein for same.

D12.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D13. SUPPLY CHAIN DISRUPTION SCHEDULE DELAYS

D13.1 The City acknowledges that the schedule for this Contract may be impacted by Supply Chain Disruption. Commencement and progress of the Work shall be performed by the Contractor with due consideration to the delivery requirements and schedule identified in the Contract, in close consultation with the Contract Administrator.

D13.2 If the Contractor is delayed in the performance of the Work by reason of Supply Chain Disruption, the Work schedule may be adjusted by a period of time equal to the time lost due to such delay and costs related to such delay will be determined as identified herein.

D13.3 A minimum of seven (7) Calendar Days prior to the commencement of Work, the Contractor shall declare whether a Supply Chain Disruption will affect the start date. The Contractor shall provide sufficient evidence that the delay is directly related to a Supply Chain Disruption, including but not limited to evidence related to ordering of material or goods, production and/or manufacturing schedules or availability of staff as appropriate.

D13.4 For any delay related to Supply Chain Disruption and identified after Work has commenced, the Contractor shall within seven (7) Calendar Days of becoming aware of the anticipated delay declare the additional delay and shall provide sufficient evidence as indicated in D13.3. Failure to provide this notice will result in no additional time delays being considered by the City.

D13.5 The Work schedule, including the durations identified in D11 where applicable, will be adjusted to reflect delays accepted by the Contract Administrator.

D13.6 Any time or cost implications as a result of Supply Chain Disruption and in accordance with the above, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

D14. ORDERS

D14.1 The Contractor shall provide a local Winnipeg telephone number or a toll-free telephone number at which orders for delivery may be placed.

D15. RECORDS

D15.1 The Contractor shall keep detailed records of the goods supplied under the Contract.

D15.2 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) delivery date(s); and

(d) description and quantity of goods supplied.

D15.3 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.

MEASUREMENT AND PAYMENT

D16. INVOICES

D16.1 Further to C10, the Contractor shall submit an invoice for each order delivered 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
Send Invoices to CityWpgAP-INVOICES@winnipeg.ca
Send Invoice Inquiries to CityWpgAP-INQUIRIES@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 goods delivered;

(e) the amount payable with GST, MRST, and any applicable environmental handling charges/fees identified and shown as separate amounts; and

(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.

D17. PAYMENT

D17.1 Further to C10, the City shall make payments to the Contractor by direct deposit to the Contractor’s banking institution, and by no other means. Payments will not be made until the Contractor has made satisfactory direct deposit arrangements with the City. Direct deposit application forms are at https://legacy.winnipeg.ca/finance/files/Direct_Deposit_Form.pdf.

D18. PAYMENT SCHEDULE

D18.1 Further to C10, payment shall be in accordance with the following payment schedule:

(a) ten percent (10%) of the Contract Amount shall be paid upon approval of shop drawings;

(b) fifty percent (50%) of the Contract Amount shall be paid upon issuance of the Certificate of Equipment Delivery (Form 100);

(c) ten percent (10%) of the Contract Amount will be paid upon the issuance of the Equipment Satisfactory Operating Test (Form 103) for each transformer under the scope of this supply for a total of forty percent (40%).

D18.1 Further to C10, payment shall be in Canadian funds net thirty (30) Calendar Days after receipt and approval of the Contractor's invoice.

WARRANTY

D19. WARRANTY

D19.1 Notwithstanding C11, the warranty period shall begin on the date the equipment is placed in operation or six (6) months after delivery to Site, whichever is earlier, and shall expire three (3) years thereafter unless extended pursuant to C11.3, in which case it shall expire when provided for thereunder.

D19.2 Further to C11, if a defect or deficiency prevents the full and normal use or operation of the Work or any portion thereof, for purposes of calculating the warranty period, time shall be deemed to cease to elapse for the defective or deficient portion, and for any portion of the Work whose use or operation is prevented by such defect or deficiency, as of the date on which the defect or deficiency is observed or the use or operation is prevented and shall begin to run again when the defect or deficiency has been corrected or the Work may be used or operated to the satisfaction of the Contract Administrator.

DISPUTE RESOLUTION

D20. DISPUTE RESOLUTION

D20.1 If the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator, the Contractor shall act in accordance with the Contract Administrator’s opinion, determination, or decision unless and until same is modified by the process followed by the parties pursuant to D20.

D20.2 The entire text of C19.4 is deleted, and amended to read: “Intentionally Deleted”

D20.3 The entire text of C19.5 is deleted, and amended to read:

(a) If Legal Services has determined that the Disputed Matter may proceed in the Appeal Process, the Contractor must, within ten (10) Business Days of the date of the Legal Services Response Letter, submit their written Appeal Form, in the manner and format set out on the City’s Purchasing Division Website, to the Chief Administrative Officer, and to the Contract Administrator. The Contractor may not raise any other disputes other than the Disputed Matter in their Appeal Form.

D20.4 Further to C19, prior to the Contract Administrator’s issuance of a Final Determination, the following informal dispute resolution process shall be followed where the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator (“Dispute”):

(a) In the event of a Dispute, attempts shall be made by the Contract Administrator and the Contractor’s equivalent representative to resolve Disputes within the normal course of project dealings between the Contract Administrator and the Contractor’s equivalent representative.

(b) Disputes which in the reasonable opinion of the Contract Administrator or the Contractor's equivalent representative cannot be resolved within the normal course of project dealings as described above shall be referred to a without prejudice escalating negotiation process consisting of, at a minimum, the position levels as shown below and the equivalent Contractor representative levels:

(i) The Contract Administrator;

(ii) Supervisory level between the Contract Administrator and applicable Department Head;

(iii) Department Head.

D20.4.1 Names and positions of Contractor representatives equivalent to the above City position levels shall be determined by the Contractor and communicated to the City at the pre-commencement or kick off meeting.

D20.4.2 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.

D20.4.3 Both the City and the Contractor agree to make all reasonable efforts to conduct the above escalating negotiation process within twenty (20) Business Days, unless both parties agree, in writing, to extend that period of time.

D20.4.4 If the Dispute is not resolved to the City and Contractor's mutual satisfaction after discussions have occurred at the final escalated level as described above, or the time period set out in D20.4.3, as extended if applicable, has elapsed, the Contract Administrator will issue a Final Determination as defined in C1.1(v), at which point the parties will be governed by the Dispute Resolution process set out in C19.

THIRD PARTY AGREEMENTS

D21. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

D21.1 Funding for the Work of the Contract is being provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada and accordingly, as required by the applicable funding agreements, the following terms and conditions shall apply.

D21.2 For the purposes of D21:

(a) **"Government of Canada"** includes the authorized officials, auditors, and representatives of the Government of Canada; and

(b) **"Government of Manitoba"** includes the authorized officials, auditors, and representatives of the Government of Manitoba.

D21.3 Indemnification By Contractor

D21.3.1 In addition to the indemnity obligations outlined in C15 of the General Conditions for Goods, the Contractor agrees to indemnify and save harmless the Government of Canada and the Government of Manitoba and each of their respective Ministers, officers, servants, employees, and agents from and against all claims and demands, losses, costs, damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from this Contract or the Work, or from the goods or services provided or required to be provided by the Contractor, except those resulting from the negligence of any of the Government of Canada's or the Government of Manitoba's Ministers, officers, servants, employees, or agents, as the case may be.

D21.3.2 The Contractor agrees that in no event will Canada or Manitoba, their respective officers, servants, employees or agents be held liable for any damages in contract, tort (including negligence) or otherwise, for:

(a) any injury to any person, including, but not limited to, death, economic loss or infringement of rights;

(b) any damage to or loss or destruction of property of any person; or

(c) any obligation of any person, including, but not limited to, any obligation arising from a loan, capital lease or other long term obligation;

in relation to this Contract or the Work.

D21.4 Records Retention and Audits

D21.4.1 The Contractor shall maintain and preserve accurate and complete records in respect of this Contract and the Work, including all accounting records, financial documents, copies of contracts with other parties and other records relating to this Contract and the Work during the term of the Contract and for at least six (6) years after Total Performance. Those records bearing original signatures or professional seals or stamps must be preserved in paper form; other records may be retained in electronic form.

D21.4.2 In addition to the record keeping and inspection obligations outlined in C6 of the General Conditions for Goods, the Contractor shall keep available for inspection and audit at all reasonable times while this Contract is in effect and until at least six (6) years after Total Performance, all records, documents, and contracts referred to in D21.4.1 for inspection, copying and audit by the City of Winnipeg, the Government of Manitoba and/or the Government of Canada and their respective representatives and auditors, and to produce them on demand; to provide reasonable facilities for such inspections, copying and audits, to provide copies of and extracts from such records, documents, or contracts upon request by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada and their respective representatives and auditors, and to promptly provide such other information and explanations as may be reasonably requested by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada from time-to-time.

D21.5 Other Obligations

D21.5.1 The Contractor consents to the City providing a copy of the Contract Documents to the Government of Manitoba and/or the Government of Canada upon request from either entity.

D21.5.2 If the Lobbyists Registration Act (Manitoba) applies to the Contractor, the Contractor represents and warrants that it has filed a return and is registered and in full compliance with the obligations of that Act, and covenants that it will continue to comply for the duration of this Contract.

D21.5.3 The Contractor shall comply with all applicable legislation and standards, whether federal, provincial, or municipal, including (without limitation) labour, environmental, and human rights laws, in the course of providing the Work.

D21.5.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.

D21.5.5 The Contractor represents and warrants that no current or former public servant or public office holder, to whom the Value and Ethics Code for the Public Sector, the Policy on Conflict of Interest and Post Employment, or the Conflict of Interest Act applies, shall derive direct benefit from this Contract, including any employment, payments, or gifts, unless the provision or receipt of such benefits is in compliance with such codes and the legislation.

D21.5.6 The Contractor represents and warrants that no member of the House of Commons or of the Senate of Canada or of the Legislative Assembly of Manitoba is a shareholder, director or officer of the Contractor or of a Subcontractor, and that no such member is entitled to any benefits arising from this Contract or from a contract with the Contractor or a Subcontractor concerning the Work.

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 The following are applicable to the Work:

SECTION NO.	TITLE	NO. OF PAGES
	DIVISION 01	
01 11 00	Summary of Work	2
01 33 00	Submittals	12
01 61 00	Common Product Requirements	4
01 65 00	Equipment Installation	8
01 78 00	Closeout Submittals	9
01 79 00	Demonstration and Training	7
01 91 31	Commissioning Plan	10
	DIVISION 26	
26 12 13	Liquid Filled, Medium Voltage Transformers	17

DRAWING NO.	DRAWING NAME/TITLE
1-0101U-E0013-001	Single Line Diagram 4160V Electrical Distribution

E1.3 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B6. In every instance where a brand name or design specification is used, the City will also consider approved equals and/or approved alternatives in accordance with B6.

E2. GOODS

E2.1 The Contractor shall supply Item No. 1- Liquid Filled, Medium Voltage Transformers in accordance with Specification Section 26 12 13.

E3. APPROVED PRODUCTS

E3.1 Subject to E1.3, the following products are approved:

(a) Partner Technologies Incorporated (PTI).

(b) Eaton (Cooper Power Series) Substation Transformers.

(c) Or approved equal.

TABLE OF CONTENTS

END OF SECTION

SUMMARY OF WORK

1. GENERAL

1.1 Description

.1 The work in this Supply Contract comprises of the supply 480 V and 600 V transformers complete with all electrical and control appurtenances. Work also includes start-up, commissioning, training, performance testing and O&M manuals.

.2 The Work includes, but is not limited to the following elements:

.1 Supply and delivery of two (2) 4160V / 347-600V and two (2) 4160V / 277-480V transformers;

.2 Installation assistance, start-up, training, commissioning, performance testing and operations and maintenance (O&M) manuals and complete with Shop Drawings; and

.3 Spare parts and special tools required for maintenance.

.3 Equipment to be installed under a separate contract, with installation guidance from the transformers Supplier.

.4 Coordinate delivery, storage requirements, installation, training, start-up and commissioning with the Construction Contractor.

.5 All products or materials that are deemed no longer supported or the product is no longer produced at the expiration of the warranty period, shall not be acceptable and will be replaced with the subsequent product. The City shall be notified of these products prior to delivery.

1.2 Work Sequence

.1 Coordinate progress Schedule with the City and Contract Administrator during construction to minimize disruption and maintain disinfection.

.2 Proposed stages include:

.1 Award of Contract.

.2 Review and approval of Shop Drawings.

.3 Review and approval of O&M manual and training content.

.4 Delivery to Site.

.5 Installation assistance.

.6 Start-up, commissioning, and training.

1.3 Work Coordination

.1 Coordinate work with the General Contractor in regard to equipment delivery, storage, installation, start-up, commissioning and training.

1.4 City of Winnipeg Personnel Occupancy

.1 The City personnel will work around Site during the entire construction period for the execution of normal operations.

.2 Co-operate with the City personnel in scheduling operations to minimize conflict and maintain UV disinfection in the system at all times.

.3 Assist the City with operational strategies for when the City is operating the new UV system alongside the existing UV system to preserve disinfection capability.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

SUBMITTALS

1. GENERAL

1.1 Description

.1 Submit to the Contract Administrator the submittals required by individual Specification Sections for review. Submit promptly and in an orderly sequence according to the Schedule of Submittals to not cause a delay in Work. Failure to submit in the scheduled time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Provide a copy of all the Specification Sections in the Tender package with any applicable addenda with each paragraph check-marked to indicate Specification compliance or cross-marked to indicate non-compliance. Requested deviations and clarifications from the specified requirements shall be provided with the Shop Drawings.

.3 Do not proceed with Work affected by the submittal until reviewed by the Contract Administrator.

