Township of Edwardsburgh Cardinal
Cardinal WTP UV Replacement
Contract No. 2025-7806

Submission Deadline:

2:00 pm Tuesday, April 8th, 2025

THE GREER GALLOWAY GROUP INC., a division of Jp2g Consultants Inc.
CONSULTING ENGINEERS
1620 Wallbridge-Loyalist Road,
R.R#5, Belleville, On, K8N 4Z5
Tel. (613) 966-3068
Fax. (613) 966-3087

Township of Edwardsburgh Cardinal
18 Centre St. PO Box 129
Spencerville, ON
K0E 1X0

THE TENDER – CARDINAL WTP UV REPLACEMENT

Tender Requirements

Tenders for Contract **2025-7806** for the **Cardinal WTP UV Replacement** project, for the Township of Edwardsburgh/Cardinal, **will be received until 2:00 pm, Tuesday, April 8th, 2025.**

1. Tenders shall be enclosed in a sealed envelope plainly marked "Tender for Contract No. 2025-7806" and delivered to the offices of:

   Township of Edwardsburgh/Cardinal
   18 Centre St.
   P.O. Box 129
   Spencerville, Ontario
   K0E 1X0

2. When the contract agreement is signed, the successful bidder must furnish:

   - Proof of a WSIB Clearance Certificate;
   - Schedule of work;
   - Contractor's Health and Safety Policy;
   - Ministry of Labor "Notice of Project";
   - Ministry of Labor "Registration of Constructors and Employees Engaged in Construction";
   - MSDS for any WHMIS controlled products;
   - Proof of $5,000,000 General Commercial Liability Insurance. The Township of Edwardsburgh Cardinal must be shown as additional insured on the policy, including a cross-liability provision in favour of the Township of Edwardsburgh Cardinal
   - Proof of $5,000,000 Automobile/Equipment Insurance. The Township of Edwardsburgh Cardinal must be shown as additional insured on the policy, including a cross-liability provision in favour of the Township of Edwardsburgh Cardinal. The certificate of insurance must provide for 30 days written notice to the Township of Edwardsburgh Cardinal of any intent to cancel the Insurance Policy;
   - A Performance Bond for 50% of the Tender;
   - A Materials and Labour bond for 50% of the Tender;

3. Tenders shall be submitted on the Tender Form supplied herein and must be properly signed and witnessed or signed and sealed if the bidder is a Corporation.

4. All entries in the Tender shall be clear and legible and made in ink. All items shall be tendered according to any instructions in the Tender Documents and with entries made for unit price, lump sum, extensions and totals as appropriate.

5. Alterations may be made providing they are legible and initialed by the tenderer's signing officer. Tenders which are incomplete, unbalanced, conditional or obscure, or which contain erasures or alterations not properly initialed, or irregularities of any kind, may be rejected as informal or void.

6. When copies of the executed contract are returned and found acceptable, the deposit cheques of the successful bidder and the second low bidder shall be returned. Following the opening of tenders, all deposit cheques other than the low and second low bidders shall be returned to the applicable bidders by registered mail.

7. Should a bidder find discrepancies in, or omissions from the drawings or Contract Documents, he/she should immediately notify the Engineer who may send a written instruction to all bidders. In this case, the bidder will list and attach any addenda that were considered when the tender was prepared.

8. The contractor shall include all incidental items he deems necessary to complete the scope of work, regardless of whether items are clearly outlined or not. The contractor must satisfy himself that he has included all components in order to complete the contract in its entirety. No additional compensation will be made for the contractor's omission of incidental items required to complete the contract.

9. No oral interpretations shall be effective to modify any of the provisions of the Contract Documents. All requests for interpretations shall be made in writing to the Engineer.

10. The Owner expects that all tenderers will be able to furnish satisfactory evidence that they have the ability, experience, capital and plant to enable them to prosecute and complete the contract successfully. Contractors must be authorized to do business in the Dominion of Canada and the Province of Ontario.

11. In order to aid the Owner in determining the responsibility of each tenderer, the tenderer shall complete the following statement sheets, which are bound herein.

    Statement "A" — Stating the tenderer's experience in similar work which he/she has successfully completed.

    Statement "B" — Giving the name and address of each proposed Sub-Contractor used in making up his/her tender and shall state the portion of the work allotted to each. Only one Sub-Contractor shall be named for each part of the work to be sublet.

    After the tender has been accepted by the Owner, the Contractor shall not be allowed to substitute other Sub-Contractors in place of those named in his/her tender without written approval from the Engineer, in accordance with Section G.C. 3.10 of the General Conditions.

12. TENDERS will be deemed complete if they include:
    a) A completed **Letter of Intent**;

    b) A completed and executed **Form of Tender**;

    c) A completed **Schedule of Items and Prices**;

    d) A completed **Statement "A";**

    e) A completed **Statement "B";**

    f) Signed copies of any **Addenda** that have been issued.

Letter of Intent

To: Township of Edwardsburgh Cardinal

Re: Contract No. 2025-7806

In general, this project includes the construction of the Cardinal WTP UV Replacement.

The undersigned has carefully examined the plans, specifications and location of the work described herein and is fully informed as to the nature of the work and the conditions related to its performance and understands that the quantities shown are approximate only and are subject to either increase or decrease.

The undersigned hereby proposes to furnish all necessary machinery, tools, apparatus, and other means of construction to do all the work, furnish all materials, except as otherwise specified, and for the unit prices named in the itemized list, to complete the work herein described in strict accordance with the contract documents, therefore, and in conformity with the requirements of the specifications and supplemented specifications as may be provided by the Owner for the performance of this Work.

Submitted by:

_____

Name of firm or individual
(Hereinafter referred to as the "Tenderer")

_____

Address

_____

Name of person signing for the Tenderer

_____

Title of person signing for the Tenderer

(To be returned as part of the Bid Submission)

Form of Tender

This Tender is submitted by:

_____
FIRM NAME

_____
ADDRESS

_____
PHONE NUMBER

_____
FAX NUMBER

To the Township of Edwardsburgh Cardinal:

1. I/We, the undersigned declare that no person, firm or corporation other than the one who's signature or the signature of whose proper officers and seal is or are attached below, has any interest in this tender or in the Contract proposed to be undertaken.

2. I/We further declare that this tender is made without any connection, knowledge, comparison of figures or arrangements with any other company, firm or person making a tender for the same work and is in all respects fair and without collusion or fraud.

3. I/We further declare that no member of the Township of Edwardsburgh Cardinal or any other Officer of the Township is or will become interested directly, or indirectly, as a Contractor in the performance of the Contract, or in the supplies, work or business to which it relates or in any portion of the profits thereof, or of any such supplies to be used therein or in any of the monies to be derived there from.

4. I/We further declare that the several matters stated in the said tender are in all respects true.

5. I/We further declare that I/We have carefully examined the locality and site of the proposed works, and having read, understood and accepted the Provisions, Specifications, Conditions, Form of Tender, Tender Requirements, Contract Agreement attached hereto, each and all of which forms part of this Tender, hereby offer to furnish all machinery, tools, labour, apparatus, plant and other means of construction; all materials, except as otherwise stated in the Contract; including in every case freight, duty, exchange and federal and provincial sales tax in effect on the date of the acceptance of the tender, and to complete the work in strict accordance with the Provisions, Specifications, and Conditions hereto attached for the sums calculated in accordance with the actual measured quantities and unit prices set forth in the tender herein as follows.

6. I/We agree that this offer is to continue open to acceptance until the formal Contract is executed by the successful tenderer for the said work or until 45 calendar days after the said opening, whichever event first occurs; and that the Corporation may, at any time within that period, without notice, accept this tender whether any other tender has been previously accepted or not.

7. I/We agree that if I/We withdraw this tender before the Council of the said Corporation shall have considered the tenders and awarded the Contract, the amount of the deposit accompanying this tender shall be forfeited to the Corporation.

8. I/We agree that the awarding of the Contract based on this tender by the Council of the Corporation shall be an acceptance of this tender.

9. I/We hereby agree that the Owner may reject any or all tenders without explanation and the lowest tender will not necessarily be accepted.

10. I/We hereby agree that the work specified in the contract will be performed in accordance with the Special Provisions, Plans, Standard Specifications and General Conditions.

11. I/WE hereby agree that notification of acceptance of this Tender shall be in writing, and may be sent by prepaid post, and if sent by prepaid post, acceptance shall be deemed to have been made on the date of the mailing of such notification.

_____ _____

Witness Signature of Contractor

Dated this_____day of _____, 2025.

(To be returned as part of the Bid Submission)

Schedule of Items & Prices

The Contractor hereby offers to complete the work specified for Contract **2025-7806** for the following unit prices:

HST Registration Number: _____

Item Spec. #	OPSS No.	Description	Unit	Quantity	Unit Price	Total Amount
1.		Mobilization and Demobilization	LS	1		
2.	OPSS.MUNI.100	Insurance and Bonding	LS	1		
3.		Maintenance Manuals and Record Drawings	LS	1		
4.		Removal and Disposal of Existing UV Disinfection System	LS	1		
5.		Supply and Installation of New UV Disinfection System	LS	1		
6.		Supply and Installation of Instrumentation and Controls	LS	1		
7.		Mechanical General Work	LS	1		
8.		Electrical General Work	LS	1		
9.		Contingencies	LS	1	$10,000	$10,000
					Sub-Total	

(To be returned as part of the Bid Submission)

Statement "A": Reference Information

Bidders are required to provide three (3) references listing contracts similar to the project described in this tender and undertaken within the past three (3) years.

1) NAME (Company/Government Agency) _____

Contract Description _____

Contact Person _____

Phone Number: ( ) _____ Fax Number: ( ) _____

E-Mail Address (if available): _____

Value of Contract: $ _____

2) NAME (Company/Government Agency) _____

Contract Description _____

Contact Person _____

Phone Number: ( ) _____Fax Number: ( ) _____

E-Mail Address (if available): _____

Value of Contract: $ _____

3) NAME (Company/Government Agency) _____

Contract Description _____

Contact Person _____

Phone Number: ( ) _____Fax Number: ( ) _____

E-Mail Address (if available): _____

Value of Contract: $ _____

The Owner reserves the right to check additional references and sources to those supplied by the bidder.

_____ _____

Company/BIDDER Authorized Signature

(To be returned as part of the Bid Submission)

Statement "B": List of Proposed Subcontractors

The Tenderer shall list hereunder the names of all Subcontractors and material suppliers proposed to be used.

SUBCONTRACTOR	ADDRESS	TRADE	APPROXIMATE VALUE OF SUB-LET WORK

It is understood by the Tenderer that the above list of Subcontractors is complete and that no additions to this list will be permitted after Closing Date of Tenders, without the written approval of the Engineers.

(To be returned as part of the Bid Submission)

Agreement to Bond

We, the undersigned, hereby agree to become bound as Surety for

_____

_____

in a bond totaling Fifty Per Cent (50%) of the Contract amount and conforming to the Instruments of the Contract attached hereto, for the full and due performance of the works shown as described herein if the Tender for Contract No. 2025-7806 for the Cardinal WTP UV Replacement Project in the Township of Edwardsburgh Cardinal is accepted by the Owner.

It is a condition of this Agreement that if the above-mentioned Tender is accepted, application for a Performance Bond must be completed with the undersigned within ten (10) days of acceptance of the tender related thereto, otherwise this Agreement shall be null and void.

Dated this _____ day of _____, 2025

_____
Name of Bonding Company

_____
Signature of Authorized Person
Signing for Bonding Agency

_____
Position

(To be returned – or equivalent - as part of the Bid Submission)

Performance Bond

Bond No. _____ Amount _____Contract No._____

Know All By These Presents, that I/we _____
(The Contractor)

Hereinafter called the "Principal", and _____
(The Bonding Company)

Hereinafter called the "Surety", are jointly and severally held and firmly bound unto _____

Hereinafter called the "Oblige", in the sum of _____
(In words)

_____ (dollars $)_____

of lawful money of Canada, to be paid to the said oblige or to its successors or assigns, for which payment well and truly be made, we, the Principal and Surety, jointly and severally bind ourselves, our and each of our several and respected heirs, executors, administrators and successors and assigns by these presents.

