REQUEST FOR PROPOSAL
EQUIPMENT PRESELECTION
INGLESIDE WWTP UPGRADES
REQUEST FOR PROPOSAL NO.: RFP 14-2020

SUBMITTED BY:

Trojan Technologies
3020 Gore Rd, London, Ontario, Canada
Rob Jansen
(519) 457-3400
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H2Flow Equipment
Oster Lane, Vaughan, Ontario, Canada
Albert Wakim
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September 15, 2020

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TROJAN UV
WATER CONFIDENCE™

September 15, 2020

EVB Engineering
800 Second St. W.
Cornwall, Ontario,Canada
K6J 1H6

Attention: Jamie Baker
Re: Ingleside WWTP

RFP No. 14-2020
Bidding Document for System # 05 – Ultraviolet Disinfection System

Dear Mr. Baker

We would like to thank you and the Township of South Stormont for the opportunity to provide a response to the RFP for the UV system upgrade at the Ingleside facility.

During our >40-year history, Trojan has led the world's innovations in UV: from the introduction of the first large-scale medium-pressure lamp UV system to the commercialization of electronic ballasts and automated cleaning systems. This leadership is evidenced by the development of a high-efficiency UV reactor for the world's largest UV installation: the Catskill-Delaware Water Treatment Plant in New York City, New York, USA.

These innovations along with our environmental stewardship are reasons why Trojan was awarded the 2009 **Stockholm Water Prize** – the industry's most prestigious award for water technology innovation and leadership. In 2013 Trojan **TrojanUVSigna™** System also received the **WEF Innovation Technology Award** which has again led the way to a trend in the industry toward inclined systems.

We have examined the design specification and after evaluating two viable options (the Trojan 3000 Plus and the Trojan UV Signa) we have decided to offer the much newer and much more efficient Trojan UV Signa to ensure the municipality would be getting the latest and most advanced technology available. Also, we thought we would offer 2 options, so on top of our 2 Channel Base bid, we also offered a single channel alternative for consideration.

We would like to take this opportunity to outline the key features that differentiate the proposed TrojanUVSigna™ System. The TrojanUVSigna™ offers the following advantages over other older UV systems:

- Reactor and Lamp Orientation – the lamp orientation of the TrojanUVSigna™ is a unique staggered, inclined array. This orientation was selected because it combines the best benefits of both horizontal and vertical lamp UV systems.
    - Like a horizontal system, it offers high disinfection performance, hydraulic benefits and is effective over a wide range of water quality. Like a vertical system, it offers maintenance benefits (e.g. easy lamp replacement).
    - The inclined arrangement overcomes the drawbacks of vertical system such as stress on quartz sleeves and debris collecting on the lamp arc length.
    - The inclined lamp position has additional benefits (over vertical systems) in that modules are more stable, less prone to vibration and are easier to raise from the channel.
    - The lamp pattern was developed specifically to maximize the reactor performance with the high powered Solo Lamp™.

- The Solo Lamp™, used in the TrojanUVSigna™ is the most powerful high efficiency low pressure high output lamp in the world. This results in the **LOWEST** lamp count meaning fewer lamps to maintain. Power fluctuation can **range from 30% to 100%** resulting in significant power savings over older systems with less turndown.

- The Solo Lamp™ has been independently validated according to NWRI protocol to show only a 14% degradation over its **industry best guaranteed lifetime of 15,000 hours**.

- A fully automatic chemical/mechanical cleaning system (ActiClean™) is provided for the quartz sleeves. This fully automated sleeve cleaning system optimizes power consumption and eliminates operator involvement for system cleaning. This will significantly reduce the plant's operating and maintenance costs (both labor and materials) and is far superior to any system that just has mechanical wiping or scraping only.

- The TrojanUVSigna™ system is uniquely modular. Modules are scalable through the incremental addition of lamps which results in the reduction in oversizing associated with other manufacturers confined to specific lamps/module. The end result is cost savings and a minimum number of lamps, sleeves, drivers, etc. to maintain.

- The Solo Lamp™ is powered by a Lamp Driver located in a separate electrical panel which can be located beside the channel or in a separate building. The lamp driver has an **industry best 10 year warranty**.

- An integral module lifting device for each module/bank means there is no need for expensive overhead cranes. For seasonal disinfection applications the modules can simply be translated to their out of channel position for winterization.

- UV modules are rated 6P meaning they are designed to tolerate temporary flood conditions without damage unlike other systems.

- All control panels, power distribution systems (PDCs), hydraulic system systems (HSC) and system control center (SCC) are all outdoor rated or NEMA 4X and do not require any additional protection from inclement weather as they include their own heating/cooling systems

The design and support of the proposed TrojanUVSigna™ system is provided by Trojan Technologies, a world leader in UV based disinfection technologies. Purchasing a UV system from Trojan Technologies offers the following advantages:

- The largest installed base of municipal systems in the world, including over 10,000 systems worldwide.

- A lifetime disinfection performance guarantee is provided, at no extra cost, and is valid for the life of the System. This is significantly better than the one (1) year performance guarantee offered by some UV manufacturers.

- Demonstrated comprehensive after-market service (including Service Contracts), replacement parts and routine service and maintenance is also provided directly through our local Trojan factory trained service representatives at H2Flow located in Vaughn, ON. We also offer 24 hours a day, 7 days a week support through our toll free number.

Thank you for the opportunity to present this proposal to you and to the Township of South Stormont and staff of the Ingleside WWTP. If you have any questions please do not hesitate to contact us at (519) 457-3400 or through our local sales representative, Albert Wakim with H2Flow Equipment (905) 660-9775.

Best regards,

Rob Jansen
Regional Manager, Trojan Technologies.

APPENDIX C – SUBMISSION FORM

A. General Proponent Information

The undersigned hereby acknowledges that he/she, as an officer of the stated corporation, has read and understands the specifications, requirements, and proposed agreement regarding the **Equipment Preselection** for the Ingleside WWTP, Township of South Stormont. He/she further acknowledges that the seller's proposed product, equipment, materials, and services fully meet or exceed those as specified in the Township's RFP. Additionally, the Proponent agrees that all its technical and financial documents and responses to the aforementioned RFP will, at the option of the Township, become a legally binding and essential portion of the final contract agreement between the successful Proponent and the Township following execution of the contract agreement.

The following information must be completed to ensure tender acceptance.

*ADDENDA No. 1 to ~~X~~ 4 INCLUSIVE WERE CAREFULLY EXAMINED.

DATED THIS 15th DAY OF September, 2020.

PROPONENT'S COMPANY NAME: Trojan Technologies Group ULC

ADDRESS: 3020 Gore Rd

CITY/ PROVINCE: London, Ontario POSTAL CODE: N5V4T7

PHONE NO.: 519-457-3400 FAX NO.: 519-457-3030

EMAIL ADDRESS: rjansen@trojanuv.com

WEBSITE: https://www.trojantechnologies.com/

CONTACT NAME (please print): Rob Jansen

TITLE (please print): Regional Manager PHONE NO.: 519-457-3400

AUTHORIZED SIGNATURE:

HST REGISTRATION NO: 743287328TR0002 WSIB - YES

WSIB COVERAGE: (YES) NO

* The proponent shall attach and initial all addenda received during the period and shall take them into consideration when preparing their bid submission. A signed copy of each Addendum must be included with the bid submission. Failure to comply may be cause for rejection of bid submission.

2. Acknowledgment of Non-Binding Procurement Process

The proponent acknowledges that the RFP process will be governed by the terms and conditions of the RFP, and that, among other things, such terms and conditions confirm that this procurement process does not constitute a formal, legally binding bidding process (and for greater certainty, does not give rise to a Contract A bidding process contract), and that no legal relationship or obligation regarding the procurement of any good or service will be created between the Township and the proponent unless and until the Township and the proponent execute a written agreement for the Deliverables.

3. Ability to Provide Deliverables

The proponent has carefully examined the RFP documents and has a clear and comprehensive knowledge of the Deliverables required. The proponent represents and warrants its ability to provide the Deliverables in accordance with the requirements of the RFP for the rates set out in its proposal.

4. Non-Binding Pricing

The proponent has submitted its pricing in accordance with the instructions in the RFP. The proponent confirms that the pricing information provided is accurate. The proponent acknowledges that any inaccurate, misleading, or incomplete information, including withdrawn or altered pricing, could adversely impact the acceptance of its proposal or its eligibility for future work.

5. Addenda

The proponent is deemed to have read and taken into account all addenda issued by the Township prior to the Deadline for Issuing Addenda.

6. Communication with Competitors

For the purposes of this RFP, the word "competitor" includes any individual or organization, other than the proponent, whether or not related to or affiliated with the proponent, who could potentially submit a response to this RFP.

Unless specifically disclosed below under Disclosure of Communications with Competitors, the proponent declares that:

(a) it has prepared its proposal independently from, and without consultation, communication, agreement or arrangement with any competitor, including, but not limited to, consultation, communication, agreement or arrangement regarding:

   (i) prices;

   (ii) methods, factors or formulas used to calculate prices;

   (iii) the quality, quantity, specifications or delivery particulars of the Deliverables;

   (iv) the intention or decision to submit, or not to submit, a proposal; or

   (v) the submission of a proposal which does not meet the mandatory technical requirements or specifications of the RFP; and

(b) it has not disclosed details of its proposal to any competitor and it will not disclose details of its proposal to any competitor prior to the notification of the outcome of the procurement process.

Disclosure of Communications with Competitors

If the proponent has communicated or intends to communicate with one or more competitors about this RFP or its proposal, the proponent discloses below the names of those competitors and the nature of, and reasons for, such communications:

Not Applicable

7. No Prohibited Conduct

The proponent declares that it has not engaged in any conduct prohibited by this RFP.

8. Conflict of Interest

The proponent must declare all potential Conflicts of Interest, as defined in section 3.4.1 of the RFP. This includes disclosing the names and all pertinent details of all individuals (employees, advisers, or individuals acting in any other capacity) who (a) participated in the preparation of the proposal; **AND** (b) were employees of the Township within twelve (12) months prior to the Submission Deadline.

If the box below is left blank, the proponent will be deemed to declare that (a) there was no Conflict of Interest in preparing its proposal; and (b) there is no foreseeable Conflict of Interest in performing the contractual obligations contemplated in the RFP.

Otherwise, if the statement below applies, check the box.

> The proponent declares that there is an actual or potential Conflict of Interest relating to the preparation of its proposal, and/or the proponent foresees an actual or potential Conflict of Interest in performing the contractual obligations contemplated in the RFP.

If the proponent declares an actual or potential Conflict of Interest by marking the box above, the proponent must set out below details of the actual or potential Conflict of Interest:

Not Applicable

9. Disclosure of Information

The proponent hereby agrees that any information provided in this proposal, even if it is identified as being supplied in confidence, may be disclosed where required by law or by order of a court or tribunal. The proponent hereby consents to the disclosure, on a confidential basis, of this proposal by the Township to the advisers retained by the Township to advise or assist with the RFP process, including with respect to the evaluation of this proposal.

Signature of Proponent Representative

Jo Anne Vanhooydonk

Name of Proponent Representative

VP of Finance and CFO

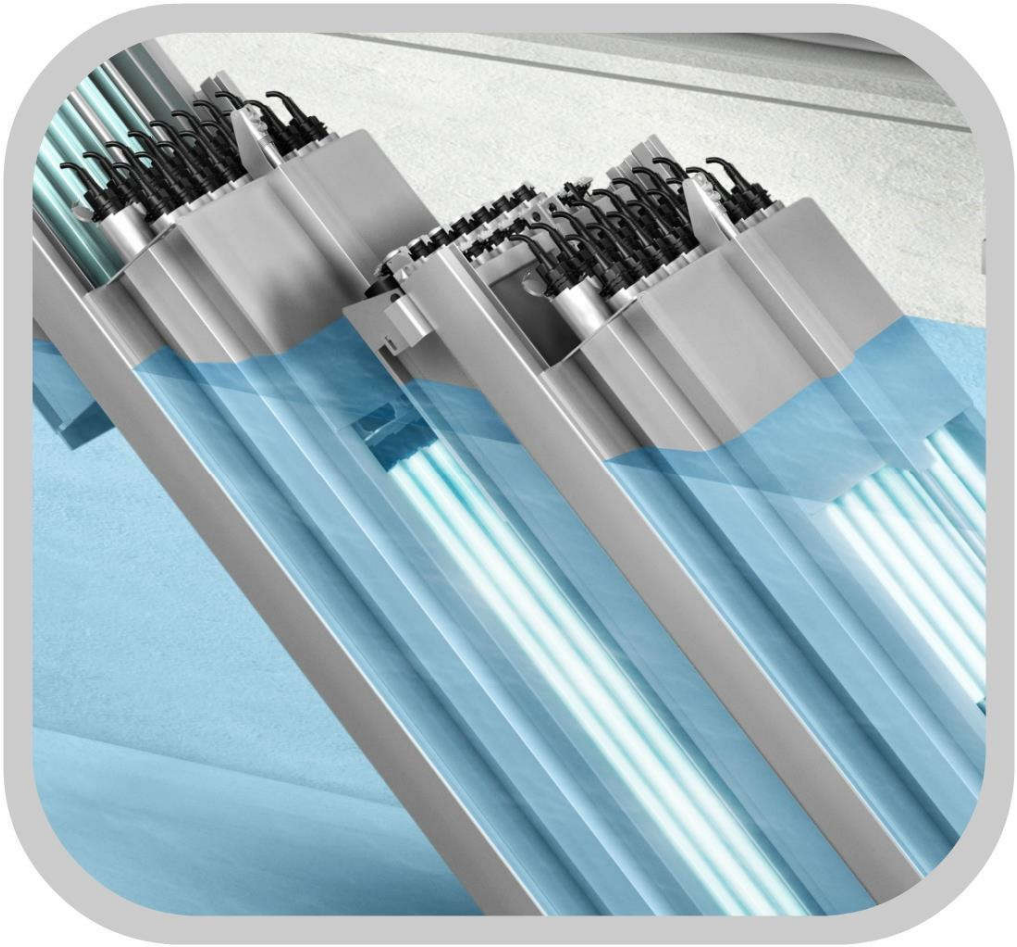
Title of Proponent Representative

September 14. 2020

Date

I have the authority to bind the proponent.

ADDENDUMS



PART 1 GENERAL

The following changes are effective immediately and shall be incorporated into the Contract Documents.

PART 2 INFORMATION/CLARIFICATION

2.1 CLARIFICATION

.1 The submission deadline is extended to September 15, 2020 @ 14:00:00 local time.

.2 Amend Part 1 Section 1.5.3 Proposals to be Submitted in Prescribed Format as follows:

  .1 "Proponents should submit ~~**1 hard copy of their proposal (original) and**~~ one (1) electronic copy ~~**on USB in a sealed package**~~ **(original) of their proposal via email or other secured format**. If there is a conflict or inconsistency ~~**between the hard copy and**~~ **with the submittal of** the electronic copy of the proposal, ~~**the hard copy of the proposal will prevail**~~ **it is the proponents responsibility to confirm successful delivery to the contact identified in the RFP. At no time is it the owners or their agent's responsibility to facilitate delivery of the submission, i.e. We assume no liability for the successful delivery of the proposal.** All ~~**hard copies**~~ **submitted documentation** shall be printed in high quality and perfectly legible; duplicated, illegible copies may result in rejection of the proposal. Proposals should be prominently marked with the RFP title and number (see RFP cover), with the full legal name and return address of the proponent.

.3 Add the following drawings to the entire RFP package as supporting documentation:

  .1 Drawing G1.1 – Preliminary Hydraulic Profile for Future WPCP
  .2 Drawing PD1.2 – Preliminary Process Equipment Layout (Thickener)
  .3 Figure 7.1 – Proposed Headworks Building and Primary Clarifiers
  .4 Figure 7.2 – Preliminary Sections
  .5 Figure 7.3 – Site Plan Sketch Views

PART 3 SPECIFICATIONS

3.1 SPECIFICATION 26 05 01

.1 **Amend Section 2.8.6** as follows:

.1 Manufacturers:

.1 Baldor.
.2 General Electric.
.3 ~~**Reliance Electric.**~~
.4 TECO-Westinghouse.
.5 ~~**Toshiba.**~~
.6 **WEG**
.7 **SEW Euro Drive**
.8 **Siemens**
.9 **ABB**

3.2 SYSTEM #1 – FINE SCREEN AND COMPACTOR

.1 Part 1 – General

.1 **Add Subsection 1.1.5.** "The fine screen system shall be an inclined screen with the capacity of removing a **minimum** of 75% of the solids 6 mm diameter and larger."

.2 Part 2 – Products

.1 **Amend Subsection 2.2.6.4.2** "One (1) electrically actuated **(solenoid)** ~~**NEMA4X**~~ **NEMA-7** SS ball valve."

.2 **Amend Subsection 2.4.4** "An emergency Pull Cord mechanism and hardware are ~~**provided by others**~~ **to be provided by the supplier as part of the conveyor package**, for use with each conveyor **and integrated with the control system.**"

.3 **Amend Subsections 2.4.5.5.3.2.2 and 2.4.5.3.3.2** "One (1) electrically actuated **(solenoid)** Class 1, Div. 1, ANSI ~~**304**~~ **316L** full port…"

.4 **Amend Subsection 2.5.2.5** "Local Class 1, Div. 1 motor disconnect stations for installation within the screening room and within sight-line of the screening equipment to be supplied by ~~**the screening system manufacturer**~~ **others** for proper integration…

.5 **Amend Subsection 2.6.3.8** "One (1) x ~~**10-inch**~~ **12-inch** color Allen Bradley model Panel View Plus 7."

3.3 SYSTEM #2 – VORTEX GRIT REMOVAL AND CLASSIFIER

.1 Part 1 – General

.1 **Amend Subsection 1.2.2** "The Vortex Grit Removal units are to be designed **in-parallel, with full redundancy, each unit providing 100%** of the following design basis:"

.2 Amend Subsection 1.2.4.5.1 "~~**95% of all grit larger than 50 micron (270 mesh),**~~ **Match the Vortex removal rates identified in 1.2.2.7"**

.2 Part 2 – Products

.1 **Amend Subsection 2.1.2 "All housings, structural components, troughs, hoppers, chutes, manifolds, nozzles, valve bodies, ducts, bases, anchors, and fasteners must be Type 316L stainless steel for all welded components and 316 stainless steel for all other components.** All stainless-steel main components…."

.2 **Delete Subsection 2.2.1.2 "~~Tanks to be covered with removable aluminum (bolted) checker plate panels generally designed to meet the Ontario Building Code requirements including one (1) 600 mm x 600 mm hinged section. Cover to be designed for a minimum 8 kPa load.~~"**

.3 **Amend Subsection 2.2.1.7.1** "Each tank shall be supplied with a **minimum** one (1) water scour system complete with a **minimum** 50mm **316 full port** stainless steel solenoid valve and one (1) manual ~~25~~ **50**mm 316 SS full port isolation ball valve, wye strainer, complete with flushing valve, to be supplied to the base of each vortex grit removal tank. **Sizing of the scour water lines shall be per the manufacturer's requirements to achieve the performance criteria; valve sizing shall match the required line size. The flow rate for** the water scour system **shall be identified by the supplier in the submission** ~~**requires 100 L/min at 175 kPa**~~ **, the line pressure to each tank provided external to the manufacturers supply shall be a maximum of 375 kpa (55 psi(g)). Should a higher pressure be required, it should be identified in the submittal.** Pressure regulator to be provided by supplier.

.4 **Delete Subsection 2.2.1.7.2 "~~The structural frame shall be fabricated with two lateral plates connected by means of cross braces. A bolted plate shall seal the top of the frame.~~"**

.5 **Amend Subsection 2.2.1.8** "Each grit tank to be equipped with a manual 316 Stainless Steel isolation slide gate on both the inlet and outlet channels, **supplied by others**."

.6 **Amend Subsection 2.4.4** "Grit washing system to include 2-piece stainless steel ball isolation valve, rated, ~~**brass**~~ **316 SS**, slow closing …"

.7 **Amend Subsection 2.4.5 "All** wetted components (trough, grit settling tank, weir, discharge chute, classifier support structure, screw assembly, cover, piping, nozzles, hardware and fasteners) are to be ~~**304**~~ **316L** Stainless Steel…."

.8 **Amend Subsection 2.4.11** "…one contact for use in the conveyor interlock control circuit within the remote starter and one for remote indication of switch status to the ~~**plant**~~ **main controlling** PLC."

.9 **Amend Subsection 2.4.12** "Spray wash system designed to wash grit prior to discharge to bin while grit classifier is operating. Spray wash system shall consist of stainless-steel spray header, nozzles, and ball valves, **all components shall be constructed of 316 stainless steel.** A ~~**12mm diameter,**~~ NC **316** stainless steel EEMAC 7X solenoid valve

suitable for 120V, 1 phase, 60 Hz power supply shall control the water flow rate to the wash system. **Size of the spray wash line and valve shall be sized by the manufacturer to ensure compliance with the performance criteria.**"

~~.10~~ **Delete Subsection 2.3.2.10 "~~Pumps to be controlled by remote plant PLC system. Pump manufacturer to factory connect sufficient cable to connect to starter.~~"**

.11 **Amend Subsection 2.5.2.5** "Local Class 1, Div. 1 motor disconnect stations for installation within the grit room and within sight-line of the grit equipment to be supplied by ~~the screening system manufacturer~~ **others** for proper integration…"

.12 **Amend Subsection 2.6.3.8** "One (1) x ~~7-inch~~ **12-inch** color Allen Bradley model Panel View Plus 7 (~~or) Siemens TP700 Comfort MMI touch screen~~."

3.4 SYSTEM #4 – WASTE ACTIVATED SLUDGE THICKENER

.1 Section 1.6 System Description

.1 Modify 1.6.2 "All drives, motors, instrumentation etc. supplied shall be designed for a ~~Class 1, Division I environment, Group D environment~~ **Unclassified environments**.