.4 Present Shop Drawings, product data, and samples in SI Metric units. Dual units are acceptable.

.1 Where items or information is not produced in SI Metric units, convert units to SI Metric.

.5 Review submittals prior to submission to the Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of Work and Contract Documents.

.6 The review by the Contract Administrator is for the sole purpose of ascertaining conformance with the general concept. It does not provide 'approval' of the detail design inherent in Shop Drawings (which remains with the Supplier), nor does it relieve the Supplier of responsibility for errors or omissions in Shop Drawings or for meeting all requirements of the construction and Contract Documents.

.7 Verify that field measurements and affected adjacent Work are coordinated.

.8 The Supplier shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of submittals. The Supplier shall direct specific attention in writing on resubmitted submittals to revisions other than the corrections requested by the Contract Administrator on the previous submission.

.9 After the Contract Administrator’s review and return of copies, distribute copies to sub-trades as appropriate.

1.2 Submittals Procedures

.1 Details regarding submittals can be found in the individual Specification Sections.

.2 Direct submittals to the Contract Administrator.

.3 Hardcopy Submittals: Submit hard copies only where specifically required under individual Specifications Sections.

.4 Electronic Submittals: Submittals made in electronic format shall be as follows:

.1 Each submittal shall be an electronic file in a searchable Adobe Acrobat Portable Document Format (PDF), and native files (e.g., Word, Excel, AutoCAD, etc.). Use the 2010 version or newer.

.2 Electronic files that contain more than ten (10) pages in PDF format shall contain internal book marking from index page to major sections of the document.

.3 PDF files shall be set to open “Bookmarks and Page” view.

.4 Add general information to each PDF file, including title, subject, author, and keywords.

.5 PDF files shall be set up to print legibly at 215.9 mm by 279.4 mm, 279.4 mm by 431.8 mm or ISO A1 (594 mm by 841 mm). No other paper sizes will be accepted.

.6 Submit new electronic files for each resubmittal.

.7 Include copy of transmittal of Supplier’s submittal.

.8 Contract Administrator will reject submittals that are not accompanied by an electronic copy.

.9 Provide authorization for Contract Administrator to reproduce and distribute each file as many times as necessary for Project documentation.

.5 Transmittal of Submittal:

.1 Stamp each submittal with a uniform approval stamp before submitting to the Contract Administrator.

.1 Stamp to include project name, submittal number, Specification number, Supplier’s reviewer name, date of Supplier’s approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract.

.2 Contract Administrator will not review submittals that do not bear Supplier’s approval stamp and will return them without action.

.3 Contract Administrator will not review submittals received directly from a Subcontractor and will return them without action.

.4 Complete, sign, and transmit with each submittal package, one (1) transmittal of Supplier’s submittal form.

.2 Identify each submittal with the following:

.1 Numbering and tracking system:

.1 Sequentially number each submittal.

.2 Resubmission of submittal shall have original number with sequential alphabetic suffix.

.2 Specification Section and paragraph to which submittal applies.

.3 Project title and City Tender number.

.4 Date of transmittal.

.5 Name of Supplier.

.3 Include Supplier's written response to each of Contract Administrator's review comments with resubmission of submittals stamped "Exceptions Noted, Resubmit".

.6 Format:

.1 Do not base Shop Drawings on reproductions of Contract Documents.

.2 Package submittal information by individual Specification Section. Do not combine different Specification Sections together in submittal package, unless otherwise directed in Specification.

.3 Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract.

.4 Index with labeled tab dividers in orderly manner.

.7 Timeliness:

.1 Schedule and submit submittals in accordance with schedule of submittals and requirements of individual Specification Sections.

.2 Submit Shop Drawings and samples a minimum of two (2) months ahead of the scheduled delivery date for associated equipment and material and in an orderly sequence so as to cause no delay in the Work.

.8 Processing Time:

.1 Time for review shall commence on Contract Administrator's receipt of submittal.

.2 Contract Administrator will act upon Supplier's submittal and transmit response to Supplier no later than ten (10) Business Days after receipt, unless otherwise specified.

.3 Supplier shall make all submittal corrections and resubmit to the Contract Administrator within ten (10) Business Days after receipt of mark-ups.

.4 Resubmittals will be subject to the same review time.

.5 The review time required will not alleviate the Supplier of his responsibility to deliver the completed Work within the required time frame and schedule. Planning for submittal reviews and the risk to the delivery schedule remains the Supplier's sole responsibility.

.9 Resubmittals:

.1 Clearly identify each correction or change made and include revision date.

.2 No adjustment of the schedule outlined in the Supplemental Conditions or Contract Price will be allowed due to delays in progress of Work caused by rejection and subsequent resubmittals.

.10 Incomplete Submittals:

.1 The Contract Administrator will return the entire submittal for the Supplier's revision if preliminary review deems it incomplete.

.2 Incomplete Shop Drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.

.3 When any of the following are missing, the submittal will be deemed incomplete:

.1 Supplier's review stamp completed and signed.

.2 Transmittal of Supplier's submittal form completed and signed.

.3 Insufficient number of copies.

.4 All requested information is not provided.

.5 Submittals missing Professional Engineer's seal and signature, where it is required.

.4 The submittal will be deemed incomplete if unusual high number of errors are identified on the submittal, making it difficult to proceed with the review.

.11 Submittals not required by Contract:

.1 Will not be reviewed and will be returned stamped "RECEIVED FOR INFORMATION".

.2 Contract Administrator will keep one (1) copy of all Shop Drawings and Product Data.

1.3 Shop Drawings and Product Data

.1 The term "Shop Drawing" as defined in the City's General Conditions for Construction (Revision 2020-01-31) means all drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor, Subcontractor, Manufacturer, Supplier, or distributor and which illustrate some portion of the Work.

.2 All equipment to be installed at the Site shall require Shop Drawings, which shall be submitted to the Contract Administrator.

.3 Sales bulletins and other general publications are not acceptable as submittals for review except where necessary to provide supplemental technical data.

.4 Adjustments made on Shop Drawings by the Contract Administrator shall not change the Contract Price.

.5 All Shop Drawings shall include details as follows:

.1 General arrangement drawings, outline dimensions and weights.

.2 Anchoring method and dimensioned foundation template.

.3 Dimensioned cable entry locations.

.4 Dimensioned cable termination and pothead height.

.5 Electrical and instrumentation diagrams.

.6 Complete bill of materials listing the scope of supply.

.7 Identified internal and external component layout on assembly drawing.

.8 Insulating liquid type and materials.

.9 Insulating liquid capacity.

.10 Provide data on pressure-relief valves, oil sampling valves (drain, tap, sample), pressure/vacuum gauge, pressure/vacuum regulation, level gauge, liquid temperature indicator, and separable connectors.

.11 Nameplate data, including equipment certification.

.6 Provide recommended spare parts and prices.

.7 Provide estimated losses at no load, 50% load and full load in either Watts per hour (preferred), or BTUs per hour.

.1 Placement and installation of all equipment shall be subject to the approval of the City.

.8 Electrical and instrumentation and control system Shop Drawings shall include additional details as follows:

.1 Elevation layouts, bill of materials (BOM), fuse charts, schematics, interconnections, point-to-point wiring diagrams, loop wiring diagrams, motor control diagrams, single line diagram, 3-line diagram, and CSA/cUL panel plates in addition to the other wiring and detail requirements of the Contract.

.1 Panel plates shall be included in submissions, to be permanently affixed on the front exterior door of the enclosure. They shall contain all information required under CSA C22.1 and C22.2. At a bare minimum the short circuit current rating (SCCR) of panel plates shall be equal to the MCC or Panelboard from which they are fed.

.2 Wiring diagrams shall mark conductor identification, field terminals, changes, etc.

.3 Detailed listing of all nameplates.

.4 Identification in accordance with the Drawings.

.5 Network architecture showing all components of the network supplied by the Supplier. Tables showing data maps for communications with Plant PLC. Tables showing data map for communications with Plant HMI. Control schematics with plant PCS interconnect details. Interconnection diagrams shall show all electrical and network connections between equipment, panel, terminal junction.

.2 Instrument Loop Diagrams (ILDs) – detailed drawings showing typical interconnections for the specified instrumentation and control devices. The Supplier is to reproduce an ILD for each device and record all relevant notes and installation-specific information on each sheet. Update the ILDs as necessary and fill in all terminal and wiring number from relevant Shop Drawings as they become available.

.1 Loop wiring diagrams shall follow ISA 5.4 for standard drawing layout, symbols, and wiring depictions.

.3 Motor Control Schematics (MCS) – when these are included, they are detailed drawings showing typical interconnections of motor control equipment. The Supplier shall reproduce a MCS for each motor and record all relevant notes and installation-specific information on each sheet. Update the MCS as necessary and fill in all terminal and wiring numbers from relevant Shop Drawings as they become available.

.4 Equipment descriptive data and detailed information for the system hardware and software (i.e., cutsheets or product literature). Failure to provide product literature or cutsheets with drawing submissions is grounds for marking the submission “Revise and Resubmit” without review.

.1 Highlight only relevant information for the products provided. The intent of the literature is a technical review of the products suitability, technical ratings and limitations, and the installation/application. Sales literature, or custom-made sheets, or sales declarations shall not be included. Only manufacturer issued technical literature shall be accepted.

.2 Where products have configurable part numbers, the part number options shall be broken down and either circled in red or highlighted in yellow.

.3 All cutsheets and product literature shall be provided showing CSA or cUL markings either circled in red or highlighted in yellow.

.4 Where hazardous location products are required, they shall be submitted with their CSA or cUL certificates, and CSA or cUL required wiring diagrams for hazardous installations. The control system wiring diagrams shall capture these requirements, provide intrinsically safe barriers and methods as required by NFPA 820, and provide notes for the electrical installer.

.9 Notify the Contract Administrator in writing of any deviations in Shop Drawings from the requirements of the Contract.

.1 Contract Administrator will not assume the responsibility for searching out deviations in the Supplier’s drawings.

.10 The Supplier shall examine all Shop Drawings prior to submission to the Contract Administrator to ensure that all necessary requirements have been determined and verified and that each Shop Drawing has been checked and coordinated with the requirements of the Work and the Contract. Examination of each Shop Drawing shall be indicated by stamp, date, and signature of a responsible person of the Subcontractor for supplied items and of the Supplier for fabricated items. Shop Drawings not stamped, signed, and dated will be returned without being reviewed and stamped " REVISE AND RESUBMIT ". Ensure that the following are verified:

.1 Field measurements.

.2 Field construction criteria.

.3 Catalogue numbers and similar data.

.11 Submittals shall be in one (1) of the following formats:

.1 Submit three (3) copies of white prints and three (3) copies of all fixture cuts and brochures.

.2 Submit one (1) electronic searchable PDF copy.

.12 Shop Drawings will be returned to the Supplier with one (1) of the following notations:

.1 When stamped "REVIEWED" or "NO EXCEPTIONS TAKEN", distribute additional copies as required for execution of the Work.

.2 When stamped "REVIEWED AS MODIFIED" or "MAKE NOTED CORRECTIONS", ensure that all copies for use are modified and distributed, same as specified for "REVIEWED".

.3 When stamped "REVISE AND RESUBMIT", make the necessary revisions, as indicated, consistent with the Contract and submit again for review.

.4 When stamped "NOT REVIEWED" or "REJECTED", submit other Shop Drawings, brochures, etc., for review consistent with the Contract.

.5 Only Shop Drawings bearing "REVIEWED", "NO EXCEPTIONS TAKEN", "MAKE NOTED CORRECTIONS", or "REVIEWED AS MODIFIED" shall be used on the Work unless otherwise authorized by the Contract Administrator.

.13 After submittals are stamped "REVIEWED", "NO EXCEPTIONS TAKEN", "MAKE NOTED CORRECTIONS" or "REVIEWED AS MODIFIED", no further revisions are permitted unless re-submitted to the Contract Administrator for further review.

.14 Make changes in Shop Drawings, which the Contract Administrator shall require, consistent with Contract. When re-submitting, notify the Contract Administrator in writing of any revisions other than those requested by the Contract Administrator.

.15 The mark-up and comments on submittals and O&M package shall be incorporated within two (2) months of receipt from the Contract Administrator regardless of the status of the returned submittal. Supplier shall submit long-term storage requirements for equipment that is received by the Construction Contractor and stored prior to installation.

.16 Supplier shall provide a list of maintenance requirements for uninstalled equipment to be performed and documented by the Construction Contractor. The list shall be submitted one (1) month prior to the delivery of the equipment.

.17 Construction Contractor shall submit records of the maintenance schedules to the Contract Administrator on a monthly basis.

1.4 Description of Construction Methods

.1 The Supplier shall, if required by the Contract Administrator, submit for the review of the Contract Administrator method statements which describe in detail, supplemented with Drawings where necessary, the methods to be adopted for executing any portion of Work.

.2 These statements shall also include details of constructional plan and labour to be employed. Acceptance by the Contract Administrator shall not relieve the Supplier of any of his responsibilities, nor shall reasonable refusal to approve entitles the Supplier to extra payment or an extension of time.

.3 Other Considerations:

.1 Fabrication, erection, installation, and commissioning may require modifications to equipment and systems to conform to the design intent. Revise pertinent Shop Drawings and resubmit.

1.5 Requests for Information

.1 In the event that the Supplier or any Subcontractor involved in the Work, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation by the Contract Administrator, the Supplier shall submit a Request for Information (RFI) Form in writing to the Contract Administrator.

.2 Submission Procedure:

.1 Submit RFI's to the Contract Administrator on the "Request for Information" form appended to this Specification Section. The Contract Administrator shall not respond to a RFI except as submitted on this form.

.2 Number RFI's consecutively in one sequence in order submitted, in a numbering system established by the Contract Administrator.