SEALED with our several and respective seals this _____Day of _____ 2025.

WHEREAS the Principal and the Surety to the oblige are subject to the Construction Lien Act 1983 (updated 2021) and the regulations hereinafter called the "Act".

And whereas by an agreement in writing dated the _____ Day of_____ 2025.

The Principal has entered into a contract with the oblige, hereinafter call "The Contract" for the construction, alteration, repair or maintenance of a public work, namely;

_____
(Description of Work)

_____

_____

_____

As in the Contract provided, which contract is by reference herein made a part thereof as fully to all intents and purposes as though recited herein.

Now Therefore the Condition of this Obligation is such, that if the Principal shall well, truly, and faithfully in all respects, perform, execute and carry out the Contract, and all the terms and conditions thereof to the satisfaction of the said Oblige and shall maintain and keep in good working order and complete repair the whole of the work performed under the Contract, including any extra work which may be ordered pursuant thereto, for the period in the Contract mentioned, and shall then forthwith hand over the same to the Oblige completed and in perfect order and repair, as in the Contract provided, and shall at all times indemnify and keep indemnified the Oblige and all the Officers, servants and agents thereof from all loss, damage, expense, suits, claims, liens and demands arising out of the Contract or incurred by reason of the execution of the said work, or the supply of material therefore, according to the terms of the Contract, then this obligation shall be null and void, but otherwise shall be and remain in full force and virtue.

AND it is hereby declared and agreed that the above bonded Surety shall be liable as Principal and nothing of any kind or matter whatsoever, that will not discharge the said Principal, shall operate as a discharge or release of liability of Surety to the contrary notwithstanding, and that this obligation may be signed before or after the signing of the Contract and shall be all binding by all signing this obligation whether separately, singly or jointly, and whether or not all mentioned herein sign or do not sign, and notwithstanding that the work herein mentioned shall have been begun or been completed, and whether the said Contract or this obligation shall have been legally or properly signed by any other party hereto.

SIGNED, SEALED AND DELIVERED
BY THE SURETY
IN THE PRESENCE OF

_____ _____
Witness signs here Principal signs here with seal where applicable

SIGNED, SEALED AND DELIVERED
BY THE SURETY
IN THE PRESENCE OF

_____ _____
Witness signs here Surety Company Officer signs here
With seal where applicable

(To be completed – or equivalent – by the <u>successful</u> Bidder only.)

Agreement

THIS AGREEMENT made in triplicate this the _____day of _____, 2025

BETWEEN: _____

Hereinafter called the "Contractor"

THE PARTY OF THE FIRST PART

-AND-

Township of Edwardsburgh Cardinal

Hereinafter called the "Owner"

THE PARTY OF THE SECOND PART

WITNESSETH, that the party of the first part, for and in consideration of the payment or payments specified in the Tender for this work, hereby agrees to furnish all necessary machinery, tools, equipment, supplies, labor and other means of construction and, to the satisfaction of the Engineer, to do all the work as described hereafter, furnish all the materials except as herein otherwise specified, and to complete such works in strict accordance with the plans, specifications and Tender herein, which are identified and acknowledged in the Schedule of Provisions, Plans, Specifications and Conditions attached to the Tender and all of which are to be read herewith and form part of this present Agreement as fully and completely to all intents and purposes as though all the stipulations hereof have been embodied herein.

DESCRIPTION OF THE WORK:

In general, this project includes the construction of the Cardinal WTP UV Replacement in Edwardsburgh/Cardinal, Ontario. This includes the Supply and Installation of two (2) replacement UV disinfection units, associated Mechanical and Electrical Upgrades, and associated SCADA integration upgrades.

The Contractor further agrees that he/she will deliver the whole of the works completed in accordance with this Agreement within the time stipulated in the Special Provision entitled "Liquidated Damages".

The Contractor agrees that any monies due to the Owner as a result of no completion of the works within the time stipulated may be deducted from any monies due the Contractor on any account whatsoever.

IN CONSIDERATION WHEREOF, said party of the second part agrees to pay to the Contractor for all work done, the unit prices on the Tender.

This agreement shall ensure to the benefit of and be binding upon the heirs, executors, administers and assigns of the parties hereto.

IN WITNESS THEREOF, the Contractor and the Owner have hereunto signed their names and set their seals on the day first above written, or caused their corporate seals to be affixed, attested by the signature of their proper officers, as the case may be.

_____

Signature of the Witness

_____

Signature of Contractor or Seal of the Corporation

_____

Signature of the Owner or Seal of the Corporation

(To be completed by the <u>successful</u> Bidder only.)

INFORMATION TO TENDERERS

Tender Submission

Tenders for this Contract will be received until **2:00 pm (local time) April 8th, 2025**.

Tenders shall be enclosed in a sealed envelope plainly marked "Tender for Contract No. 2025-7806 Cardinal Water Plant UV System Replacement Project" and delivered to the Offices of:

Township of Edwardsburgh Cardinal
18 Centre St.
P.O. Box 129
Spencerville, Ontario
K0E 1X0

The use of the mail or courier services for delivery of a tender will be at the risk of the bidder. The tender must come into the possession of the above-mentioned representative of the Owner before the deadline for submission or the tender will be returned to the bidder unopened.

Inquiries, Omissions, Discrepancies and Interpretations

All inquiries relative to the Tender Documents should be directed to:

The Greer Galloway Group
a division of Jp2g Consultants Inc.
1620 Wallbridge-Loyalist Road
Belleville, On, K8N 4Z5
Tel. (613) 966-3068
Fax. (613) 966-3087

Attention: Tony Guerrera, P.Eng.
Senior Project Manager

Should a tenderer find omissions from or discrepancies in any of the Tender Documents, or should the tenderer be in doubt as to the meaning of any part of such documents, the tenderer should notify the designated person and office without delay. If the designated person considers that a correction, explanation or interpretation is necessary or desirable, an addendum will be issued to all those who have taken out tender documents.

Although the Greer Galloway Group a division of Jp2g Consultants Inc. will make every reasonable effort to ensure that a bidder receives all addenda issued, it is the bidder's ultimate responsibility to ensure that all addenda have been received. The bidder will list and attach any addenda that were considered when the tender was prepared.

No oral explanation or interpretation will modify any of the requirements or provisions of the Tender Documents.

Award of the Contract

Tenders will be opened at a public tender opening meeting immediately following the deadline for submission.

The Owner will not be liable for any cost of preparation or presentation of tenders. All tenders and accompanying documents submitted by the bidder become the property of the Owner.

The Owner reserves the right to reject the tender of any bidder who does not furnish evidence of sufficient capital, plant, and experience to successfully execute the work in the specified time should such evidence be requested. The lowest or any tender may not be accepted.

The Owner may accept a tender in whole or in part, whether the total acquisition cost is the lowest or not and may reject any or all tenders. There shall be no requirement of this tender, implied or otherwise, that the tender representing the lowest total acquisition cost will be selected or preferred. The tender process is used as a means of evaluating a number of criteria. Bidders must submit their tenders in accordance with all items identified in this tender.

The Owner reserves the right to award by items, groups of items, parts of items or parts of groups of items, or all items of the tender, and to award contracts to one or more bidders; to accept or reject any tender in whole or in part; to waive irregularities and omissions in The Owner's sole and unfettered discretion, if in so doing, the best interest of Owner will be served. No liability shall accrue to the Owner for its decision in this regard.

The Owner reserves the right to reject any or all tenders or to accept any tender should it be deemed in their best interest to do so. The lowest or any tender will not necessarily be accepted. In making a decision as to which tenders to accept, The Owner reserves the right to consider, some or all of the following factors:

1. The general reputation of the Contractor;
2. any prior experience the Owner has had with the Contractor;
3. the financial status and strength of the Contractor;
4. the previous experience of the Contractor in this area;
5. any previous experience between the Contractor and other municipalities;
6. the proposed schedule of the Contractor;
7. the Owner's determination of the ability of the Contractor to deliver the work to quality and standards required and within the time frames and in the quantities; and
8. any other factors that the Owner believes reasonably impact on the Contract and the ability to complete the Contract to the full satisfaction of the Owner.

The Owner reserves the right to recall or cancel the tender when only one tender is received and there is a known multiple source potential.

All tenders shall be irrevocable for forty-five (45) days following the deadline for submission to allow sufficient time for evaluation of the tenders and for the investigation of the bidders.

Bidder Eligibility

Bidders must meet The Owner's requirements for experience. The owner will disqualify any bidder who cannot provide the following, when requested by the Owner:

i) proof that they have previously held and satisfactorily completed a contract of the size and type being proposed; or
ii) proof of employment in the type of service being proposed and written references as to their satisfactory performance; or
iii) adequately demonstrate that they have the ability to provide the necessary expertise and resources to satisfactorily complete the contract;
iv) evidence of sufficient general liability and up-to-date clearance issued by the W.S.I.B. (Workers Safety Insurance Board).

The Owner reserves the right to investigate and evaluate the experience, capability, registration and financial position of any bidder prior to an award of a contract. The Owner reserves the right to reject any bidder or tender based on the information obtained.

Disqualification of Tenders

Under no circumstances will Tenders be considered which are:

- Received after the advertised closing date and time for Tenders.
- Considered as being informal by Owner.

Tenders must be submitted in a sealed envelope.

Withdrawal or Qualifying of Tenders

A Contractor who has already submitted a Tender may submit a further Tender at any time before the official closing time. The last Tender received shall supersede and invalidate all Tenders previously submitted by that Contractor for this Contract.

A Contractor may withdraw or qualify his Tender at any time up to the official closing time by submitting a letter bearing his signature and seal as in his original Tender and addressed in the same manner on the original Tender. No telegrams, telephone calls or facsimiles will be considered.

Site Meeting

A mandatory site meeting will be held on, **Thursday, March 27th at 1:00 pm local time**. The site meeting will be held at the Cardinal WTP to allow bidders to review site conditions and access.

Tenderers to Investigate

The Contractor must satisfy themselves as to the local conditions to be met with during the construction and conduct of the work before submitting his Tender. He shall make his own estimate of the facilities and difficulties to be encountered including the nature of the subsurface materials and conditions. He is not to claim at any time after submission of his Tender that there was any misunderstanding of the terms and conditions of the Contract relating to site conditions.

The Tenderer shall carefully examine all contract documents so that the unit prices tendered are commensurate with the nature of the work.

Examination of Plans, Specifications, and Tender Documents

The Contractor shall carefully examine the plans, provisions, specifications and conditions described herein and accept the said plans, provisions, specifications and conditions for the prices set forth in this tender, and hereby offers to furnish all materials and to complete the work in strict accordance with the said plans, provisions, specifications and conditions.

The Contractor acknowledges that quantities shown in the tender documents and drawings are estimated only, and are subject to increase, decrease or deletion entirely by the Township of Edwardsburgh Cardinal, if found not to be required or if in excess of budgetary limitations.

Utilities

The location of utilities as shown on the contract drawings (if any) are approximate only and are not guaranteed by the Owner. It is the Tenderer's responsibility to contact the Utility Companies for further information in regard to these utilities and to exercise the necessary care in construction operations to take such precautions as are necessary to safeguard the utilities from damage. The costs of all damages to utilities, both overhead and underground, caused by the Tenderer will be the responsibility of the Tenderer. The Tenderer shall ensure that utility service is not disturbed during the course of construction, by reason of the construction.

Harmonized Sales Tax

Unit and/or lump sum prices shall not include Harmonized Sales Tax.

Guaranteed Maintenance Period

The guaranteed maintenance period shall be a period of one (1) year from the date of Substantial Performance in accordance with the General Conditions. During this period, the Contractor shall maintain all the work and correct at their expense any defects in the work as directed by the Engineer. Repairs as requested by the Engineer shall be undertaken within 24 hours of notice being given; otherwise, the Owner shall have such repairs carried out by others and charged against the Contractor.