.2 Section 46 73 00 2.2. Equipment Requirements

.1 **Revise sentence 2.2.1.2.** to read as follows: "The skid shall be fabricated or welded and bolted Type 316 L stainless steel members. ~~The skid shall be capable of spanning between two concrete piers supports as shown on the Drawings~~."

.1 **Add Section 2.2.1.3. Equipment base and support frame:**

.1 Provide fabricated base to support the complete assembly. Design frame to adequately support all loads with no vibration when operating at maximum rated drum speed and throughput.

.2 Fabricate in sections as required for shipping and installation and provide bolted connections. Alternatively, provide separate bases for major equipment.

.3 Supply all necessary spring type vibration isolators (if needed) to permit bolting of the base directly to the operating floor. Provide isolators with built-in leveling bolts and resilient shocks as per isolator manufacturer recommendations.

.4 Provide data on required anchor bolts complete with installation instructions.

.5 Provide frame with four removable lifting eyes to facilitate handling.

.6 **Provide framework fully equipped with stairs and walking bridges and handrails as required to monitor and service and working components of the units.**

.7 **Assume that the service platform for the RDT type equipment shall be located 1.0 m above the finished floor upon which it is mounted to allow for the discharge hopper (included in the supply) to be connected to the TWAS progressive cavity discharge pump (NIC) which will be installed on the finished floor and connected to the outlet of the TWAS hopper.**

.2 **Revise sentence 2.2.6.2.1** to read as follows: "The hopper shall have a minimum volume of ~~2,000~~ **750** liter's **to adequately convey the thickened sludge without bridging or overflowing and arranged to convey the peak material production rate from the thickener** and shall...."

.3 **Remove Section 2.3 POLYMER FEED SYSTEM in its entirety.**

.4 **Revise Section 2.4 ELECTRICAL REQUIREMENTS**

.1 Modify Section 2.4.3.2 "If transformers are required to modify the 600V feed, the Supplier **is to provide the power requirements. The transformer shall be provided by others."**

.5 Revise Section 3.4 Manufacturer's Services

.1 **Modify 3.4.7.2. "~~5~~ 2 person days for functional and performance testing, training, and completion of Manufacturer's Certificate of Proper Installation; ~~2~~ 1 trips..."**

.2 **Modify 3.4.7.3 "~~2~~ 1 person days for pre-start-up classroom or site training: ~~2~~ 1 trips.**

.3 **Delete Item 3.4.7.4.**

3.5 SYSTEM #5 – UV DISINFECTION 46 83 00

.1 Amend Part 1, 1.2 Design as follows:

.1 Amend 1.2.1.2 Operation Configuration One (1) Duty/ One (1) Standby **in a two-channel configuration, each unit to provide full treatment and hydraulic redundancy.**

.2 Modify 1.2.1.6. UV Safety Factors for Design:

.1 **Delete ~~.3 Safety Factor 0.9 or lower.~~**

.3 Add 1.2.1.7 UV Dosage 30 mJ/cm^2, the basis for evaluating the dose delivered by the UV disinfection system shall be the manufacturer's MS-2 Bioassay results as determined by independent third-party reactor validation testing.

.2 **Revise Part 2 Section 2.4 ELECTRICAL REQUIREMENTS**

.1 Modify Section 2.4.2.2 "If transformers are required to modify the 600V feed, the Supplier **is to provide the power requirements. The transformer shall be provided by others.**"

PART 4 QUESTIONS AND ANSWERS

4.1

.1 **Q** – There are no drawings provided, is it possible to get some guidance on the length of the washer/compactor and the configuration.

A – The screens, washer and compactor will be arranged within the channels identified in the attached Figure 7.1.

.2 **Q** – With reference to System #1 specification 2.2.5, if the proposed unit does not have a self-adjusting brush will we be disqualified.

A – No, we will accept the submission. The proponent should identify the deficient area of their offering and provide details of their design and how it will achieve the intent of the specification.

.3 **Q** – Could the polymer system be provided under the general contract?

A – Yes, Section 46 73 00 2.3 Polymer Feed System is deleted from the scope of supply. Refer to item 3.4.2.3 above. The thickener controls shall be capable of controlling the polymer system as described by the supply will be by others.

.4 **Q** - Request a one-week extension for Ingleside RFP No 14 - 2020.

A - At this time, a 5-day extension will be provided. However, to address delivery issues **Item 1.5.3 Proposals to be Submitted in Prescribed Format is amended (see above) for the submission of only one (1) electronic copy via email and/or other secured digital transmission.**

.5 **Q** - Request pdf be unlocked allowing access to the fillable forms.

A – We will endeavor to facilitate this request with Merx and Biddingo. Currently, we are not able to circulate the forms in the format requested.

.6 **Q** - Is this a new installation or retrofit? Are there any drawings for review?

A – This is a new installation within an existing facility (i.e. we are currently designing the structures which will house the equipment). As such there are currently no drawings to circulate which define the channels and/or space within which the equipment will be installed. We will be designing around the selected equipment.

.7 **Q** - Bid submission requires hard copy plus electronic copy. Will electronic copy only submission be acceptable due to COVID-19?

A – As per question 5 and item 2.1.2 above, we will be accepting electronic submissions only.

.8 **Q** - The UV specification calls for one (1) duty / one (1) standby configuration. Will 2 duty and 1 standby be acceptable as a base bid?

A – No, our intent is to design a two-channel system with full redundancy, each channel shall contain a system meeting the peak flow and treatment requirements.

.9 **Q** - Will higher than 0.8 lamp aging factor be acceptable if third party report is available. Will need a signed NDA for circulation of report.

A - No, the lamp aging factor is 0.8 for this application.

.10 **Q** - What is the safety factor 0.9 for? UV equipment typically applies end of lamp life factor, quartz sleeve fouling factor, and quartz transmission factor.

A – The safety factor of 0.9 will be deleted from the required design safety factors.

.11 **Q** - Can the electronic submission be considered the official one? Couriers have been terrible lately.

A – See response to question 4 and item 1.5.3 above.

.12 **Q** – RFP 3.6.3 – Non-Binding Price Estimate. Not sure what to make of this para.?

A – The entire section 3.6 Procurement Process Non-binding is intending to illustrate that there is no contract between the proponent and the owner until the formal agreement is signed and ratified by both parties. As indicated in 3.6.3, the pricing submitted will be used for the evaluation and pending no other changes, the selected equipment supplier will be requested to enter into the formal agreement at which time the pricing is binding and there is a procurement contract.

.13 **Q** - GT 2.0.2 Not sure how to interpret this – meaning the Tenders will contact the suppliers for a price. Isn't the price we give the price?

A – The intention of providing the opportunity to review your price is based on several items. 1 – We do not know exactly when the General Tender will be let, as such we do not expect the proponent to maintain their proposal price indefinitely. It is defined as 240 days in the proposal documents; however, we have no project funding confirmation at this time. 2 – As the design progresses, we may modify the scope of supply, again changing the value of goods. We will be working with the selected supplier throughout the design process to ensure we both understand when/if there are scope changes. 3 - This force the supplier to review the design package to ensure nothing is different than the agreed upon changes while ensuring the supplier is familiar with the design. 4 – This keeps the supplier's price confidential. It is our intent that we will be in correspondence with the suppliers prior to closing the general tender so that we will receive the updated suppliers pricing that should match the price submitted to the general contractor.

.14 **Q** - GT 4.0.4 – Seems if we state it is imported and state the Foreign Exchange rate, it will be adjusted at time of equipment entry into Canada. This is good for US manufacturers, but may not be your intent?

A – As we currently do not know when the General Tender will be let, identifying the exchange rate at the time of proposal removes the risk from the equipment supplier with regards to exchange rate fluctuations.

.15 **Q** – There is no added value for having the L3 TYPE CompactLogix where an L1 or L2 would be suitable. Processor remains identical. The gain in space and price associated will be to the benefit of the Owner.

A – L1 or L2 type CompactLogix units are not acceptable.

.16 **Q** - Having the same HMI size will increase the uniformity of the plant.

A – All PLC HMI's will be 12-inch Allen Bradley PanelView Plus 7, see specification updates above.

.17 **Q** - Can you confirm if IEC NEMA rated motor starters are acceptable.

A - No, only NEMA rated motor starters are acceptable.

.18 **Q** – Can you please confirm that WEG is an acceptable manufacturer for the motors?

A – Yes, WEG is acceptable. Specification 26 05 01 2.8.6 is updated with this addendum.

.19 **Q** – Can you please clarify the water level to be expected down stream of the screens? What is the projected controlling element downstream of the screens?

A – Refer to the attached Hydraulic Gradeline Drawing G1.1 for the preliminary water profile within the headworks area. A Parshall flume will be installed downstream of the vortex grit units and used to control the upstream water levels. Refer also to attached Figure 7.1 for the preliminary headworks layout.

.20 **Q** – With reference to 46 43 00 2.2, can you please confirm the material to be used for all the components described in this section?

A – Refer to Part 2 Products 2.1.2.

.21 **Q** – For Class 1, Division 1 area installation, NEMA-7 rating is required. Can you please confirm that the wash water valves should be NEMA-7 and not NEMA-4X?

A – Yes, NEMA-7 is required. Specification 46 43 00 2.2.6.4.2 is amended accordingly.

.22 **Q** – Can you please confirm a solenoid valve is acceptable in lieu of the actuated ball valve?

A – Yes, solenoid valves are acceptable in lieu of the actuated ball valves (46 43 00 2.2.6.4.2).

.23 **Q** – Can you please confirm if the Emergency Pull Cord is supplied by others?

A – No, the Emergency Pull Cord shall be supplied by the equipment supplier, Specification 46 43 00 2.4.4. is amended accordingly.

.24 **Q** – The spiral screw in Hardox should not come in contact with wear bars having the same material to ensure that the wear bars be considered as wear items and not the screw. We recommend using stainless steel wear bars. Please confirm this will be acceptable.

A – The design of the spiral and the wear bar interaction should be based on the manufacturers design. Stainless wear bars are acceptable, and the manufacturer should provide comment and frequency/ease of replacement and longevity of the entire system, the proposals will be evaluated accordingly.

.25 **Q** – Can you please confirm that solenoid valves are acceptable instead of motorized valves?

A – Yes, solenoid valves are acceptable. Specifications 46 43 00 2.4.5.5.3.2.2 and 3.3.2 are amended accordingly.

.26 **Q** – Can you please confirm the material to be used for the valves?

A – The valves identified in Specifications 46 43 00 2.4.5.5.3.2.2 and 3.3.2 are to be SS 316L, the specification is amended accordingly.

.27 **Q** – 46 43 00 2.5.2.5 Can you please clarify if the motor disconnect switches will be part of the Electrician Contractor's supply?

A – Yes, the disconnect switches will be supplied by others and the specification amended accordingly.

.28 **Q** – Can you please clarify the water level to be expected downstream of the grit chambers?

A – Refer to the attached Drawing G1.1.

.29 **Q** – Can you please confirm the material to be used for all the components described in this section (46 53 00)?

A – All housings, structural components, troughs, hoppers, paddles, shafts, chutes, manifolds, nozzles, valve bodies, ducts, bases, anchors, and fasteners must be a minimum of Type 316 or 316L Stainless Steel.

.30 **Q** – Can you please clarify if redundancy is required on the Grit Train? What is the peak flow to be handled by each Grit Vortex?

A – There are two vortex grit units, each unit shall be rated for the peak flow. The units will be arranged in-parallel as indicated in the preliminary headworks layout provided in the attached Figure 7.1.

.31 **Q** – Can you please confirm that the cyclone performance will be 95% of all grit larger than 150 micron?

A – The cyclone performance shall match the vortex performance; item 1.2.4 will be amended accordingly.

.32 **Q** – Can you please confirm that the checker plate is out of the Manufacturer's supply (46 53 00 2.2.1.2)?

A – Yes, the checker plate will not be included in the Manufacturer's scope, subsection 2.2.1.2 is amended accordingly.

.33 **Q** – Can you please confirm that a 155 psi pressure will be available for the water scour?

A – No, 155 psi will not be available. A maximum water pressure of approximately 55 psi will be available, if the system requires 155 psi that should be identified in the proposal and the supplier shall include the necessary equipment. The supplier should also identify whether impingement plates are required within the unit to protect the vessel.

.34 **Q** – Can you please confirm the function of this component (46 53 00 2.2.1.7.2)?

A – This item will be deleted.

.35 **Q** – Can you please confirm that the slide gates are part of the contractor's supply (46 53 00 2.2.1.8)?

A – Yes, confirmed.

.36 **Q** – Are the grit pumps to be controlled by the plant's PLC or the main control panel (by manufacturer) (46 53 00 2.3.2.10)?

A – The grit pumps shall be controlled by the manufacturers control panel and via integration by the plants SCADA system. Item 2.3.2.10 will be deleted.

.37 **Q** – Can you please confirm the material of the valves to be used on the spray wash system (46 53 00 2.4.12)?

A – All solenoid valves shall be full port ball valves 316 SS.

.38 **Q** – Can you please confirm that design which does not use ForkSwitch are acceptable (46 53 00 2.4.13)?

A – Yes, a fork switch is acceptable.

.39 **Q** – Can you please confirm if a shafted screw design is acceptable for the Grit Classifier?

A – A shafted screw design will be accepted for the grit classifier provided that the manufacturer justifies their selection and materials. However, the end bearing seal needs to be addressed in the submission, leaking end bearing seals are common for this type of arrangement. No leakage will be accepted.

.40 **Q** – For shafted design, can you please confirm that the zero-speed switch and wear liner are to be discarded as they are not applicable to shafted design?

A – The manufacturer shall provide their justification for not provided the identified components.

.41 **Q** – Can you confirm if brass is the right material for the solenoid valve?

A – No it is not. All valves shall be SS 316 (Specification 46 53 00 2.4.4 has been amended).

.42 **Q** – Can you please confirm that 304 stainless steel is the right material? All other material seems to be grade 316 (46 53 00 2.4.5).

A – Specification 46 53 00 2.4.5 has been amended to include on SS 316L materials for all welded components and SS 316 for valves and appurtenances.

.43 **Q** – Can you please confirm that a 100% pitch will be acceptable for the Grit Classifier (46 53 00 2.4.9)?

A – A short pitch is required for the inclinations greater than 10°. Depending on the arrangement, the pitch for inclinations greater than 10° can vary between 50 – 67%.

.44 **Q** – 46 53 00 2.6.3.17, the.1 to .8 of this section are redundant with the HMI functionality. Can you clarify the physical button to be installed on the control panel front door and on the local control stations versus the ones provided by the HMI?

A – Provided that the Grit removal system is provided with its own PLC, the local control panels shall include items .1 to .8, the remote control panel (PLC) will include a general alarm (light), power on (light), reset (push button) and E-stop (push button).

.45 Q – The control system lights are now mainly LED. De we still need to provide sets of bulbs (46 53 00 2.8.1)?

A – Provided that the indicator lights are LED, no spare lights are required.

.46 Q – What is the inlet-outlet configuration desired for the Grit Chamber? What is the angle between the inlet and outlet?

A – Refer to attached Figure 7.1, the outlet is oriented 180° to the inlet location.

.47 Q – Can you please clarify if the motor disconnect switches are part Electrician Contractor's supply (46 53 00 2.5.2.5)?

A – The motor disconnect switches will be provided by others; the specification is amended.

.48 Q – Is there a layout available to show the basic chain of treatment and set the hydraulic profile?

A – Refer to the attached Drawing G1.1.

END OF SECTION

Received

PART 1 GENERAL

The following changes are effective immediately and shall be incorporated into the Contract Documents.

PART 2 INFORMATION/CLARIFICATION

2.1 CLARIFICATION

.1 The RFP Timetable (1.4.1 Key Dates) is **updated** as follows:

Issue Date of RFP	August 13, 2020
Deadline for Questions	September ~~2~~ **10**, 2020 23:59:59 local time
Deadline for Issuing Addenda	September **14**, 2020 23:59:59 local time
Submission Deadline	September ~~10~~ **15**, 2020 14:00:00 local time
Rectification Period	2 business days
Anticipated Ranking of Proponents	September 24, 202
Contract Negotiation Period and Notification	5 calendar days
Anticipated Execution of Agreement	October 14, 2020

PART 3 SPECIFICATIONS

3.1 SYSTEM #2 – VORTEX GRIT REMOVAL AND CLASSIFIER

.1 Part 1 – General

.1 **Amend Subsection 1.2.2.6** "Grit Density: ~~1,700 – 2,000~~ **2,650** kg/m^3".

.2 Part 2 – Products

.1 **Amend Subsection 2.3.2.1** ".1 ~~Single-piece grey cast iron, ASTM-A-48, Class 35 B.3"~~ Casing shall be made of gray iron No. 30 with internal volute scroll. Casing shall incorporate mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance. A fill port of 3-in/(90 mm) diameter minimum shall be supplied for ease of filling the pump casing. A casing drain of at least 1-1/4 (32 mm) in NPT shall be provided to insure complete and rapid draining. Units shall include G-R Hard Iron Impeller, Seal Plate and wear plate. Casing shall include Gray Iron 30 Suction and Discharge Spool Flanges to ANSI 150#."

.2 **Add Subsection 2.3.2.1.3. Coverplate** "Pumps must be equipped with a lightweight removable cover plate, allowing complete access to the pump interior to permit the clearance of stoppages and to provide simple access for services and repair without disturbing suction or discharge piping. Replacement of wear plate, impeller, and seal shall be accomplished through the removable cover plate. In consideration for safety, a pressure relief valve shall be supplied as standard equipment.

.3 **Add Subsection 2.3.2.1.4. Rotating Assembly** "Entire rotating assembly, which includes bearings, shaft, seal and impeller, shall be removed as a unit without disturbing pump casing or piping. Means shall be provided for external adjustment of the impeller to the wear plate."

.4 **Amend Subsection 2.3.2.1.1. Impeller** " "

.5 **Delete Subsection 2.3.2.3** ~~Pump Shaft: .1 Pump and motor shaft shall be the same unit and shall be type 431 stainless steel.~~

~~.6~~ **Delete Subsection 2.3.2.4** ~~Wear Rings .1 Stationary brass wear ring drive fitted to the volute inlet.~~

.7 **Amend Subsection 2.3.2.5. Replaceable Wear Plate: "Pumps shall also be fitted with a replaceable wear plate secured to the cover plate by studs and nuts and made of G-R hardened iron** ~~Hardened Alloy Steel~~**."**

.8 **Add Subsection 2.3.2.6.2:** ".2 The mechanical seal shall seal pump shaft against leakage. Rotating and stationary seal faces shall be tungsten titanium carbide, cage and spring shall be stainless steel, and elastomers shall be Viton. .3 Each seal face must be ground to produce a flatness tolerance not to exceed three light bands, as measured by on optical flat and monochromatic light. To insure steel faces are in full contact at all times, stationary seal seat shall be double floating and self-aligning during periods of shock loads that will cause deflection, vibration and axial or radial movements of the pump shaft. .4 The Mechanical seal shall be installed within a seal housing adjacent to an oil filled reservoir in the pump pedestal, the oil serving as both lubricating and cooling media."

.9 **Add Subsection 2.3.2.12 Drive Unit:** ".1 Pump motors shall be as indicated, NEMA design B with cast iron frame with copper windings, induction type, with normal starting torque and low starting current characteristics, suitable for continuous service. The motors shall not overload at the design condition or at any head in the operating range as specified. .2 Provide motors with 3-wire RTD PT100, one per phase complete with dedicated RTD junction box mounted on the motor for remote monitoring of motor winding temperature. .3 Motors are to be premium efficiency. .4 Motors will be fed from VFDs (provided by others) and are to be NEMA MG1 Part 31 certified. Shop drawings are motor labels are to indicate compliance with NEMA MG1 Part 31. Inverter Duty statements will not be accepted."

.10 **Add Subsection 2.3.2.13 Drive Transmission:** ".1 Power to pumps transmitted via direct drive or V-belt drive assemblies (preference shall be to a direct drive arrangement). The sheave/belt combination shall provide the speed ratio needed to achieve the required pump operating conditions. .2 Each drive assembly shall utilize V-belts as indicated providing a minimum combined safety factor of 1.5. Single belt drives or system with a safety factor of less than 1.5 are not acceptable. Computation of safety factors shall be based on performance data published by the drive manufacturer. .3 The pump manufacturer shall submit power transmission calculations which document the following: .1 Ratio of pump/motor speed. .2 Pitch diameter of driver and driven sheaves. .3 Number of belts required per drive. .4 Theoretical horsepower

transmitted per belt, based on vendor's data. .5 Center distance between pump and motor shafts. .6 Arc-length correction factor applied to theoretical horsepower transmitted. .7 Service factor applied to established design horsepower. .8 Safety factor ratio of power transmitted/brake horsepower."

3.2 SYSTEM # 3 – CLARIFIER MECHANISM

.1 Part 1 – General

.1 **Amend Subsection 1.2.1.2** "Coefficient of Friction UHMW to UHMW – ~~0.011~~ **0.2 to 0.3 as per ASTM D1894**.

.2 **Amend Subsection 1.6.2** "All dirves, motors, instrumentation etc. supplied shall be designed for a Class 1, Division ~~1~~ **2** environment **for the primary clarifiers and unclassified for the secondary clarifiers."**

.2 Part 2 – Products

.1 **Amend Subsection 2.1.7** "Primary Clarifier Cross Collector Width ~~1.2 m~~ **1.85 m"**

.2 **Amend Subsection 2.1.8** "Secondary Clarifier Cross-Collector Width ~~1.2 m~~ **1.85 m"**

.3 **Amend Subsection 2.3.1** " The Collector Chain Sprockets shall be Nylon 6 **or UHMW-PE**, with an alternate hardened rim and tooth design."

.4 **Amend Subsection 2.6.2** "Maximum water absorption shall be no greater than 0.6% after immersion for ~~48~~ **24** hours at 23 degree Celsius in accordance with ASTM D570."