.3 Submit one (1) distinct subject per RFI request. The unrelated items shall not be combined on one (1) form.

.4 Where RFI form does not have sufficient space, attach additional sheets as required.

.5 Submit with RFI form all necessary supporting documentation.

.3 In the RFI, the Supplier shall clearly and concisely provide:

.1 The issue for which clarification or interpretation is sought and why a response is needed from the Contract Administrator; and

.2 An interpretation or understanding of the requirement along with reasons why such an understanding was reached.

.4 The Contract Administrator will review all RFIs to determine whether they are valid RFIs. If it is determined that the document is not a valid RFI, it will be returned to the Supplier not having been reviewed with an explanation why it was deemed not valid.

.5 An RFI response shall be issued within ten (10) Business Days of receipt of the request from the Supplier unless the Contract Administrator determines that a longer time is necessary to provide an adequate response. When the RFI submission is received by the Contract Administrator before noon, the review period commences on that Business Day. When the RFI submission is received by the Contract Administrator after noon, the review period commences on the subsequent Business Day.

.6 If, at any time, the Supplier submits a large number of RFI's or the Contract Administrator considers the RFI to be of such complexity that the Contract Administrator cannot process the RFI's within ten (10) Business Days, the Contract Administrator shall confer with the Supplier within five (5) Business Days of receipt of such RFI's and the Contract Administrator and the Supplier will jointly prepare an estimate of the time necessary for processing the RFI as well as an order of priority among the RFI's submitted. The Supplier shall accommodate such necessary time at no impact to the schedule and at no additional cost to the Contract.

.7 If the Supplier submits a RFI on an activity with ten (10) Business Days or less of available time to the impacted activity on the current project schedule, the Supplier shall not be entitled to any time extension due to the time it takes the Contract Administrator to respond to the request provided that the Contract Administrator responds within the ten (10) Business Days set forth above.

.8 An RFI response from the Contract Administrator will not change any requirement of the Contract. In the event the Supplier believes that the RFI response from the Contract Administrator will cause a change to the requirements of the Contract, the Supplier shall within ten (10) Business Days give written notice to the Contract Administrator stating that the Supplier believes the RFI response will result in a change to the Contract and the Supplier intends to submit a change request. Failure to give such written notice of ten (10) Business Days shall waive the Supplier's right to seek additional time or cost under the requirements of the Contract.

1.6 Closeout Submittals

.1 Refer to Section 01 78 00 - Closeout Submittals.

1.7 Miscellaneous Submittals

.1 Prepare and submit required Contract Documents.

.2 Copies: Submit one (1) electronic copy to Contract Administrator. Method of electronic submission shall be coordinated with Contract Administrator after execution of the Contract.

.1 Submit hard copies for paint samples and other submittals where specifically required under individual Specifications Sections.

.3 The Contract Administrator will review submittals for general conformance with design concept and intent, and general compliance with Contract.

.4 The Contract Administrator's review does not relieve Supplier from compliance with requirements of Contract nor from errors in submittals or Supplier's design.

.5 The Construction Contractor shall be responsible for confirmation of dimensions at Site; fabrication processes; means, methods, techniques, sequences, and procedures of

construction; coordination of work of all trades; and performance of Work in safe and satisfactory manner and in accordance with Specification Sections 01 65 00 and 01 91 31.

.6 At the Contract Administrator's option, the Contract Administrator's review comments and review stamp will be placed either directly on submitted copies of submittals or on separate submittal review comment form.

.7 Where work is to be designed by the Supplier, comply with applicable codes and furnish submittals signed and sealed by a Professional Engineer licensed in the Province of Manitoba, as required by Specifications. If requested, calculations shall be submitted for review. Calculations shall be signed and sealed by a Professional Engineer registered in the Province of Manitoba.

1.8 Supplements

.1 The supplements listed below, following "End of Section", are part of this Specification:

.1 Request for Information (RFI), RFI No.0.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

SUBMITTALS

For details and instructions on how to complete this document, click the [¶] icon under the Home tab to display the hidden text.

RFI Title: _____ **RFI No.:** 0

Date RFI initiated: _____ **Date Response Requested by:** _____

Date Response Issued: _____

Project Name: _____

Submitted To:			
Contract Administrator (CA):		Consultant Ref. No.	
Company/Dept.:		Tender No.	

Requested By:		***For CA Use***	
Name:		City File No.:	
Title:		Project ID:	
Company:		Project Record Index No.:	
Email::		Purchase Order No.:	

Request/Question: (to be completed by Contractor)

Answer/Response: (to be completed by Contract Administrator)

Attachment(s):

Distribution (to be completed by Contract Administrator)

- Contract Administrator
- Contractor
- City Project Manager
- Other:

Click here to enter text.

COMMON PRODUCT REQUIREMENTS

1. GENERAL

1.1 Standards

.1 Within text of each Specification Section, references are made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in the Specifications.

.3 If there is question as to whether products or systems are in conformance with applicable standards, the Contract Administrator reserves the right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing shall be borne by the City in event of conformance with Construction Contract Documents or by the Construction Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids.

1.2 Quality Assurance

.1 Products, materials, equipment and articles incorporated in the Work shall be new, not damaged or defective, and of the best quality for the purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of Work, shall be rejected, regardless of previous inspections. Inspection shall not relieve responsibility but is a precaution against oversight or error. Supplier shall remove and replace defective products at his own expense and shall be responsible for delays and expenses caused by rejection.

.3 Should disputes arise as to the quality or fitness of products, decision rests strictly with the Contract Administrator based upon the requirements of the Construction Contract Documents.

.4 Unless otherwise indicated in the Specifications, maintain uniformity of manufacture for any particular or like item.

.5 Permanent labels, trademarks and nameplates on products shall not be acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

.6 The Construction Contractor shall be responsible for development of a quality plan to ensure all tasks are performed to the necessary requirements and Supplier specifications. The supplier shall provide requirements to the Construction Contractor.

1.3 Availability

.1 Immediately upon the City exercising its option to purchase, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, immediately notify Contract Administrator of such, in order that

substitutions or other remedial action shall be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Contract Administrator at commencement of Work and should it subsequently appear to the Contract Administrator that Work may be delayed for such reason, Contract Administrator reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 Storage, Handling and Protection

.1 The Supplier shall provide the Construction Contractor with full instructions in writing of all preservation requirements, procedures and precautions for long-term storage and protection of the equipment. A copy of all instructions shall be provided to the Contract Administrator.

.2 The Construction Contractor shall be responsible for storage of the equipment, appurtenances, and materials and for protection against weather, loss, damage, or theft until equipment installation.

.3 The storage location shall be inspected and approved by the Contract Administrator and/or the City.

.4 The Construction Contractor shall:

.1 Handle and store products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with Supplier's instructions.

.2 Store packaged or bundled products in original and undamaged condition with Manufacturer's seal and labels intact. Items shall not be removed from packaging or bundling until provided to the Construction Contractor.

.3 Store products subject to damage from weather in above zero weatherproof enclosures.

.4 Store materials on flat, solid supports and keep clear of ground. Slope to shed moisture.

.5 Remove and replace damaged products at own expense and to the satisfaction of the Contract Administrator.

.6 Touch-up damaged factory finished surfaces to Contract Administrator’s satisfaction. Use touch-up materials to match original. Do not paint over nameplates.

.5 The Construction Contractor shall adhere to Supplier’s long-term storage and maintenance instructions.

.6 Preservation requirements and procedures as per Supplier’s recommendation shall be followed and documented by the Construction Contractor. Construction Contractor shall keep records of the maintenance schedules (lubrication, coatings, etc.) frequently and submit the records to the Contract Administrator on a monthly basis.

1.5 Transportation

.1 Pay costs of transportation of products required in performance of Work. Goods shall be delivered freight on board, all duties and taxes paid, to Winnipeg, MB.

.2 The Construction Contractor shall be responsible for receiving, off-loading, and placing into storage all equipment at the Site.

1.6 Supplier's Instructions

.1 Unless otherwise indicated in the Specifications, the Construction Contractor shall install or erect products in accordance with the Supplier's instructions.

1.7 Quality of Work

.1 Ensure Quality of Work is of the highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify the Contract Administrator if required Work is such as to make it impractical to produce required results.

.2 The Supplier and Contractor shall not employ anyone unskilled in their required duties for Work. The Contract Administrator reserves the right to require dismissal from Site for workers deemed incompetent or careless.

.3 Decisions as to the standard or fitness of Quality of Work in cases of dispute rest solely with the Contract Administrator, whose decision is final.

1.8 Location of Fixtures

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform the Contract Administrator of conflicting installation. Install as directed.

1.9 Fastenings

.1 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wooden, or any other organic material, plugs are not acceptable.

.2 Keep exposed fastenings to a minimum, space evenly and install neatly.

.3 Fastenings which cause spalling or cracking of material to which anchorage is made shall not acceptable.

.4 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.5 Use heavy hexagon heads, semi-finished unless otherwise specified. Use 304 stainless steel unless specified otherwise.

.6 Bolts may not project more than one diameter beyond nuts.

.7 Prevent electrolytic action between dissimilar metals and materials.

.8 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

EQUIPMENT INSTALLATION

1. GENERAL

1.1 Description

.1 This Section describes requirements for all equipment supplied under this Contract relating to factory inspections, equipment delivery, equipment installation training, equipment installation, commissioning, equipment performance testing, and process performance tests.

.2 At least thirty (30) days prior to commencing equipment operation and the Running Test, the Supplier shall assist the Construction Contractor to prepare and submit a detailed start-up plan to indicate the schedule and sequence of equipment installation checks and tests required for the Contract Administrator's review and inputs. No testing Work shall commence until this plan has been discussed and reviewed by all parties involved and accepted by the Contract Administrator.

1.2 Definitions

.1 Supplier's Representative: A Supplier's Representative is a trained person empowered by the Supplier to provide:

.1 Witnessing of delivery.

.2 Installation instruction.

.3 Assistance in pre-start up checks and testing.

.4 Training to the City's staff.

1.3 Expertise and Responsibility

.1 The Contract Administrator recognizes the expertise of the Supplier.

.2 Should the Contract Administrator issue an Addendum, Field Order, Change Order, or Instruction to change the Work which would, in the opinion of the Supplier, compromise the success or safety of the Work, then it shall be incumbent on the Supplier to notify in writing the Contract Administrator to this effect within two (2) days.

1.4 Inspection at Factory

.1 The City or the Contract Administrator may, before or after selection of equipment has been made, inspect or have an authorized representative inspect the manufacturing, assembling, and testing facilities at the Supplier's or Subcontractor equipment factory, to satisfy themselves of the capability of the Supplier or Subcontractor equipment to supply the specified equipment.

.2 The City and/or the Contract Administrator may inspect or have an authorized inspector inspect the equipment factory or the process of manufacture or testing of the equipment at the Supplier's or Subcontractor equipment factory at any reasonable time. The City and/or the Contract Administrator or the inspector may notify the Supplier or Subcontractor at any time of unsatisfactory materials, workmanship, or processes.

.3 The Supplier shall provide every reasonable facility, access, and cooperation to assist the City and the Contract Administrator or an authorized inspector in carrying out inspection or testing at the equipment factory or facility.

.4 Inspection or testing carried out by the City or the Contract Administrator or an authorized inspector shall not relieve the Supplier of the responsibility for supplying equipment in accordance with the Contract and good engineering practice.

1.5 Equipment Delivery

.1 Delivery shall be coordinated with and made to the Construction Contractor. Written acceptance of receipt, at delivery, by the Construction Contractor shall constitute "Delivery to Site" under this Contract. The shipping lists of materials shall be carefully checked by the Supplier's Representative in the presence of the Contract Administrator and the Construction Contractor. When the Construction Contractor accepts the equipment delivery, they shall certify the delivery by completing Form 100 – Certificate of Equipment Delivery, attached to this Specification.

.2 The Supplier shall provide a schedule within fifteen (15) calendar days after notification of acceptance of Shop Drawings. No delivery to the Site of the Work shall occur until Reviewed Shop Drawings are received by the Supplier.

.3 The schedule shall allow for:

.1 Two (2) weeks for the Contract Administrator to review and comment on the Supplier's Shop Drawings for the equipment to be supplied. Additional time for Shop Drawings corrections and resubmittals shall be accommodated in the schedule.

.4 The Supplier shall be entitled to an extension of the quoted delivery period on account of:

.1 Delay attributable to Acts of God or other matters, which were not the fault of the Supplier and over which it had no control, provided that the Supplier took all possible action to reduce delays and notified the City promptly of the occurrence of such delays.

.5 Ten (10) days before delivery, notice shall be given to the Contract Administrator so that arrangements for receipt and for inspection can be made. The shipping lists of materials shall be carefully checked by the Supplier in the presence of the Contract Administrator and the Construction Contractor.

.6 The Supplier shall clearly mark each item to be shipped and identify and reference it to the packing lists and to bills of materials on the Shop Drawings. The lists will be used by the Supplier, the Construction Contractor, and the Contract Administrator to check the contents of each delivery. No shipments shall be off-loaded until itemized packing lists have been received by the parties mentioned herein.

.7 The Supplier shall adequately pack and crate each component to provide protection during transport, handling, and storage. Equipment suitable for outside storage will be stored to the satisfaction of the Supplier and the Contract Administrator. The Supplier shall identify each component with durable labels or tags securely attached to each piece of equipment, crate, or container. All crates shall be clearly labelled with five (5) (five) cm red font as "Indoor Storage" or "Outdoor Storage" on a minimum of four (4) faces of the crate.

.8 The Supplier shall protect polished and machined metal surfaces from corrosion and damage during shipment and storage and shall carefully pack and crate the equipment for

shipment. The Supplier shall protect threaded connections with threaded plugs or caps and shall protect open plain end pipes with caps.