Occupational Health and Safety Act

Bidders should note that where the provisions of the Occupational Health and Safety Act of Ontario and Regulations apply to the services to be provided under a contract resulting from this tender, and all the responsibilities and obligations imposed upon the "Contractor" under this Act must be assumed by the bidder. All costs of service/materials required to fulfil these obligations shall be included in the contract price quoted. Should the owner be aware of any violations of the Act and Regulations, a notification will be made to the appropriate authorities. Where so warranted, work could be suspended or terminated with no cost to the owner.

Variation of Quantities

The contract may be adjusted, by Owner or Engineer only, as required. No additional compensation will be allowed for any adjustment, which may increase or decrease tender quantities identified in the "Form of Tender", unless directed by Owner & Engineer. The Owner will not pay an increase or decrease in quantities

unless identified and approved before commencement. Any work, in excess of contract quantities, done without written approval may not be eligible for payment and will be at the sole discretion of the Owner & Engineer.

Idemnification

The Contractor shall save, keep harmless and indemnify the Owner from and against all actions, claims and demands that may be brought against the Owner and against all types of losses, liabilities, claims, costs, or expenses the Owner may incur resulting or arising from the Contractor's failure to exercise reasonable care, skill, or diligence in their performance of this contract.

The Contractor shall indemnify the Owner from any claims arising from unpaid accounts relating to this Contract.

Contract Cancellation

The Owner shall have the right to cancel any uncompleted or unperformed portion of the Contract. The Owner shall not be liable for loss of anticipated profit on the cancelled portion(s) of the Contract. If the Contractor fails or neglects to comply with any condition in this Contract, the Contract may be cancelled unconditionally by the Owner without notice.

SPECIAL PROVISIONS – GENERAL

Description of Work

The general intent of this project is to complete all work identified in this tender. In the event tender pricing is such that the entire scope of work cannot be completed the awarded work will be modified as necessary at the discretion of the Owner.

The principal focus of the project is:

The construction of the Cardinal WTP UV Replacement:

- Supply and Installation of two (2) replacement UV disinfection units
- Associated Mechanical and Electrical upgrades
- Associated SCADA integration upgrades

The Engineer shall have the right, at any time before or during the prosecution of work, or before or after the execution of the Contract, to make, or order in writing, any alterations or changes deleting, extending, increasing, decreasing, varying or otherwise altering any lines, grades, forms, dimensions, methods, plans or materials, omissions of any portion or portions of the work, variations in any other way the works contracted for, or to order any additional or extra work to be done or extra material to be furnished. The Contractor shall proceed with and carry out the work as directed and/or supply such materials as directed and shall do so without being entitled to any additional payment on account of any changes in work or materials except as otherwise provided. The Contractor shall proceed with work without delay and, if he is of the opinion he is entitled to additional compensation, shall make a written claim for additional compensation prior to completing the work. If, in the opinion of the Engineer, such order or change materially increases or decreases the cost of the work or material from that on which the Contractor based his bid, other than estimated quantities, the Engineer, in his sole discretion, may increase or decrease the Contract price by an amount or amounts he, in his sole discretion, considers appropriate. The Engineers decision shall be final.

Contractor to Investigate

It shall be the Contractor's responsibility to thoroughly inspect the site of the proposed works, determine the location of any buried or obstructing services and make satisfactory arrangements to remove any interference with such service with the proper jurisdictional authority.

Definition of Owner and Engineer

Wherever the word "Owner" or "Corporation", appears in this Contract, it shall be interpreted as meaning The Township of Edwardsburgh Cardinal.

Wherever the word "Engineer" or “Contract Administrator” appears it shall be deemed to mean The Greer Galloway Group a division of Jp2g Consultants Inc., as their interests may apply.

Governmental Requirements

The Contractor shall obey all Federal, Provincial and Municipal Laws, Acts, Ordinances, Regulations, Orders-in-Council and By-laws, which could in any way pertain to the work outlined in the Contract or to the Employees of the Contractor.

Notice to Contractors - Employment

The Contractor and any Sub-Contractor of the Contractor will, respective of the construction to be carried out under this contract,

1. Employ residents of Canada only, and
2. In employing persons, refrain from discriminating against any person by reason of his/her race, religious views or political affiliations.

Payment of Workers

The Contractor shall pay all non-skilled workers employed by him/her at the site of the work a wage that shall be the Ministry of Labor's current Fair Wage Scale for Roads and Structures.

In the event the Contractor assigns the performance of any of his/her obligations at the site of the work to a sub-contractor, then any such assignment of work to a sub-contractor shall contain a provision obligating the sub-contractor to abide by the provisions of the preceding paragraph with respect to non-skilled workers employed by him/her at the site of the work.

Environmental Considerations

It is intended that the works proposed be executed in a manner, which to the fullest possible extent minimizes any adverse effects on the cultural and natural environment of the project area. The environmental conditions of the contract stated herein must be complied with in all respects. It is the responsibility of the Contractor to ensure that all of his personnel be sufficiently instructed so that the work is carried out in a manner consistent with minimizing environmental impact.

The Contractor shall confine his operations within the limits of the project. All activities shall be confined to the areas requiring actual construction as per the project plans. If additional areas are required by the Contractor for storage, or for other construction purposes, the Contractor may obtain such additional area by agreement with the proprietor of the property, without additional cost to the Owner. The Contractor shall provide, to the Engineer, a certified copy of all agreements for the use of private property. The contractor shall pay for all rentals and costs of repairs, where necessary, in connection with the use of private property.

The entire site shall be restored to a state equal to or better than original conditions.

Field Layout

The contractor is responsible for all field layout including setting all existing horizontal and vertical alignment control prior to the start work.

Co-ordination of Meetings

The Contractor shall attend such meetings with Municipal and Utility Company Authorities as may be required by the Engineer to co-ordinate services affected by the Contract.

Insurance, Protection and Damage

Paragraph .01 of Subsection GC 6.03.02 - General Liability Insurance is deleted and replaced by the following;

.01 The Contractor shall take out and keep in force, until the date of acceptance of the entire work by the Owner, a comprehensive policy of public liability and property damage insurance, acceptable to the Owner, providing insurance coverage, in respect of any one accident to the limit of at least $5,000,000.00 exclusive of interest and cost, against loss or damage resulting from bodily injury to, or death of, one or more persons and loss of or damage to property. The policy shall name the Township of Edwardsburgh Cardinal and The Greer Galloway Group a division of Jp2g Consultants Inc., as additional insured there under and shall indemnify them and their representatives from and against all claims, demands, loss, costs, damage or injury including death to any person or persons and for damage to any property of Township of Edwardsburgh Cardinal or any other public or private property resulting from or arising out of any act or omission on the part of the Contractor or any of his servants or agents during the execution of the contract. The Contractor shall forward with the executed contract documents a certified copy of the policy or certificate thereof to the Owner before the work is started.

Property Owners Release of Pit and Waste Disposal Areas on Privately Owned or Municipally Owned Land Used by the Contractor

Where the Contractor uses privately owned or municipally owned lands for pits or waste disposal areas, the Contractor shall provide the Engineer with one copy of a release signed by or on behalf of the owner of each pit or waste disposal area used by the Contractor.

The Contractor is responsible for ensuring that the disposal of surplus material is carried out in an environmentally acceptable manner and to the satisfaction of the owner of the land upon which the material is disposed.

Prevention of Damage

The failure of the Engineer to order necessary precautionary measures, protective work or any other requirements shall not relieve the Contractor of the responsibility for the prevention of damage to the project, buildings, or other surface or sub-surface structures, or for accidents to persons, whether employed on the project or not, which might result from such failure to install, place or use such

precautionary measures, protective work or other requirements. Furthermore, the fact that the Engineer does or does not order precautionary measures, protective work or other requirements shall not relieve the Contractor from any of his/her responsibilities under this contract.

Protection of Adjacent Structures

The Contractor shall in the manner specified, sustain in their places and protect from injury all existing equipment and structures in the vicinity of the work. The contractor shall assume all costs and expenses for damage which may be caused by injury to any of them.

Restoration of Work Areas

Unless construction or restorations of all work areas are included in the contract under specific tender items, the Contractor shall restore all work areas to their previous condition to the satisfaction of the Engineer (i.e. Grass areas will be sodded, paved areas will be asphalted, etc.). No additional compensation will be allowed for this restoration.

Restoration of staging, material, equipment areas and areas disturbed beyond that which was specifically necessary to complete the work is required but will not be compensated.

Dust Suppression

Dust suppression is to be completed during construction to supress and control dust within the plant.

Location and Storage of Materials and Equipment

Materials shall not be stored within 4 m of the traveled portion of any roadway except in the medians (if any) where the minimum clearance required is 2.5 m. Equipment shall not be stored within 4 m of the traveled portion of any roadway or parked on private property unless prior written approval has been submitted to the Contract Administrator.

Notwithstanding the foregoing, the Contractor shall, at the Contractor's expense, remove any equipment or material, which, in the opinion of the Contract Administrator, constitutes a traffic hazard.

Delivery and Trucking

The Contractor shall plan and schedule the routes of vehicles transporting all materials to, from or within the job, so that vehicular movements are accomplished with minimum interference and interruptions to traffic in accordance with the restrictions on construction operations and the permitted time for closures. This will necessitate vehicles to "slip-off" or "slip-on" in the direction of traffic, in order to merge with and thereby avoid crossing traffic lanes.

The Contractor shall obtain the Contract Administrator's prior approval for the location of any "slip-off" or "slip-ons". The Contract Administrator reserves the right to alter, reject or close same as considered necessary. The Contractor shall notify suppliers of materials and equipment of the above requirements.

Metric and Imperial Systems of Measurement

Quantities and dimensions referenced in the Special Provisions, Specifications and General Conditions shall be converted from one system of measurement to the other as required in order to complete the work.

Where a conflict occurs between imperial and metric quantities or dimensions, the Contract Administrator shall determine the appropriate system of measurement to be used.

In the event that a weigh scale is not available in the required metric or imperial units as designated for material to be weighed on this Contract, then the quantities so weighed on the scale supplied, shall be converted to the designated units by the Contract Administrator, for payment purposes. One conversion only shall be made at the end of each day; on the basis that one metric tonne is equivalent to 1.102 imperial tons.

Where conversion from one system of measurement to the other is required the Metric Practice Guide, standard CSA Z234.1-00 shall apply.

Lines, Levels and Grades

Layout for the work on this contract shall be provided by the Contractor, in accordance with GC 3.05, GC 7.01, and the following:

The Contractor shall carefully lay out his work so that during its progress and at its completion, it shall conform to the lines and levels as shown on the plans and profiles and established by him in the field. The work shall be built in accordance with the contract drawings and directions given from time to time by the Engineer.

The Contractor shall provide a copy of grade sheets to the Engineer on a weekly basis for all work related to this contract.

The cost of layout performed by the Engineer because of errors in the Contractor’s layout or because of the Contractor’s inability to correctly perform the layout shall be charged to the Contractor at rates normally charged for such work by the Engineer. Charges incurred under this provision shall be withheld by the Owner from payments made to the Contractor, or otherwise collected by the Owner from the Contractor.

The Contractor shall provide to the Engineer, two copies of all calculated grade sheets, and grade set records for all phases of the work.

Spills Reporting

Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the MOE Spills Action Centre at 1-800-268-6060 and the Contract Administrator.

Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1980.

All spills or discharges of liquid, other than accumulated rainwater, from luminaries, internally illuminated signs, lamps, and liquid type that are a result of the Contractor's operations shall, unless otherwise indicated in the contract, be assumed to contain PCBs and shall forthwith be reported to the MOE Spills Action Centre at 1-800-268-6060 and the Contract Administrator.

This reporting will not relieve the Contractor of his/her legislated responsibilities regarding such spills or discharges.

Management and Disposal of Excess Materials

The Contractor will be responsible for all hauling and disposal of excess material to the satisfaction of the Contract Administrator and/or Municipal staff.

Payment for management and disposal of excess materials shall be included in related contract items.

Occupational Health and Safety – Confined Spaces

The Contractor's attention is specifically directed to Section 119 of the OH&S Regulations for Construction Projects regarding requirements for working in confined spaces. All maintenance holes, catch basins and structures must be checked for the presence of gases prior to removal of covers and/or entering them.

Should the Contractor not have the proper equipment for this procedure he/she may make arrangements, at his/her own expense, to have the testing performed by the Township.