.5 **Amend Subsection 2.13.5:** "The drive units for the primary ~~and secondary~~ clarifiers shall be explosion rated for suitable installations in areas classified as Class 1 Division 2. **The drive units for the secondary clarifiers shall be suitable for installation in non-classified areas**".

PART 4 QUESTIONS AND ANSWERS

4.1

.1 **Q** – The scope for the "Manufacturer's Services" listed in Section 3.5 of the specifications for the UV system (Section 46 83 00) below mentions the number of trips. Could you please clarify the intent of the "2 trips" is it: 2 person days for installation and inspection: X 2 trips? Or 2 person days for installation and inspection: to be accomplished in 2 trips, if necessary?

A – The installation assistance and inspection shall be provided in 2 trips as necessary.

.2 **Q** – Is the RDT manufacturer providing the Thickened sludge pump or will the pump be provided by the contractor when the job bids.

A – The thickened sludge pumps shall be provided by others. However, they will be controlled by the thickener control panel. There will be one dedicated TWAS pump per thickener controlled by VFD.

.3 **Q** – WAS feed pumps – how many feed pump? Are they VFD controlled or just on off?

A – There will be 2 or 3 WAS feed pumps and they will be VFD controlled.

.4 **Q** – Will the thickener filtrate discharge be by gravity?

A – Yes, the filtrate discharge will discharge by gravity.

.5 **Q** – Can we offer standard Nylon 6/6 material wear shoes, in lieu of the specified UHMW-PE shoes (46 63 00 2.7)?

A – The Nylon 6/6 wear shoes are acceptable.

.6 **Q** – Can we offer standard cast Nylon 6 split- collars versus the specified UHMW-PE collars?

A – The Nylon 6 split collars are acceptable.

.7 **Q** – Can we to provide our standard tubular UHMW-PE bearing sleeves on our Cast Nylon 6 headshaft spindles, to incorporate our 100 % FRP headshaft, and also our Cast Nylon 6 Stub Shafts?

A – The arrangement is acceptable.

.8 **Q** – We requests assurance that all Clarifiers are not operated for extended periods under dry tank conditions, as stated in the paragraph 2.1.9 specification, for no longer than paragraph 2.1.12 sates for 30 minutes. When longer than that period we recommend using a hose at least every 30-minutes to wet down the each of the UHMW-PE sprocket bearings.

A – The intention is not to run the mechanisms dry with the exception of installation and maintenance. Any operational restrictions such as this should be stated within the submittal and in the operational procedures.

.9 **Q** – We request allowance to provide our Cast Nylon 6 Stub Shafts with their integral UHMW-PE bearings, and our standard Cast Nylon 6, one piece, 17-tooth idler shafts sprockets, except our standard split 23-tooth Cast Nylon 6, keyway mounted, sprockets on the headshafts.

A – Accepted.

.10 **Q** – We requests allowance to provide our "Ultra Plus" flights in lieu of the specified "Diamond" flights exclusively fabricated by a competitor manufacturer.

A – Ultra Plus flights will be accepted as equivalent to the Diamond flight.

.11 **Q** – Polychem requests that the maximum water absorption shall be changed to no greater than 0.6% after immersion for 24 hours at 23 degrees Celsius, in accordance with ASTM D570.

A – The reference is corrected to 24 hours, see System #3 above.

.12 **Q** – We request for allowance of provision for our 100% FRP, telescopic triple-tube, overlapping headshaft, manufactured from high strength glass fiber reinforced with epoxy resin and biaxially wrapped at 45-degrees, and wall mounted to our non-metallic wall mounted spindles, and having keyways and keys sized to transmit the power required and fit our non-metallic sprockets.

A – The FRP headshaft is accepted.

.13 **Q** – We requests permission to offer our standard Nylon 6-6 support brackets for the FRP return rails.

A – Accepted.

.14 **Q** – Polychem requests permission to implement our standard 10-foot length UHMW-PE wear strips that incorporate four (4) counter sunk mounting holes, with one round hole and three slotted holes for thermal expansion, with squared ends that easily accommodate our large radius wear shoes.

A – Accepted.

.15 **Q** – We are inquiring the explosion-proof drive requirement for the secondary tanks, as these type tanks do not usually out gas explosive vapors, and would it be acceptable to incorporate standard drives?

A – See section 3.2.2.5 above.

.16 **Q** – We request allowance for providing our own design bearing housings on the scum troughs you have specified, as it is also stainless steel and well designed for a better seal and sufficient pipe bearings. also incorporating sufficient thickness Neoprene seals for wall mounting.

A – Accepted.

.17 **Q** – Would you accept our control panels with CUL certifications, as our electrical shop is only listed for CUL and not CSA?

A – CUL certifications are acceptable equivalents.

.18 **Q** – We request to provide the Secondary Tanks with dual output drives employing jaw clutches to enable a manual shut-down of any one tank of the drive, while offering a less cost drive.

A – Acceptable.

.19 **Q** – 46 63 00 1.2.1.2 Please change the standard coefficient of friction UHMW/UHMW = 0.2 to 0.3.

A – See 3.2.1.1 above.

.20 **Q** – Please clarify that there are two primary collector mechanisms, two drives, with a common cross collector.

A – For the Primary Clarifiers, there will be two longitudinal sludge collection mechanisms each discharging into one of two sludge collection troughs. Each of the two (2) sludge collection troughs will have a dedicated cross collector. There are 2 longitudinal and 2 cross – collectors servicing the primary clarifiers. 4 drives are required.

.21 **Q** – Please clarify that there are four secondary collector mechanisms, four drives, two cross collectors.

A – For the Secondary Clarifiers, there will be four longitudinal sludge collection mechanisms each discharging into one of two sludge collection troughs. Each of the two (2) sludge collection troughs will have a dedicated cross collector. There are 4 longitudinal and 2 cross – collectors servicing the secondary clarifiers. The number of drives will depend on the layout, as a minimum there will be two drives for the two cross collectors. If dual output drives are proposed for the secondary longitudinal clarifiers there will be 2 units with each unit driving two longitudinal collector mechanisms.

.22 **Q** – 46 63 00 2.8.2 Deflection listed as 2mm/m. Deflection in 1.2 was 3mm/m. Please confirm which is correct.

A – Specification 46 63 00 2.8.2 is correct, drive shaft deflection shall not exceed 2.0 mm/m at the load identified.

.23 **Q** – 46 43 00 2.2.3.1.2 Please confirm that curved screen panels are acceptable as an equal. Curved panels are proven to have a higher capture and efficiency rate.

A – Curved screen panels are acceptable.

.24 **Q** – 46 43 00 Section 1.1.4 Is there an editable copy of all specifications in order to submit a checklist version?

A – No, there is no editable copy available for circulation.

.25 **Q** – 46 43 00 Section 1.2.1 Is there a Down Stream Level at peak flow to take into account for the fine screens? Are we free to set the DSWL?

A – Addendum 1 provided the preliminary HGL for the headworks area, the specification indicates a maximum of 200mm headloss across the screen at peak flow (assuming a single channel in operation) such that the downstream water level may be 82.40m under peak conditions.

.26 **Q** – 46 43 00 Section 1.2.2 For the conveyor, where are the screenings conveying to? Is there a physical location?

A – Refer to Addendum 1 Figure 7.1, the conveyor/washer/compactor will discharge from the influent channels to the waste bin location identified on the Headworks ground floor plan.

.27 **Q** – 46 43 00 Section 1.2.2 For the washer/compactor, is a carbon steel auger acceptable? If not, the spec calls for a 304 stainless steel auger, should this be 316 stainless steel to conform with the rest of the equipment?

A – The carbon steel auger is not acceptable. Please submit as specified.

.28 **Q** – Section 1.7.1.9 Is the European and U.S. equivalent of the CWB acceptable?

A – Yes.

.29 **Q** – Section 2.2.1 Is there a preferred screen angle?

A – The preferred screen angle is 75 degrees from horizontal.

.30 **Q** - Section 2.2.2.1.1 Please confirm that the conveyor chute may be removed to pivot the screen.

A – Confirmed, the conveyor chute may be removed to pivot the screen for maintenance.

.31 **Q** – Section 2.2.3.1.8 Please state what the maximum hydraulic static differential is.

A – Refer to question 25 and the HGL drawing provided in Addendum 1.

.32 **Q** – Section 2.6.3.21 – States "The control package shall include final copies of the PLC and HMI program on a USB key and a user license granted to the owner." Final As Built programs can be supplied on a USB key. Please confirm an Allen-Bradley PLC programming development license is not to be supplied by the Screen manufacturer.

A – The development license is not to be supplied by the Screen manufacturer.

.33 **Q** – 46 53 00 Section 1.2.2.6 Please confirm the Specific Gravity used in the calculation of the grit density. Standard is 2.65 SG. The spec data is based on 1.7 to 2.0 SG.

A – An SG = 2.65 is acceptable for the evaluation.

.34 **Q** – Section 1.2.4.5.1 Is grit removal rate of 95% of .2mm grit with 2.65 Specific Gravity acceptable? The spec is 95% of 3 micron for the vortex grit.

A – The spec requires 95% grit removal rate for diameters large than 300 µm. 0.2 mm is acceptable at the SG = 2.65.

.35 **Q** – Section 2.2.1.7.2 Is the structural frame integrated with the removable aluminum checker plate panels, to be provided by a miscellaneous metals contractor rather than the grit equipment supplier?

A – All Miscellaneous metals will be supplier through the general contactor, the equipment supplier is not responsible for the covers or supporting structures.

.36 **Q** – Section 2.4.2 Are ANSI or DN flanges required?

A – ANSI 125# Flanges are required.

.37 **Q** – Section 3.1.E Is the service of a factory trained technical representative for receiving/handling/storage/completeness of shipped components is addition to the Manufacture's Services as outlined in Section 3.4.7?

A – The services described in Section 3.1.E may be provided within the time allotment outlined in Section 3.4.7.

.38 **Q** – 46 63 00 2.13.4 The gear box and drive unit shall be housed in an insulated, heated, stainless steel shelter. We offer aluminum enclosures which are lighter than stainless steel. We don't normally provide insulation and heaters, as we don't want the motors to overheat. The motors can be provided with temperature sensors and anti-condensation heaters.

A – The enclosure heaters will be controlled via thermostat and will operate based on the external temperature and the conditions within the drive unit. Aluminum enclosures are acceptable provided the gauge is #12 or less.

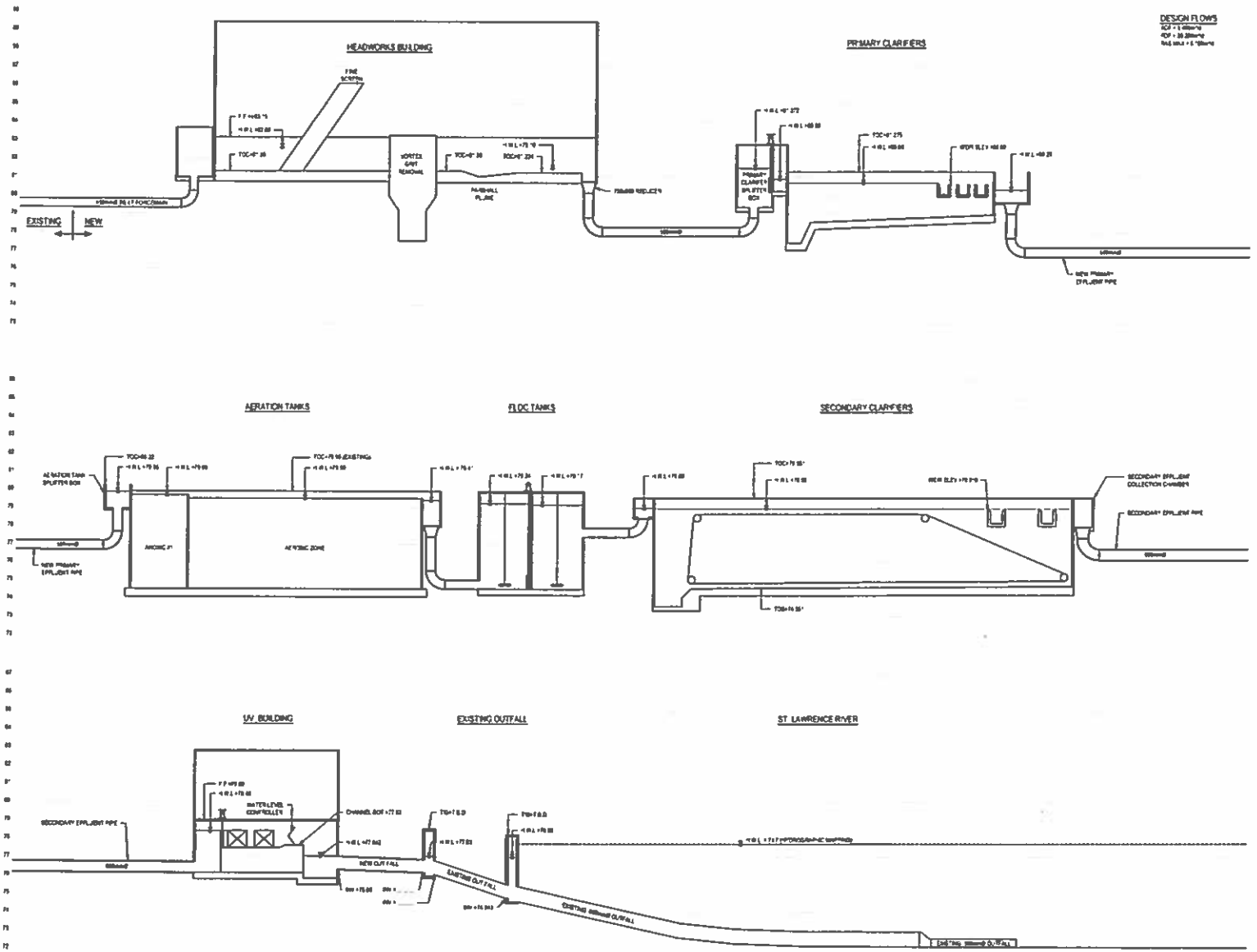
.39 **Q** – 2.13.5 Drive units shall be explosion rated. We don't normally provide explosion-proof motors because clarifiers are not typically explosion rated areas. Please confirm if this requirement is necessary.

A – See section 3.2.2.5 above.

.40 **Q** – 2.16.2 The scum troughs shall be Schedule 10 stainless steel pipe. Are the scum troughs to be type 304 or 316 stainless steel?

A – The scum troughs should be type 304 L stainless steel. The specification identifies minimum 10" Sch 10s pipe with a wall thickness not less than 0.25". The thickness doesn't match the pipe Sch 10s thickness at 10", the supplier shall size the scum troughs and ensure that the proposed pipe size is sufficient for unsupported span with the pipe filled with water.