.9 The Supplier shall pack electrical equipment and control panels to prevent scratching, access by dirt, moisture, or dust, or damage to insulation and shall cover equipment having exposed bearings and glands to exclude foreign matter. All openings in the equipment shall be covered before shipment. Sufficient lifting hooks shall be supplied for handling all crates and boxes and heavy pieces.

.10 The Construction Contractor shall provide temperature controlled, humidity controlled and secure local storage in Winnipeg, MB in a location to be inspected and approved by the City, between equipment delivery and installations according to Section 01 61 00.

.11 The Construction Contractor may elect to store the equipment for an extended duration (i.e.. 6 months or more), to accommodate the construction schedule. The Supplier shall provide any special packaging and protective coatings, lubricants, etc., which the Supplier deems necessary to protect the equipment during the protracted storage and prior to equipment performance testing. Coordinate with the Construction Contractor.

.12 The Supplier shall be responsible for providing the Construction Contractor with full instructions in writing of all precautions to be observed in connection with the storing and protection of the equipment.

.13 The Construction Contractor shall keep records of the maintenance schedules and submit to the Contract Administrator on a monthly basis.

.14 The Construction Contractor shall notify the Contract Administrator of any damages and loss occurred to the stored equipment during the storage period. Any damaged crate shall be fully inspected by the City and the Supplier. The Construction Contractor shall be responsible for the repair and replacement of the damaged and lost good.

.15 The Construction Contractor shall be responsible for removing any protective coatings prior to installation and equipment performance testing in accordance with the Supplier's written instructions.

.16 The Supplier's Representative shall be at the delivery Site to witness the off-loading, moving and placement of the equipment and to examine the equipment for damage and loss, and to inspect the Construction Contractor's storage facilities for the equipment supplied for compliance with the Supplier's recommendations. The Supplier shall maintain an inventory of all equipment supplied and delivered to the Construction Contractor.

.17 The Construction Contractor shall be responsible for receiving, off-loading, and placing into storage all equipment at the Site and/or the off-Site storage location.

1.6 Installation Assistance

.1 The equipment will be installed by the Construction Contractor adjacent to the UV building at separate time periods so that the existing UV system can be maintained. The Supplier's Representative shall assist in each installation period. It is currently anticipated that equipment installation (one (1) of each transformer type) will be separated by several months.

.2 Unless otherwise specifically stated in the Specifications, the Supplier shall provide, a factory-trained Representative who, in conjunction with the Contract Administrator or their agent, shall give instructions regarding the installation of the equipment.

.3 Before commencing installation of the equipment, the Construction Contractor shall arrange for the attendance of the Supplier's Representative who shall provide instructions in the methods, techniques, precautions, and any other information relevant to the successful installation of the equipment.

.4 The Construction Contractor shall inform the Contract Administrator, in writing, of the attendance at the Site of any Supplier's Representative for installation training at least fourteen (14) days prior to arrival.

.5 Before commencing the second installation period, the Supplier's Representative shall be at the storage site to inspect the stored equipment for damage and loss. The Supplier's Representative shall identify any outstanding deficiencies and shall provide a copy of the inspection report to the Contract Administrator. The deficiencies shall be rectified by the Construction Contractor and the Supplier's Representative shall re-inspect the equipment.

.6 When the Supplier's Representative is satisfied that the Construction Contractor is aware of all installation requirements, they shall so certify by completing Form 101 – Certificate of Readiness to Install, attached to this Specification.

.7 The completed form shall be delivered to the Contract Administrator prior to departure of the Supplier's Representative from the Site.

.8 Installation of the equipment shall not commence until the Contract Administrator has advised that he has received the completed Form 101.

.9 Separate copies of Form 101 shall be used for different equipment and for each installation period.

1.7 Installation

.1 If necessary, or if so directed by the Contract Administrator during the course of installation, the Construction Contractor shall contact the Supplier's Representative to receive clarification of installation procedures, direction and any other additional information necessary to continue and complete the installation in an appropriate manner.

.2 The Construction Contractor shall arrange for the Supplier's Representative to visit the Site to provide assistance and instruction during all of the separate installation periods, and including items such as all aspects of installation, at the Construction Contractor's cost. For clarity, the Supplier's Representative is not required to witness the entirety of the installation.

.3 Prior to completing each period of installation, the Construction Contractor shall inform the Supplier's Representative and arrange for the attendance at the Site of the Supplier's Representative to verify successful installation.

.4 The Supplier's Representative shall conduct a detailed inspection of the installation for each period of installation including alignment, electrical connections, workmanship and all other items as required to ensure successful operation of the equipment.

.5 The Supplier's Representative shall identify any outstanding deficiencies in the installation.

.6 The deficiencies shall be rectified by the Construction Contractor and the Supplier's Representative shall be required to re-inspect the installation, at the Construction Contractor's cost.

.7 When the Supplier's Representative accepts the installation, they shall certify the installation by completing Form 102 – Certificate of Satisfactory Installation, attached to this Specification.

.8 Separate copies of Form 102 shall be used for each transformer installation.

.9 Deliver the completed Form 102 to the Contract Administrator prior to departure of the Supplier's Representative from the Site.

.10 Tag the equipment with a 100 mm by 200 mm card stating "EQUIPMENT CHECKED. DO NOT RUN." stencilled in large black letters. Sign and date each card.

1.8 Operation and Performance Verification

.1 Equipment shall be subjected to a demonstration and Running Test after the installation has been verified and any identified deficiencies have been remedied.

.2 During the demonstration and Running Test, the Construction Contractor shall operate equipment as required by Section 01 91 31 to complete the Performance Verification.

.3 Inform the Contract Administrator at least fifteen (15) days in advance of conducting the tests and arrange for the attendance of the Supplier's Representative. The tests may be concurrent with the inspection of satisfactory installation if mutually agreed by the Construction Contractor and the Contract Administrator.

.4 The Supplier's Representative shall conduct all necessary checks to the equipment and if necessary, advise the Construction Contractor of any further checking, flushing, cleaning, or other work needed prior to confirming the equipment is ready to run.

.5 Testing shall be performed according to Section 01 91 31.

1.9 Supplements

.1 The supplements listed below, following "End of Section", are part of this Specification:

.1 Form 100 – Certificate of Equipment Delivery.

.2 Form 101 – Certificate of Readiness to Install.

.3 Form 102 – Certificate of Satisfactory Installation.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

CERTIFICATE OF EQUIPMENT DELIVERY
FORM 100

We certify that the equipment listed below has been received and delivered into the care of the Construction Contractor. The equipment has been found to be in satisfactory condition. No defects in the equipment were found.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Authorized Signing Representative of the Construction Contractor) Date

_____ _____
(Authorized Signing Representative of the Supplier) Date

_____ _____
(Authorized Signing Representative of the Contract Administrator) Date

CERTIFICATE OF READINESS TO INSTALL
FORM 101

I have familiarized the Construction Contractor of the specific installation requirements related to the equipment listed below and am satisfied that he understands the required procedures.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Authorized Signing Representative of the Supplier) Date

I certify that I have received satisfactory installation instructions from the equipment Supplier.

_____ _____
(Authorized Signing Representative of the Construction Contractor) Date

CERTIFICATE OF SATISFACTORY INSTALLATION
FORM 102

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

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

OUTSTANDING DEFECTS: _____

_____ _____
(Authorized Signing Representative of the Supplier) Date

_____ _____
(Authorized Signing Representative of the Construction Contractor) Date

_____ _____
(Authorized Signing Representative of the Contract Administrator) Date

CLOSEOUT SUBMITTALS

1. GENERAL

1.1 Submittals

.1 Submittals shall be in accordance with Section 01 33 00.

.2 Prepare instructions and data using personnel experienced in the maintenance and operation of described products.

.3 A copy will be returned after final inspection with the Contract Administrator's comments.

.4 Revise the content of the documents as required prior to final submittal.

.5 All mark-ups identified from previous reviews shall be implemented for final O&M manuals.

.6 Four (4) weeks prior to Substantial Performance of the Work, the Construction Contractor will submit, to the Contract Administrator, six (6) final paper copies of the Operating and Maintenance (O&M) Manuals and one (1) searchable electronic copy (PDF) on USB drive in S.I. Units. Supplier shall submit the information contained herein, electronically and in a format such that the Construction Contractor can submit hard copies as specified herein.

.7 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of the same quality and manufacture as the products provided in Work.

.8 Furnish evidence, if requested, for type, source and quality of the products provided.

1.2 Format

.1 Organize data as an instructional manual.

.2 The Construction Contractor will submit the manual as follows. Binders shall be vinyl, hard covered, 3 'D' ring, loose leaf with spine and face pockets. The maximum width of each binder shall not exceed 125 mm; where there is more data than will fit in a binder of 125 mm maximum width, the number of binders shall be as required.

.3 When multiple binders are used, correlate the data into related consistent groupings. Identify contents of each binder on the spine.

.4 Covers shall be used to identify each binder with type or printed title "Operation and Maintenance Manual"; list date, title of project, the City, Construction Contractor and Contract Administrator, and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 The text shall be Manufacturer's printed data.

.8 Drawings shall be provided with reinforced punched binder tab. Bind in with text, fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in dwg format on a USB drive.

.10 Provide one (1) electronic copy (on USB drive) of the entire manual. The electronic copy shall have a linked Table of Contents to each section and shall be word searchable.

.11 PDF files shall be set to open “Bookmarks and Page” view and contain internal book marking from index page to major sections of document.

1.3 Contents - Each Volume

.1 Table of Contents: provide title of project:

.1 Date of submission; names.

.2 Addresses and telephone numbers of the Contract Administrator, Contractor and Sub-Contractor with the names of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product and system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Drawings larger than 210 mm x 300 mm (A4) shall be contained in plastic pouch. Provide a separate panel for each drawing.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating Manufacturer's instructions.

.6 Training: refer to Section 01 79 00.

1.4 As-Builts and Samples

.1 Maintain one (1) record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed Shop Drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Label record documents and file in accordance with Section number listings in the List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.3 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.4 Keep record documents and samples available for inspection by the Contract Administrator.

1.5 Equipment and Systems

.1 For each item of equipment and each system:

.1 Include the description of the unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Provide copy of reviewed submittals.

.3 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.4 Include installed colour coded wiring diagrams.

.5 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and any special operating instructions.

.6 Maintenance Requirements: include preventative and corrective maintenance routine, procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.7 For any equipment requiring measurement to be taken, the baseline values of all measurements shall be provided.

.8 Safety Data Sheets (SDSs) for all chemicals needed in operation and maintenance.

.9 Provide a maintenance and lubrication schedule, and a list of lubricants and quantities required. Use the summary forms provided at the end of this Section.

.10 Include Manufacturer's printed O&M instructions.

.11 Include the sequence of operation by the controls Manufacturer.

.12 Provide original Manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.13 Provide a list of original Manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Additional requirements: as specified in individual Specification Sections.

1.6 Materials and Finishes

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include the Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual Specifications Sections.

1.7 Spare Parts

.1 Provide spare parts, in quantities specified in individual Specification Sections.

.2 Provide items of the same manufacture and quality as items in the Work.

.3 Deliver to Site, place and store.

.4 Receive and catalogue items. Submit inventory using the summary form at the end of this Section. Include approved listings in O&M Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.8 Maintenance Materials

.1 Provide maintenance and extra materials, in quantities specified in the individual Specification Sections.

.2 Provide items of the same manufacture and quality as items in the Work.

.3 Deliver to Site, place and store.

.4 Receive and catalogue items. Submit inventory listing to the Contract Administrator. Include approved listings in the O&M Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.9 Special Tools

.1 Provide special tools, in quantities specified in individual Specification Section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to Site, place and store.

.4 Receive and catalogue items. Submit inventory listing to the Contract Administrator. Include approved listings in the O&M Manual.

1.10 Storage, Handling and Protection

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration and in accordance with the Manufacturer's preservation instruction.

.2 Store in original and undamaged condition with Manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.

1.11 Warranties and Bonds

.1 Develop a warranty management plan to contain information relevant to Warranties. Warranty management plan to include required actions and documents to assure that the Contract Administrator receives warranties to which it is entitled.

.2 Provide the plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.3 Submit warranty management plan to the Construction Contractor, a minimum of sixty (60) days before planned pre-warranty conference.

.4 Submit warranty information made available during the construction phase, to the Contract Administrator for approval prior to each monthly pay estimate.

.5 Assemble approved information for Construction Contractor and submit upon acceptance of work. Organize the information as follows:

.1 Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing.

.2 List Subcontractor, Supplier, and Manufacturer, with name, address, and telephone number of responsible principals.

.3 Obtain warranties and bonds, executed in duplicate by Subcontractors, Suppliers, and Manufacturers, within ten (10) days after completion of the applicable item of Work.

.4 Verify that documents are in proper form, contain full information, and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

.6 Conduct a joint ten (10) month warranty inspection, measured from the time of acceptance by the Contract Administrator. The inspection shall be attended by the Contract Administrator, Contractor, and Supplier's Representative.

.7 Include information contained in the warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of Construction Contractors, Subcontractors, Manufacturers or Suppliers involved.

.2 Provide a list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of Manufacturers or Suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one (1) year overall warranty of construction after Substantial Performance for all the units functioning. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of the warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent O&M Manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.3 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.8 Respond in a timely manner to oral or written notification of required construction warranty repair work.

.9 Written verification will follow oral instructions. Failure to respond will be cause for the City to proceed with action against the Construction Contractor.

1.12 Warranty Tags

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water-resistant tag approved by the Contract Administrator.

.2 Attach tags with a durable plastic tie.

.3 Leave the date of acceptance until project is accepted for occupancy.