Schedule of Work

Upon award of this Contract, the Contractor shall prepare a "Contractor's Schedule of Work". The "Contractor's Schedule of Work" will be itemized, outlining the items to be scheduled by the Contractor. The Contractor shall complete and remit this Schedule to the Owner with the Contractor's signed Contract Documents for execution by the Owner.

All work shall be completed prior to November 30th, 2025.

Liquidated Damages

Fixed Completion Date and Charges

1. **Time**

Time shall be the essence of this Contract.

2. Progress of the Work and Time for Completion

The Contractor shall establish and provide a schedule of work to the Contract Administrator at the pre-construction meeting.

Work on this Contract may commence after signing of the Contract agreement. The Contractor shall diligently prosecute his work on this Contract to ensure that all works are completed in a timely fashion.

If the time limit specified is not sufficient to permit completion of the Work by the Contractor working a normal number of hours each day, or week on a single daylight shift basis, it is expected that additional and/or augmented daylight and night shifts will be required throughout the life of the Contract to the extent deemed necessary by the Contractor to ensure that the Work will be completed within the time limit specified. Any additional costs occasioned by compliance with these provisions will be considered to be included in the prices bid for the various items of work and therefore no additional compensation will be allowed.

No weekend work, or work on statutory holidays will be permitted unless otherwise stipulated in the contract and approved by the Township or Owner. Extension of time allowed as per GC3.07, Extension of Contract Time, of OPS General Conditions of Contract, August 1990. Hours of work shall be from one hour after dawn until one hour before dusk unless prior written approval is received from the Contract Administrator.

3. Liquidated Damages

It is agreed by the parties to the Contract that in the case that all the work called for under the Contract is not completed within the dates included, a loss or damage will be sustained by the Owner. Since it is, and will be impracticable and extremely difficult to ascertain and determine the actual loss or damage which the Owner will suffer in the event of and by any reason of such delay, the parties hereto agree that the Contractor will pay to the Owner the sum of **$500** as liquidated damages for each and every calendar days delay in finishing the work in excess of the required completion dates prescribed herein. It is agreed that this amount is an estimate of the actual loss or damage to the Owner, which will accrue during the period in excess of the prescribed completion dates.

The Owner may deduct any amount under the above paragraph from any monies that may be due or payable to the contractor on any account whatsoever. The liquidated damages payable under this paragraph are in addition to, and without prejudice to, any other remedy, action or other alternative that may be available to the owner.

An application by the Contractor for an extension of time as herein provided shall be made to the Contract Administrator, in writing, at least fifteen days prior to the date of completion fixed by the contract.

Any extension of time that may be granted to the Contractor shall be so granted and accepted without prejudice to any rights of the Owner whatsoever under this contract. All such rights shall continue in full force and effect after the time limited in this contract for the completion of the work and whenever, in this contract, power and authority is given to the Owner or the Contract Administrator or any person to

take any action consequent upon the act, default, neglect, delay, non-observance or non-performance by the Contractor in respect of the work or contract, or any portion thereof. Such powers or authorities may be exercised from time to time, not only in the event of the happening of such contingencies before the time limited in this contract for the completion of the work, but also in the event of the same happening after the time so limited, in the cause of the Contractor being permitted to proceed with the execution of other work under an extension of time granted by the Contract Administrator.

Garbage/Recycling Pickup

If the occupation of a street by the Contractor prevents, in the opinion of the Contract Administrator, the Corporation's garbage and/or recycling collector from carrying out the collection of garbage/recycling on their regular route, the Contractor shall remove the garbage and/or recycling from the area to the garbage disposal site at no additional cost to the Contract.

Extra Work

The Contractor shall notify the Contract Administrator in writing before the commencement of any work that he considers extra work so that records may be kept. If notice is not given, it will be deemed that payment is included in the contract prices and no additional payment for extra work will be made.

Invoices for extra work shall be submitted as soon as possible after the completion of such work and in no case later than 30 days after the completion of the work in question.

Payment will be made on the next payment certificate after the approval of the Contractor's invoice. If extra work invoices and all required substantiation and support are not received within 30 days, it is deemed that the Contractor does not intend to charge for the work and no payment will be made.

Guaranteed Maintenance

Section GC7.15.02 of the General Conditions is amended as follows:

The Contractor shall maintain the works and every part thereof in such condition as will meet the approval of the Engineer for a period of twelve (12) months from the date of substantial completion for each stage thereof, ordinary wear and tear excepted.

The Contractor shall make good, at his own expense in a permanent manner, satisfactory to the Engineer, any imperfections that may appear or defects that may be discovered in the works due to materials and/or workmanship during the said period as determined by the Engineer. The Contractor shall commence repairs on any work identified as defective under this clause within 48 hours of receipt of notice from the Owner.

Payments

Except as herein provided, payments under this Contract will be made in accordance with Section GC8.02.03 of the General Conditions.

A statutory holdback of 10% shall apply to this Contract.

The completion Payment Certificates to include statutory holdback release, will be issued within 120 days after the date of completion as specified under GC1.06. The date for interest due to late payment shall commence following 180 days after the date of completion of the work.

As a condition of the final holdback payments, the Contractor shall provide the required Property Owner's Releases as specified elsewhere, as appropriate.

The Contractor is advised that the Owner may withhold payment on Interim and Holdback Release Certificates up to 30 calendar days from the date of receipt of the executed Payment Certificates.

In order to obtain a Certificate of Substantial Performance, the Contractor shall submit the following documentation and meet Section GC1.05 of the General Conditions:

a) A release by the Contractor in a form satisfactory to the Owner releasing the Owner from all further claims to the Contract, qualified by stated exceptions where appropriate;
b) A Statutory Declaration in a form satisfactory to the Owner that all liabilities incurred by the Contractor and the Contractor's sub-contractors in carrying out the Contract have been discharged, qualified by stated exceptions where appropriate.
c) A satisfactory Certificate of Clearance from the Worker's Safety and Insurance Boards.

The Contractor shall include in the Total Tender Price the publication cost of the Certificate of Substantial Performance. Publication is mandatory whether the Contractor requests Substantial Performance or not.

END OF SECTION

SPECIAL PROVISIONS – TENDER ITEM DESCRIPTIONS

1. Mobilization/Demobilization

The work performed under this section includes the mobilization and demobilization of all labour, equipment, and materials necessary for the project. Contractor is to supply their own site trailer and sanitary facilities for their forces. Insurance requirements listed in this tender are to be included here. Any power required for work is the responsibility of the contractor. Payment for this item will be at 60% for the mobilization portion, payable on the first invoice, and at 40% for the demobilization, payable on the invoice issued at Substantial Completion.

2. Insurance and Bonding

The unit bid price for the above tender item shall be full compensation for the provision of insurance and bonding as required for the completion of this project. Bonding is to include a Performance Bond as well as a Labour and Material Bond, each in the amount of 50 percent of the total tender amount.

Payment at the contract price for the above tender item shall be full compensation for all costs associated. Item shall conform to OPSS.MUNI.100. Measurement for payment is by Lump Sum.

3. Maintenance Manuals and Record Drawings

The Contractor is to supply maintenance manuals and marked up record drawings showing changes during construction prior to substantial performance. Manuals and drawings are to be provided in both electronic and hard copies. Drawings are to be printed full size and to scale. Record drawings to show as-built conditions.

Measurement for payment for this item is by Lump Sum.

4. Removal and Disposal of Existing UV Disinfection System

The Contractor is to furnish all labour, materials, and equipment required for the full removal and disposal of the existing UV Disinfection System as shown on the contract drawings. Full removal includes the existing UV reactors and existing control panels.

Measurement for payment for this item is by Lump Sum.

5. Supply and Installation of New UV Disinfection System

The Contractor is to furnish all labour, materials, and equipment required for the new UV Disinfection System as shown on the contract drawings. This includes the supply and installation of new UV reactors and control panels. The new system shall be a like for like replacement of the existing system.

Manufacturer: Trojan

Model: UV Swift 2L12

Contact:
Yianni Siamandouros
yianni@h2flow.com
(416) 835-8851

Measurement for payment for this item is by Lump Sum.

6. Supply and Installation of Instrumentation and Controls

The Contractor is to furnish all labour, materials, equipment, and appurtenances required to supply and install Instrumentation and controls including control panels and all other instrumentation not covered elsewhere.

Controls and integration work shall be performed by the following dedicated controls and integration contractor. Contractor is responsible for coordinating site visits with dedicated controls and integration contractor.

Controls and Integration Contractor Contact:
Schneider Electric
Stephane Loyer
stephane.loyer@se.com
1 (514) 781-4075

All work is to be done as per contract drawings and specifications. Payment shall be by Lump Sum.

7. Mechanical General Work

The mechanical contractor will be responsible for supply, installation, and commissioning of all items as indicated on the contract drawings and in the specifications. Under this item the mechanical contractor will supply all labour, material and necessary appurtenances not called out in other items as indicated in the specifications and drawings. This will also include all labour and materials not called out by other items. This scope of work is not limited to the mechanical drawings. Payment for this item is by Lump Sum.

8. Electrical General Work

The electrical contractor will be responsible for supply, installation, and commissioning of all items as indicated on the contract drawings. Under this item the electrical contractor will supply all conduit, cables, panels, switches, brackets, lighting, power outlets and hardware and all necessary electrical related appurtenances not called out in other items to install and commission the upgrades as indicated in the specifications and drawings. This will also include all labour and materials not called out by other items. This scope of work is not limited to the electrical drawings. Payment for this item is by Lump Sum.

9. Contingencies

A lump sum allowance of $10,000 has been made for contingencies in the contract. This IS NOT A BILLABLE ITEM under the contract. Any additional work items approved in writing on behalf of the Owner, by the Contract Administrator, will be formalized by way of Change Order and billed as separate items, which shall be added to the contract.

END OF SECTION

APPENDIX A – TECHNICAL SPECIFICATIONS

Township of Edwardsburg Cardinal
Cardinal WTP UV Replacement
Contract No. 2025-7806

TECHNICAL SPECIFICATIONS

1. Submittals

General

1. Refer to tender document for additional contractual information concerning submittals.

2. Refer to individual sections and drawings for detailed information on submittal requirements.

3. Schedule submissions at least two (2) weeks before dates reviewed submissions will be needed.

4. Do not proceed with work until relevant submissions are reviewed.

5. Shop drawings which have not been requested will be returned to the Contractor with no action taken by the Engineer. The Engineer has not necessarily reviewed shop drawings to which the Engineer's standard 'Received' stamp is affixed.

Identification of Submittals

1. Identify each submittal made with project, Owner's, Consultant's, Contractor's, Sub-Contractor's and Supplier's name. Indicated origin and intended use in work. Submittal is to be accompanied by transmittal letter recording the above information. Samples to be permanently identified with the same information.

Documents Required Before Construction Start:

1. Insurance forms.
2. WSIB Clearance Certificate.

Statutory Declaration

1. Submit, with each monthly progress claim, a Statutory Declaration certifying that all payments for any liability for which Owner might become responsible if unpaid, have been paid.

WSIB Clearance Certificate

1. Submit with each monthly progress claim, Workplace Safety and Insurance Board Clearance Certificate.

Schedule of Values

1. Itemize separately: Individual sections of specifications, different phases of the work, permits, mobilization, field supervision and layout, temporary facilities and controls, major equipment, materials costs delivered, installation costs, each allowance, clean up, hand over and commissioning.

Shop Drawings And Product Data

1. Submit 10 copies of shop drawings for Engineer's review in accordance with this section.

2. For non-custom items or equipment, manufacturer's publications or catalogue excerpts are acceptable if suitably noted in ink.

3. For line drawings, maximum 11 x 17 size, submit one (1) copy only; otherwise submit a maximum of two (2) copies.

4. Shop drawings shall be dated and contain the name of project, description or names of materials and items and complete identification of locations of which materials are to be installed.

5. Accompanying shop drawings by transmittal letter containing project name, Contractor's name, number of drawings, titles, description of drawings and other pertinent data.

6. Shop drawings submitted which have not been thoroughly reviewed, coordinated, stamped, dated and signed by a responsible person in Contractor's office will be returned without review for re-submittal.