END OF SECTION



LEGEND

HGL	HYDRAULIC GRADE LINE PEAK FLOW EVENT
TOC	TOP OF CONCRETE ELEVATION
TG	TOP OF GRATE ELEVATION

EVB

ARCHITECTURE | 49

CLIENT

SOUTH STORMONT

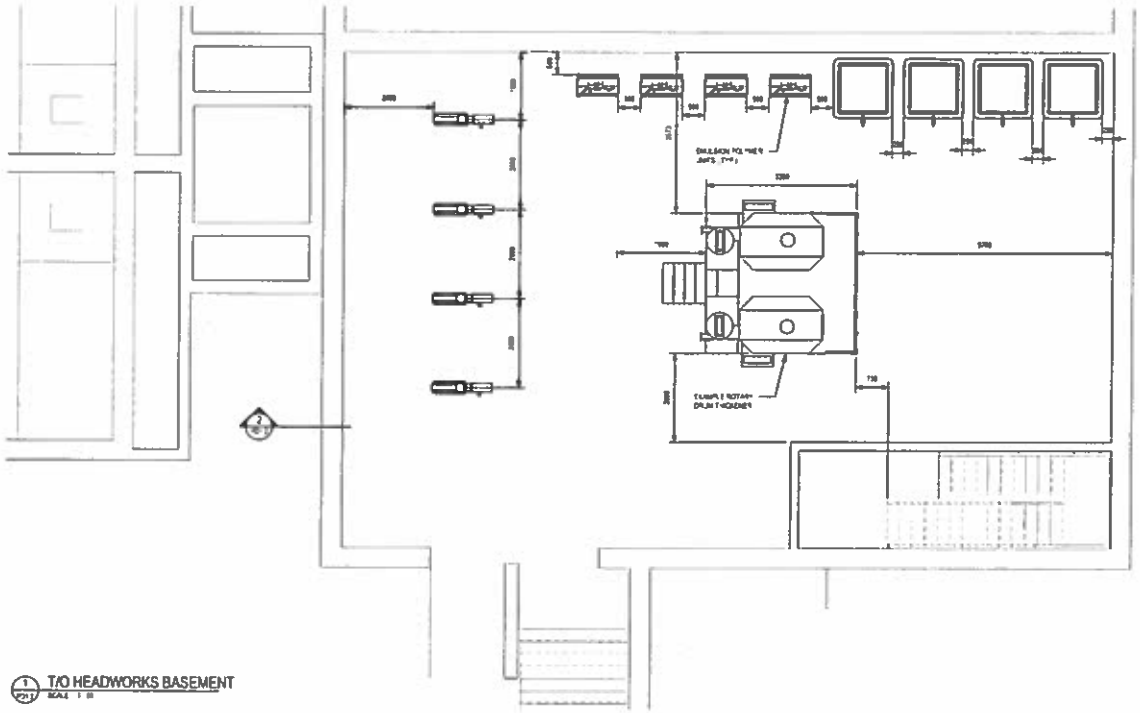
PROJECT

INGLESIDE WWTP UPGRADES

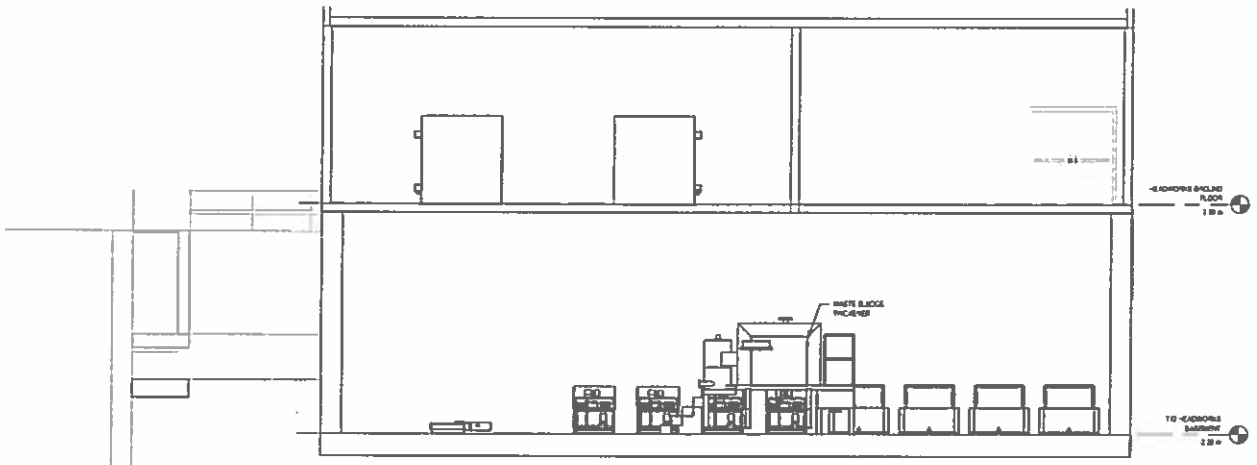
TITLE

PRELIMINARY HYDRAULIC PROFILE FOR FUTURE WPCP

G1.1



1 T/O HEADWORKS BASEMENT
SCALE 1 : 50



2 Section A
SCALE 1 : 50

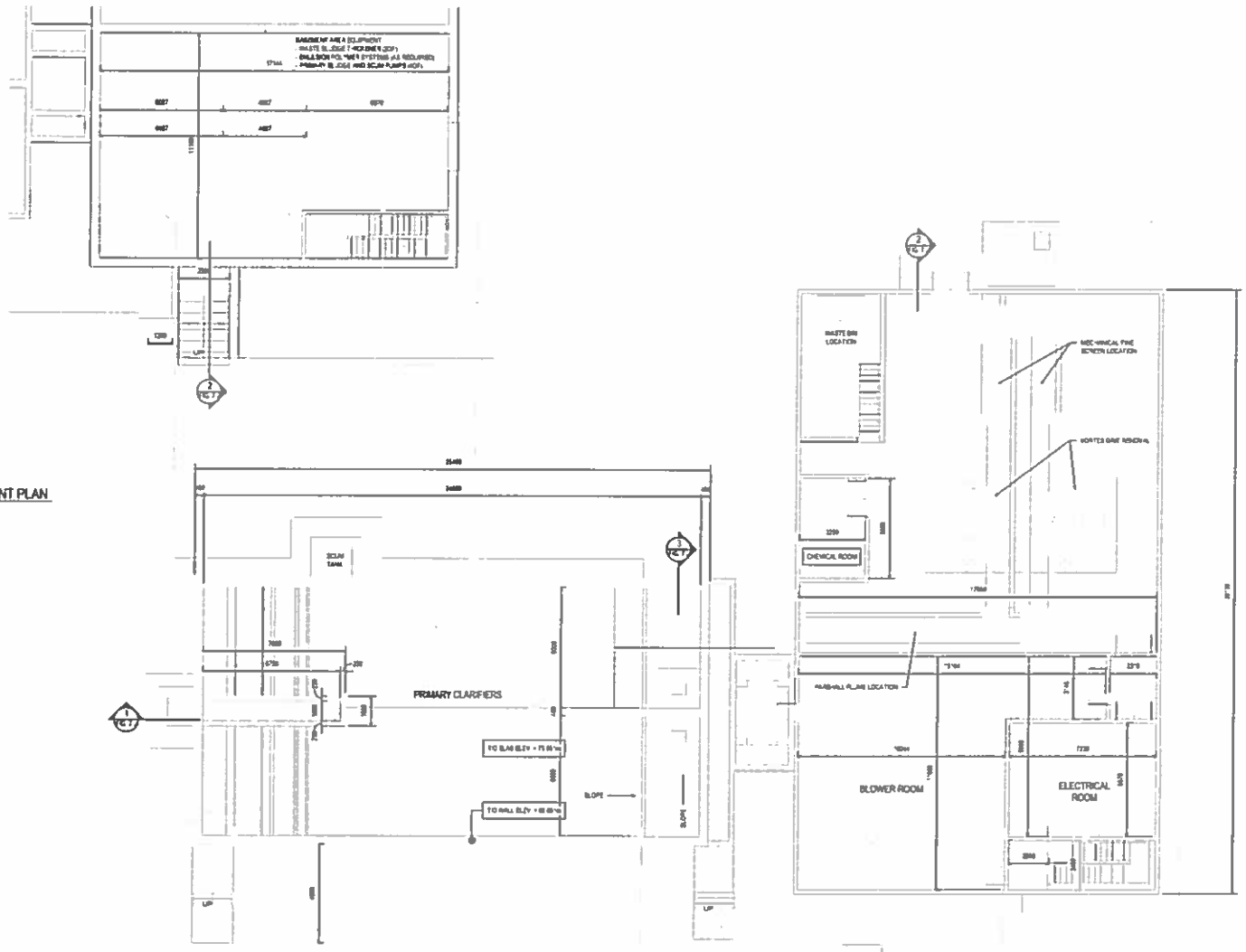
EVB

SOUTH STORMONT

INGLESIDE WWTP UPGRADES

PRELIMINARY PROCESS EQUIPMENT LAYOUT

PD1.2



2 / SD-7 BASEMENT PLAN
1 : 100

1 / SD-7 HEADWORKS GROUND FLOOR
1 : 100

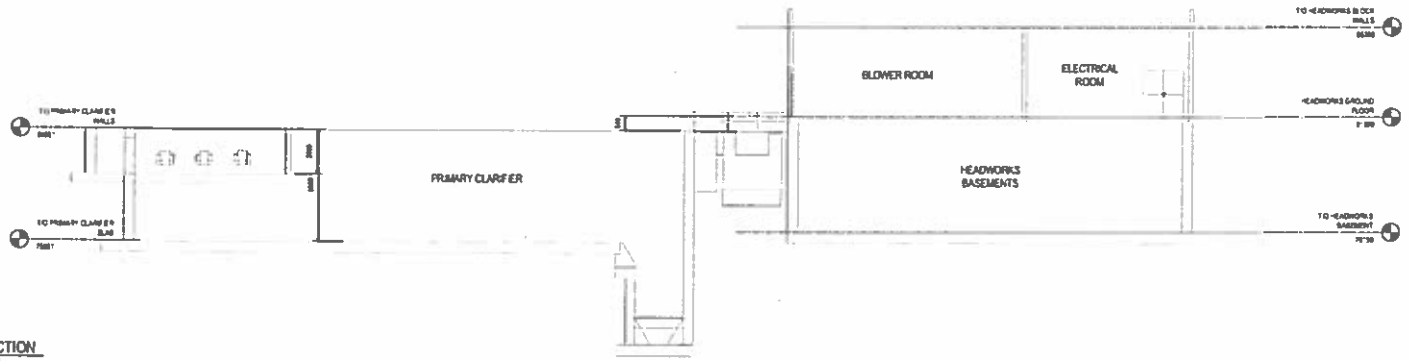
EVB

SOUTH STORMONT

INGLESIDE WWTP UPGRADES

PROPOSED HEADWORKS BUILDING AND PRIMARY CLARIFIERS

FIG. 7-1



1 / G.7 SECTION
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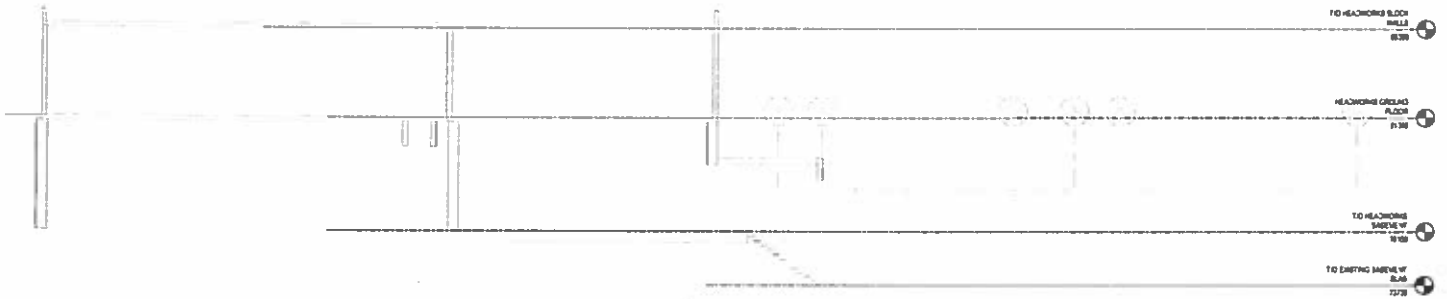

2 / G.7 SECTION
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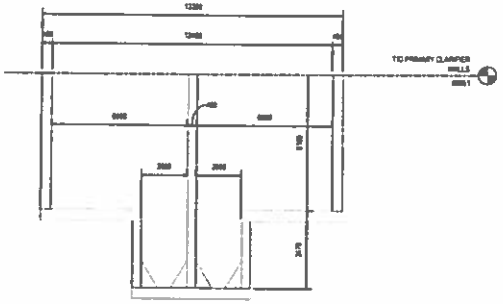


3 / G.7 SECTION
1 : 100

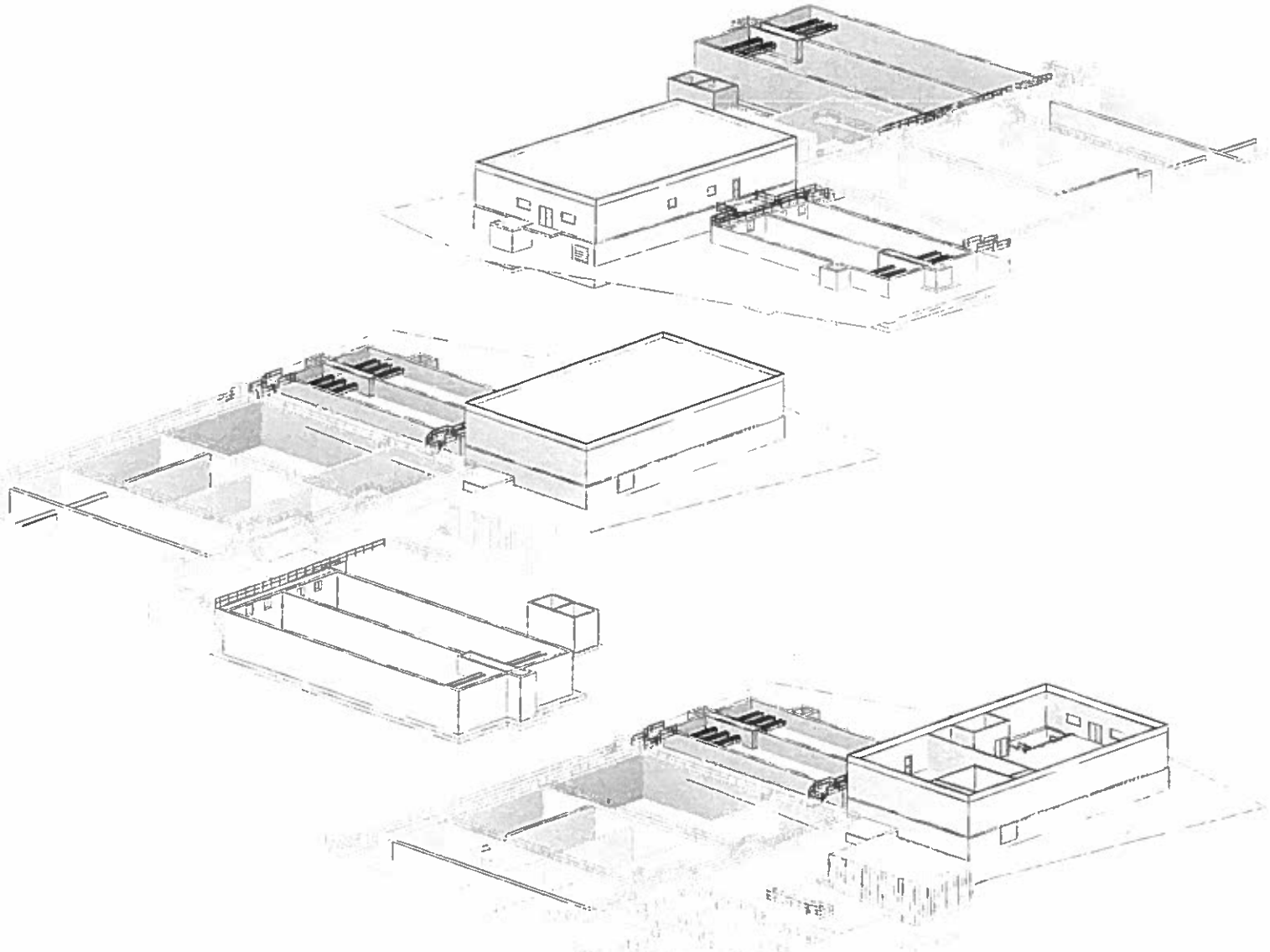
EVB

SOUTH STORMONT

INGLESIDE WWTP UPGRADES

PRELIMINARY SECTIONS

FIG. 7-2



SOUTH STORMONT

INGLESIDE WWTP UPGRADES

SKETCH VIEWS

FIG. 7-3

Reviewed.

PART 1 GENERAL

The following changes are effective immediately and shall be incorporated into the Contract Documents.

PART 2 INFORMATION/CLARIFICATION

2.1 CLARIFICATION

.1 Attached are the unsecured editable submission forms including : Appendix C and Submissions Forms for Systems 1 through 5.

PART 3 SPECIFICATIONS

3.1 SYSTEM #4 – WASTE SLUDGE THICKENER

.1 Part 1 – General

.1 **Amend Subsection 2.2.1.3 Equipment Base and Support Frame:**

~~.1~~ **Delete Subsections 2.2.1.3.6 "~~.6 Provide framework fully equipped with stairs and walking bridges and handrails as required to monitor and service and working components of the units."~~**

3.2 SYSTEM # 5 – UV DISINFECTION

.1 Part 2 – Products

.1 **Amend Subsection 2.2 Performance Requirements as follows:**

.1 Delete Subsection 2.1.1 and 2.1.2 : **~~".1 Provide a system capable of reducing the influent fecal coliform count to 200 MPN/100 mL on a 30 day geometric mean of daily samples based on the design conditions provided in Section 1.2." .2 The UV dosage shall be not less than 30,000 microwatt seconds per square cm based on peak design flow conditions, lamp output at 65% of its initial level after 1 year (8760 hours) of lamp operation without fouling on the lamp sleeves, and minimum UV transmittance as stated in Section 1.2."~~**

.2 **Add Subsections 2.1.**

.1 The ultraviolet disinfection system will produce an effluent conforming to the following discharge permit: 200 Fecal Coliform/100 ml, based on a 30 day Geometric Mean. Grab samples will be taken in accordance with the Microbiology Sampling Techniques found in Standard Methods for the Examination of Water and Wastewater, 19th Ed.

.2 **Provide a UV disinfection system complete with UV Banks, System Control Center, Power Distribution Center(s), Support Racks(s) and Level Controller(s) as shown on the contract drawings and as herein specified.**

.3 **The UV system will be designed to deliver a minimum UV dose of 30 mJ/cm^2 MS2 at peak flow, in effluent with a UV Transmission of 55 % at end of lamp life (EOLL) after reductions for quartz sleeve fouling. The basis for evaluating the UV dose delivered by the UV system will be the independent third party bioassay, without exception. Bioassay validation methodology to follow protocols described in NWRI Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (May 2003) and/or applicable sections of the US EPA Design Manual – Municipal Wastewater Disinfection (EPA/625/1-86/021).**

.4 **The UV Dose will be adjusted using an end of lamp life factor of 0.5 to compensate for lamp output reduction over the time period corresponding to the manufacturer's lamp warranty. The use of a higher lamp aging factor will be considered only upon review and approval of independent third party verified data that has been collected and analysed in accordance with protocols described in NWRI Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (May 2003).**

.5 **The UV Dose will be adjusted using a quartz sleeve fouling factor of 0.8 when sizing the UV system in order to compensate for attenuation of the minimum dose due to sleeve fouling during operation. The use of a higher quartz sleeve fouling factor will be considered only upon review and approval of independently verified data that has been collected and analysed in accordance with protocols described in NWRI Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (May 2003).**

.6 **Independent 3rd Party Validation for use of higher factors (lamp aging and sleeve fouling) must be submitted as part of the proposal.**

.7 **The system will be able to continue providing disinfection while replacing UV lamps, quartz sleeves, ballasts and while cleaning the UV lamp sleeves.**

.8 **The system will be designed for complete indoor installation.**

.2 **Amend Subsection 2.3.2.1** "Lamps shall be low-pressure mercury vapour type of the hot-cathode ~~**instant-start**~~ **preheated design to promote longevity** in which the coiled filamentary cathodes are heated

by the arc current. The filament shall be a clamped design and shall withstand shock and vibration. **Lamps that are not amalgam or that are based on driving a low pressure lamp at amperages greater than 500 milliamps will not be allowed."**

.3 **Add Subsection 2.3.2.6 " Electrical connections will be at one end of the lamp and have four pins, dielectrically tested for 2,000 Vrms. Lamps that do not have 4 pins will be considered instant start. To be considered as an alternate, instant start lamp systems will supply replacement spare lamps equal to 50% of the total number of lamps in the system."**

.4 **Add Subsection 2.3.2.7 "Lamps will be operated by electronic ballasts with variable output settings."**

.5 **Amend Subsection 2.5 Cleaning System** as follows:

.1 Delete Subsections 2.5.2, 2.5.3 and 2.5.4 "~~**.2. Cleaning tank shall be stainless steel and equipped with air compressor, lamp module rack, hose connections and drains. Tank shall hold at least 3 modules and be equipped with hard rubber casters. Tank shall have a sealed cover to prevent spilling. Unit shall be equipped with disconnect switch, a grounded plug and 3 m of outdoor cable. .3 A cleaning rack mounted above the portable cleaning tank shall be provided to hold one horizontal module above the cleaning liquid for hand wiping of the sleeves. .4 Sleeve conditioner and cleaning solution shall be provided for 12 months of normal operation. Conditioner and cleaning solution shall be supplied in containers not greater than 20 L capacity."**~~

.2 **Add Subsections 2.5.2:**

.1 Hydraulic System Center (HSC):

.1 One (1) HSC will be supplied to house all components required to operate the automatic cleaning system.

.2 Enclosure material of construction will be Type 304 Stainless Steel - Type 4X (IP66).

.3 The HSC will contain a hydraulic pump complete with integral 4-way valve and fluid.

.2 Cleaning System:

.1 An automatic cleaning system will be provided to clean the quartz sleeves using both mechanical and chemical methods. Wiping sequence will be automatically initiated with capability for manual override.

.2 The cleaning system will be fully operational while UV lamps and modules are submerged in the effluent channel and energized.

.3 Cleaning cycle intervals to be field adjustable.

.4 Remote Manual and Remote Auto cleaning control options will be provided.

.5 The cleaning system will be provided with the required solutions necessary for initial equipment testing and for equipment start-up.

.3 **To be considered as an alternate, systems that use only mechanical wiping must have the ability to periodically be cleaned out of channel using a chemical bath. Out of channel cleaning will include lifting slings, removable banks, cleaning tanks, agitation system and air compressors, as required. The UV manufacturer will be responsible for supplying all equipment including any equipment not specifically listed required to perform out of channel chemical cleaning. Contactor will be responsible for installation.**

PART 4 QUESTIONS AND ANSWERS [N/A]

END OF SECTION

APPENDIX C – SUBMISSION FORM

A. General Proponent Information

The undersigned hereby acknowledges that he/she, as an officer of the stated corporation, has read and understands the specifications, requirements, and proposed agreement regarding the **Equipment Preselection** for the Ingleside WWTP, Township of South Stormont. He/she further acknowledges that the seller's proposed product, equipment, materials, and services fully meet or exceed those as specified in the Township's RFP. Additionally, the Proponent agrees that all its technical and financial documents and responses to the aforementioned RFP will, at the option of the Township, become a legally binding and essential portion of the final contract agreement between the successful Proponent and the Township following execution of the contract agreement.

The following information must be completed to ensure tender acceptance.

*ADDENDA No. _____ to _____ INCLUSIVE WERE CAREFULLY EXAMINED.

DATED THIS _____DAY OF _____, 2020.

PROPONENT'S COMPANY NAME:_____

ADDRESS: _____

_____

CITY/ PROVINCE: _____ POSTAL CODE: _____

PHONE NO.: _____ FAX NO.: _____

EMAIL ADDRESS: _____

WEBSITE: _____

CONTACT NAME (please print): _____

TITLE (please print): _____ PHONE NO.: _____

AUTHORIZED SIGNATURE: _____

HST REGISTRATION NO: _____

WSIB COVERAGE: YES NO

* The proponent shall attach and initial all addenda received during the period and shall take them into consideration when preparing their bid submission. A signed copy of each Addendum must be included with the bid submission. Failure to comply may be cause for rejection of bid submission.

2. Acknowledgment of Non-Binding Procurement Process

The proponent acknowledges that the RFP process will be governed by the terms and conditions of the RFP, and that, among other things, such terms and conditions confirm that this procurement process does not constitute a formal, legally binding bidding process (and for greater certainty, does not give rise to a Contract A bidding process contract), and that no legal relationship or obligation regarding the procurement of any good or service will be created between the Township and the proponent unless and until the Township and the proponent execute a written agreement for the Deliverables.

3. Ability to Provide Deliverables

The proponent has carefully examined the RFP documents and has a clear and comprehensive knowledge of the Deliverables required. The proponent represents and warrants its ability to provide the Deliverables in accordance with the requirements of the RFP for the rates set out in its proposal.

4. Non-Binding Pricing

The proponent has submitted its pricing in accordance with the instructions in the RFP. The proponent confirms that the pricing information provided is accurate. The proponent acknowledges that any inaccurate, misleading, or incomplete information, including withdrawn or altered pricing, could adversely impact the acceptance of its proposal or its eligibility for future work.

5. Addenda

The proponent is deemed to have read and taken into account all addenda issued by the Township prior to the Deadline for Issuing Addenda.

6. Communication with Competitors

For the purposes of this RFP, the word "competitor" includes any individual or organization, other than the proponent, whether or not related to or affiliated with the proponent, who could potentially submit a response to this RFP.

Unless specifically disclosed below under Disclosure of Communications with Competitors, the proponent declares that:

(a) it has prepared its proposal independently from, and without consultation, communication, agreement or arrangement with any competitor, including, but not limited to, consultation, communication, agreement or arrangement regarding:

   (i) prices;

   (ii) methods, factors or formulas used to calculate prices;

   (iii) the quality, quantity, specifications or delivery particulars of the Deliverables;

   (iv) the intention or decision to submit, or not to submit, a proposal; or

   (v) the submission of a proposal which does not meet the mandatory technical requirements or specifications of the RFP; and

(b) it has not disclosed details of its proposal to any competitor and it will not disclose details of its proposal to any competitor prior to the notification of the outcome of the procurement process.

Disclosure of Communications with Competitors

If the proponent has communicated or intends to communicate with one or more competitors about this RFP or its proposal, the proponent discloses below the names of those competitors and the nature of, and reasons for, such communications:

_____

_____

_____

_____

_____

_____

7. No Prohibited Conduct

The proponent declares that it has not engaged in any conduct prohibited by this RFP.

8. Conflict of Interest

The proponent must declare all potential Conflicts of Interest, as defined in section 3.4.1 of the RFP. This includes disclosing the names and all pertinent details of all individuals (employees, advisers, or individuals acting in any other capacity) who (a) participated in the preparation of the proposal; **AND** (b) were employees of the Township within twelve (12) months prior to the Submission Deadline.

If the box below is left blank, the proponent will be deemed to declare that (a) there was no Conflict of Interest in preparing its proposal; and (b) there is no foreseeable Conflict of Interest in performing the contractual obligations contemplated in the RFP.

Otherwise, if the statement below applies, check the box.

☐ The proponent declares that there is an actual or potential Conflict of Interest relating to the preparation of its proposal, and/or the proponent foresees an actual or potential Conflict of Interest in performing the contractual obligations contemplated in the RFP.

If the proponent declares an actual or potential Conflict of Interest by marking the box above, the proponent must set out below details of the actual or potential Conflict of Interest:

_____

_____

_____

9. Disclosure of Information

The proponent hereby agrees that any information provided in this proposal, even if it is identified as being supplied in confidence, may be disclosed where required by law or by order of a court or tribunal. The proponent hereby consents to the disclosure, on a confidential basis, of this proposal by the Township to the advisers retained by the Township to advise or assist with the RFP process, including with respect to the evaluation of this proposal.

_____
Signature of Proponent Representative

_____
Name of Proponent Representative

_____
Title of Proponent Representative

_____
Date

I have the authority to bind the proponent.