.4 Indicate the following information on the tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Construction Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

1.13 Supplements

.1 The supplements listed below, following “End of Section”, are part of this Specification:

.1 Forms: Maintenance Summary Form.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

MAINTENANCE SUMMARY FORM

PROJECT: _____ CONTRACT NO.: _____

1. EQUIPMENT ITEM _____
2. MANUFACTURER _____
3. MODEL _____
4. SERIAL NUMBER _____
5. EQUIPMENT/TAG NUMBER(S) _____
6. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 45 KG) _____
7. NAMEPLATE DATA (hp, voltage, speed, etc.) _____
8. MANUFACTURER' S LOCAL REPRESENTATIVE _____
   a. Name _____ Telephone No. _____
   b. Address _____
9. MAINTENANCE REQUIREMENTS

MAINTENANCE OPERATION COMMENTS	**FREQUENCY**	**LUBRICANT (IF APPLICABLE)**
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable.)	List required frequency of each maintenance operation	Refer by symbol to lubricant required.

10. LUBRICANT LIST

REFERENCE SYMBOL	**[SHELL]**	**[STANDARD OIL]**	**[GULF]**	**[ARCO]**
List symbols used in No. 9. above.	List equivalent lubricants, as distributed by each manufacturer for the specific use recommended.			

11. RECOMMENDED SPARE PARTS FOR THE CITY'S INVENTORY.

PART NO.	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT COST**
Note: Identify parts provided by this Contract with two asterisks.				

DEMONSTRATION AND TRAINING

1. GENERAL

1.1 Description

.1 This Section contains requirements for training City staff, by persons retained by the Contractor specifically for the purpose of proper operation and maintenance of all equipment supplied and installed under this Contract.

.2 The Contractor will develop the overall training plans for the equipment with input from the Supplier and the City. The Supplier shall be responsible for providing qualified training instructors and field lesson plans as detailed in the Specifications and as described herein.

.3 Arrange for Supplier's Representatives to supply detailed classroom and hands-on training to the City's operations personnel, maintenance personnel, and select on-call personnel on operation and maintenance of specified product (system, subsystem, and component) and as required in applicable Specifications.

.1 Be tailored for the specific audience in each course.

.2 Ensure that each course accommodates plant staff shift schedules by providing multiple sessions covering the same content if necessary.

.3 Arrange for and require plant staff to perform the demonstrated procedures and provide an evaluation of the Participants.

.4 The City shall require training for at least two (2) sessions for Electrical and Instrumentation staff. See Table 1.

Table 1 : Training Requirements

Training Participant Groups	Approximate Number of Personnel	Minimum Number of Sessions	Constraints
Maintenance Personnel			
Electrical and Instrumentation Maintenance	14	2	

.5 To facilitate scheduling of the City personnel, the City may elect to divide sessions into operation-specific topics and maintenance-specific topics as applicable, to allow operations/ on-call staff and maintenance staff to attend separately. The Contractor shall coordinate with the Contract Administrator and the City. Training to be scheduled and coordinated to not interfere with the operation and maintenance of the existing NEWPCC facility.

.6 Training will be scheduled at least four (4) weeks in advance of the respective training sessions.

.7 Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with the City and familiar with Operation and Maintenance manual information specified in Section 01 78 00 - Closeout Submittals

.8 Training sessions shall be conducted by qualified Supplier's Representatives, with a minimum of two (2) years' experience. Supplier's Representatives shall be familiar with the specified equipment as well as with facility operation and maintenance requirements.

.9 The Contract Administrator has the authority to determine if the training is sufficient based on the lesson plan submitted by the Contractor.

.10 Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.

1.2 Submittals

.1 Submit the following information to the Contract Administrator thirty (30) Calendar Days prior to the first training session. The material will be returned as either "NO EXCEPTIONS TAKEN", "EXCEPTIONS NOTED" or "EXCEPTIONS NOTED - RESUBMIT".

.1 Lesson plan and supplemental training manuals, handouts, visual aids and other reference material required for each training session.

.2 Submit proposed lesson plan not less than twenty-one (21) Calendar Days prior to scheduled training and revise as necessary for acceptance.

.3 Lesson Plan: When training of the City personnel is specified, prepare for each required course, a lesson plan containing but not limited to the following information:

.1 Title and objectives.

.2 Recommended types of attendees (e.g., managers, engineers, operators, maintenance).

.3 Course description and outline of course content.

.4 Format (e.g., lecture, self-study, demonstration, hands-on).

.5 Instruction materials and equipment requirements, including supplemental training manuals, handouts, visual aids and other reference material required for each training session.

.6 Resumes of instructors providing the training.

.4 Training Schedule:

.1 Submit not less than twenty-one (21) Calendar Days prior to start of equipment installation and revise as necessary for acceptance.

.2 List specified equipment and systems that require training services and show:

.1 Respective Supplier.

.2 Estimated dates for installation completion.

.1 Training schedule to include:

.1 Course name;

.2 Course Lesson Plan submittal dates;

.3 Planned session dates and durations; and

.4 Planned Training Participant Groups.

.3 Adjust schedule to ensure training of appropriate personnel as deemed necessary by the City, and to allow full participation by Supplier's Representatives. Adjust schedule for interruptions in operability of equipment.

.4 Individual sessions shall not exceed four (4) hours. A break should be incorporated into sessions that exceed two (2) hours. Training session anticipated to exceed four (4) hours can be assigned to multiple-sessions; however, no more than one (1) – 3-hour and one (1) - 4-hour sessions (seven (7) hours total) may be delivered to the same participants in a single day. Two (2) successive 4-hour sessions may be delivered to alternating shifts of attendees in a single day (i.e., one group of attendees in the morning, and a second group of attendees in the afternoon). Training sessions requiring more than seven (7) hours may be delivered on separate days.

.5 Classes shall not be scheduled concurrently.

1.3 Location and Training Facilities

.1 The City shall provide the classroom training facilities.

.2 Field training sessions shall take place at the equipment location.

1.4 Format and Content

.1 The training program shall:

.1 Provide a high-level overview of maintenance requirements. Include a point-form outline of maintenance intervals consistent with the summary form in Section 01 78 00.

.2 Ensure training covers all aspects of the unit needed by operations or maintenance staff (such as operating the system locally, operating the system remotely, reviewing alarms and actions required, operating the system during fault or upset, returning the system to normal operating condition, etc.)

.3 Ensure training covers all aspects of the Process Control System (PCS) including screens and graphics, screen navigation, pre-configured and custom trending, pop-up dialog boxes, alarm management, remote/local and manual/automatic operating modes, and any programmed sequences.

.2 The training sessions shall be comprised of both classroom training and field training. As a minimum, they shall cover the following topics for each item of equipment or system:

.1 Classroom training shall cover:

.1 Familiarization.

.2 Safety.

.3 Operation, including reviewing alarms and required actions;

.4 Troubleshooting;

.5 Preventative and predictive maintenance;

.6 Corrective maintenance;

.7 Parts; and

.8 Local representation.

.2 Field Training:

.1 As a minimum, field equipment training for operations personnel shall include:

.1 Identification of equipment: location of primary element; location of instrument readout; discussion on purpose, basic operation, and information interpretation.

.2 Identification of instrumentation and calibration, if applicable.

.3 Discussion and demonstration of standard operating procedures, safe work procedure, and daily visual inspection of system operations.

.4 Discussion and demonstration of the preventative maintenance activities, and predictive maintenance activities where applicable.

.5 Discussion and demonstration of start-up and shutdown procedures.

.6 Demonstration of routine disassembly and assembly of equipment.

.7 Identification and review of safety items and demonstration of safety procedures.

.8 Review of Operation and Maintenance Manuals.

.9 Demonstration of operating parameter adjustment for optimized equipment and system operation.

1.5 Training Deliverables

.1 Supplier shall provide all material used in the training to the City;

1.6 Training Material

.1 The Training Material shall be provided in electronic native, editable file format.

.2 The Training Material shall be organized by course, with all material used and collected from Participant Groups during training systematically arranged in a consistent manner.

1.7 Training Completion Forms

.1 Form T1, attached to this Specification, shall be signed by the trainer, the Contract Administrator, and by a City Staff representative for each City shift when classroom training has been completed. One (1) form is to be used for each item of equipment and each system for which training has been provided. Once all classroom training sessions have been completed, Form T1 is to be submitted to the Contract Administrator.

.2 Form T2, attached to this Specification, shall be signed by the trainer, the Contract Administrator, and by a City Staff representative for each City shift when field training has been completed. One (1) form shall be used for each item of equipment and each system for which training has been provided. Once all field training sessions have been completed, Form T2 shall be submitted to the Contract Administrator.

.3 The supply of adequate training, including completion of Forms T1 and T2 shall be a required prerequisite for handover of equipment, as appropriate to the City.

1.8 Supplement

.1 Supplements listed below, following “End of Section,” is a part of this Specification:

.1 Form T1 Certificate of Satisfactory Classroom Training.

.2 Form T2 Certificate of Satisfactory Field Training.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

CERTIFICATE OF SATISFACTORY TRAINING
FORM T1

We certify that the classroom training for the equipment listed below has been provided as per the Specifications.

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Trainer) Date

_____ _____
(City Staff Representative) Date

_____ _____
(Contract Administrator) Date

CERTIFICATE OF SATISFACTORY TRAINING
FORM T2

We certify that the field training for the equipment listed below has been provided as per the Specifications.

PROJECT: _____

ITEM OF EQUIPMENT: _____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Trainer) Date

_____ _____
(City Staff Representative) Date

_____ _____
(Contract Administrator) Date

COMMISSIONING PLAN

1. GENERAL

1.1 Description

.1 Provide a complete and fully functional system ensuring that:

.1 City personnel have been fully trained in aspects of installed systems as per Section 01 79 00.

.2 Documentation relating to installed equipment and systems has been completed as per Section 01 65 00.

.2 The Supplier shall cooperate with Construction Contractor in all commissioning activates pertaining to the supplied equipment.

.3 The Supplier shall cooperate with Construction Contractor to develop a Detailed Commissioning Plan and Commissioning Schedule using this Section as a Base Commissioning Plan.

.4 Use this Section as a master planning document for Commissioning as it:

.1 Outlines organization, scheduling, allocation of resources, and documentation pertaining to implementation of Commissioning.

.2 Communicates responsibilities of team members involved in Commissioning including scheduling, documentation requirements, and verification procedures.

.3 Sets out deliverables relating to operation, maintenance, process, and administration of Commissioning.

.4 Describes how the process of verification meets the design requirements of the completed Works.

.5 Sets out scope, standards, roles and responsibilities, expectations, deliverables and provides:

.1 An overview of Commissioning.

.2 A general description of elements that make up the Detailed Commissioning Plan.

.3 A process and methodology for successful Commissioning.

.5 The Contract Administrator shall witness and certify tests and reports of results.

.6 Commissioning activities shall be completed before issuance of Substantial Performance.

1.2 Definitions

.1 Acceptance: for the purpose of this Specification Section, acceptance shall be defined as the formal turnover of a system to the City. This shall occur after the successful end of Commissioning of each system through a formal acknowledgement between the Contract

Administrator, the City, and the Contractor. Success of the Commissioning period is determined by the Contract Administrator.

.2 Base Commissioning Plan: General Commissioning requirements within this Section to be used in the development of a Detailed Commissioning Plan.

.3 Commissioning: for the purpose of this Specification Section, Commissioning shall be defined as the successful completion of the Operating Test specified in Section 26 12 13.

.4 Commissioning Agent: Agent of the Contractor with experience in Commissioning, satisfactory to the Contract Administrator, responsible for the oversight and execution of Commissioning.

.5 Commissioning Report: the final Commissioning document as described in Clause 3.13.

.6 Commissioning Schedule: Gantt chart showing planned dates for performing all activities related to commissioning of all upgraded systems. The Commissioning Schedule is to be developed by the Contractor and submitted to the Contract Administrator for review, as described in Clause 3.1. The Supplier shall provide input as necessary.

.7 Detailed Commissioning Plan: Commissioning Plan developed by Contractor from the Base Commissioning Plan to be submitted and reviewed by the Contract Administrator, as described in Clause 3.2. Unless defined as “Base Commissioning Plan”, all other instances of “Commissioning Plan” refer to the Detailed Commissioning Plan.

.8 System: for the purpose of this Specification Section, a system shall be defined as the equipment, piping, controls, ancillary devices, electrical power, etc., which together perform a specific function at the facility.

1.3 Submittals

.1 Provide submittals in accordance with Section 01 33 00.

.2 Commissioning Schedule to be submitted and accepted by the Contract Administrator as per Clause 3.1.

.3 Detailed Commissioning Plan to be submitted and accepted by the Contract Administrator as per Clause 3.2.

.4 Detailed Commissioning Plan to be refined and resubmitted as required during the construction phase as per Clause 3.3.

1.4 Composition, Roles, and Responsibilities of Commissioning Team

.1 Commissioning Team to consist of the following members:

.1 Contract Administrator who is responsible for:

.1 Monitoring Commissioning activities.

.2 Witnessing and certifying reported results.

.3 Reviewing and approving Contractor submissions.

.4 Assisting in the resolution of issues resulting from all tests.

.5 Reviewing the final Commissioning Report.

.2 City personnel who are responsible for:

.1 Attending Commissioning activities to verify re-installed existing equipment operates as per the original sequence of operations.

.2 Attending Commissioning activities to verify newly installed equipment operates as intended.

.3 Performing necessary testing as noted in Clause 1.5.1.

.3 Construction Team: Contractor, Subcontractors, suppliers, and support disciplines, who are responsible for construction and/or installation in accordance with Contract Documents, including:

.1 Testing.

.2 Mechanical testing, adjusting and balancing (TAB).

.3 Integrating Commissioning activities into the Contractor's Project Schedule.

.4 Performing and documenting equipment installation as per Section 01 65 00.