7. Present submittals in SI metric units; if not produced in metric, convert all values.

8. Individual submissions will not be reviewed until all related information is available. Incomplete submission will be rejected and returned to the Contractor and Contractor may be charged for Engineer's time and expense involved.

9. Delete product data information not relevant to project.

10. Supplement standard information to provide details applicable to project.

Record Drawings

1. Maintain contract drawings at site office for record purposes. Record accurately deviations from contract documents caused by site conditions, change orders, site instructions and addenda. Mark in red ink. Provide one table for this set to be placed on.

2. Include depth of various elements of foundation, horizontal and vertical location of new, maintained, rerouted and abandoned underground utilities and of utilities concealed in construction. All unseen or hidden components must be located by dimension.

3. Ensure that drawings are up to date and in good condition at all times.

4. Submit record drawings to Engineer just prior to substantial completion.

Manuals Of Instruction and Maintenance

1. Prior to substantial performance, inspection, submit to Engineer, four (4) copies of Instructions and Maintenance Manuals as follows:

    1. Bind Data in 8 1/2" x 11", vinyl covered three ring loose-leaf binders.

    2. Enclose title sheet, labeled "Instructions and Maintenance Manual" with project name, list of contents, date and names of Owner, Engineer and Contractor.

    3. Organize contents into applicable sections of work to parallel project specification break down.

    4. Mark each section by labeled tabs protected with celluloid covers fastened to hard paper dividing sheets.

    5. Include manufacturers & suppliers name, address, phone number, fax number, and contact person from every item contained in manual.

    6. All operation and maintenance manuals to be submitted in English only.

    7. Neatly type lists and notes. Use clear drawings, diagrams or manufacturer's literature.

    8. Contents:

        - As called for in individual sections of specifications and drawings.
        - Maintenance instructions for exterior and interior floor, wall and ceiling surfaces as well as all installed fittings as printed by manufacturer.
        - Operating and maintenance instructions for mechanical and electrical equipment called for in drawings and specifications, bound separately.
        - Colour schedule; hardware schedule.
        - Copies of all guarantees and warranties.
        - Complete set of final approved shop drawings, bound separately, indicating corrections and changes made during fabrication and installation.
        - Names, addresses and phone numbers of Sub-Contractors and suppliers.
        - WHMIS Manual containing MSDS information for all products supplied.

END OF SECTION

2. Closeout Submittals

Section Includes

1. As-built, samples and specifications
2. Equipment and systems
3. Product data, materials and finishes, and related information
4. Operation and maintenance data
5. Spare parts, special tools and maintenance materials
6. Warranties
7. Final site survey

Related Sections

1. Section 01.1 – Submittal Procedures
2. Section 01.2 – Closeouts
3. Section 01.4 – Commissioning
4. Section 01.5 – Demonstration and Training

Submissions

1. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
2. Copy will be returned after final inspection, with Engineer's comments.
3. Revise content of documents as required prior to final submittal.
4. A draft Operation and Maintenance Manual shall be submitted with shop drawings.
5. Ensure spare parts, maintenance materials and special tools provided are new, undamaged and non-defective and of same quality and manufacture as products provided in Work.
6. If requested, furnish evidence as to type, source and quality of products provided.
7. Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
8. Pay costs of transportation.

Format

1. Organize data in the form of an instructional manual.

2. Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

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

4. Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

5. Arrange content by systems, process flow, 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. Text: Manufacturer's printed data, or typewritten data.

8. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

Contents – Each Volume

1. Table of Contents.

2. Provide title of project.

3. Date of submission.

4. Names, addresses and telephone numbers of Engineer and Contractor with names of responsible parties.

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

6. For each product or system: list names, addresses and telephone numbers of Sub-Contractors and suppliers, including local source of supplies and replacement parts.

7. Product Data: Mark each sheet to clearly identify specific products and component parts and data applicable to installation; delete inapplicable information.

8. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

9. Typewritten Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified.

10. Training: Refer to Section 01.5 – Demonstration and Training.

As-Builts And Samples

1. In addition to requirements in General Conditions, maintain at the site for Engineer and Owner on record copy of:
    1. Contract Drawings.
    2. Specifications.
    3. Addenda.
    4. Change Orders and other modifications to the Contract.
    5. Reviewed shop drawings, product data and samples.
    6. Field test records.
    7. Inspection Certificates.
    8. Manufacturer's Certificates.
    9. Store record documents and samples in field office apart from documents used for construction. Provide files, racks and secure storage.
    10. Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
    11. Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
    12. Keep record documents and samples available for inspection by Engineer.

Recording Actual Site Conditions

1. Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Engineer.

2. Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

3. Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

4. Contract Drawings and shop drawings: Legibly mark each item to record actual construction, including:

    1. Measured depths of elements of foundation in relation to finished first floor datum.
    2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
    3. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
    4. Field changes of dimension and detail.
    5. Changes made by change orders.
    6. Details not on original Contract Drawings.
    7. References to related shop drawings and modifications.

5. Specifications: Legibly mark each item to record actual construction, including:

    1. Manufacturer, trade name, and catalogue number of each product actually installed particularly optional items and substitute items.
    2. Changes made by Addenda and Change Orders.

6. Other Documents: Maintain manufacturer's certifications, inspection certifications, field test records, required by individual specification sections.

7. The Contractor must at the end of construction submit a full set of drawings that are marked to show any and all deviations from the issued for construction drawings, this will include but not be limited to the following:

    1. Site conditions and building locations and variations.
    2. Grades and elevations.
    3. Mechanical and Electrical equipment installed.
    4. Location, size, depth and material description of all utilities encountered or installed during the project.

Equipment And Systems

1. Each Item of Equipment and Each System: Include description of 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. Panel Board Circuit Directories: Provide electrical service characteristics, controls and communications.

3. Include installed colour coded wiring diagrams.

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

5. Maintenance Requirements: Include routine procedures and guide for trouble shooting; disassembly, repair and reassembly instructions; and alignment, adjusting, balancing and checking instructions.

6. Provide servicing and lubrication schedule, and list of lubricants required.

7. Include manufacturer's printed operation and maintenance instructions.

8. Include sequence of operation by controls manufacturer.

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

10. Provide installed control diagrams by controls manufacturer.

11. Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

12. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

13. Provide 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.

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 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 specification sections.

Spare Parts

1. Provide spare parts, in quantities specified in individual specification sections.

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

3. Deliver to site; place and store.

4. Receive and catalogue all items. Submit inventory listing to Engineer. Include approved listings in Maintenance Manual.

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

Maintenance Manuals

1. Provide maintenance and extra materials, in quantities specified in individual specification sections.

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

3. Deliver to site and store.

4. Receive and catalogue all items. Submit inventory listing to Engineer. Include approved listings in Maintenance Manual.

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

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 all items. Submit inventory listing to Engineer. Include approved listings in Maintenance Manual.

Storage, Handling, And Protection

1. Store spare parts, maintenance materials and special tools in manner to prevent damage or deterioration.

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 Engineer.

Warranties

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

2. List Sub-Contractor, supplier and manufacturer, with name, address and telephone number or responsible principal.

3. Obtain warranties, executed in duplicate by Sub-Contractors, suppliers and manufacturers, within ten days after completion of the applicable item of work.

4. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

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

6. Co-execute submittals when required.

7. Retain warranties until time specified for submittal.

END OF SECTION

3. Commissioning

General

Section Includes

1. Includes general requirements for commissioning facilities and facility systems.

Related Sections

1. Section 01.6 – Demonstration and Training

Description

1. Purpose:

    1. Verify operation and functional performance of process and electrical systems for compliance with design intent.

    2. Document process and electrical system tests and inspections.

    3. Verify application of operation and maintenance manuals, as-builts (record) documents, spare parts listing and other items as may be specified herein for support of process and electrical systems and equipment.

    4. Coordinate and direct training to personnel for operation and maintenance of process and electrical equipment and systems.

2. General:

    1. Furnish labour and material to accomplish complete process systems commissioning as specified herein.

    2. The contractor will be responsible for co-ordination of commissioning of all equipment. One day of pump start up and two days of control panel commissioning, start-up and training.

3. Definitions:

1. Acceptable Performance: A component or system being able to meet specified design parameters under actual load.

2. Commissioning Authority: The qualified person, company, or agency that will plan and carry out the overall commissioning process. The General Contractor shall be the “Commissioning Authority”.

3. Commissioning Plan: The overall document, prepared by the commissioning authority, which outlines the organization, scheduling, allocation of resources, documentation etc., pertaining to the overall commissioning process.

4. Design Professional: The Engineer responsible for the design and preparation of the contract documents for the various systems.

5. Functional Performance Testing: That full range of checks and tests carried out to determine if all components, sub-systems, systems, and interfaces between systems function in accordance with the contract documents. In this context, “function” includes all modes and sequences of control operation, all interlocks and conditional control responses, and all specified responses to abnormal emergency conditions.

Documentation

1. The Commissioning Authority shall obtain the following:

    1. Project plans and specifications (Contract Documents), authorized revisions, equipment shop drawings and submittals (approved), test and inspection reports, equipment start-up and certification reports, etc.

    2. Records of required code authority inspections, documentation sign-offs, etc.

Submittals

1. Submit documentation in accordance with Section 01.1 – Submittals.

2. Prior to start of Work, submit name of organization proposed to perform services of Commissioning Authority. Designate who has managerial responsibilities for coordination of entire testing, adjusting and balancing.

3. Process Commissioning Authority will submit to Engineer for approval prior to starting the commissioning process:

    1. Commissioning plan describing extent and delivery schedule.

    2. Training plan (describe the extent of plan, expected duration of training, personnel involved, schedule, etc…)

4. Commissioning Authority shall submit other documentation specified throughout at times indicated in the specification.

5. Submit documentation to confirm organization compliance with quality assurance provision.

6. Submit 3 preliminary specimen copies of each of report forms proposed for use.

7. Fifteen days prior to Substantial Performance, submit 3 copies of final reports on applicable forms.

8. Submit reports of testing, adjusting and balancing postponed due to seasonal, climatic, occupancy or other reasons beyond Contractor's control, promptly after execution of those services.

Responsibility Of Others

1. Applicable specification sections may outline trade or manufacturer's responsibilities during the commissioning process.

2. General Contractor shall verify completeness of the building envelope, perimeter and interior items which effect proper operation and control of equipment and systems.

3. The General Contractor will assure participation and cooperation of contractors under his jurisdiction as required for the commissioning process.

4. Process Equipment Contractor shall commission Equipment and other systems specified throughout drawings and specifications

5. Electrical Contractor shall commission electrical systems and equipment specified throughout drawings and specifications.

6. Owner/Operator will schedule personnel to participate in commissioning process. This may include building Engineer, operation and maintenance personnel. Personnel operating and maintaining equipment and systems will attend training sessions, factory schools and educational institutions where indicated.

Quality Assurance

1. Comply with applicable procedures and standards of the certification sponsoring association.

2. Perform services under direction of supervisor qualified under certification requirements of sponsoring association.

Final Reports

1. Organization having managerial responsibility shall make reports.

2. Ensure each form bears signature of recorder, and that of supervisor of reporting organization.

3. Identify each instrument used and latest date of calibration of each.

4. Include all data required throughout the specification sections.

Products

Instrumentation

1. Instrumentation as required shall be provided by Commissioning Authority, or provided by process, mechanical, or electrical Contractors.

Execution

General

1. Commissioning Authority shall actively participate in the construction phase of the project to assure compliance with Commissioning requirements.

Procedure

1. Attend pre-construction meeting and establish requirements for commissioning authority process throughout construction phase.

2. Prepare and submit to Engineer, 6 weeks after the contract award, Commissioning plan which shall outline:

    1. Responsibility of each trade affected by Commissioning as required by appropriate section of this specification.

    2. Requirement for documentation as listed elsewhere herein.

    3. Requirements for documentation of tests and inspections required by code authorities.

    4. Requirements for the Commissioning Program during specified operational conditions, part and full loads as further delineated in 3.3.