PART 1 FORM OF PROPOSAL

(See Clause 24 in General Terms and Conditions for Instructions)

BY: _____

_____

_____

TO: The Corporation of the Township of South Stormont

c/o Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #1: Supply, delivery and commissioning of the Fine Screens, Screening Conveyor and Screening Compactor for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be **240 days** from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

Name of Supplier

Witness (Name & Signature)

Signature of Authorized Officer

Date

Company Seal

1.1 FINANCIAL DETAILS

1. Supply and delivery of the Fine Screens, Screening Conveyor and Screening Compactor and the associated equipment complete as specified.	
1a. Fine Screens	$
1b. Screening Conveyor	$
1c. Screening Washer/Compactor	$
2. Preparation and delivery of Shop Drawings.	$
3. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the Fine Screen Systems.	$
Total Quoted Price (1+2+3)	$
Per diem rate for additional field work not included in the above	$/Day
Total Price Valid For	240 Days
Delivery of Shop Drawings	Weeks
Delivery of Equipment (after approved shop drawings)	Weeks
*Amount of Currency Exchange USD/CAD	$
*Additional Amount of Duty Paid (if applicable)	$
Percent of Imported Components (if greater than 10%)	%

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 TECHNICAL DETAILS

.1 Fine Screens Description

Parameter	Description
Manufacturer of Screens	
Make of Screens	
Model of Screens	
# of Screens	
Screen Type (bar, perforated, step, etc.)	
Screening Opening Size	_____ mm
Installation Angle	
Effective Flow Rate	_____ m^3/d to _____ m^3/d
Required Channel Dimensions	Width _____ mm Total Depth _____ mm Water Level @ ADF _____ mm Water Level @ PF _____ mm
Headloss	@ Peak Flow & Clean Screen _____ mm @ Peak Flow & 50% Obstructed _____ mm @ Peak Flow & 70% Obstructed _____ mm

.2 Fine Screen components included:

Component	Description/Material
Structural Frame • Frame Thickness • Front Cover Thickness • Back Housing Thickness • Discharge Chute	 _____ mm _____ mm _____ mm

Component	Description/Material
Thickness	_____ mm
• Type of Pivot	_____
Screening Removal Mechanism	
• Quantity of Elements	_____
• Element Thickness	_____ mm
Chain Driving System	
• Chain Type	_____
• Breaking Load	_____ KN
Wash Water System	
• Wash Water Flow Rate	_____ L/s
• Min. Water Pressure	_____ KPa
• Connection Size	_____ mm
Drive Unit	
• Main Power Supply	_____ V _____ Phase _____ Hz
• Element Drive Motor	_____ KW
• Bruch Drive Motor	_____ KW
• Motor Enclosure Type	_____
• Motor Service Factor	_____
• Reducer Service Factor	_____
Materials of Construction	
• Structural Frame	_____
• Housing Sheets	_____
• Discharge Chute	_____
• Elements	_____
• Chain Links	
• Bushings	_____
• Chain Pins	_____
• Sprockets	_____
• Element Slides	_____
• Bottom Revolving	_____

Component	Description/Material
Element Guide • Spray Wash Manifold • Spray Nozzles	_____ _____ _____
Describe Screens (including inclination and special features)	
Describe the Screen Drive System	
Describe Cleaning Operation	

.3 Screening Conveyor Description

Parameter	Description
Manufacturer of Screening Conveyor	
Make of Screening Conveyor	
Model of Screening Conveyor	
# of Screening Conveyors	
# of Inlets per Conveyor	
# of Outlets per Conveyor	
Wet Screening Maximum Unit Capacity	_____ m^3/hr
Type of Screw	Shaftless or Shafted (Circle one)
Conveyor Length	_____ mm

Parameter	Description
Transport Mode	Push or Pull (Circle one)
Dimensions • Overall Length • Conveyor Length • Conveyor Diameter • Screw External Diameter	 _____ mm (including motor) _____ mm _____ mm _____ mm
Drive Units • Motor Power • Motor • Motor Classification • Motor Service Factor Min. • Reducer Service Factor Min.	 _____ V _____ Phase _____ Hz _____ KW _____ _____ _____
Materials of Construction • Structural Components • Spiral Screw • Drive Shaft • Wear Liner • Fasteners & Hardware	 _____ _____ _____ _____ _____

.4 Screening Washer Compactor Description

Parameter	Description
Manufacturer of Screening Washer Compactor	
Make of Screening Washer / Compactor	
Model of Screening Washer / Compactor	
# of Screening Washer Compactors	
Wet Screening Maximum Unit Capacity	_____ m^3/hr
Solids Reduction	_____ % (by Volume)

Parameter	Description
	_____ % (by Weight)
Output Dryness	_____ %
Organics Removal	_____ %
Drive Units	
• Motor Power	_____ V _____ Phase _____ Hz
• Motor	_____ KW
• Motor Classification	_____
• Motor Service Factor Min.	_____
• Reducer Service Factor Min.	_____
Dimensions	
• Inlet Length	_____ mm
• Conveyor Diameter	_____ mm
• Installation Angle	_____ degrees
• Discharge Angle	_____ degrees
• Discharge Height	_____ mm
• Spiral Screw External Diameter	_____ mm
• Perforation Size	_____ mm
• Drain Diameter	_____ mm
Wash Water System	
• Wash Water Flow Rate	_____ L/s
• Min. Water Pressure	_____ KPa
• Connection Size	_____ mm
Material of Construction	
• Structural Components	_____
• Screw Flights	_____
• Screw Shaft	_____
• Roller Bearing Housing	_____

Parameter	Description
• Screw Housing	_____
• Collecting Trough	_____
• Spray Wash Manifold	_____
• Spray Nozzles	_____
• Fasteners & Hardware	_____

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 Provide weight of screens and screening conveyor/washer/compactor. Yes / No (circle one)

.3 Proposed drive locations, drive weight and supporting information has been provided. Yes / No (circle one)

.4 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one)

.5 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.6 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

.7 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.8 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

- .1 Owner
- .2 Owner contact information
- .3 Contract contact information
- .4 Brief description of the equipment provided
- .5 Capacity of equipment
- .6 Year the equipment was put into operation
- .7 Value of supply contract

END OF SECTION

PART 1 FORM OF PROPOSAL

(See Clause 24 in General Terms and Conditions for Instructions)

BY: _____

_____

_____

TO: The Corporation of the Township of South Stormont

C/O Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #2: Supply, delivery and commissioning of the Vortex Grit Removal System with Grit Classifier for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be **240 days** from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

Name of Supplier

Witness (Name & Signature)

Signature of Authorized Officer

Date

Company Seal

1.1 FINANCIAL DETAILS

1. Supply and delivery of the Vortex Grit Removal Units, Grit Pumps and Grit Classifier and the associated equipment complete as specified.	
1a. Vortex Grit Units	$
1b. Grit Pumps	$
1c. Grit Classifier	$
2. Preparation and delivery of Shop Drawings.	$
3. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the Grit Removal Systems.	$
Total Quoted Price (1+2+3)	$
Per diem rate for additional field work not included in the above	$/Day
Total Price Valid For	240 Days
Delivery of Shop Drawings	Weeks
Delivery of Equipment for Each Phase (after approved shop drawings)	Weeks
*Amount of Currency Exchange USD/CAD	$
*Additional Amount of Duty Paid (if applicable)	$
Percent of Imported Components (if greater than 10%)	%

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 TECHNICAL DETAILS

.1 Vortex Grit System Description

Parameter	Description
Manufacturer of Vortex Grit Unit	
Make of Vortex Grit Unit	
Model of Vortex Grit Unit	
# of Vortex Grit Units	
Manufacturer of Grit Classifier	
Make of Grit Classifier	
Model of Grit Classifier	
# of Grit Classifier(s)	
Manufacturer of Grit Pump	
Make of Grit Pump	
Model of Grit Pump	
# of Grit Pumps	
Effective Flow Rate	_____ m^3/d to _____ m^3/d
Required Channel Dimensions	Influent Width _____ mm Influent Total Depth _____ mm Influent Water Level @ ADF _____ mm Influent Water Level @ PF _____ mm Effluent Width _____ mm Effluent Total Depth _____ mm Effluent Water Level @ ADF _____ mm Effluent Water Level @ PF _____ mm

Parameter	Description
Vortex Grit Removal Unit Removal Efficiency	_____ % of grit greater than 50 mesh _____ % of grit greater than 70 mesh _____ % of grit greater than 100 mesh
Grit Classifier Unit Design Inflow Grit Slurry Rate % reduction Maximum Daily Grit Load	 _____ l/s to _____ l/s _____% reduction by Volume / Mass (circle) _____ m^3/d at average reduction of _____% by Volume/Mass (Circle)

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 Provide weight of vortex grit drive, grit pumps and grit classifier. Yes / No (circle one)

.3 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one)

.4 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.5 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

.6 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.7 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

- .1 Owner
- .2 Owner contact information
- .3 Contract contact information
- .4 Brief description of the equipment provided
- .5 Capacity of equipment
- .6 Year the equipment was put into operation
- .7 Value of supply contract

END OF SECTION

PART 1 FORM OF QUOTATION

(See Clause 24 in General Terms and Conditions for Instructions)

BY: _____

_____

_____

TO: The Corporation of the Township of South Stormont

c/o Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #3: Supply, delivery and commissioning of the Rectangular Clarifier Mechanisms for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be 240 days from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

Name of Supplier

Witness (Name & Signature)

Signature of Authorized Officer

Date

Company Seal

1.1 FINANCIAL DETAILS

1. Supply and delivery of the Primary Clarifier Mechanisms and the associated equipment complete as specified.	
1a. Longitudinal Collector including all appurtenances.	$
1b. Cross Collector including all appurtenances.	$
1c. Scum Trough including all appurtenances	$
1d. PLC Based Flight Monitoring System	$
2. Supply and delivery of the Secondary Clarifier Mechanisms and the associated equipment complete as specified.	
2a. Longitudinal Collector including all appurtenances.	$
2b. Cross Collector including all appurtenances.	$
2c. Scum Trough including all appurtenances	$
2c. PLC Based Flight Monitoring System	$
3. Preparation and delivery of Shop Drawings.	$
4. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the Clarifier Mechanisms.	$
Total Quoted Price (1+2+3+4)	$
Per diem rate for additional field work not included in the above	$/Day
Total Price Valid For	240 Days
Delivery of Shop Drawings	Weeks
Delivery of Equipment for Each Phase (after approved shop drawings)	Weeks
*Amount of Currency Exchange USD/CAD	$
*Additional Amount of Duty Paid (if applicable)	$
Percent of Imported Components (if greater than 10%)	%

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 TECHNICAL DETAILS

.1 Clarifier Mechanisms components included:

Component	Description/Material
Drive Chain	
Collector Chain, Pins and Retainer Clips	
Collector Chain Links	
Flights	
Wear Shoes	
Filler Blocks	
Hardware	
Headshafts	
Driven Sprockets	
Collector Sprockets for Headshafts	
Set Collars	
Headshaft Keys	
Anchor System	
Collector Sprockets for the Stub Shafts	
Idler Stub Shafts	
Retainer Plate for Stub Shaft	
Stub Shaft Jacking Bolts and Hardware	
Wall Bracket Supports for Return Track	
Run Shoe to Splice Wall Bracket Return Track	
Return Track	
Wear Strip	
Chain Tensioner	
Limit Switch	

Component	Description/Material
Drive Sprocket Shear Pin Assembly	
Shear Pin Kits	
Drive Unit Output Shaft	
Drive Units w/Motor and Reducer	
Drive Unit Motor Size and Voltage	
Base Plate for Drive Units	
Chain Guard for Drive Chain	
Scum Trough Material	
Scum Trough Operator	

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 Proposed drive locations, drive weight and supporting information has been provided. Yes / No (circle one)

.3 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one)

.4 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.5 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

.6 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.7 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

- .1 Owner
- .2 Owner contact information
- .3 Contract contact information
- .4 Brief description of the equipment provided
- .5 Capacity of equipment
- .6 Year the equipment was put into operation
- .7 Value of supply contract

END OF SECTION

PART 1 FORM OF QUOTATION

(See Clause 21 in General Terms and Conditions for Instructions)

BY: _____

_____

_____

TO: The Corporation of the Township of South Stormont

c/o Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #6: Supply, delivery and commissioning of the Waste Activated Sludge Thickener for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be 240 days from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

Name of Supplier

Witness (Name & Signature)

Signature of Authorized Officer

Date

Company Seal

1.1 FINANCIAL DETIALS

1. Supply and delivery of the Waste Activate Sludge Thickeners and the associated equipment complete as specified. 1a. Sludge Thickener	$
2. Preparation and delivery of Shop Drawings.	$
3. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the RDT Systems.	$
Total Quoted Price (1+2+3)	$
Per diem rate for additional field work not included in the above	$/Day
Total Price Valid For	240 Days
Delivery of Shop Drawings	Weeks
Delivery of Equipment for Each Phase (after approved shop drawings)	Weeks
*Amount of Currency Exchange USD/CAD	$
*Additional Amount of Duty Paid (if applicable)	$
Percent of Imported Components (if greater than 10%)	%

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 TECHNICAL DETAILS

.1 Sludge Thickener Description

Parameter	Description
Manufacturer of Thickener	
Make of Thickener	
Model of Thickener	
# of Thickeners	
Dimension of Flocculation Tank • Diameter • Height • Effective Volume	 _____ m _____ m _____ m^3
Dimensions of Thickener • Length • Width • Height	 _____ m _____ m _____ m
Effective Range of Operation • Total Solids • Concentration • Volumetric Sludge Loading	 _____ kg/d to _____ kg/d _____ mg/L TS to _____ mg/L TS _____ m^3/hr to _____ m^3/hr
Performance at Maximum Feed Rate	Solids Feed Rate at maximum feed rate: _____ kg/hr at 1% TS (dry weight basis) or _____ kg/hr at 0.7% TS (dry weight basis).
Performance at Minimum Feed Rate	Solids Feed Rate at maximum feed rate: _____ kg/hr at 1% TS (dry weight basis) or _____ kg/hr at 0.7% TS (dry weight basis).
Minimum Solids Capture Rate	_____ %
Maximum active polymer dosage rate	_____ kg/ton feed solids (dry basis)
Thickened Sludge Solids Concentration	Minimum _____% on a dry-weight basis at the specified hydraulic and solids loading rates.
Materials of Construction • Structural Frame • Flocculation Tank • Rotary System	 _____ _____ _____

Parameter	Description
• Sprockets • Element Slides • Spray Wash Manifold • Spray Nozzles • Enclosure • TWAS Hopper	_____ _____ _____ _____ _____ _____
Describe the drive system for the Unit	
Thickened Sludge Pumping • Pump Type & # of pumps • Pump Manufacturer • Model • Capacity • Hopper Size • Control Description • Instrumentation • Enclosure • TWAS Hopper Mat'l	 _____ _____ _____ _____ _____ _____ _____ _____ _____

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 Provide weight of RDT (dry and wet). Yes / No (circle one)

.3 Proposed drive locations, drive weight and supporting information has been provided. Yes / No (circle one)

.4 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one)

.5 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.6 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

.7 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.8 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

- .1 Owner
- .2 Owner contact information
- .3 Contract contact information
- .4 Brief description of the equipment provided
- .5 Capacity of equipment
- .6 Year the equipment was put into operation
- .7 Value of supply contract

END OF SECTION

PART 1 FORM OF QUOTATION

(See Clause 24 in General Terms and Conditions for Instructions)

BY: _____

_____

_____

TO:

c/o Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #7: Supply, delivery and commissioning of the Ultraviolet Disinfection System for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be **240 days** from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

Name of Supplier

Witness (Name & Signature)

Signature of Authorized Officer

Date

Company Seal

1.1 FINANCIAL DETAILS

1. Supply and delivery of the UV Disinfection System and the associated equipment complete as specified. 1a. UV Disinfection Systems	$
2. Preparation and delivery of Shop Drawings.	$
3. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the UV Disinfection Systems.	$
Total Quoted Price (1+2+3)	$
Per diem rate for additional field work not included in the above	$/Day
Total Price Valid For	240 Days
Delivery of Shop Drawings	Weeks
Delivery of Equipment for Each Phase (after approved shop drawings)	Weeks
*Amount of Currency Exchange USD/CAD	$
*Additional Amount of Duty Paid (if applicable)	$
Percent of Imported Components (if greater than 10%)	%

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 PROPOSAL DETAILS

.1 UV Disinfection System Description

Parameter	Description
Manufacturer of UV system	
UV Reactor Model:	
Total Number of UV Reactors (Duty + Standby)	
Number of Modules per Reactor	
Number of Lamps per Module	
Total Number of Lamps	
Effective Range of Flow Rates	_____ L/s to_____ L/s
Confirm Maximum UV Delivered Dose at design peak flow	_____ μWs/cm^2
Minimum Guaranteed Lamp Operating Life	_____ hours
Minimum Guaranteed Ballast Life	_____ years
Minimum Quartz Sleeve Life	_____ years
Cost for Replacement Parts: • Lamps • Ballasts • Quartz Sleeves	$_____ ea $_____ ea $_____ ea
Required Channel Dimensions • Width of Channel • Total Depth of Channel • Side Water Level Depth in Channel	_____ mm _____ mm _____ mm
Provide Description of Water Level Controls	
Provide Description of Cleaning System, Cleaning System Options	
Provide Electrical Power Requirements and Equipment Description	

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one)

.3 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.4 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

.5 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.6 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

- .1 Owner
- .2 Owner contact information
- .3 Contract contact information
- .4 Brief description of the equipment provided
- .5 Capacity of equipment
- .6 Year the equipment was put into operation
- .7 Value of supply contract

END OF SECTION

REVIEWED
By Rob Jansen at 8:04 am, 9/15/20

PART 1 GENERAL

The following changes are effective immediately and shall be incorporated into the Contract Documents.

PART 2 INFORMATION/CLARIFICATION

CLARIFICATION

.1 A person day is defined as 7.5 hrs of on-site work.

.2 Submission Form System # 2 Vortex Grit Removal System as been modified to include a field for the value of the PLC Control Panel as a separate line item.

PART 3 SPECIFICATIONS [N/A]

PART 4 QUESTIONS AND ANSWERS [N/A]

.1 **Q –** 46 43 00 / 3.4.6 Can you confirm for this section the meaning of "person days"? Our understanding is that 2 person days ; 2 trips equal 2 trips of 2 days, please confirm. Same goes for the rest of section.

A – The person days identified is the total on-site time. The number of trips identified, are the total number of anticipated trips to provided the person days identified. For example, as per 3.4.6.1, we are requesting that the manufacturer's representative be on-site two separate days (they may not be consecutive) and on each day that are on-site for 7.5 hours for installation assistance and inspection of the installed product. Travel time etc. is not included in the person days.

.2 **Q –** 46 53 00 / 3.4.7 Can you confirm for this section the meaning of "person days"? Our understanding is that 2 person days ; 2 trips equal 2 trips of 2 days, please confirm. Same goes for the rest of section.

A – See response to question 1. As a further example, in item 3.4.7.2, 3 person days are identified and 2 trips. In this case the 3 person days (3 x 7.5 on-site hours) are broken down between 2 separate trips to site. Again, travel time and other requirements are not included in the required on-site time.

.3 **Q –** 46 63 00 2.10 We would like to be able to bid our standard non-metallic (CPVC) return track supports instead of the SS in the spec.

A – The CPVC return track supports are acceptable provided that the design and referenced installations support the track support type.