.5 Performing and documenting start-up including installation and start-up checklists.

.4 Contractor's Commissioning Agent who shall be responsible for implementing specified Commissioning activities including:

.1 Planning and preparing checklists (installation/start-up checklists as required, product information) and test procedures.

.2 Determining operational training requirements.

.3 Developing a Detailed Commissioning Plan, updating information provided in the Base Commissioning Plan.

.4 Performing and documenting Running Test and Performance Testing.

.5 Preparing and updating issues logs.

.6 Verifying, reviewing, and conducting training.

.7 Preparing final Commissioning Report.

1.5 Extent of Commissioning

.1 Testing of electrical panels must be completed before proceeding with Commissioning activities.

.1 Testing after the electrical modifications shall conform to CSA C22.2 No. 14, CSA C22.2 No. 286 and related CSA standards. CSA special inspections shall be coordinated by the Contractor after operation is confirmed.

2. PRODUCTS

2.1 Equipment

.1 Provide sufficient instrumentation at the Supplier's expense to verify and commission the installed systems.

3. EXECUTION

3.1 Commissioning Schedule

.1 Provide input to the Construction Contractor as they prepare a detailed Commissioning Schedule. The Construction Contractor will submit to the Contract Administrator for review and approval at the same time as the Project Schedule. Include milestones, testing, documentation, training, and Commissioning activities of components, equipment, subsystems, systems, and integrated systems.

.2 After approval, incorporate the Commissioning Schedule into the Project Schedule.

.3 Contractor, Contractor's Commissioning Agent, and Contract Administrator will monitor progress of Commissioning against the approved Commissioning Schedule.

3.2 Development of Commissioning Plan

.1 This Section is to be considered a Base Commissioning Plan for the equipment, to be used by the Construction Contractor in the development of a Detailed Commissioning Plan. Provide assistance to the Construction Contractor when requested by the Construction Contractor.

.2 The Detailed Commissioning Plan and associated Commissioning Schedule shall be approved by the Contract Administrator at least twenty (20) Business Days prior to the planned start of Commissioning. The plan shall comply with the requirements that have been established by the Contract Administrator.

.3 The Detailed Commissioning Plan shall be drafted by the Contractor and reviewed by the Contract Administrator and shall incorporate the contents of the Base Commissioning Plan as specified in this Section. The Detailed Commissioning Plan shall include the following:

.1 Inform the Contract Administrator at least fifteen (15) Business Days in advance of conducting the tests and arrange for the attendance of the Manufacturer's Representative. The tests may be concurrent with the inspection of satisfactory installation if mutually agreed by the Contractor and the Contract Administrator.

.2 The Manufacturer's Representative shall conduct all necessary checks to the equipment and advise the Contractor of any further checking, flushing, cleaning, or other work needed prior to confirming the equipment is ready to run.

.3 Contingency plans in the event of a process malfunction.

.4 Drawings and sketches as required to illustrate the planned sequence of events.

.5 List and details for all temporary equipment or component (additional spool pieces, etc.) required to facilitate Commissioning.

.6 List of all personnel who the Contractor plans to be in attendance for Commissioning and handover with information indicating their qualifications for this Work.

.4 The Detailed Commissioning Plan shall take into account:

.1 Approved Shop Drawings and product data.

.2 Approved changes to the Contract.

.3 Project Schedule.

.4 Contractor's, Subcontractor's, and Suppliers' requirements.

.5 Project construction team's and Commissioning team's requirements.

.5 The Detailed Commissioning Plan shall include:

.1 Commissioning Schedule.

.2 Installation and start-up check lists provided by Manufacturers and Suppliers.

.3 Manufacturer Performance Testing forms provided by Manufacturers and Suppliers.

.1 Forms to include testing parameters at full range of operating conditions to verify responses of equipment and systems.

.6 Submit the completed Detailed Commissioning Plan to the Contract Administrator for review and acceptance. The Detailed Commissioning Plan shall be reviewed prior to its implementation. The Contract Administrator shall be the final arbiter.

3.3 Refinement of Commissioning Plan

.1 During the construction phase, the Construction Contractor will revise, refine, and update the Detailed Commissioning Plan to include approved design and construction changes. Provide input to the Construction Contractor as required.

.1 At each revision, indicate revision number and date.

.2 The Construction Contractor will submit each revised Detailed Commissioning Plan to the Contract Administrator for review and acceptance.

3.4 Equipment

.1 All process, electrical, control, and miscellaneous equipment related to the system shall be successfully installed and tested in accordance with Section 01 65 00, this Section, and any specific requirements noted in other Divisions. Form 103 shall be executed for each transformer.

.2 Temporary equipment or components will be installed and tested as necessary to ensure that it functions reliably and consistently through the Commissioning period.

3.5 Controls

.1 All controls which are the responsibility of this Contractor shall be installed and tested prior to Commissioning.

.2 The Contract Administrator shall arrange for the simulation of the control sequences or shall allow for the operation of the system without the features included in the Work of others. Every effort shall be made to ensure that the Commissioning period provides for the full and comprehensive operation of the equipment under all anticipated normal and adverse operating conditions.

.3 In the event that achieving adverse operating condition was deemed impractical by the City operation, the I/O signals may be manipulated to achieve the necessary reaction of the system.

3.6 Plant Utility Service

.1 The City shall provide power and other ancillary services as necessary to operate the facility through the Commissioning period. Provision of these services shall be limited to reasonable levels.

3.7 Manpower

.1 Supply all staff required during Commissioning as necessary to assist the City's staff in the operation of the facility.

.2 Supply competent staff capable of maintaining, repairing, and adjusting the equipment and controls to achieve the intended design functions during the Commissioning period.

.3 Ensure equipment Supplier's Representatives are available as necessary to certify adjustments in equipment, to guide in setting correct operating limits, and to generally provide input as required for the appropriate operation of the equipment.

3.8 Operating Descriptions

.1 Operating descriptions shall be prepared by the Contract Administrator for the facility systems. Other information outlining the operating requirements shall also be available from the Contract Administrator. The Supplier and the Construction Contractor will review these descriptions and shall make themselves familiar with the requirements in order that they can undertake Commissioning in an appropriate manner.

.1 Operating descriptions shall be considered part of documentation for systems as listed in Clause 3.13.2.

3.9 Design Parameters

.1 Design parameters for the system shall be as defined in the Specifications and/or the operating descriptions.

3.10 Pre-Commissioning Activities

.1 Conduct pre-start-up pressure, static, flushing, cleaning, "bumping" testing, and loop validation during construction as specified in the individual sections. This testing shall be witnessed and certified by the Contract Administrator and does not form part of Commissioning specifications. Include completed documentation with the Final Commissioning Report.

.2 Perform prestart up inspections prior to commencing Commissioning. Utilise approved installation and start-up check lists if required. Rectify any deficiencies to the Contract Administrator's satisfaction. Include completed documentation with the Final Commissioning Report.

.3 Pre-commissioning activities shall include, at minimum:

.1 Process systems:

.1 "Bump" each item of equipment in its "stand-alone" mode.

.2 Complete pre-start-up checks and complete relevant documentation.

.3 After equipment has been started, test related systems in conjunction with control systems on a system-by-system basis.

3.11 Commissioning of Instrumentation and Control

.1 Commissioning activities shall only proceed after instrumentation and control tests have been completed.

.2 A minimum written notice of two (2) weeks shall be required prior to commencing with process commissioning activities. To qualify for process commissioning the following activities shall be completed:

.1 Instrument calibrations;

.2 Initial Control Settings and adjustments have been made;

.3 All field devices have been set-up;

.4 Forms (i.e., 100 forms) have been completed;

.5 PLC/SCADA IO and loop checks have been completed; and

.6 Proper mounting and connections have been made.

.3 During Commissioning, demonstrate to the Contract Administrator proper calibration and correct operation of instruments and gauges.

.4 Commissioning of the instrumentation and control system shall include but not be limited to the following:

.1 Verify installation of components, wiring connections, and piping connections.

.2 Verify wiring continuity and pipe leak tests.

.3 Verify instrument calibrations and loop tests and provide a written report to the Contract Administrator.

.1 The report shall include record of functional checks and any adjustments required for the instruments and control equipment under operational conditions.

.4 Coordinate instruments and control equipment supplier's service personnel as required for complete system testing.

.5 Coordinate and cooperate with the City, Contract Administrator, and other contractors to commission the Control System I/O points.

.6 Direct plant personnel at hand-over as to final adjustment of the system for correct operation of plant as per Section 01 79 00.

.7 Ensure that the instrumentation and control equipment suppliers cooperate to complete the Work.

.8 Verify signal levels and wiring connections to all instrumentation and control equipment.

3.12 Start-Up and Commissioning of Equipment

.1 A Supplier’s Representative shall conduct all necessary checks to the equipment prior to start-up as described in Section 01 65 00.

.2 Following the installation and calibration of the equipment, the Construction Contractor shall perform an Operating Test of equipment which will be witnessed by the Supplier’s Representative and the Contract Administrator. It will be the responsibility of the Construction Contractor to arrange the times for testing and start-up activities. The Construction Contractor shall confirm that these times are acceptable to the Contract Administrator and the City.

.1 During the Operating Test, the Contractor shall operate equipment as required to meet the requirements from all Divisions of this Specification.

.2 If required, the Contractor shall supply any ancillary equipment or services required to complete the testing.

.3 Should the testing reveal any defects, then those defects shall be documented and promptly rectified, and the testing shall be repeated to the satisfaction of the Contract Administrator. Even if this shall require repeating of all commission procedures from the beginning, it will be at the sole discretion of the Contract Administrator.

.4 Additional costs incurred by the Contractor due to repeat testing shall be borne by the Contractor.

.3 On successful completion of the Operating Test, Form 103 – Certificate of Equipment Satisfactory Operating Test Performance (attached to this Specification) will be signed by the Supplier’s Representative, the Contractor, and the Contract Administrator. Form 103 is required for each transformer.

.4 Operating Test:

.1 The Running Test shall be performed in accordance with Section 26 12 13.

3.13 Final Commissioning Report

.1 Construction Contractor to submit the completed Commissioning Report within a maximum of two (2) weeks of completion of Commissioning. The final Commissioning Report is to be reviewed and accepted by the Contract Administrator prior to granting Substantial Performance. The Supplier shall provide documentation as required.

.2 Final Commissioning Report shall include:

.1 Start-up, pre- Commissioning activities, and documentation for systems and equipment.

.2 Description of Commissioning activities and documentation.

.3 Description of Commissioning of integrated systems and documentation.

.4 Completed installation checklists.

.5 Completed Running Test Report(s).

.6 Final settings of commissioned equipment.

.7 Training Plans.

.3 Before the final Commissioning Report is accepted, individual reported results to be subject to verification by the Contract Administrator.

3.14 Training Plans

.1 Refer to Section 01 79 00 - Demonstration and Training.

3.15 Supplements

.1 The supplements listed below, following “End of Section”, are part of this Specification:

.1 Form 103 – Certificate of Equipment Satisfactory Operating Test Performance.

END OF SECTION

CERTIFICATE OF EQUIPMENT SATISFACTORY OPERATING TEST PERFORMANCE
FORM 103

We certify that the equipment listed below has been operated and tested as per the Specifications and that the equipment meets its Operating Test criteria. No defects in the equipment were found. The equipment is therefore classed as "conforming".

PROJECT: _____

ITEM OF EQUIPMENT: _____

_____

TAG NO: _____

REFERENCE SPECIFICATION: _____

_____ _____
(Authorized Signing Representative of the Supplier) Date

_____ _____
(Authorized Signing Representative of the Contractor) Date

_____ _____
(Authorized Signing Representative of the Contract Administrator) Date

Acknowledgement of Receipt of O&M Manuals.

_____ _____
(Authorized Signing Representative of the City) Date

LIQUID FILLED, MEDIUM VOLTAGE TRANSFORMERS

1. GENERAL

1.1 Related Sections

.1 This Section provides comprehensive requirements for the design, installation, and other application specific requirements for liquid-filled Medium Voltage (MV) Transformers, substation type.

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section. This section supplements requirements of other Divisions.

1.2 Description

.1 This Section covers the furnishing of all materials, equipment and services for the design, fabrication, supply and delivery, installation/labour, and testing of outdoor transformers.

.2 This Specification outlines only general performance and minimum requirements; it is not intended to relieve the Vendor of responsibility for the design of equipment in accordance with the latest applicable codes and standards.

.3 The intent of this Specification is to convey minimum requirements for complete, operable, safe, effective and approved equipment delivered to the Site ready for installation.

1.3 References

.1 ASTM International (ASTM):

.1 B117, Standard Practise for Operating Salt Spray (Fog) Apparatus.

.2 D117, Standard Guide for Sampling, Test Methods, and Specifications for Electrical Insulating Oils of Petroleum Origin.

.3 D4059, Standard Test Method for Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography (PCB).

.4 36, Standard Specification for Structural Steel.

.2 Canadian Standards Association (CSA):

.1 C2.1, Single-Phase and Three-Phase Liquid-Filled Distribution Transformers.

.2 CAN3-C235, Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

.3 C22.1, Canadian Electrical Code Part I (CEC) as amended by provincial, territorial or municipal authority having jurisdiction. References to CEC elsewhere in this document shall include reference to such amendments.

.4 C22.2 No. 0, General Requirements – Canadian Electrical Code – Part II.

.5 C88, Power Transformers and Reactors.

.6 C802.1, Minimum Efficiency Values for Liquid-Filled Distribution Transformers.

.7 C802.3, Minimum efficiency values for Power Transformers.

.3 Electrical and Electronic Manufacturers' Association of Canada (EEMAC), now known as Electro-Federation Canada.

.4 International Electrotechnical Commission (IEC):

.1 60076-8, Power Transformers – Application Guide.