    5. Format for training program for operation and maintenance personnel.

    6. Periodically attend construction and coordination meetings.

Commissioning

Phase 1 – Pre Construction

1. Introduction

    1. The objective of this phase is to outline the scope of design requirements for the process and electrical systems being constructed with a comprehensive commissioning process. The commissioning authority shall meet and review with the design Engineer the design intent and work with the design Engineer to develop the design criteria.

2. Scope of Phase 1

    1. Phase 1 documents should include detailed requirements for commissioning as follows:

    2. Design criteria and assumptions

    3. Description of the process and electrical systems, intended operation and performance.

    4. Commissioning plan

    5. Documentation required

    6. Verification procedures

    7. Commissioning documentation

    8. Operation and performance

    9. Design Criteria: Design criteria and assumptions should include design conditions for each system.

3. Description of process and electrical systems:

    1. The description of the process and electrical systems and its intended operation and performance shall include design intent, assumptions, design criteria and system loadings.

    2. The description of the process, and electrical systems shall include basic system type, major components, capacity and sizing criteria, automatic controls and sequence of operation.

    3. The operation and performance data shall include equipment selection and redundancy criteria, intended operation under all operating loads, changeover procedures, part-load operational strategies, modes of operation, design set-points of control systems with permissible adjustments and any other engineered operational mode of the system.

Commissioning Plan

1. The process commissioning plan shall detail the implementation of the commissioning process. It shall

include the requirements that each party involved in the commissioning process will have to accomplish, including:

2. Sequence, scheduling, documentation requirements, verification procedures, staffing requirements, etc.

3. The parties involved will include the Owners, design professional, contractors, vendors, project managers, commissioning authority, manufacturers and other parties as required.

4. The needed staffing skills and qualifications shall be specified for the following:

    1. Commissioning team

    2. Operation and maintenance teams

5. Documentation Requirements:

    1. The requirements for each party involved in the process commissioning process shall detail the documentation that each must prepare to satisfy the commissioning plan requirements of the specification and submit for review.

    2. The documents shall include the following:

6. Detailed procedures for the test to be performed by each party in the commissioning process.

7. Detailed checklists for performance testing.

8. Report forms that will be used to submit test data and results:

    1. Calibration data for test equipment.

    2. Sequence and schedule of procedures.

    3. Verification Procedures: The procedures for performance tests and verification include, but are not limited to, the following:

        - Testing, adjusting and balancing performance.
        - Verification of all equipment performance.
        - Verification of the performance of subsystems consisting of combinations of equipment (i.e. pumps and interconnecting piping).
        - Verification of the performance of the automatic controls in all operating modes.
        - Verification of the performance of the process systems as a whole.

    4. Commissioning Documentation: Commissioning documentation shall be prepared and submitted by the commissioning authority at the completion of the commissioning process. This documentation

shall include readiness, start-up and performance checklists of the commissioning plan with actual results achieved.

5. Testing, adjusting and balancing.

6. Performance of all equipment.

7. Control schematics, performance reports, and checklists for verification of the total process systems and process subsystems.

8. Operating data to include all necessary instructions to the Owners maintenance and operating staff in order to operate the system to specified standards.

9. Maintenance data to include all necessary information required to maintain all equipment in continuous operation.

10. As-built documents for the process systems to include all systems, equipment, automatic controls and piping systems.

11. Operation and performance: The schedules for the participation of the operations and maintenance personnel during the construction phase and the subsequent phases of the commissioning process.

Phase 2 – Construction

1. Introduction:

    1. This section describes the process commissioning process during the construction phase of the project. In this phase, the systems are installed, tested and put into operation. When construction is completed, the systems are ready for functional performance testing.

    2. Commissioning is an ongoing process. It continues through the installation of the systems. In this phase, the commissioning authority shall witness all pressure tests of piping and duct systems and shall also coordinate and participate in all start-up testing, adjusting and balancing and calibration activities.

    3. An important part of the commissioning process is the training of the operations and maintenance personnel. These people should be available at the site during construction to observe the installation of the process and electrical systems and to learn about its operation. The commissioning authority shall direct this training.

2. Procedure:

    1. This section describes the events and procedures that should occur during the construction phase in

order to facilitate proper commissioning.

2. The system operation description should be updated to incorporate design changes that occur prior to or during the construction phase. This information then should be combined with the equipment maintenance data and equipment submittals, including performance data, to form one complete operations and maintenance manual for training and subsequent use of the operations and maintenance staff.

3. Operation:

    1. During the construction phase, the building operations and maintenance staff should be available at the site for the purpose of observing construction, especially equipment installations.

4. Submittals:

    1. Submittals shall be reviewed prior to construction. In addition to shop drawings, equipment submittals, testing and balancing procedures and forms, submittals shall also include the commissioning plan and commissioning format.

    2. Equipment submittals shall include complete performance data for each piece of equipment – capacity, flow rates, velocity, pressure losses, horsepower, rpm, electrical data, etc. After review of equipment submittals, the equipment operations and maintenance information (including parts lists, installation instructions and special tools needs) shall be submitted in accordance with specifications requirements.

5. Because of the importance of the control systems to the proper operation of the process and electrical systems, control submittals shall be carefully reviewed to ensure it includes all information needed by the operations and maintenance staff to keep the control systems adjusted and calibrated. Information shall include:

    1. A fully labeled control piping or wiring schematic, which shows point-to-point piping and wiring and includes all performance parameters such as set points, throttling ranges, actions, spans, proportional bands, and other control component adjustment or setting data. Locations of pneumatic test ports and electronic terminal strips should be indicated on the schematic drawings.

    2. Fully labeled elementary electrical ladder diagrams.

    3. Sequence of operation (narrative description of control system functions) cross-referenced to the control schematics and elementary electrical ladder diagrams.

    4. Specification sheets for each control component.

6. The commissioning plan should be prepared following the format described in the contract specifications. It shall detail how the commissioning process will be organized, scheduled and documented to include:

1. The organization of the commissioning team (commissioning authority; testing, balancing, and adjustment specialists; contractors, vendors, manufacturers; Owners operations and maintenance staff, etc…).

2. A list of activities required to commission the subsystems and systems and the functions of each member of the commissioning team.

3. A logical sequence schedule for each commissioning activity coordinated with all members of the commissioning team.

4. Commissioning plan documentation forms for all components and systems submitted.

7. The procedures for testing, balancing and adjusting shall be performed in accordance with recognized standards.

8. Construction phase activities:

    1. Each Section Contractor , contractor shall perform testing, adjusting and balancing work prior to start of commissioning. Operational tests shall also be conducted on equipment, pipe and control systems to verify that pressures and flow rates meet design requirements.

    2. Controls testing and calibration shall begin concurrent with and be completed subsequent to the testing, adjusting and balancing work.

    3. The commissioning authority shall observe and verify all start-up, testing and balancing, and calibration activities as part of the ongoing commissioning process.

    4. Controls testing shall be accomplished on each control device. Actuators shall be checked and adjusted for beginning and extent of travel. All relays and adapters shall be checked for proper action. All system interlocks, interconnections and safety devices shall be checked for proper function.

    5. All control devices shall be adjusted and calibrated. All control settings shall be verified by comparing actual input and output values to calculated values.

    6. Testing, adjusting and balancing work shall be substantially complete with reports submitted prior to the verification and acceptance phase.

    7. Training, warranty, special tools and spare parts shall be taken into account under the construction phase.

    8. Contractor and equipment warranties shall be verified.

    9. Special tools and spare parts list shall be verified.

Phase 3 - Acceptance Procedures

1. Introduction:

    1. This section describes acceptance procedures for the commissioning process.

2. Pre-requisites to Functional Performance Tests:

    1. Prior to functional performance testing of each system, the commissioning authority shall observe and verify that the physical installation of components and systems being tested is substantially installed in accordance with the contract documents.

    2. This shall include: Hydrostatic testing, flushing, cleaning, start-up or activation of equipment and systems, completion of testing, adjusting and balancing, calibration and test of automatic controls.

3. General:

    1. The functional performance test checklists contained in the approved commissioning plan shall be used to document the results of the functional performance testing process.

    2. The functional performance testing process shall be accomplished for all equipment, subsystems, systems and system interfaces. There may be several similar pieces of equipment, systems, etc., on a project. All must be tested for acceptances, and there shall be a separate checklist for each to ensure documentation specific to each is complete.

    3. Functional performance testing shall progress from equipment or components through subsystems to complete systems. Functional performance testing will have to consider sequences of testing, starting with components and progressing towards complete systems. As a result, the causes of any functional problem should be easier to locate and correct.

    4. The specific tests and the most efficient order of testing will vary widely depending on the type of system, the number of systems, the sequence of construction, the relationship between building systems, the degree of interaction between systems, the complexity of the controls sequence, the impact of system failures on health or safety and other factors.

    5. At the end of the process, every mode of systems operation, all system equipment, components and zones and every component in the control sequence description shall have been proved operational under all normal operational modes, including part and full load and under abnormal or emergency conditions.

4. Equipment and Subsystem Functional Performance Tests:

    1. Operate the equipment and subsystems through all specified modes of control and sequences of operation. Include full and part load and emergency conditions.

5. Systems Functional Performance Test:

    1. Each system shall be operated through all modes of system operation, such as seasonal and part loading, including every individual interlock and conditional control logic, all control sequences, both full and part load conditions, and simulation of all abnormal conditions for which there is a specified system or controls response.

    2. Temporary upsets of systems, such as distribution fault, control loss, set point change, equilibrium upset and component failure shall be imposed at different operating loads to determine system stability and recovery time.

6. Verification and Documentation:

    1. As each individual check or test is accomplished, the commissioning authority shall observe the physical responses of the system and compare them to the specified requirements to verify the test results. The actual physical responses of the system components must be observed. Reliance on control signals or other indirect indicators is not adequate. The input and output signals for each control component also need to be observed to confirm they are correct for each physical condition.

    2. Verification of the testing, adjusting and balancing report shall be an integral part of functional performance testing.

    3. The commissioning authority shall record the result of each individual check or test on the pre-approved test and report form from the commissioning plan.

7. Deferred Functional Performance Tests:

    1. If any check or test cannot be accomplished for seasonal reasons, lack of loading or for other reasons, this fact shall be noted along with an indication of when the test will be scheduled.

    2. If any check or test cannot be accomplished due to building structure or other building system deficiencies, these deficiencies shall be resolved and corrected by the appropriate parties before completion of the commissioning process.

    3. Every check or test for which acceptable performance was not achieved shall be repeated after the necessary corrective measures have been completed. This re-testing process shall be repeated until acceptable performance is achieved.

8. Corrective Measures:

    1. If acceptable performance cannot be achieved, then the necessary corrective measures shall be carried out. The General Contractor shall determine corrective measures in conjunction with the design Engineer.

9. Intersystem Functional Performance Tests:

    1. When all individual systems' functional performance has been proved, the interface or coordinated responses between systems shall be checked. The systems involved may be within the overall process, electrical work, or they may involve other systems, such as emergency systems for life safety.

    2. The approach to intersystem performance testing shall follow that previously described for systems.

10. Acceptance Documentation:

    1. A copy of the commissioning plan and functional performance test results shall be included with each copy of the Operations and Maintenance Manuals. These manuals, along with testing and balancing reports, controls schematics and any other documents required, shall be submitted to the design professional for review.

11. Operator Training:

    1. The building operator shall be on site periodically during the construction phase, particularly during start-up of equipment, testing, adjusting and balancing and during the entire functional performance testing process.

    2. Operator training shall provide a complete overview of all equipment, components and systems with an emphasis on:

    3. Documentation in the final Operations and Maintenance Manuals.

    4. How to use the Operation and Maintenance Manuals.

    5. System operational procedures for all modes of operation and all loading conditions.

    6. Acceptable tolerances for system adjustments in all operating modes.

    7. Procedures for dealing with abnormal conditions and emergency situations for which there is a specified system response.

12. Final Acceptance:

    1. When requirements of the commissioning plan have been completed and satisfactorily documented and required documentation has been completed, submitted to the Engineer, and accepted, the commissioning will be considered complete.