END OF SECTION

PART 1 FORM OF PROPOSAL

(See Clause 24 in General Terms and Conditions for Instructions)

BY: _____

_____

_____

TO: The Corporation of the Township of South Stormont

C/O Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #2: Supply, delivery and commissioning of the Vortex Grit Removal System with Grit Classifier for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be **240 days** from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

_____ _____

Name of Supplier Witness (Name & Signature)

_____

Signature of Authorized Officer

_____ _____

Date Company Seal

1.1 FINANCIAL DETAILS

1. Supply and delivery of the Vortex Grit Removal Units, Grit Pumps and Grit Classifier and the associated equipment complete as specified.	
1a. Vortex Grit Units	$
1b. Grit Pumps	$
1c. Grit Classifier	$
1d. Vortex Grit PLC Control Panel	$
2. Preparation and delivery of Shop Drawings.	$
3. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the Grit Removal Systems.	$
Total Quoted Price (1+2+3)	$
Per diem rate for additional field work not included in the above	$/Day
Total Price Valid For	240 Days
Delivery of Shop Drawings	Weeks
Delivery of Equipment for Each Phase (after approved shop drawings)	Weeks
*Amount of Currency Exchange USD/CAD	$
*Additional Amount of Duty Paid (if applicable)	$
Percent of Imported Components (if greater than 10%)	%

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 TECHNICAL DETAILS

.1 Vortex Grit System Description

Parameter	Description
Manufacturer of Vortex Grit Unit	
Make of Vortex Grit Unit	
Model of Vortex Grit Unit	
# of Vortex Grit Units	
Manufacturer of Grit Classifier	
Make of Grit Classifier	
Model of Grit Classifier	
# of Grit Classifier(s)	
Manufacturer of Grit Pump	
Make of Grit Pump	
Model of Grit Pump	
# of Grit Pumps	
Effective Flow Rate	_____ m^3/d to _____ m^3/d
Required Channel Dimensions	Influent Width _____ mm Influent Total Depth _____ mm Influent Water Level @ ADF _____ mm Influent Water Level @ PF _____ mm Effluent Width _____ mm Effluent Total Depth _____ mm Effluent Water Level @ ADF _____ mm Effluent Water Level @ PF _____ mm

Parameter	**Description**
Vortex Grit Removal Unit Removal Efficiency	_____ % of grit greater than 50 mesh _____ % of grit greater than 70 mesh _____ % of grit greater than 100 mesh
Grit Classifier Unit Design Inflow Grit Slurry Rate % reduction Maximum Daily Grit Load	 _____ l/s to _____ l/s _____% reduction by Volume / Mass (circle) _____ m^3/d at average reduction of _____% by Volume/Mass (Circle)

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 Provide weight of vortex grit drive, grit pumps and grit classifier. Yes / No (circle one)

.3 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one)

.4 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.5 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

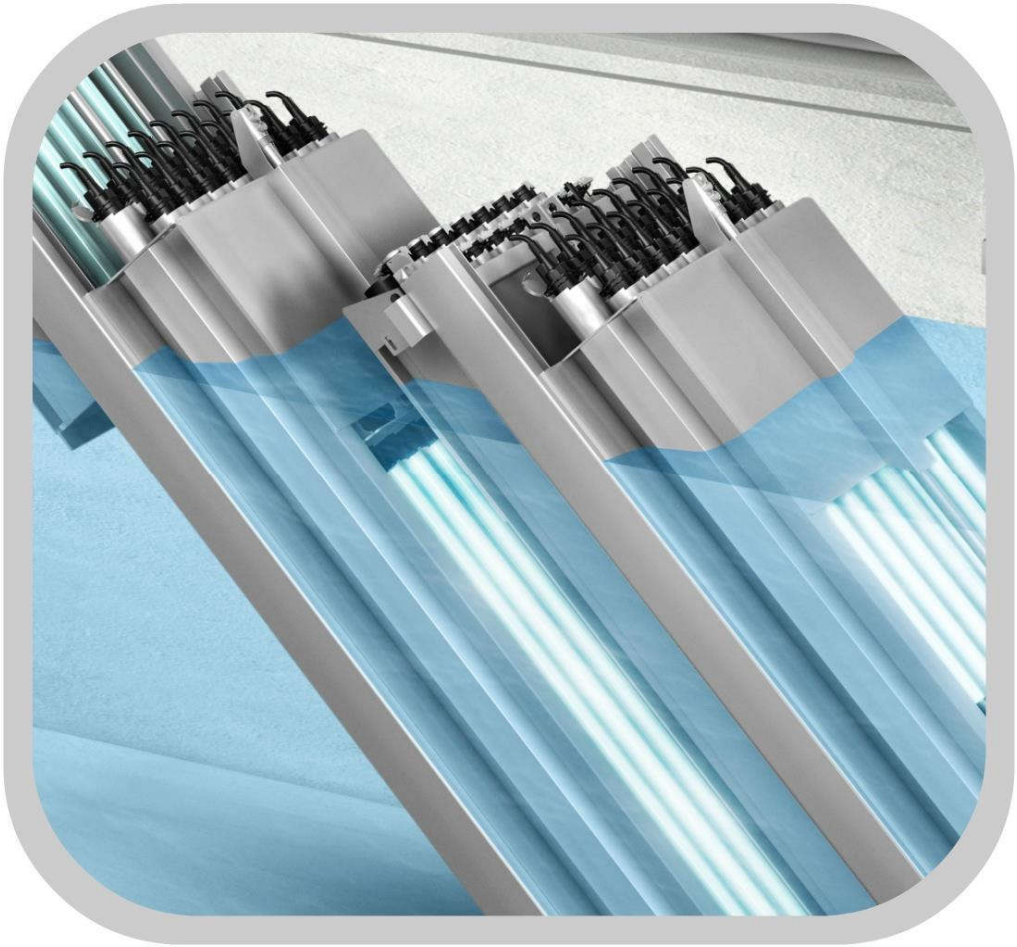
.6 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.7 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

- .1 Owner
- .2 Owner contact information
- .3 Contract contact information
- .4 Brief description of the equipment provided
- .5 Capacity of equipment
- .6 Year the equipment was put into operation
- .7 Value of supply contract

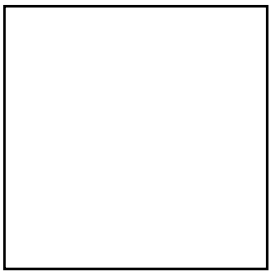
END OF SECTION

FORM OF PROPOSAL



F. System #5 Submission Forms - Ultraviolet Disinfection

Trojan Technologies Base Bid



PART 1 FORM OF QUOTATION

(See Clause 24 in General Terms and Conditions for Instructions)

BY: Trojan Technologies Group ULC

TO:

c/o Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #7: Supply, delivery and commissioning of the Ultraviolet Disinfection System for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be **240 days** from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

Trojan Technologies Group ULC
Name of Supplier

Witness (Name & Signature)
Jona Thier Executive Assistant

Jona Theresa Thier, Notary Public, County of Middlesex, limited to the attestation of instruments and the taking of affidavits, for Trojan Technologies Group ULC and its subsidiaries, associated companies and affiliates. Expires September 20, 2020.

Signature of Authorized Officer
Jo Anne VanHooydonk, VP of Finance and CFO

September 14, 2020
Date
September 14, 2020

Company Seal

Trojan Technologies Group ULC

1.1 FINANCIAL DETAILS

1. Supply and delivery of the UV Disinfection System and the associated equipment complete as specified. 1a. UV Disinfection Systems	[redacted]
2. Preparation and delivery of Shop Drawings.	
3. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the UV Disinfection Systems.	
Total Quoted Price (1+2+3)	
Per diem rate for additional field work not included in the above	
Total Price Valid For	240 Days
Delivery of Shop Drawings	4-6 Weeks
Delivery of Equipment for Each Phase (after approved shop drawings)	16 - 20 Weeks
*Amount of Currency Exchange USD/CAD	[redacted]
*Additional Amount of Duty Paid (if applicable)	
Percent of Imported Components (if greater than 10%)	

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 PROPOSAL DETAILS

.1 UV Disinfection System Description

Parameter	Description
Manufacturer of UV system	Trojan Technologies
UV Reactor Model:	UVSigna
Total Number of UV ~~Reactors~~ Banks (Duty + Standby)	2 Channels (1 Duty, 1 Standby) 4 Banks (2 Duty, 2 Standby)
Number of ~~Modules~~ Banks per ~~Reactor~~ Channel	2
Number of Lamps per ~~Module~~ Banks	10
Total Number of Lamps	40 (includes 20 redundant lamps)
Effective Range of Flow Rates	0 L/s to 240 L/s
Confirm Maximum UV Delivered Dose at design peak flow	30,600 $\mu Ws/cm^2$
Minimum Guaranteed Lamp Operating Life	15,000 hours
Minimum Guaranteed Ballast Life	10 years
Minimum Quartz Sleeve Life	10 years
Cost for Replacement Parts: • Lamps • Ballasts • Quartz Sleeves	$ 600 ea $ 900 ea $ 160 ea
Required Channel Dimensions • Width of Channel • Total Depth of Channel • Side Water Level Depth in Channel (maximum upstream water level)	895 mm 2350 mm 1632 mm Please refer to layout drawing for channel length and weir dimensions
Provide Description of Water Level Controls	Fixed weir provided
Provide Description of Cleaning System, Cleaning System Options	Automatic mechanical and chemical (in situ)
Provide Electrical Power Requirements and Equipment Description	Max power consumption is 42.1 kW, please refer to P&ID for more information

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one)

.3 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.4 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

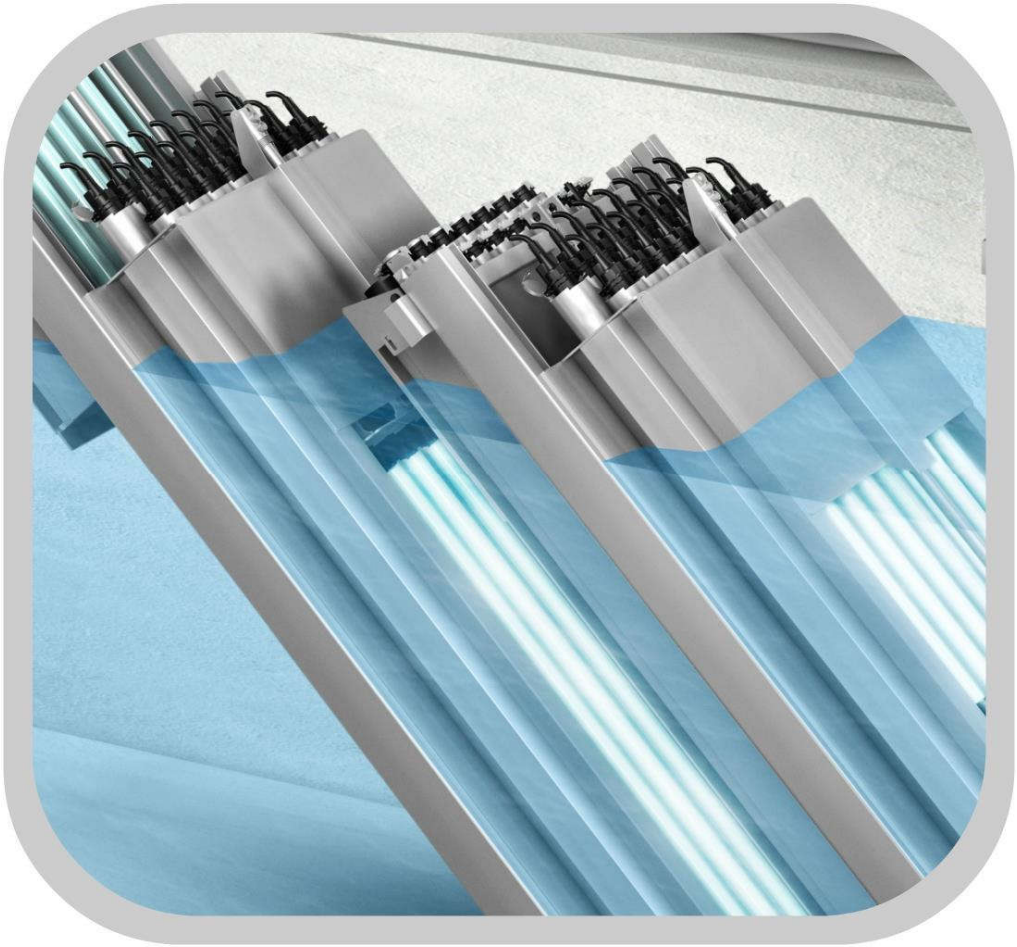
.5 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.6 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

- .1 Owner
- .2 Owner contact information
- .3 Contract contact information
- .4 Brief description of the equipment provided
- .5 Capacity of equipment
- .6 Year the equipment was put into operation
- .7 Value of supply contract

END OF SECTION

SCOPE OF SUPPLY



SCOPE OF SUPPLY FOR INGLESIDE WASTEWATER TREATMENT PLANT
ULTRAVIOLET DISINFECTION EQUIPMENT – TROJANUVSigna™

Prepared for: All Bidding Contractors

Specification Section: 46 83 00

Addendum: 1-3X 4

Submitted by: Rob Jansen

Trojan Quote: 226188

Design Criteria:

Current Peak Design Flow:	20 200 m3/d
Average Flow:	5 400 m3/d
UV Transmission:	55 % minimum
Total Suspended Solids:	25 mg/l (Maximum, grab sample)
Minimum Dose:	30 mJ/cm^2 MS2 Red
Discharge Limit:	200 Fecal Coliform/100ml (based on a 30 Day Geometric Mean)
Redundancy:	One (1) Duty and One (1) Redundant Channel

We are pleased to submit the following scope of equipment based on the above criteria.

The purchaser is responsible for reading all information contained in this Supply Contract. Trojan will not be held accountable for the supply of equipment not specifically detailed in this document. Detailed installation instructions are provided with the shop drawings and are available earlier upon request. Changes to this Scope of Supply that affect selling price will be handled through a change order.

Please refer inquiries to Trojan Manufacturer's Representative:

Representative: Albert Wakim
H2Flow Equipment Inc.
Phone: 905-660-9775 ex. 23
Email: albert@h2flow.com

This proposal has been respectfully submitted by,
Trojan Technologies

Rob Jansen
Regional Sales Manager

GENERAL CONFIGURATION

The TrojanUVSigna equipment described in this Scope of Supply consists of Two (2) channels with two (2) UV banks in each channel.

Channel Dimensions:	Length:	9750mm
	Width:	895mm
	Depth:	2350mm

Note: Dimensions do not include inlet or outlet structures upstream or downstream of the UV channel.

Unless otherwise indicated in this proposal all anchor bolts, conduit, conductors, local disconnects and transformers (if required) are the responsibility of the Installation Contractor and are not included in Trojan's Scope of Supply. Specific cable types listed below are for reference only. Selecting cables that are appropriate for the installation environmental conditions and in compliance with local code is the responsibility of the Installation Contractor.

Site to provide approved (engineered) anchor points for personnel to use as part of their fall restraint system around open channels. The anchor points must be positioned so that the preferred retractable lifeline of 8 ft (2.4 m) is of sufficient length to access the work at the channel. Refer to local safety regulation.

UV BANKS

Trojan's Responsibility:
Each bank supplied will consist of TrojanUV Solo Lamps™, quartz sleeves, supporting structures, ActiClean™ chemical/mechanical cleaning system and an automatic bank lifting mechanism. UV lamps are powered from an individual electric feed from a lamp driver located in a Power Distribution Center (PDC).

Model and Make:	TrojanUVSigna™
Quantity:	Two (2) UV Banks / Channel Each bank will be supplied with 12 UV lamps and quartz sleeves, one (1) UV intensity sensor, one (1) ActiClean chemical-mechanical wiping system and one (1) automatic bank lifting mechanism
Rating:	Type 6P / IP68 (lamp sleeve assemblies)
Approximate Weight:	10 Lamp - 410 lbs (186kg)

Installation Contractor's Responsibility:
The Installation Contractor shall install, align, secure, and seal (grout) each UV bank and lifting system in the channel per the instructions provided. The Installation Contractor shall provide solid grating downstream of the UV bank to block out UV light. Please refer to the supplied Trojan-supplied drawings for details.

SYSTEM CONTROL CENTER

Trojan's Responsibility:
A System Control Center (SCC) shall be supplied to monitor and control the UV disinfection System. Trojan will provide a PLC I/O and soft address map to aid the Installation Contractor with integration of the UV PLC and SCADA system.
Note: if Trojan is required to provide a managed switch in the SCC, the Plant's IT department or System Integrator will be responsible for configuring the switch to meet the Plant's security and traffic routing requirements.
The UV SCC shall consist of the following:

Quantity Supplied:	One (1) SCC will be supplied
Location:	PLC Wall Mount
Controller Type:	CompactLogix L33ER
Operator Interface:	SCC HMI AB Panelview Plus 7 - 15" (Indoor Rated)
Material / Rating:	316 Stainless Steel (Type 4X, IP 66)

Approximate Weight:	200 lbs (91 kg)
UPS:	24 VDC w/ 20 minutes of back up
SCADA:	EtherNet/IP
Surge Protection:	TVSS

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for mounting the SCC as indicated on the drawings. Unless otherwise indicated, the Installation Contractor to be responsible for the supply, installation and connection of the following at the SCC:

1. One (1) 110-240V, 50/60 Hz, 1 Phase, 2 Wire + GND, 1.8kVA (maximum)
2. One (1) bond link to plant ground, in accordance with applicable codes and standards
3. One (1) Modbus communication link, Belden 3106A (or equivalent), to PDCs (daisy chained)
4. One (1) Modbus communication link, Belden 3106A (or equivalent), to HSCs (daisy chained)
5. One (1) Cat 5e Ethernet communication link to SCADA
6. One (1) 4-20 mA analog shielded twisted pair from plant flow meter
7. One (1) 4-20 mA analog shielded twisted pair from online UV Transmittance monitor
8. Control signal conductors (as required by actuator) for control of inlet gate

POWER DISTRIBUTION CENTERS

Trojan's Responsibility:
The Power Distribution Center (PDC) distributes power to the UV lamps and shall consist of the following:

Quantity Supplied:	Two (2) PDCs will be supplied
Method of Cooling:	Air-conditioning
Material / Rating:	304 Stainless Steel
Approximate Weight:	AC Included PDC (Single Wide) – 1213 lbs (550 kg)

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for setting in place and bolting the PDC in location. The Installation Contractor to be responsible for the supply, installation and connection of the following at each PDC:

1. One (1) 480 / 277V, 50/60 Hz, 3 phase, 4 wire + GND, 23.2 kVA power feed with local disconnect to each of PDC
   Please note: Any transformers required are not included in this Scope and should be supplied by the Contractor.
2. One (1) bond link to plant ground, in accordance with applicable codes and standards (to underside of panel)
3. One (1) bond link from each UV bank to the corresponding PDC in accordance with the applicable drawings, specifications, codes, and standards
4. One (1) bank-in-place sensor cable (by Trojan) from each UV bank to corresponding PDC
5. One (1) UV intensity sensor cable (by Trojan) from each UV bank to corresponding PDC
6. One (1) Modbus communication link, Belden 3106A (or equivalent), from the SCC
7. One (1) discrete, 2 conductor, cable from level sensor control box for low water level signal
8. Installation and termination of lamp cables from the UV banks to each PDC. (Qty: 12 per UV Bank – supplied by Trojan)

HYDRAULIC SYSTEM CENTER

Trojan's Responsibility:
The Hydraulic System Center (HSC) houses the ancillary equipment required to operate the quartz sleeve cleaning system and automatic bank lifting mechanism.

Quantity Supplied:	Two (2) HSCs will be supplied
Materials / Rating:	304 Stainless Steel (Type 4X, IP 66)
Hydraulic Fluid:	PureDrive
Approximate Weight:	500lbs (228 kg)

Installation Contractor's Responsibility:
The Installation Contractor shall be responsible for setting in place and bolting the HSC's as shown on the Trojan drawings. The HSC's must be located within 50 ft (15 m) of the furthest PDC. The Installation Contractor shall be responsible for the supply, connection and installation of the following at each HSC:

1. One (1) 480V 60Hz, 2.5 kVA power feed with local disconnect
2. One (1) bond link to plant ground, in accordance with applicable codes and standards
3. One (1) Modbus communication link, Belden 3106A (or equivalent), from the SCC
4. Cut and crimp hydraulic hoses (coordination with Parker Store) (hoses and connections supplied by Trojan)
5. Connection of the hydraulic hoses, total of four (4) per UV bank

WATER LEVEL CONTROLLER

Trojan's Responsibility
A level control device is required to maintain and control the effluent level in the channel, regardless of flow rate.

Quantity Supplied:	Two (2) Fixed Weir
Material of Construction:	304 Stainless Steel
Effective Weir Length:	7082mm per weir

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for setting in place, bolting, grouting and sealing each level control weir trough as per Trojan's and Engineer's drawings.

LOW WATER LEVEL SENSORS

Trojan's Responsibility:
A Low Water Level Sensor is required downstream of the UV System to generate a low water level signal that will shut down and protect the UV System if the water level in the channel drops too low.

Quantity Supplied:	One (1) of each water level sensor to be supplied per channel
Approximate Weight:	10 lbs (22 kg) (panel)

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for setting in place and bolting the water level sensor panel to the effluent channel wall as per Trojan's and Engineer's drawings.

LEVEL SENSOR CONTROL BOX

Trojan's Responsibility:
Trojan will provide a wall mounted Level Sensor Control Box 24 x 14 x 6 in (61 x 36 x 15 cm) to provide power and relays for low level sensors.

Quantity Supplied:	One (1) Level Sensor Control Box per channel
Materials / Rating:	304 Stainless Steel (Type 4X)
Approximate Weight:	40 lbs (18 kg)

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for mounting the Level Sensor Control Box as indicated on the drawings. The Installation Contractor shall also be responsible for supplying mounting hardware, watertight conduit and for the supply, installation and connection of the following at each Control Box:

1. One (1) 120 Volt, 1 phase, 2 wire + GND 72 VA power supply
2. One (1) discrete, 2 conductor cable from the Low Level Sensor to the level sensor control box
3. One (1) discrete, 2 conductor cable from the level sensor control box to each PDC

SPARE PARTS AND ADDITIONAL EQUIPMENT

Trojan's Responsibility:
The following equipment will be supplied with the UV system:

Description	Qty
908081-003 1000W Solo Lamp	4
916841 2kW Solo Lamp Driver	2
337863 Signa 2 Row - Wiper Seal Kit Assembly (2 seals, springs, cage, spacers) – includes lamp end seals	8
338229G 1000W Solo Sleeve	4
906002 UV Face Shield (Spare)	1
907666-020P Pure Drive Hydraulic Fluid (Spare)	1
Operator Kit (includes gloves, faceshield, goggles)	1
Warning Signs	2

NOTES AND CLARIFICATIONS TO SPECIFICATION

Trojan Technologies appreciates the opportunity to submit this proposal. Our proposal is submitted subject to and based on Trojan's standard terms and conditions, which we have attached as part of our proposal. We believe these terms and conditions are customary in the trade and respectfully reserve the opportunity to negotiate, fair and reasonable contract terms acceptable to both parties, if Trojan is selected for this project.

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Part 2.7 – Please note that some spares noted in this section are not applicable for the UVSigna system. A complete module assembly, lamp socket connectors and a portable maintenance rack will not be provided as part of this Scope.

MICROBIOLOGICAL PERFORMANCE TESTING

Trojan's Responsibility:
Trojan will conduct performance testing (5 days duration w/samples taken with 3 samples per day); protocol to be forwarded to the Engineer for approval. Trojan will produce the final test report (based on data supplied by the independent lab) and will forward the final report to the Contractor.

DOCUMENTATION (SHOP DRAWINGS AND O&M MANUALS)

The following documentation will be supplied by Trojan per the following schedule:

- One (1) electronic copy of Trojan Shop Drawing Submittals 4 - 6 weeks after receipt of written purchase order (hardcopies available upon request)
- One (1) electronic copy of Trojan Standard O&M manuals at time of equipment delivery (hardcopies available upon request)

DELIVERY, START-UP AND TRAINING

Equipment shipped **16-20** weeks after approval of Shop Drawings.

Installation Contractor's Responsibility:
The Contractor is responsible for:

- Un loading of the components supplied by Trojan, storage of all components, if required in a clean dry environment
- Installing the equipment outlined in the scope of Supply in accordance with contract drawings, Trojan's shop drawings, instructions and installation checklist.
- Supplying all conduits and conductors and components per the sites state regulations and components indicated as supplied by others,
- Completing the Checklist and returned at least two (2) weeks prior to date requested for commissioning.