.2 60214-2, Standard for Tap-changers.

.5 Institute of Electrical and Electronics Engineers (IEEE):

.1 C57.12.00, Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.

.2 C57.12.36, Standard Requirements for Liquid-Immersed Distribution Substation Transformers.

.3 C57.12.70, Standard for Standard Terminal markings and Connections for Distribution and Power transformers.

.4 C57.12.90, Test Code for Liquid-Immersed Distribution, Power, And Regulating Transformers.

.5 C57.109, Guide for liquid immersed transformer through-fault current duration.

.6 C57.131, Standard Requirements for Tap Changers.

.6 Manitoba Workplace Safety and Health Act, and Regulations.

.7 Manitoba Energy Code for Buildings (MECB):

.1 Manitoba amendments to the National Energy Code of Canada for Buildings.

.8 National Electrical Manufacturers Association (NEMA):

.1 TRI, Transformers, Regulators and Reactors.

.9 National Electrical Testing Association (NETA):

.1 ATS – Acceptance Testing Specifications for Electrical Power Equipment and Systems.

.10 Winnipeg Electrical By-law (WEB):

.1 Winnipeg amendments to the Canadian Electrical Code (CEC).

.11 Winnipeg Building By-law (WBB):

.1 Winnipeg amendments to the National Building Code of Canada (NBC).

1.4 Warranty

.1 As a minimum, the Vendor shall include a warranty for twelve (12) months of operation or eighteen (18) months after arrival on Site, whichever is less. The Vendor shall state their standard warranty for the Transformer specified.

.2 Vendor shall extend the warranty to three (3) years.

1.5 Submittals

.1 Provide submittals in accordance with Division 1 and Division 26.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, and limitations.

.3 Submit Shop Drawings giving equipment dimensions, centre of gravity points, anchoring information, total weight, ratings of the transformer, switches, fuses, and breakers. Provide data on pressure-relief valves, oil sampling valves (drain, tap, sample), pressure/vacuum gauge, pressure/vacuum regulation, level gauge, liquid temperature indicator, and separable connectors. Shop Drawings shall also indicate:

.1 Anchoring method and dimensioned foundation template.

.2 Dimensioned cable entry locations.

.3 Dimensioned cable termination and pothead height.

.4 General arrangement drawings and outline dimensions.

.5 Electrical and instrumentation diagrams.

.6 Complete bill of materials listing the scope of supply.

.7 Identified internal and external component layout on assembly drawing.

.8 Primary and secondary fuse make, model, size and time-current characteristics.

.9 Insulating liquid capacity.

.10 Insulating liquid materials.

.4 Provide recommended spare parts and prices.

.5 Provide estimated losses at no load, 50% load and full load in either Watts per hour (preferred), or BTUs per hour.

.6 Include Quality Assurance Submittals:

.1 Manufacturing and quality assurance procedures.

.2 Engineering, manufacturing and quality assurance milestone schedule.

.3 Factory Tests: Furnish manufacturer's certified standard test reports for the transformer ratings shown in the Drawings and for the tests specified herein.

.4 Instruction Manuals: Furnish manufacturer's installation and maintenance manuals on the transformers and accessories.

.7 Closeout Submittals:

.1 Provide operation and maintenance data for transformers for incorporation into manual specified in Division 1.

.2 Include insulating liquid maintenance data.

.3 Submit to the Contract Administrator standard factory test certificates of each transformer and type test of each transformer with high voltage accessories in accordance with CSA, manufacturer standard tests, and onsite testing/commission in accordance with Division 26. Include test results and documents in the O&M Manuals.

1.6 Quality Assurance

.1 Manufacturer Qualifications: Single source manufacturer regularly engaged in manufacturing transformers complying with requirements of these Specifications and experienced with at least five (5) projects of similar size and scope.

.2 Product Selection for Restricted Space: Drawings indicate size, profiles, and dimensions for transformer equipment including clearances between transformers and adjacent surfaces and items, and are based on manufacturer’s preliminary information.

.3 Regulatory Requirements:

.1 Components and installation shall comply with CSA.

.4 IEEE Compliance: Comply with applicable requirements of IEEE standards, including IEEE C2.1.

1.7 Delivery, Storage and Handling

.1 Coordinate delivery of transformers to allow movement into designated space.

.2 Handle transformers components in accordance with manufacturer’s instructions. Use factory installed lifting provisions.

.3 All radiator valves are to be properly gasketed and sealed off prior to shipment to ensure no loss of oil or moisture infiltration.

.4 Radiators are to be removed from transformer, properly packaged, sealed from atmospheric elements and shipped separately from the transformer.

.5 One (1) set of gaskets/O-rings shall be supplied with the transformer to replace bushing and radiator shipping seals.

.6 Transformer is to be shipped via an air-ride trailer. A suitable impact recorder that measures impacts in the X, Y and Z direction is to be installed on the transformer prior to shipping. This impact recorder is to be inspected prior to offloading of the transformer at its final destination.

.7 Complete installation instructions for any parts shipped separate from transformers shall accompany transformer shipment.

.8 Material safety data sheet(s) (MSDS's) for equipment shall be provided to shipper at time of shipping.

.1 MSDS's shall conform to all relevant regulations where equipment will be located.

.2 If any chemical so shipped is exempt from such laws, a statement to that effect shall be included on MSDS.

.3 MSDS's shall be provided to the City a minimum of two (2) weeks before shipment to allow for entrance to customer site.

.4 Oil shall be non-PCB.

1.8 Maintenance

.1 Provide maintenance materials for incorporation into O&M manuals in accordance with Division 1.

.2 Extra Materials:

.1 Furnish extra materials matching products installed as described below, packaged with protective covering for storage, and identified with labels clearly describing contents.

.2 Touch-Up Paint: 3 half-pint (240 mL) containers of paint matching enclosure exterior finish.

.3 Contact Lubricant: 1 container.

2. PRODUCTS

2.1 Acceptable Manufacturers

.1 Partner Technologies Incorporated (PTI).

.2 Eaton (Cooper Power Systems).

.3 Approved Equal.

2.2 Transformer Type

.1 Liquid cooled, outdoor, substation transformer type, KNAN.

.2 The transformer shall include additional accessories to form a complete factory assembled, self contained, steel fabricated unit for mounting on an existing concrete pad. Dimensions shall not exceed those indicated.

2.3 Supply Characteristics

.1 600 V Secondary:

.1 Each transformer shall have the following characteristics:

.1 Primary (HV)voltage: 4160 V, 60 Hz, delta connected, three-phase, three-wire.

.2 Secondary (LV) voltage: 600 V, grounded wye, three-phase, four-wire with neutral connected to ground. Low voltage neutral shall be a fully insulated X0 bushing with ground strap. Downstream LV MCC is three-phase, three-wire.

.3 Capacity: 1000 kVA, KNAN.

.2 480 V Secondary:

.1 Each transformer shall have the following characteristics:

.1 Primary (HV)voltage: 4160 V, 60 Hz, delta connected, three-phase, three-wire.

.2 Secondary (LV) voltage: 480 V, grounded wye, three-phase, four-wire with neutral conductor grounded. Low voltage neutral shall be a fully insulated X0 bushing with ground strap. Downstream LV MCC is three-phase, four-wire.

.3 K-Factor of K-4 to a harmonics of UV disinfection system.

.4 Capacity: 1000 kVA, KNAN.

2.4 Design Requirements

.1 The Transformer shall be designed and manufactured in accordance with the Vendor's standard and shall meet the applicable industrial standards. All transformers shall be by the same equipment vendor – no split packages are allowed.

.2 The Transformer shall be designed for outdoor use and for continuous operation, twenty-four (24) hours per day, 365 days per year.

.3 The Transformer shall be an oil filled, substation type, complete with cable compartments, options and accessories to form complete factory assembled, self contained, steel fabricated unit for mounting on a concrete pad.

.1 Type: KNAN (Oil with flash point greater than 300°C, oil natural, air natural), with provision for future fans (KNAF):

.1 Provision for future cooling equipment shall mean that all necessary terminal blocks, control panels, and fan wiring will be supplied at the time of transformer purchase. The only equipment accessories required at a later date will be the fans and their mounting brackets.

.2 The provision shall assume one external 208V three-phase 60 Hz power supply to the control cabinet of the transformer. The supply will be used to operate cooling

fans (when provided), auxiliary 208-120V control transformer, and controls section heater (if required).

.3 Oil type: Ester Dielectric (Environtemp FR3), PCB free, suitable for -40°C conditions.

.4 Refer to other Transformer requirements as provided further in this Specification and in the Drawings.

2.5 Transformer Characteristics

.1 The provided Ratings called out here are specific to the project or application, ratings not specifically called out here need to conform to industry recognized and standard specific requirements. Refer to other parts of this Specification for additional requirements.

.2 Basic Impulse Level (BIL):

.1 Primary Side BIL: 60 kV (minimum).

.2 Secondary Side BIL: 30 kV (minimum).

.3 Bushings:

.1 The type and design of the bushing is coordinated with the impulse level of the transformer to form an integrated insulation system. Transformers shall be shipped with the bushings mounted in place.

.4 The transformer shall be designed and constructed to be completely self-protected by its ability to withstand the external short-circuits, as defined and tested in accordance with CSA C88.

.1 Maximum rms short-circuit: 25 kA, on the primary side.

.2 Transformer shall withstand thermally and mechanically two second (or greater) short circuit at its secondary terminals.

.5 Minimum %Z Impedance:

.1 The minimum impedance (%Z) shall be based on the self-cooled rating of the transformer. The typical desired %Z has been provided below, and not more then 1.5% above minimum levels.

kVA	% Z
150 and smaller	2.0
225	3.5
300	4.0
500	4.0
750 and larger	5.75

.6 Losses:

.1 The no-load loss and exciting current for an individual three-phase transformer shall not exceed the guaranteed value by more than 7.5%.

2.6 Transformer Manufacture

.1 Transformer: Unit shall be dead front, 3-phase, two winding, 60 Hz, 65°C (117°F) rise above a 40°C (104°F) ambient, self-cooled, the windings shall be copper.

.1 The high potential (HP) winding of a three-phase transformer shall be delta-connected and the low potential (LP) winding shall be wye-connected with angular displacement of 30 degrees (Vector group Dyn1) in accordance with CSA Standard CSA C88.

.2 Core: Cold rolled grain-oriented steel lamination.

.2 Grounding:

.1 Tinned Copper grounding bus sized for the transformation, mounted on insulators rated for the system voltages. Separate Ground bus in HV & LV compartments.

.2 Provisions for connection for a minimum of six (6) ground cables to accommodate cable sizes as per the Drawings. Provisions shall be provided for additional 20% grounding connections.

.3 2-hole long barrel copper crimp connector type.

.4 Transformer shall be provided with stainless steel grounding pads at two diagonally opposite ends.

.3 Primary Compartment: Provide the following equipment as a minimum:

.1 Dead-front construction. Air terminal connection box configured to allow cable entry from bottom. Suitable clearance between concrete pad and bottom of connection box to allow cable entry with cable run in cable tray secured to concrete surface.

.2 Bushings: Separable insulated (dead front) connectors for power distribution systems above 600 V shall conform to IEEE 386. Bushing well connectors with bushing well inserts to shall also conform to IEEE 386.

.1 Medium-voltage bushing inserts and bushings for separable loadbreak elbow connectors, amperes continuous. Provide a parking stand for each elbow connector. Equip connector with steel-reinforced hook-stick eye, grounding eye, test point, and arc-quenching material.

.2 Shall be suitable for termination of conductors as indicated on the Drawings.

.3 Surge Protection Device (SPD) with 3-phase fuse box for primary side protection.

.1 Manufacturer: Magney Grande p/n MGFMV-40SB, or approved equal.

.4 Mechanical interlock to prevent access to primary compartment unless primary supply is isolated at source. Separate padlocking for primary compartment door.

.5 Tap Changer:

.1 External tap changing handle operable only when the transformer is de-energized.

.2 Fitted with a manually operated de-energized off-load-tap-changer on the primary winding, with four (4) taps at 2.5%, two (2) FCAN and two (2) FCBN, externally operated and equipped with a pad-lockable handle capable of pad-locking in each tap position.

.3 The tap changer shall be capable of carrying the full transformer short-circuit current without damage or contact separation.

.4 The tap changer shall be gang operated from a single operating point and shall have an easily visible position indicator.

.5 Tap changer shall be functional at minus (-) 40˚C ambient.

.4 Low-Voltage Compartment: Provide the following equipment as a minimum:

.1 Dead-front construction. Air terminal connection box configured to allow cable entry from bottom. Suitable clearance between concrete pad and bottom of connection box to allow cable entry with cable run in cable tray secured to concrete surface.

.2 Secondary low-voltage bushings with spade terminals designed for copper conductors. All customer connections shall be wired to terminal blocks and be clearly identified on the wiring diagrams.

.1 Minimum of NEMA 8-hole pad (copper) voltage terminals, suitable for a minimum of six (6) conductors per phase, size (6) conductors per neutral. Refer to the single line drawing for required cable connections.

.2 Low-voltage bushings shall be separable insulated connectors.

.3 All transformers shall have an insulated neutral X0 bushing with a removable ground strap accessible from the secondary cable compartment. X0 should not be connected to ground that is internal to the oil-filled transformer compartment.

.1 The wye point of the Low Potential (LP) winding shall be brought to a bushing for the connection to downstream MCC equipment as indicated.

.5 Accessories

.1 Infrared (IR) Scanning Windows in both the Primary and Secondary termination boxes. Windows to be suitable for scanning all connection points for both Primary and Secondary windings.

.2 A rapid pressure rise and gas accumulation relay. Provide two sets of pressure trip contacts, and one set of gas accumulation alarm contacts. Leads from the contacts shall be terminated in the transformer control cabinet.