END OF SECTION

4. Demonstration and Training

Section Includes

1. Procedures for demonstration and instruction of equipment and systems to Owner's personnel.

RELATED SECTIONS

1. Section 01.4 – Closeout submittals

2. Section 01.5 – Commissioning

DESCRIPTION

1. Demonstrate scheduled operation and maintenance of equipment and systems to Owner's personnel at time indicated in Section 01.4 – Commissioning

2. Owner will provide list of personnel to receive instructions and will coordinate their attendance at agreed upon times.

QUALITY CONTROL

1. When specified in individual specifications, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Owner's personnel and provide written report that demonstration and instructions have been given.

Submittals:

1. Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Engineer's approval.

2. Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

3. Give time and date of each demonstration, with list of persons present.

Conditions for Demonstrations

1. For training during installation, confirm dates for installation have not changed.

2. For training after completion of construction ensure:

    1. Equipment has been inspected and put into operation in accordance with specifications.

2. Testing, adjusting and balancing has been performed in accordance with Section 01.4 – Commissioning and equipment and systems are fully operational.

3. Copies of completed Operation and Maintenance Manuals for use in demonstrations and instructions are provided.

Preparation:

1. Verify that conditions for demonstration and instructions comply with requirements.

2. Verify that designated personnel are present.

Demonstration and Instructions

1. Demonstrate start-up, operation, control, adjustment, trouble-shooting, installation servicing and maintenance of each item of equipment at agreed upon times, at the designated location.

2. Instruct personnel in all phases of operation and maintenance using Operation and Maintenance Manuals as the basis of instruction.

3. Review contents of manual in detail to explain all aspects of operation and maintenance.

4. Prepare and insert additional data in Operations and Maintenance Manuals when the need for additional data becomes apparent during instructions.

END OF SECTION

5. Ultraviolet Disinfection Equipment

General

Description

1. Furnish all labor, materials, equipment and appurtenances required to provide a closed vessel, pressurized flow, high intensity medium pressure lamp, ultraviolet (UV) disinfection system complete with an automatic mechanical/chemical sleeve cleaning system and UV intensity monitoring. The UV system shall be complete and operational with all control equipment and accessories specified herein and as shown on the contract drawings.
2. The UV disinfection system shall be purchased from Trojan Technologies, the Base Bid Manufacturer, by the Contractor. The UV system shall be Trojan UV Swift Model 2L12. The system shall be installed by the Contractor and tested and commissioned by Trojan Technologies, as specified in this section.

System Description

1. Design Criteria:
    1. The UV Manufacturer shall provide equipment to disinfect water with the following characteristics:

Peak (Design) Flow:	41	L/s
Average Flow:	20	L/s
Design UVT:	90	% (at 254 nm, 1 cm path length)
Average Operating UVT:	90	% (at 254 nm, 1 cm path length)
Water Temperature:	1 ^{o}C to 30 ^{o}C	
Turbidity:	<5 NTU	
Max. Inlet Pressure:	150 PSI (PN 10)	

2. Design Dose:
    1. The UV disinfection system shall be designed to deliver the Reduction Equivalent Dose (RED) specified in Section 1.3.C, Performance Requirements. To ensure the UV system can deliver the RED at the end of lamp life, with fouled sleeves, the RED shall incorporate a Combined Aging and Fouling Factor (CAF) calculated as CAF = EOLL x FF, where EOLL is the ratio of the lamp output at the end of the lamp life relative to the new lamp output, and FF is the Fouling Factor. The FF shall be 0.5 for UV Systems with no sleeve wiping system, 0.75 for UV Systems with mechanical only

sleeve wiping system, or 0.98 for UV Systems with an on-line combined chemical and mechanical sleeve cleaning system. EOLL (End Of Lamp Life) output shall be 80% of the specified new lamp output. A higher value shall be permitted only if the EOLL output has been validated by third party witnessed testing of the output at the end of the warranted lamp life. Systems without an automatic on-line mechanical and chemical cleaning system shall include provisions to automatically chemically clean the sleeves offline.

2. The RED shall be delivered under the Peak (Design) Flow and Design UVT condition specified in 1.3.A.1, with the largest unit out of service.
3. RED must be verified by third party witnessed bioassay testing per Section 1.2.A.2.

3. Hydraulics:
    1. Headloss through each UV chamber shall not exceed 0.61 in - H2O water column under peak flow conditions.
4. System Components
    1. The UV system shall be comprised of the following components:
        - UV Chambers: 2
        - Number of lamps per chamber: 2
        - Control Power Panel(s): 1 Per Chamber
        - UV Intensity Sensor(s): One Per Lamp
        - Automatic Cleaning System: Acticlean™
5. Performance Requirements
    1. The UV Manufacturer shall provide a written guarantee that the equipment will continuously meet the specified performance requirements for each unit as follows:
    2. The UV disinfection system shall be capable of providing a MS2-RED of 40 mJ/cm2 at the Peak (Design) Flow and Design UVT condition specified in Section 1.3.A.1.
    3. At the time of bid, the UV Manufacturer must provide a Validation Certificate, to demonstrate that they have obtained third party validation that covers the full range of design and operating conditions (flow rate and UVT) described in Section 1.3.A.1. The selected UV Manufacturer must provide the Validation Report as part of the submittal package to substantiate the performance measurements described above.
    4. The system shall be able to continue providing disinfection while the UV intensity sensor calibration is being checked.

5. System shall be designed to operate in an environment with ambient relative humidity of 5-90% and ambient air temperature of 0-40ºC.
6. The system shall be able to continue providing disinfection while the automatic cleaning system is in operation.

Submittals

1. Submit for review, engineering drawings showing the following:

    1. Complete description in sufficient detail to permit comparison with the specifications.
    2. Dimensions and installation requirements.
    3. Descriptive information including catalogue cuts and manufacturers' specifications for all major components.
    4. Electrical schematics and layouts.

Guarantee

1. Equipment:
    1. The equipment furnished under this section (excluding UV lamps) shall be free of defects in materials and workmanship, including damages that may be incurred during shipping for a period of 12 months after system start-up or 18 months after shipment, whichever occurs first.
2. UV Lamps:
    1. The UV lamps shall be warranted for 5000 hours of operation (prorated after 3000 hours) or 36 months after shipment, whichever occurs first.

Products

Manufacturer

1. The physical layout of the system shown on the contract drawings and the equipment specified herein are based solely upon the TrojanUVSwift™, as manufactured by Trojan Technologies, London, Ontario, Canada.
2. To be acceptable, the UV system must operate in a closed vessel, use high intensity medium pressure UV lamps, use fully electronic ballasts with multiple power settings, and incorporate an automatic on-line mechanical/chemical sleeve cleaning system for both lamp sleeves and sensor sleeves/windows.
3. To be acceptable, the cleaning solution must be ANSI/NSF Standard 60 Certified for Drinking Water Treatment Chemicals. All tanks, cleaning chemicals, valves, power supplies and associated piping shall be supplied by the UV manufacturer. The UV manufacturer shall be responsible for supplying all equipment

including any equipment not specifically listed that may be required to perform chemical cleaning, including complete controls integration. Contractor shall be responsible for installation. Contractor to make suitable arrangements for chemical to be safely drained from site. UV disinfection systems that do not have a mechanical and chemical cleaning system will not be accepted.

Design, Construction and Materials for Manufacturer

1. UV Chamber:
    1. The UV Chamber shall be of welded construction manufactured from Type 316L stainless steel. The UV Chamber shall be pickled, passivated and bead blasted for uniform external finish.
    2. UV Chamber shall occupy a plan footprint no greater than 15 ft2.
    3. The UV Chamber shall be designed to handle a maximum operating pressure of 150 PSI (PN 10), and shall be fully assembled and hydrostatically tested to 1.5 times the rated operating pressure, for at least 10 minutes without leakage, in the factory prior to shipment.
    4. Each UV Chamber shall be supplied with ANSI 150 lb flanged inlet/outlet connections.
    5. Each UV Chamber shall be a nominal 300 mm in diameter.
    6. Each UV Chamber shall fit within a 1500 mm pipe length.
    7. Each UV chamber shall consist of high intensity medium pressure UV lamps arranged horizontally and perpendicular to the direction of flow.
    8. Each lamp shall be enclosed in an individual quartz sleeve, one end of which shall be closed and the other sealed with compressed o-rings.
    9. Each quartz sleeve shall be independently sealed within the chamber.
    10. The UV chamber shall be designed such that operating personnel at the plant can change the lamps without draining the chamber.
    11. The UV chamber shall be provided with access ports for easy access to the quartz sleeves and cleaning system.
    12. All access for chamber components, including lamps, sleeves and cleaning system shall be from the same side. Designs requiring access from more than one side of the chamber are not permitted.
    13. Piping shall be designed so that the chamber will be full of water at all times. Air trapped in the chamber shall result in chamber shut down to avoid overheating.
    14. The UV chamber shall be installed either vertically or horizontally. However lamps must be installed horizontally.

15. The UV Lamps shall reach maximum UV output within three (3) minutes. If discharging water that may not have received specified dose levels during the warm-up period is not acceptable, then a separate cooling water line may be required. Cooling water is not required for system start-up as long as the minimum in-line flow rates are initiated within the allowable "zero flow" operation time. If it is expected that the minimum in-line flow rates cannot be initiated within the allowable "zero flow" operation time, or if the plant desires to operate the systems in "Hot Standby" mode (i.e. the lamps are powered, but process water is not being passed through the chamber), then cooling water is required.
16. Dry weight of the chamber shall not exceed 300 lbs / 136 kg.
17. Wet weight of the chamber shall not exceed 430 lbs / 195 kg. If pipe supports are necessary, they shall be supplied by others.
18. All wetted components within the chamber shall be NSF 61 certified.

2. UV Lamps:
    1. The UV lamps shall be high intensity, medium pressure type with a 12 inch arc length and a maximum power input of 3.0 kW.
    2. The filament shall be significantly rugged to withstand shock and vibration.
    3. The lamp bases shall be resistant to UV and ozone.
    4. The lamps shall be operated by variable output electronic ballasts with 1% power increments, from 30% to 100% of full rated output.
3. UV Lamp Sleeves
    1. The UV lamp sleeves shall be manufactured from Type 021 AL, fully annealed clear fused quartz tubing. Lamp sleeves shall be domed at one end.
    2. The open end of the lamp sleeve shall be sealed by means of an o-ring and Type 316 stainless steel compression plate.
4. UV Intensity Sensor(s):
    1. The UV Intensity Sensor(s) shall be located inside the chamber and contained within protective quartz sleeves.
    2. One (1) sensor shall be provided per lamp.
    3. Sensor(s) shall incorporate SiC diodes, and provide NIST-traceable measurement with a total absolute uncertainty of 15% or less at an 80% confidence level.
    4. Sensor(s) must meet the requirements of the UVDGM. Sensor(s) must filter out wavelengths below 240 nm, and have a spectral response peaking between 250 nm and 280 nm with less than

10% coming from wavelengths greater than 300 nm.

5. The complete Sensor assembly and the internal circuit board containing the diode shall each be serialized.

5. Ballasts:

1. Ballasts shall be of a high frequency output, fully electronic design with a minimum efficiency of 95% at full load, and a power factor of 99% or better.
2. Ballasts shall have a variable operation range of 30% to 100% of full rated output and be adjustable in 1% increments.
3. The maximum allowable total current harmonic distortion (current THD) shall not exceed 10% at the maximum power level.
4. Each ballast shall supply power to one (1) lamp only.
5. Ballasts shall have a mean design life expectancy of at least 10 years.

6. Control Power Panel (CPP):

1. Power distribution and control for each UV Chamber shall be through the associated CPP. The CPP shall house all power supplies and control hardware.
2. The CPP shall be designed to operate with the following electrical supply:
    - 208/120 VAC, 3 Phase, 4 wire + GND, 60 Hz, 7.3 kVA (from a grounded WYE source).
3. The maximum total power consumption rating per CPP shall be no greater than 7.3 kVA (unbalanced load).
4. The CPP enclosure shall be composed of Painted Mild Steel.
5. The CPP enclosure shall be rated Type 12 (IP 54).
6. The CPP enclosure shall be forced-air cooled.
7. Signal wiring interfacing the UV Chamber with the CPP, shall be as shown on the contract drawings.
8. The CPP shall be installed within 20 feet (6 m) (external running cable length) of the UV Chamber.
9. Each CPP shall be provided with a lockable disconnect handle that shall shut down the system/cabinet power when the cabinet door is opened.
10. CPP enclosure shall be wall mounted.
11. CPP enclosure dimensions shall not exceed 914 mm x 1,219 mm x 457 mm (W x H x D). Weight shall not exceed 300 lbs / 136 kg.