The following start-up services will be provided by Trojan-certified technicians:

- Installation assistance as required by phone or fax. Technical Assistance Center 1-866-388-0488 or tac@trojanuv.com
- Inspection of the final installation prior to start-up, **2 days, 2 trips**
- Start-up and testing of the installed UV equipment. **6 days, 2 trips**
    - If the Trojan's Certified Service Technician determines the Contractor work is not complete and the start-up cannot be completed in the allotted time a return visit will be scheduled at the Contractors expense.
- Classroom and/or jobsite training for operations staff **2 days, included in start-up trips**
    - If trainees are not available a return visit will be scheduled at the Contractors expense.
- Performance testing**, 5 days, 1 trip**

WARRANTY

Trojan will warrant the equipment and parts for 24 months from Substantial Completion. Refer to attached Terms and Conditions for additional details.

- UV lamps shall be warranted for 15,000 hours prorated after 9,000 hours.
- Lamp drivers shall be warranted for 10 years, prorated after 1 year.

PAYMENT TERMS

30% upon approval of Shop Drawings
60% upon delivery of equipment to job site
5% upon 90 days after delivery or upon installation (whichever happens first)
5% upon performance testing and acceptance
Net 30 Days

If UV System Start-up is required within 30 days of shipment, Trojan requires 95% payment unless agreed upon in writing before authorizing system Start-up.

Trojan Technologies appreciates the opportunity to submit this proposal. Our proposal is submitted subject to and based on Trojan Technologies standard terms and conditions, which we have attached as part of our proposal. We believe these terms and conditions are customary in the trade and respectfully reserve the opportunity to negotiate, fair and reasonable contract terms acceptable to both parties, if Trojan Technologies is selected for this project.

TERMS & CONDITIONS

See Trojan's Terms and Conditions attached.

Terms and Conditions of Sale

This document sets forth the Terms & Conditions of Sale for goods manufactured and/or supplied, and services provided, by the seller entity identified on the purchase order ("SELLER") and sold to the original purchaser thereof ("BUYER"). The term "SELLER" includes only SELLER, and none of its affiliates. Unless otherwise specifically stated in a previously-executed written purchase agreement signed by authorized representatives of SELLER and BUYER, these Terms & Conditions of Sale establish the rights, obligations and remedies of SELLER and BUYER which apply to this offer and any resulting order or contract for the sale of SELLER's goods and/or services ("Products").

1. APPLICABLE TERMS & CONDITIONS: These Terms & Conditions of Sale are contained directly and/or by reference in SELLER's proposal, offer, order acknowledgment, packing slip, and/or invoice documents. The first of the following acts constitutes an acceptance of SELLER's offer and not a counteroffer and creates a contract of sale ("Contract") in accordance with these Terms & Conditions of Sale: (i) BUYER's issuance of a purchase order document against SELLER's offer; (ii) acknowledgement of BUYER's order by SELLER; or (iii) commencement of any performance by SELLER pursuant to BUYER's order. Provisions contained in BUYER's purchase documents (including electronic commerce interfaces) that materially alter, add to, or subtract from the provisions of these Terms & Conditions of Sale are not a part of the Contract.

2. CANCELLATION AND RETURN: The whole or any part of this order may be cancelled only with the prior written consent of SELLER. If SELLER does consent to a cancellation, such consent will be given only upon payment of reasonable cancellation charges in an amount determined by SELLER. In addition, with respect to any Products returned on cancellation, BUYER will pay SELLER's cost of placing the returned Products in a saleable condition, sales expenses incurred by SELLER in connection with such returned Products, a reasonable restocking charge and freight costs incurred in connection with the original shipment and in connection with returning such Products to SELLER, all in such amounts as are advised to the BUYER by SELLER.

3. DELIVERY: Delivery will be accomplished EXW or CIP at the point of shipment (Incoterms 2020), unless otherwise expressly agreed between the parties. Legal title and risk of loss or damage pass to BUYER upon transfer to the first carrier, regardless of final destination and mode of transit. SELLER will use commercially reasonable efforts to deliver the Products ordered herein within SELLER's normal lead-time necessary for SELLER to deliver the Products sold hereunder. Products will be boxed or crated as determined appropriate by SELLER for protection against normal handling and there will be an extra charge to the BUYER for additional packaging required by the BUYER with respect to waterproofing or other added protection. BUYER has sole responsibility for off-loading, storage and handling of the Products at the site. Where Buyer is responsible for any delay in the delivery date or installation date, the earlier of the date of delivery or the date on which the Products are ready for shipment by SELLER may be treated as the delivery date for purposes of determining the time of payment of the purchase price. Moreover, BUYER will be responsible for reasonable storage and insurance expenses with respect to such Products. Should BUYER fail to effect pick-up of Product as previously agreed in a timely manner, SELLER may, at its discretion, assess reasonable storage charges to the account of BUYER.

4. INSPECTION: BUYER will promptly inspect and accept any Products delivered pursuant to this Contract after receipt of such Products. In the event the Products do not conform to any applicable specifications, BUYER will promptly notify SELLER of such nonconformance in writing. SELLER will have a reasonable opportunity to repair or replace the nonconforming Product at its option. BUYER will be deemed to have accepted any Products delivered hereunder and to have waived any such nonconformance for such Products unless a written notification pursuant to this paragraph is received by SELLER within thirty (30) days of delivery to BUYER destination on order.

5. PRICES & ORDER SIZES: Prices do not include any charges for services such as insurance; brokerage fees; sales, use, inventory, or excise taxes; import or export duties; special financing fees; value added tax, income, or royalty taxes imposed outside the U.S. or Canada; consular fees; special permits or licenses; or other charges imposed upon the production, sale, distribution, or delivery of Products. BUYER will either pay any and all such charges or provide SELLER with acceptable exemption certificates, which obligation survives performance under this Contract. Installation, maintenance and any other services which relate to the Products are not included unless specifically set forth in the quotation. SELLER reserves the right to establish minimum order sizes and will advise BUYER accordingly. Any orders below the minimum order size are subject to a fee as set out by SELLER. If SELLER's delivery of Products surpasses one (1) year in length, then at least on an annual basis, or if changes to the Products are requested or needed, the parties shall conduct good faith discussions regarding changes to the prices for the Products, to reflect SELLER's increased costs for which SELLER shall be entitled to additional fair and appropriate compensation.

6. PAYMENTS: All payments must be made in agreed-to currency, normally Canadian or U.S. Dollars. Unless other payment terms are expressly set forth in the purchase order or otherwise required by the Seller, invoices are due and payable NET 30 DAYS from date of the invoice, without regard to delays for inspection or transportation, with payments to be made by check to SELLER at the address listed in the purchase order or by bank transfer to the account obtainable from SELLER's Accounts Receivable Manager. In the event payments are not made or not made in a timely manner, SELLER may, in addition to all other remedies provided at law, either: (a) declare BUYER's performance in breach and terminate this Contract for default; (b) withhold future shipments until delinquent payments are made; (c) deliver future shipments on a cash-with-order or cash-in-advance basis even after the delinquency is cured; (d) charge interest on the outstanding balance at a rate of 1.5% per month or the maximum rate permitted by law, if lower, for each month or part thereof that there is an outstanding balance plus applicable storage charges and/or inventory carrying charges; (e) repossess the Products for which payment has not been made; (f) pursue other collection efforts and recover all associated costs including reasonable attorney's fees; or (g) combine any of the above rights and remedies as is practicable and permitted by law. BUYER is prohibited from setting off any and all monies owed under this Contract from any other sums, whether liquidated or not, that are or may be due to the BUYER, which arise out of a different transaction with SELLER or any of its affiliates. Should BUYER's financial condition become unsatisfactory to SELLER in its discretion, SELLER may require payment in advance or other security. If BUYER fails to meet these requirements, SELLER may treat such failure as reasonable grounds for repudiation of this Contract, in which case reasonable cancellation charges shall be due to SELLER. BUYER hereby grants SELLER a security interest in the Products, wherever located, and whether now existing or hereafter arising or acquired from time to time, and in all accessions thereto and replacements or modifications thereof, as well as all proceeds of the foregoing, to secure payment in full of all amounts to Seller, which payment releases the security interest but only if such payment could not be considered an avoidable transfer under applicable laws. The security interest granted hereby constitutes a purchase money security interest under the applicable Uniform Commercial Code or Personal Property Security Act or other applicable law, and SELLER is authorized to make whatever registration or notification or take such other action as SELLER deems necessary or desirable to perfect such security interest. BUYER's insolvency, bankruptcy, assignment for the benefit of creditors, or dissolution or termination of the existence of BUYER, constitutes a default under this Contract and affords SELLER all of the remedies of a secured creditor under applicable law, as well as the remedies stated above for late payment or non-payment.

7. LIMITED WARRANTY: Unless specifically provided otherwise in SELLER's quotation, SELLER provides the following Limited Warranty. SELLER warrants that Products sold hereunder will be free from defects in material and workmanship and will, when used in accordance with the manufacturer's operating and maintenance instructions, conform to any express written warranty pertaining to the specific goods purchased, which for Products is for a period of twelve (12) months from delivery. SELLER warrants that services furnished hereunder will be free from defects in workmanship for a period of ninety (90) days from the completion of the services. Products repaired or replaced are not covered by any warranty except to the extent repaired or replaced by SELLER, an authorized representative of SELLER, or under specific instructions by SELLER, in which cases, the Products will be covered under warranty up to the end of the warranty period applicable to the original Products. The above warranties do not include the cost of shipping and handling of returned items. Parts provided by SELLER in the performance of services may be new or refurbished parts functioning equivalent to new parts. Any non-functioning parts that are repaired by SELLER shall become the property of SELLER. No warranties are extended to consumable items such as, without limitation, light bulbs, and for normal wear and tear. All other guarantees, warranties, conditions and representations, either express or implied, whether arising under any statute, law, commercial usage or otherwise, including implied warranties of merchantability and fitness for a particular purpose, are hereby excluded. The sole remedy for Products not meeting this Limited Warranty is replacement, credit or refund of the purchase price, as determined by SELLER in its sole discretion. This remedy will not be deemed to have failed of its essential purpose so long as SELLER is willing to provide such replacement, credit or refund. To make a warranty claim, BUYER must notify SELLER in writing within 5 days of discovery of the defect in question. This notification must include a description of the problem, a copy of the applicable operator's log, a copy of BUYER's maintenance record and any analytical results detailing the problem. Any warranty hereunder or performance guarantees shall only be enforceable if (a) all equipment is properly installed, inspected regularly, and is in good working order, (b) all operations are consistent with SELLER recommendations, (c) operating conditions at the installation site have not materially changed and remain within anticipated specifications, and (d) no reasonably unforeseeable circumstances exist or arise.

8. INDEMNIFICATION: Indemnification applies to a party and to such party's successors-in-interest, assignees, affiliates, directors, officers, and employees ("Indemnified Parties"). SELLER is responsible for and will defend, indemnify and hold harmless the BUYER Indemnified Parties against all losses, claims, expenses or damages which may result from accident, injury, damage, or death due to SELLER's breach of the Limited Warranty. BUYER is responsible for and will defend, indemnify and hold harmless SELLER Indemnified Parties against all losses, claims, expenses, or damages which may result from accident, injury, damage, or death due to the negligence or misuse or misapplication of any Products or the breach of any provision of this Contract by the BUYER or any third party affiliated or in privity with BUYER.

9. PATENT PROTECTION: Subject to all limitations of liability provided herein, SELLER will, with respect to any Products of SELLER's design or manufacture, indemnify BUYER from any and all damages and costs as finally determined by a court of competent jurisdiction in any suit for infringement of any U.S. or Canadian patent (or European patent for Products that SELLER sells to BUYER for end use in a member state of the E.U.) that has issued as of the delivery date, solely by reason of the sale or normal use of any Products sold to BUYER hereunder and from reasonable expenses incurred by BUYER in defense of such suit if SELLER does not undertake the defense thereof, provided that BUYER promptly notifies SELLER of such suit and offers SELLER either (i) full and exclusive control of the defense of such suit when Products of SELLER only are involved, or (ii) the right to participate in the defense of such suit when products other than those of SELLER are also involved. SELLER's warranty as to use patents only applies to infringement arising solely out of the inherent operation of the Products according to their applications as envisioned by SELLER's specifications. In case the Products are in such suit held to constitute infringement and the use of the Products is enjoined, SELLER will, at its own expense and at its option, either procure for BUYER the right to continue using such Products or replace them with non-infringing products, or modify them so they become non-infringing, or remove the Products and refund the purchase price (prorated for depreciation) and the transportation costs thereof. The foregoing states the entire liability of SELLER for patent

infringement by the Products. Further, to the same extent as set forth in SELLER's above obligation to BUYER, BUYER agrees to defend, indemnify and hold harmless SELLER for patent infringement related to (x) any goods manufactured to the BUYER's design, (y) services provided in accordance with the BUYER's instructions, or (z) SELLER's Products when used in combination with any other devices, parts or software not provided by SELLER hereunder.

10. TRADEMARKS AND OTHER LABELS: BUYER agrees not to remove or alter any indicia of manufacturing origin or patent numbers contained on or within the Products, including without limitation the serial numbers or trademarks on nameplates or cast, molded or machined components.

11. SOFTWARE AND INTELLECTUAL PROPERTY: All licenses to SELLER's separately provided software products are subject to the separate software license agreement(s) accompanying the software media. In the absence of such express licenses and for all other software, SELLER grants BUYER only a personal, non-exclusive license to access and use the software provided by SELLER with Products purchased hereunder solely as necessary for BUYER to enjoy the benefit of the Products. A portion of the software may contain or consist of open source software, which BUYER may use under the terms and conditions of the specific license under which the open source software is distributed. BUYER agrees that it will be bound by all such license agreements. Title to software remains with the applicable licensor(s). All SELLER contributions to the Products, the results of the services, and any other work designed or provided by SELLER hereunder may contain or result in statutory and non-statutory Intellectual Property, including but not limited to patentable subject matter or trade secrets; and all such Intellectual Property remains the sole property of SELLER; and BUYER shall not disclose (except to the extent inherently necessary during any resale of Product sold hereunder), disassemble, decompile, or any results of the Services, or any Products, or otherwise attempt to learn the underlying processes, source code, structure, algorithms, or ideas.

12. PROPRIETARY INFORMATION AND PRIVACY: "Proprietary Information" means any information, technical data, or know-how in whatever form, whether documented, contained in machine readable or physical components, mask works or artwork, or otherwise, which SELLER considers proprietary, including but not limited to service and maintenance manuals. BUYER and its customers, employees, and agents will keep confidential all such Proprietary Information obtained directly or indirectly from SELLER and will not transfer or disclose it without SELLER's prior written consent, or use it for the manufacture, procurement, servicing, or calibration of Products or any similar products, or cause such products to be manufactured, serviced, or calibrated by or procured from any other source, or reproduce or otherwise appropriate it. All such Proprietary Information remains SELLER's property. No right or license is granted to BUYER or its customers, employees or agents, expressly or by implication, with respect to the Proprietary Information or any patent right or other proprietary right of SELLER, except for the limited use licenses implied by law. In respect of personal data supplied by BUYER to SELLER, BUYER warrants that is duly authorized to submit and disclose these data, including but not limited to obtaining data subjects´ informed consent. SELLER will manage BUYER's information and personal data in accordance with its Privacy Policy, a copy of which is available to Buyer upon request. In respect of other data and information that SELLER may receive in connection with BUYER´s use of the Products including without limitation data that are captured by the Products and transmitted to SELLER, BUYER hereby grants SELLER a non-exclusive, worldwide, royalty-free, perpetual, non-revocable license to use, compile, distribute, display, store, process, reproduce, or create derivative works of such data as needed for Product operation and maintenance, and to aggregate such data for use in an anonymous manner, solely to facilitate marketing, sales and R&D activities of SELLER and its affiliates.

13. SPECIAL TOOLS, DIES, JIGS, FIXTURES AND PATTERNS: Any tools, dies, jigs, fixtures, patterns and similar items which are included or required in connection with the manufacture and/or supply of the Products will remain the property of SELLER without credit to the BUYER. SELLER assumes the cost for maintenance and replacement of such items and shall have the right to discard and scrap any such item after it has been inactive for a minimum of one year, without credit to the BUYER.

14. CHANGES AND ADDITIONAL CHARGES: SELLER reserves the right to make design changes or improvements to any products of the same general class as Products being delivered hereunder without liability or obligation to incorporate such changes or improvements to Products ordered by BUYER unless agreed upon in writing before the Products' delivery date.

15. SITE ACCESS / PREPARATION / WORKER SAFETY / ENVIRONMENTAL COMPLIANCE: In connection with services provided by SELLER, BUYER agrees to permit prompt access to equipment. BUYER assumes full responsibility to back-up or otherwise protect its data against loss, damage or destruction before services are performed. BUYER is the operator and in full control of its premises, including those areas where SELLER employees or contractors are performing service, repair, and maintenance activities. BUYER will ensure that all necessary measures are taken for safety and security of working conditions, sites, and installations during the performance of any services. BUYER is the generator of any resulting wastes, including without limitation hazardous wastes. BUYER is solely responsible to arrange for the disposal of any wastes at its own expense. BUYER will, at its own expense, provide SELLER employees and contractors working on BUYER's premises with all information and training required under applicable safety compliance regulations and BUYER's policies. SELLER has no responsibility for the supervision or actions of BUYER's employees or contractors or for non-SELLER items (e.g., chemicals, equipment) and disclaims all liability and responsibility for any loss or damage that may be suffered as a result of such actions or items, or any other actions or items not under SELLER's control.

16. LIMITATIONS ON USE: BUYER will not use any Products for any purpose other than those identified in SELLER's catalogs and literature as intended uses. Unless SELLER has advised the BUYER in writing, in no event will BUYER use any Products in drugs, food additives, food, or cosmetics, or medical applications for humans or animals. In no event will BUYER use in any application any Product that requires FDA 510(k) clearance unless and only to the extent the Product has such clearance. BUYER will not sell, transfer, export, or re-export any SELLER Products or technology for use in activities which involve the design, development, production, use, or stockpiling of nuclear, chemical, or biological weapons or missiles, nor use SELLER Products or technology in any facility which engages in activities relating to such weapons. Unless the "ship-to" address is in California, U.S.A., the Products are not intended for sale in California and may lack markings required by California Proposition 65; accordingly, unless BUYER has ordered Products specifying a California ship-to address, BUYER will not sell or deliver any SELLER Products for use in California. Any warranty granted by SELLER is void if any goods covered by such warranty are used for any purpose not permitted hereunder.

17. EXPORT AND IMPORT LICENSES AND COMPLIANCE WITH LAWS: Unless otherwise expressly agreed, BUYER is responsible for obtaining any required export or import licenses necessary for Product delivery. BUYER will comply with all laws and regulations applicable to the installation or use of all Product, including applicable import and export control laws and regulations of the U.S., E.U., and any other country having proper jurisdiction, and will obtain all necessary export or import licenses in connection with any subsequent export, re-export, transfer, and use of all Product and technology delivered hereunder. BUYER will not sell, transfer, export, or re-export any SELLER Product or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical, or biological weapons or missiles, nor use SELLER Product or technology in any facility which engages in activities relating to such weapons. BUYER will comply with all local, national, and other laws of all jurisdictions globally relating to anti-corruption, bribery, extortion, kickbacks, or similar matters which are applicable to BUYER's business activities in connection with this Contract, including but not limited to the U.S. Foreign Corrupt Practices Act of 1977, as amended (the "FCPA"). BUYER agrees that no payment of money or provision of anything of value will be offered, promised, paid, or transferred, directly or indirectly, by any person or entity, to any government official, government employee, or employee of any company owned in part by a government, political party, political party official, or candidate for any government office or political party office to induce such organizations or persons to use their authority or influence to obtain or retain an improper business advantage for BUYER or for SELLER, or which otherwise constitute or have the purpose or effect of public or commercial bribery, acceptance of or acquiescence in extortion, kickbacks, or other unlawful or improper means of

obtaining business or any improper advantage, with respect to any of BUYER's activities related to this Contract. SELLER asks BUYER to "Speak Up!" if aware of any violation of law, regulation, or our Code of Conduct ("CoC") in relation to this Contract. See www.danaherintegrity.com and www.danaher.com/how-we-work/integrity-and-compliance for a copy of the CoC and for access to our Helpline portal.

18. RELATIONSHIP OF PARTIES: BUYER is not an agent or representative of SELLER and will not present itself as such under any circumstances, unless and to the extent it has been formally screened by SELLER's compliance department and received a separate duly-authorized letter from SELLER setting forth the scope and limitations of such authorization.

19. FORCE MAJEURE: SELLER is excused from performance of its obligations under this Contract to the extent caused by acts or omissions that are beyond its control, including but not limited to Government embargoes, blockages, seizures or freezing of assets, delays, or refusals to grant an export or import license, or the suspension or revocation thereof, or any other acts of any Government; fires, floods, severe weather conditions, or any other acts of God; quarantines; labor strikes or lockouts; riots; strife; insurrections; civil disobedience or acts of criminals or terrorists; war; material shortages or delays in deliveries to SELLER by third parties. In the event of the existence of any force majeure circumstances, the period of time for delivery, payment terms, and payments under any letters of credit will be extended for a period of time equal to the period of delay. If the force majeure circumstances extend for six months, SELLER may, at its option, terminate this Contract without penalty and without being deemed in default or in breach thereof.

20. NON-ASSIGNMENT AND WAIVER: BUYER will not transfer or assign this Contract or any rights or interests hereunder without SELLER's prior written consent. Failure of either party to insist upon strict performance of any provision of this Contract, or to exercise any right or privilege contained herein, or the waiver of any breach of the terms or conditions of this Contract, will not be construed as thereafter waiving any such terms, conditions, rights, or privileges, and the same will continue and remain in force and effect as if no waiver had occurred.