.3 A dial type thermometer, equipped with four (4) separately adjustable contacts, two (2) sets of adjustable contacts between 60ºC and 100ºC for alarm, and the other two (2) sets of adjustable contacts between 100ºC and 125ºC for tripping, and with a scale legible from the ground. The temperature-sensitive element shall be installed in an oil-filled or close-fitting well, located in the hottest oil, as far as practicable.

.4 A dial type oil level indicator and relay to indicate oil level within the transformer. The indicator relay shall actuate on falling oil level at a point before the insulation system is compromised. Two (2) sets of relay contacts shall be provided.

.5 A winding temperature indicator and relay to indicate the hot-spot temperatures of the windings. Associated equipment, such as heating coils, thermometer bulb, heating well gauge and current transformer, shall be provided. The indicator relay shall be automatically reset at approximately 7.5ºC ±2.5ºC below the closing temperature and shall be provided with the following electrically independent, adjustable contacts:

.1 Two (2) sets to initiate a warning, setting to be adjustable between 60ºC and 110ºC to initiate cooling fans.

.2 Two (2) sets to initiate an alarm, setting to be adjustable between 60ºC and 110ºC.

.3 Two (2) sets to initiate tripping, setting to be adjustable between 100ºC and 125ºC.

.6 One 100-ohm platinum resistance type temperature detectors for the top oil temperature shall be provided on the transformer. Leads from the temperature detectors shall be terminated in the transformer control cabinet.

.7 Transformer control cabinet, NEMA 4X enclosure, housing DIN rail mounted terminal blocks for termination of CT secondaries, all alarm contacts, relay outputs, and RTDs. Provide heater, thermostat and disconnect switch to prevent condensation. Size the heater and disconnect switch to suit. Provide 120 V terminal blocks.

.8 Vacuum pressure gauge: dial size 95.25 mm (3.75”).

.9 Bottom drain valve with sampling device.

.10 Top filling and filter press connection.

.11 Transformer case grounding pad.

.6 Compliance:

.1 Transformer shall comply with the Energy Efficiency Standards for Distribution Transformers and CSA C802.1.

.2 The transformer shall be designed to meet the average sound-level specified in CSA C88 Table 8, and CSA C227.4 Table 5, in general dBA of approximately:

.1 Less then 750 kVA: 56 dBA.

.2 750 kVA through to 1000 kVA: 58 dBA.

.3 2500 kVA and above: 62 dBA.

.3 All steel welding shall conform to the requirements of CSA W59.

.7 Enclosures:

.1 All enclosures and sub-assemblies shall be weather-resistant for outdoor Canadian weather (-40C to +40C temperature swing), with lockable provisions, and tamper-proof. Isolate and interlock high- and low-voltage enclosure compartments, with separate hinged doors.

.2 Kirk Key Interlock between transformer door and upstream feeder breaker. Key is to be released via the upstream breaker rack-out mechanism.

.3 The minimum enclosure environmental ratings of CSA/NEMA/EEMAC 4.

.4 Enclosure base shall have a 4 mil (0.1 mm) thick tar-mastic undercoat.

.5 Doors shall be provided with pad-lockable three-point latch with penta-head bolts and shall include door stays to hold compartment doors in the 110˚ open position.

.6 Box type stiffeners shall be provided with drains to prevent accumulation of water or leaked insulating liquid.

.7 The transformer shall be fitted with four jacking steps, each capable of supporting one half the weight of the transformer when filled with oil. Each step shall have a minimum free surface area for the head of the jack of 160 mm x 200 mm. The distance from the base to the jacking points shall be at least 300 mm.

.8 Hauling eyes, or 50 mm diameter holes, shall be provided at the transformer base, in pairs, to permit the transformer to be moved in either direction along the major axis or the minor axis. Both eyes or holes of each pair shall be approximately equidistant from the center of gravity of the complete transformer.

.8 Equipment Identification, Signs, and Warnings:

.1 Provide equipment identification in accordance with Division 26.

.2 Install "DANGER--HIGH VOLTAGE--KEEP OUT" signs with tamper-proof stainless steel screws on each accessible side of pad-mounted transformers.

.3 Provide a warning nameplate located near the sampling valve “WARNING – EQUALIZE INTERNAL PRESSURE PRIOR TO TAKING SAMPLES”.

.4 Corrosion-resistant nameplate and connection diagram except that the number of gallons (litres) of coolant shall be shown.

.5 Provide additional labeling as required by the authority having jurisdiction (AHJ).

.9 Manufacturer Rating Plates:

.1 Provide metallic (stainless steel) CSA label on the outside of the transformer and on the inside of the transformer in the cable compartment.

.2 Transformer shall be furnished with a non-corrosive diagrammatic nameplate, permanently attached with non-corrosive hardware. The diagrammatic nameplate shall include the name of the manufacturer of the equipment as well as the location where the transformer was manufactured and tested.

.3 In addition to the main rating plate, plates with identification and characteristics of auxiliary equipment (bushings, tap changers, special cooling equipment etc.)

.4 The Load Tap Changer (LTC) shall also contain a tap changer nameplate, permanently attached to the LTC compartment.

.1 Includes impedances on extreme tap positions.

.2 Serial number, make and complete type designation of tap changers.

.3 A non-corrosive nameplate located next to the operating handle of the de-energized tap changer shall be provided which states the following: ‘Danger - Do not operate tap changer when the transformer is energized.”

.5 Includes notation of all standards used in its manufacturer, and the manufactured date.

.6 Non-linear devices, capacitors, resistors etc. as installed on the on the winding assembly or on any tap changer shall be indicated on the nameplate.

.7 The nameplate shall contain all connection and rating information in accordance with CSA C88 and CSA C227.4 including but not limited to the following:

.1 Phasor diagram for polyphase transformers including hour clock designation (Dyn11, Dyn1, etc.)

.2 MVA rating of the Transformer shall include existing and future MVA by cooling class. Provision for future includes Forced-cooling equipment.

.3 Voltage transformers, potential devices, current transformers, winding temperature, and other misc. devices when used shall be shown.

.4 All internal leads and terminals not permanently connected shall be identified with numbers or letters in a manner that permits convenient reference to prevent confusion with terminal and polarity markings.

.5 Contains no detectable level of PCB (less than 1 ppm) at the time of manufacture.

.6 Vacuum withstand capability of conservator and all oil circulating parts as appliable.

.7 Diagram showing the location of major valves (drain, filter etc.)

.8 Type of Oil.

.9 Sound Levels at all ratings (sound pressure or intensity).

.10 PCB content in oil (less than 1 ppm) at the time of first filling.

.8 Where applicable also show the following:

.1 Tie-in resistor including their rating and the manufacturer’s name.

.2 Type, make, and serial number of the LTC reactors.

.3 Current limiting reactors including their impedance values and the manufacturer's name.

.4 On nitrogen pressurized transformers minimum and maximum pressure setting of the regulator.

.5 Location of static cylinders when used (on the core, under LTC windings etc.)

.6 A statement that the voltages and currents marked are based on no-load and are not during the load.

.7 Zero sequence impedance.

.8 Make, serial number, voltage ratio and rating of series transformer and/or compensating transformer when used.

.9 Construction designation – core type or shell type. Core details – single, two, three, four, five or seven legged.

.10 Maximum current in common winding on autotransformers with loading and during the step-up operation.

.9 Rating plate shall indicate the transformer was built to CSA C2.1, is energy efficient per CSA-C802.1, and show markings suitable for use in Canada.

2.7 Factory Finish

.1 Provide with a factory-applied, corrosion-resistant finish which shall withstand 3,000 hours of exposure to the salt spray test specified in ASTM B117 without loss of paint or release of adhesion of paint primer coat to the metal surface in excess of 1/16 inch from the scribed test mark.

.2 Cut edges or otherwise damaged surfaces of galvanized steel shall be coated with a zinc-rich paint.

.3 Exterior Finish: Munsell 7GY3.29/1.5 Green.

2.8 Factory Test

.1 In addition to the production tests specified by CSA C88, perform the following factory tests:

.1 Test methods shall be in accordance with IEEE C57.12.90, and IEEE C57.12.00 Section 8.1.

.1 An impulse test shall be carried out on each terminal of every transformer. The tests shall be based on 100% of BIL and shall be carried out in the sequence given in CSA C88. Low potential windings rated less than 1.5 KV class need not be impulse tested.

.1 ANSI reduced full wave, chopped wave impulse test with oscillograph record.

.2 ANSI full wave impulse test, observed by oscilloscope.

.2 Load loss and impedance shall be measured at full load for every transformer.

.3 The core insulation shall be tested at 5000 V. The minimum insulation resistance shall be 100 M-ohms in each of the following tests:

.1 Before final assembly of coils, for each core or core section to:

.1 All others core sections.

.2 Each core bolt and ground.

.3 Ground.

.4 Perform the following tests/checks in accordance with CSA C2:

.1 Leak detection test at 50 kPA for a 24 hour period.

.2 Ratio test on all tap connections within 0.5% tolerance.

.3 Polarity Tested: Three phase, Angular displacement.

.4 Operation tests on all devices.

.5 Applied Voltage (60 Hz):

.1 HV to LV and Grd at 19kV for 1 minute.

.2 LV to HV and Grd at 10kV for 1 minute.

.6 Induce Potential at: 2 times 647V at 400 Hz for 18 seconds.

.5 Partial discharges shall be measured on one transformer of each type during the induced potential test.

.6 Complete ANSI temperature tests.

.7 A certified test report shall be submitted and shall contain the test data for each transformer serial number manufactured. The certified test report shall as a minimum contain the data as specified in ANSI C57.12.90.

.2 Transformer shall comply to CSA C2.1 and come factory certified with markings suitable for use in Canada. Factory install external CSA transformer nameplates, stainless steel, engraved. Affixed using rivets.

2.9 Equipment Identification

.1 Provide metallic (stainless steel) CSA label on the outside of the transformer and on the inside of the transformer in the cable compartment.

.2 Provide size 11, hard plastic equipment identification lamacoid on the outside of the transformer, example as follows:

XFMR-Y701 10 00 kVA, 4.16 kV – 12.47 kV, 3Ø, 4W FED FROM CS-Y701

2.10 Warning Signs

.1 Provide warning signs in accordance with in accordance with the requirements of the CEC.

.2 Provide high voltage warning signs in accordance with AHJ requirements.

3. EXECUTION

3.1 Installation

.1 Installation in accordance with Division 1.

.2 Installation shall be by Construction Contractor in accordance with Manufacturer recommendations, under separate contract, and is not included within the scope of equipment supply.

.3 The equipment will be installed by the Construction Contractor adjacent to the UV building at separate time periods so that the existing UV system can be maintained. The Supplier's Representative shall assist in each installation period. It is currently anticipated that equipment installation (one (1) of each transformer type) will be separated by several months.

3.2 Grounding

.1 Pad-mounted transformer shall have all noncurrent-carrying metal parts connected to a solid earth ground electrode.

.2 The transformer shall be supplied with two diagonally opposite stainless steel ground pads, one of which shall be fitted with a connector suitable for securely clamping 4/0 AWG copper cable.

.3 The transformer shall be equipped with four (4) grounding ball studs complete with covers. One ball stud shall be installed on the base exterior directly bolted to transformer ground bus. In addition, one ball stud shall be bolted to each secondary phase bushings/bus.

.4 Provide Bonding of the fencing/bollards surrounding the transformer installation.

3.3 Field Tests and Quality Control

.1 Perform tests in accordance with Division 1.

.2 The Supplier's Representative shall conduct all necessary checks to the equipment, including but not limited to:

.1 Check factory made connections of transformer unit for mechanical security and electrical continuity.

.2 Check transformer insulating liquid for correct quantity/level and specification according to manufacturer's instructions.

.1 Check oil level and temperature indicators.

.2 Inspect for oil leaks and excessive rusting.

.3 Confirm that the neutral X0 terminal is insulated and not internally grounded.

.4 Perform field tests in accordance with NETA ATS Part 7.2.2.

.1 Carry out following insulation tests using megger with 20,000 megohm scale and resulting insulation resistance corrected to base of 20°C.

.1 High voltage to ground with secondary grounded for duration of test.

.2 Low voltage to ground with primary grounded for duration of test.

.3 High to low voltage.

.2 Complete turn to turn ration tests for all tap changer positions.

.3 Inspect primary and secondary connections for tightness and for signs of overheating.

.4 Inspect and clean bushings and insulators.

.5 Check fuses for correctness of type and size.

.6 Check for grounding and neutral continuity between primary and secondary circuits of transformer.

.7 Set transformer taps to rated voltage as specified.

.1 Adjusting: Adjust primary taps so secondary voltage is above, and within 2% of rated voltage.

.8 After the installation has been completed, conduct an operating test demonstrating that all equipment devices operate in accordance with the requirements of the Drawings and specifications.

.9 Operating Test: Energize the transformer and adjust the output voltage to the specified value. Further readjust tap settings, if necessary, after the facility being served is in normal operation.

.10 Have transformer oil sample taken once transformer has been energized and conduct Oil and Gas analysis on sample.

.11 Have a second sample taken after three (3) months operation and conduct Oil and Gas analysis on sample. Test facility will produce a report comparing the results of both tests.

.12 Submit to the Contract Administrator the standard factory test certificates of each transformer and type test of each transformer with high voltage accessories in accordance with CSA C2.

.13 Prior to end of Transformer warranty period the Contractor will again take an oil sample and conduct Oil and Gas analysis on sample. Test facility will produce a report comparing the results of all three (3) tests.

3.4 Closeout Activities

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Provide operation and maintenance data for pad mounted distribution transformers for incorporation into manual specified in Division 1.

.3 Include insulating liquid maintenance data.

END OF SECTION