7. Control and Instrumentation:

    1. General

        - One (1) Control Panel (CPP) is provided for each UV Chamber. All control hardware and software for a given system is contained within the associated CPP.
        - Each UV chamber shall be controlled independently.
        - Each UV chamber shall be controlled by an AB Compact Logix L33 which continuously monitors and controls the UV system's functions. The programmable logic controller (PLC) shall be capable of accepting an input flow signal (supplied by others), an input online UV transmittance signal (if needed) and the UV sensor signal(s).
        - Control of multiple chambers shall be accomplished through SCADA (by Others).

    2. Operator Interface

        - Complete control and monitoring of each TrojanUVSwift™ chamber shall be accomplished through the operator interface located on the CPP.
        - The operator interface shall be the Allen Bradley PV+7 7".
        - The operator interface shall be menu driven and shall display at minimum the following system information when prompted: chamber status, individual lamp status, lamp operating hours, RED (dose), UV Intensity, power level, alarms, alarm history.
        - The most recent alarms shall be displayed on the operator interface when prompted, recorded by alarm type, date and time of occurrence, and date and time of correction.

    3. Remote Monitoring

        - Each system shall be capable of being placed in either Local or Remote mode.
        - Each system shall be provided with the following customer interface hardwired I/O:
            - Discrete input for System On/Off Control from remote location.
            - Discrete output indicating Critical Alarm.
            - Discrete output indicating Major Alarm.
            - Discrete output indicating Minor Alarm.
            - Discrete output indicating System Ready.
            - Discrete ON/OFF status.
            - 4-20ma Flow Signal Analog input.

8. Dose-Pacing

    1. A dose-pacing system shall be supplied to modulate the lamp power levels based on changes to the flow rate, UV sensor signal(s) and UV transmission values (online UVT monitor needed), according to the validation report.

2. The system shall be dose-paced such that as the flow rate, water quality, and lamp conditions change, the UV RED (dose) target shall be achieved while conserving power.

9. Safety Features

    1. Each UV Chamber shall be equipped with a temperature switch to prevent the system from overheating. The temperature switch shall be wired to the CPP, and shall shut the system down and initiate a critical alarm condition when activated.
    2. Each UV Chamber shall be equipped with a water level sensor to prevent operation of the UV lamps in air. The level sensor shall be wired to the CPP and shall shut the system down and initiate a critical alarm condition if low water level is detected.
    3. Each UV Chamber shall be equipped with a cover to protect the lamps electrical connections. For Operator safety, the protective cover shall be equipped with a switch to disconnect power to the lamps when the cover is removed.
    4. Each CPP and chamber shall be equipped with an Emergency Stop button to shut off power to the lamps.

10. Spare Parts

    1. The following spare parts and safety equipment shall be supplied:
        - 2 UV Lamps
        - Synthetic (Validated - for Non-EU projects) sleeves
        - 1 set of seals and o-rings per reactor
        - 1 set of replacement wiper seals per reactor
        - 1 Face Shield, able to block UV light wavelengths between 200 and 400nm
        - Cleaning solution for 1 year of operation

11. Cleaning System

    1. Each UV Chamber shall be equipped with an automatic on-line sleeve cleaning system.
    2. The cleaning system shall be driven by a hermetically sealed magnetically coupled hydraulic drive. The drive system shall be designed such that all hydraulic connections are outside the UV chamber. The hydraulic fluid used shall be biodegradeable.
    3. The cleaning system shall provide both mechanical and chemical cleaning abilities for both the lamp sleeves and the UV Sensor sleeves/windows, complete with an automatically initiated and

controlled cleaning cycle. The cleaning system shall be fully operational while still providing disinfection.

4. Cleaning cycle intervals shall be field adjustable via the operator interface. Manual cleaning system control shall also be through the operator interface.
5. The system shall be provided with the cleaning reagents and solutions required for initial equipment testing and equipment start-up.
6. Cleaning reagents and solutions used shall be NSF™ 60 approved.

Execution

Installation

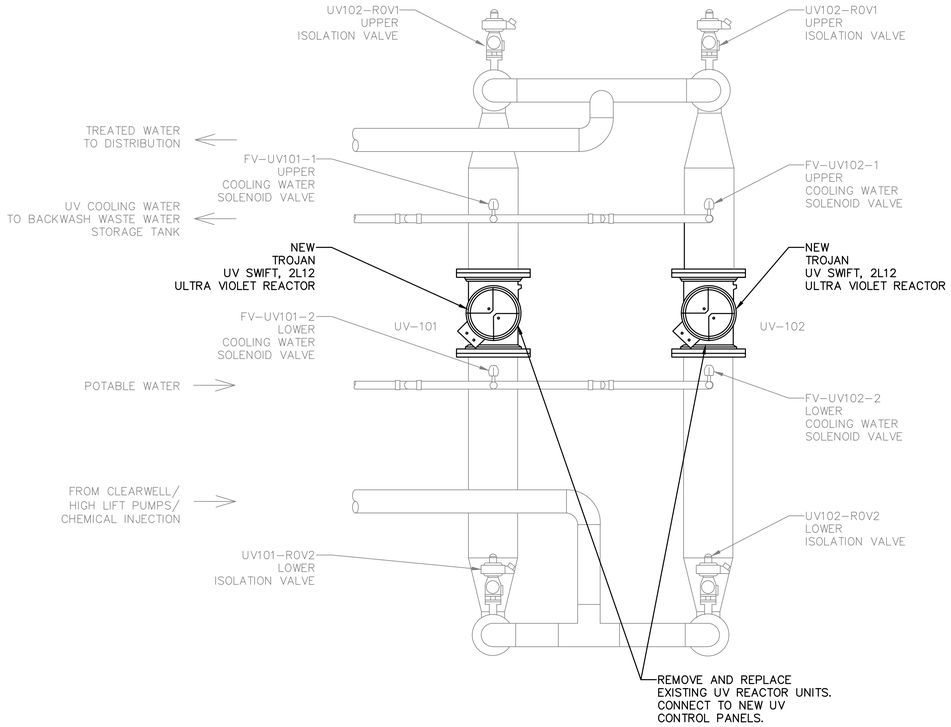
1. In accordance with the contract drawings, manufacturer's engineering drawings and instructions.

Manufacturer's Services

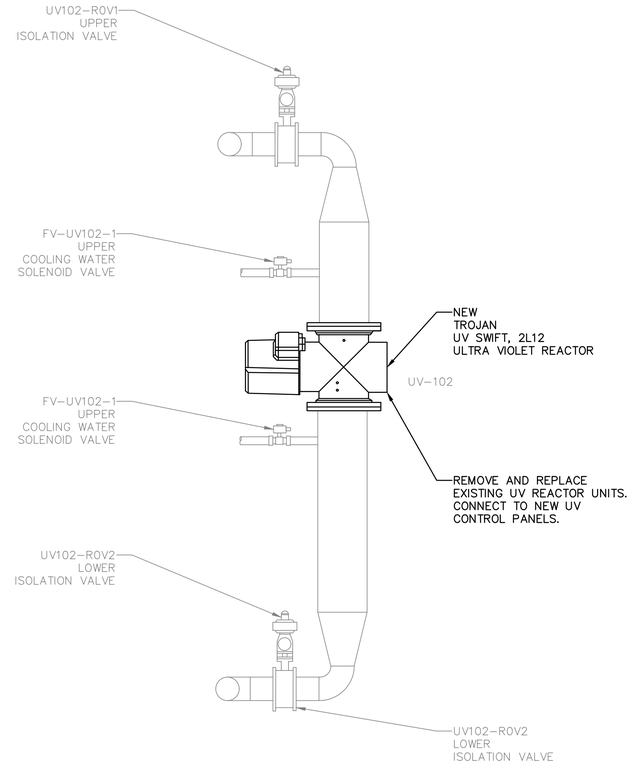
1. Installation Supervision: As required by phone or fax.
2. Start-up and Operator training: 2-3 full days on site, per chamber.
3. Service Scheduling: As required during the warranty period.

END OF SECTION

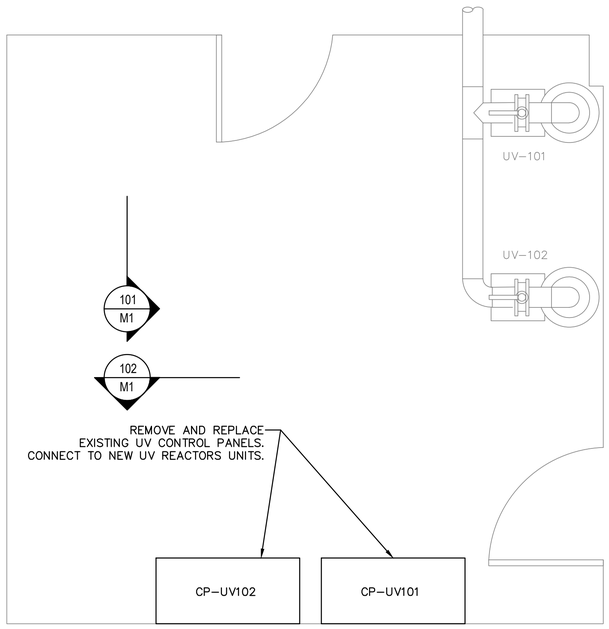
APPENDIX B – UV AREA DRAWING



101 / M1 UV AREA, FRONT VIEW
SCALE: NTS



102 / M1 UV AREA, SIDE VIEW
SCALE: NTS



103 / M1 UV AREA, PLAN VIEW
SCALE: NTS

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NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH RELEVANT CODES AND GUIDELINES.
2. ALL DRAWINGS AND ADDENDA ARE TO BE READ AS, AND IN CONJUNCTION WITH THE SPECIFICATIONS.
3. ALL EQUIPMENT SHALL BE INSTALLED AS SPECIFIED OR APPROVED EQUIVALENT.
4. CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH WORK AND BE RESPONSIBLE FOR SAME.
5. CONTRACTOR MUST REPORT ANY DISCREPANCIES TO ENGINEER FOR RESOLUTION BEFORE COMMENCING THE WORK.
6. ANY CHANGES MUST BE APPROVED BY THE ENGINEER.

A / B — A DETAIL NO. B DRAWING NO. – WHERE DETAILED

LEGEND

REVISION	DESCRIPTION	DATE
02	ISSUED FOR TENDER	25/03/18
01	ISSUED FOR REVIEW	25/02/28

NORTH

STAMP

LICENSED PROFESSIONAL ENGINEER
MAR 18/25
J. SINNAKANDU
100516015
PROVINCE OF ONTARIO

PROJECT
CARDINAL WTP UV REPLACEMENT

TOWNSHIP OF EDWARDSBURGH/CARDINAL
SPENCERVILLE, ONTARIO

DRAWING TITLE
MECHANICAL
UV AREA LAYOUTS

DESIGNED BY: J. SINNAKANDU
DRAWN BY: T. FUNARI
REVIEWED BY: T. GUERRERA
APPROVED BY: J. SINNAKANDU
PROJECT DATE: 2024/12/19 (YYYY/MM/DD)
PROJECT #: 24–3–7806
DRAWING #: M1
DRAWING SCALE (ISO A1): HOR: AS SHOWN VER: AS SHOWN

BORDER SIZE: ISO A1 (841mm x 594mm) DATE PLOTTED: 2025 / 03 / 18 @ 04:05 PM PLOT SCALE: 1:1 FILE PATH: P:\Belleville Project\7000\24378O6 – Cardinal WTP UV Replacement\Drawings\Working\24378O6 – Cardinal WTP UV Replacement – Mech 1B.dwg CAD PLOTTER: TomF

(METRIC SCALE – ALL DIMS IN MILLIMETERS U.N.O.)