21. FUNDS TRANSFERS: BUYER and SELLER both recognize that there is a risk of banking fraud when individuals impersonating a business demand payment under new mailing or banking transfer instructions. To avoid this risk, BUYER must verbally confirm any new or changed mailing or banking transfer instructions by calling SELLER and speaking with SELLER's Accounts Receivable Manager before transferring any monies using the new instructions. Both parties agree that they will not institute mailing or banking transfer instruction changes and require immediate payment under the new instructions, but will instead provide a ten (10) day grace period to verify any mailing or banking transfer instruction changes before any new or outstanding payments are due using the new instructions.

22. LIMITATION OF LIABILITY: None of SELLER, its successors-in-interest, assignees, affiliates, directors, officers, and employees will be liable to BUYER under any circumstances for any special, treble, incidental, or consequential damages, including without limitation, damage to or loss of property other than for the Products purchased hereunder; damages incurred in installation, repair, or replacement; lost profits, revenue, or opportunity; loss of use; losses resulting from or related to downtime of the Products or inaccurate measurements or reporting; the cost of substitute products; or claims of BUYER's customers for such damages, howsoever caused, and whether based on warranty, contract, and/or tort (including negligence, strict liability or otherwise). The total liability of SELLER, its successors-in-interest, assignees, affiliates, directors, officers, and employees arising out of the performance or nonperformance hereunder, or SELLER's obligations in connection with the design, manufacture, sale, delivery, and/or use of Products, will in no circumstance exceed the amount actually paid to SELLER for Products delivered hereunder.

23. APPLICABLE LAW AND DISPUTE RESOLUTION: All issues relating to the construction, validity, interpretation, enforcement, and performance of this agreement and the rights and obligations of SELLER and the BUYER hereunder shall be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein. Any provisions of the International Sale of Goods Act or any convention on contracts for the international sale of goods shall not be applicable to this agreement. The parties submit to and consent to the non-exclusive jurisdiction of courts located in the Province of Ontario.

24. ENTIRE AGREEMENT & MODIFICATION: These Terms & Conditions of Sale constitute the entire agreement between the parties and supersede any prior agreements or representations, whether oral or written. No change to or modification of these Terms & Conditions shall be binding upon SELLER unless in a written instrument specifically referencing that it is amending these Terms & Conditions of Sale and signed by an authorized representative of SELLER. SELLER rejects any additional or inconsistent Terms & Conditions of Sale offered by BUYER at any time, whether or not such terms or conditions materially alter the Terms & Conditions herein and irrespective of SELLER's acceptance of BUYER's order for the described goods and services.

Terms and Conditions Covering Sales of Configured-to-Order Projects and Systems

In addition to all terms and conditions above, the following sections apply to sales of Configured-to-Order Projects, Systems, and the like:

101. PAYMENT.

101.1 Payments will be made per the schedule of payment events set forth in Seller's Quotation; provided that if the Start-Up Date (as defined below) is less than 30 days after the Acceptance Date, 90% of the purchase price is due on or before the Start-Up Date.

101.2. In the event that achievement of a scheduled payment event is delayed or suspended due to the Buyer's convenience or other reasons for which the Buyer or its representatives is responsible, such payment event will be deemed to have occurred and Seller shall be entitled to invoice Buyer as if achievement of such payment event had been achieved. In such circumstances, Buyer must notify Seller in writing of the reasons for the delay and anticipated duration of the delay. Seller will mark the Products (or parts thereof) as the Buyer's property and shall store the Products (or parts thereof) in a segregated area until actual delivery.

102. DELIVERY

102.1 SELLER will request the BUYER to provide a firm date for delivery of the Products to the project site (the "Delivery Date") which SELLER will then use to establish the production schedule for the Products. The Delivery Date will then be binding on the BUYER except for any changes made in accordance with the provisions below.

102.2 The BUYER can request a rescheduling of the Delivery Date on one occasion only by notifying SELLER in writing not less than four weeks prior to the scheduled Delivery Date. The BUYER may request that the Delivery Date be extended by a period up to six weeks, without penalty, but may not request that the Delivery Date be moved forward. The BUYER may also request that the Delivery Date be extended beyond a six-week period but, SELLER may not agree to such extension, beyond the maximum six-week extension period

102.3 SELLER may, in its sole discretion, agree to change the Delivery Date on more than one occasion or if less than four weeks' prior notice is provided of a requested change, but is under no obligation to do so.

102.4 SELLER reserves the right to reschedule the Delivery Date to a date prior to or subsequent to the scheduled Delivery Date in order to accommodate its shipping, production or other requirements. This right to reschedule will be applicable unless otherwise agreed in writing by an authorized officer of SELLER. SELLER will provide the BUYER or its representative with a minimum of 24 hours' notice of any such rescheduling.

102.5 Where any change to the Delivery Date is made at BUYER's request, for all purposes with respect to the warranty and payment provided by SELLER in connection with the Products, the initial Delivery Date will be considered to be the Delivery Date regardless of any change later made to the Delivery Date.

103. ACCEPTANCE

103.1 During the period between the Delivery Date and the Start-up Date, the BUYER shall prepare the Products and the project site for installation and start-up and, unless otherwise agreed in writing by an authorized representative of SELLER, shall complete acceptance testing with respect to the Products. The Products shall be deemed to be accepted on the earliest to occur of the following dates (the "Acceptance Date"): (a) that date on which the Products can function in either manual or automatic operation and provide disinfection in accordance with criteria specified in the Quotation, or (b) 60 days after the Delivery Date.

103.2 All amounts which remain owing by the BUYER for the Products, including any amount which is specified to be payable on the Acceptance Date, will be paid by the BUYER to SELLER within 30 days after the Acceptance Date, unless otherwise agreed in writing by an authorized representative of SELLER.

103.3 Written notification must be given by the BUYER to SELLER within seven days after the Acceptance Date listing any outstanding deficiencies with respect to the Products and SELLER will use all reasonable efforts to correct such deficiencies promptly.

104. START-UP

104.1 SELLER will request a firm date for start-up of the Equipment (the "Start-Up Date"). Trojan will then schedule its technician to be on-site for the Start-up Date. The Start-up Date is binding except for any changes made in accordance with the provisions below.

104.2 On the Start-up Date, BUYER must have the Equipment and site ready as provided in the Installation Preparation Checklist contained in the Contractor Installation Package sent to BUYER and must have paid all amounts then due and payable to SELLER.

104.3 BUYER can request a rescheduling of the Start-up Date by notifying SELLER in writing not less than three weeks prior to the Start-up Date. BUYER may request that the Start-up Date be extended but may not request that the Start-up Date be moved forward. SELLER requires a minimum extension period of two weeks between the existing Start-up Date and the requested new Start-up Date in order to reschedule its technician.

104.4 SELLER may, in its sole discretion, agree to reschedule the Start-up Date where a BUYER requests less than a two-week extension but is under no obligation to do so. In the event that SELLER does agree to less than a two-week extension or that BUYER requests more than two changes to the Start-up Date, BUYER will be charged an administration fee in an amount determined by SELLER.

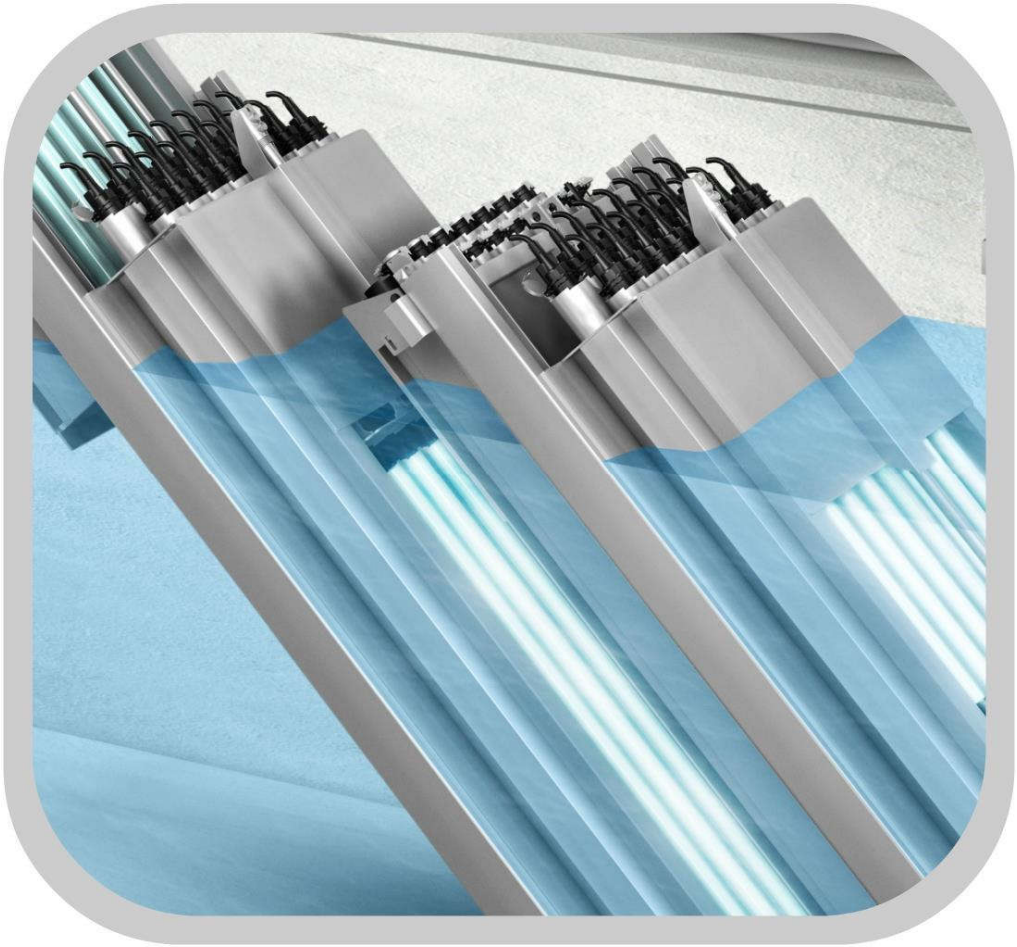
104.5 SELLER reserves the right to reschedule the Start-up Date to a date which is prior to or subsequent to the scheduled Start-up Date in order to accommodate its resource availability. This right to reschedule will be applicable unless otherwise agreed in writing by an authorized officer of SELLER. SELLER will provide BUYER or its representative with a minimum of 72 hours' notice of any such change to the Start-up Date.

104.6 In the event that SELLER'S technician arrives at the project site and finds that the Equipment or the project site is not ready for start-up as defined in the Contractor Installation Package, or any amounts then due and payable to SELLER remain unpaid, BUYER may either:

(a) provided all amounts then due and payable to SELLER have been paid, issue a purchase order for all costs involved in having SELLER correct the deficiencies, or

(b) have SELLER'S technician leave the site and then reschedule the Start-up Date to a date when all deficiencies will be corrected, and the Equipment will be ready for start-up as defined in the Contractor Installation Package. If BUYER selects this option, the cost of rescheduling will be not less than a minimum amount specified by SELLER, with the final cost being determined by SELLER based on its costs and expenses incurred in connection with the rescheduling.

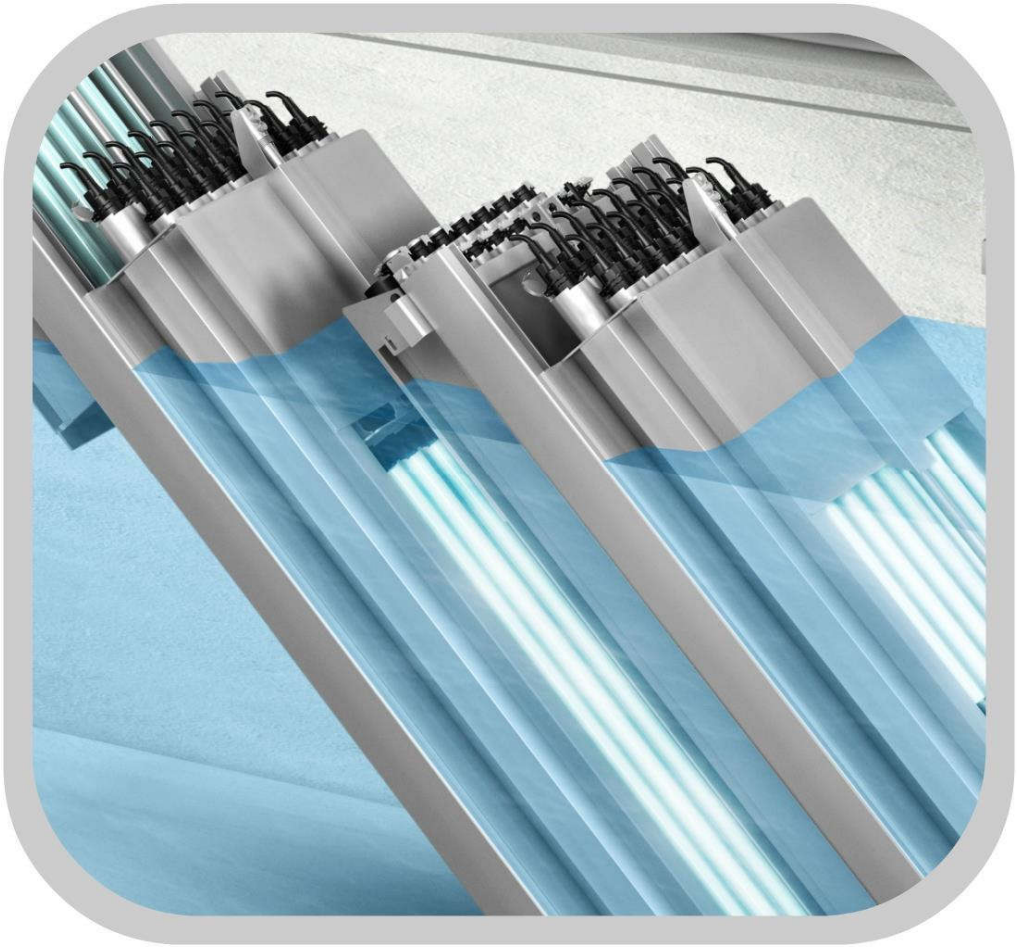
SPARE PARTS/COSTING

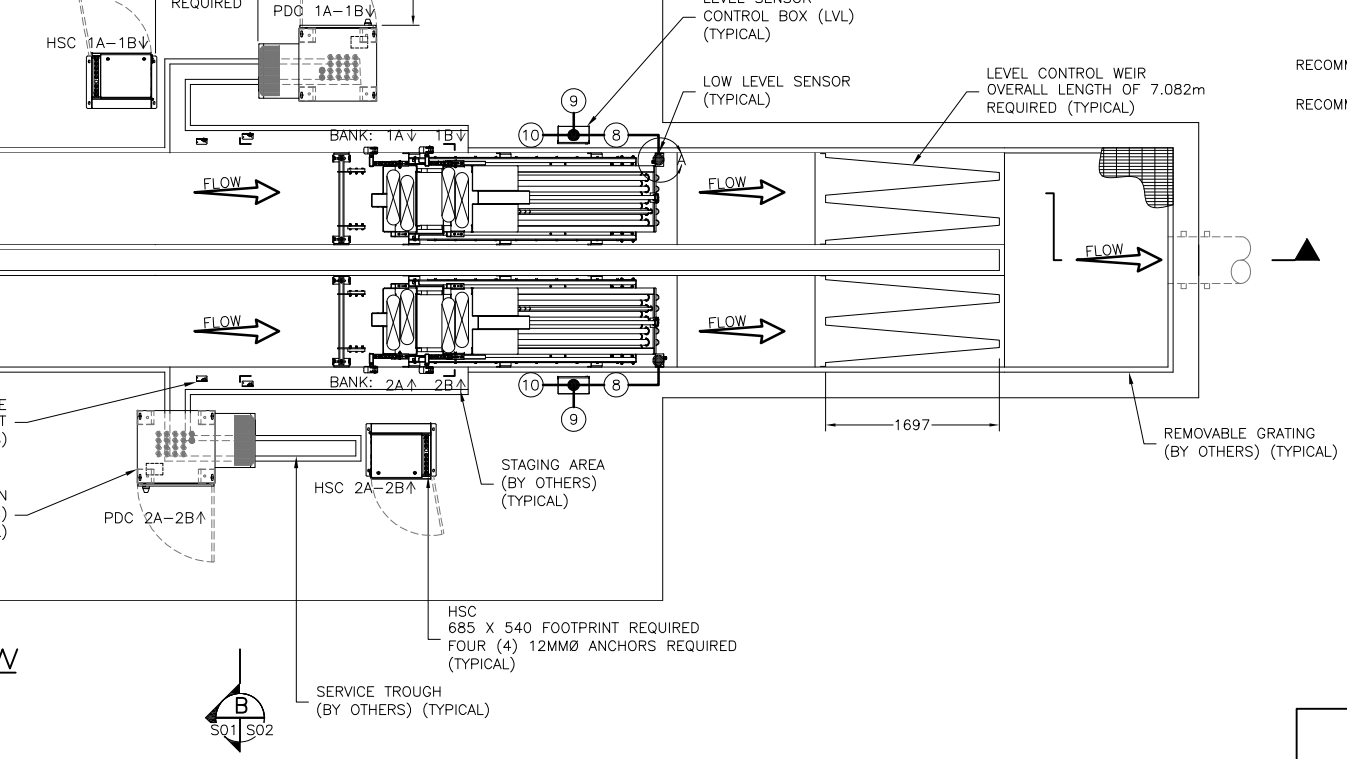


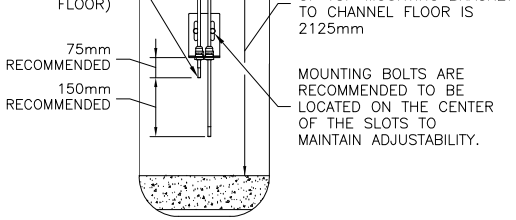
Spares Costs:

Item	Replacement Cost
Lamps	[redacted]
Lamp Plug O-Ring	
Sleeves	
Wiper Seals (Set)	
ActiClean Gel	
Hydraulic Filter	
Lamp Driver (ballast)	
Sensors	

DRAWINGS

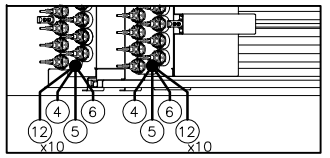






DETAIL A

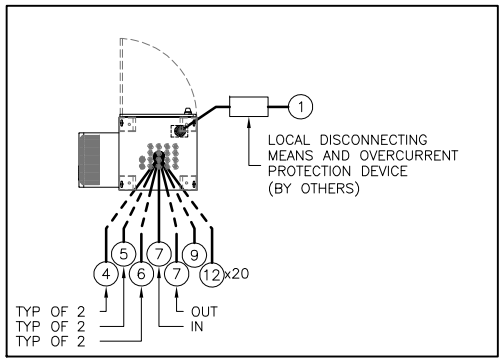
SCALE: NOT TO SCALE



UV BANK INTERCONNECT DETAIL

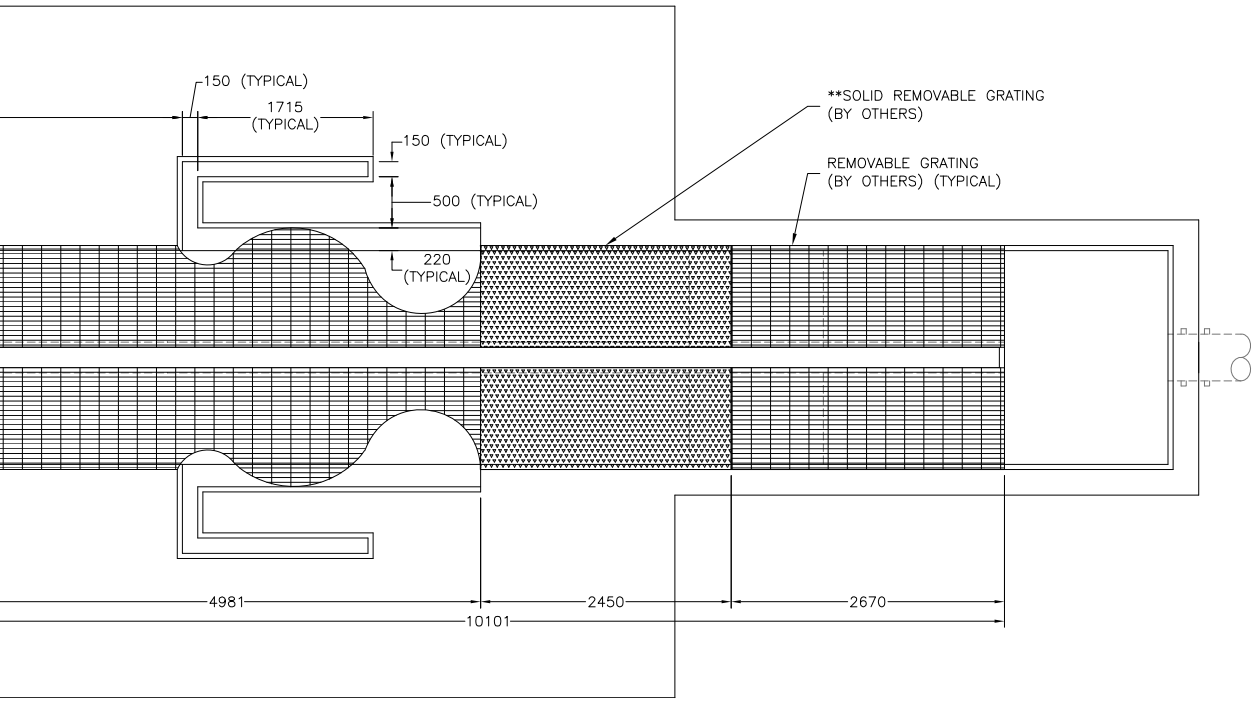
SCALE: NOT TO SCALE
NOTE: TYPICAL FOR ALL UV BANKS.
TROUGH NOT SHOWN FOR CLARITY.

	23.2 kVA/PDC POWER DRAW
2	SYSTEM CONTROL CENTER (SCC) POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GRO
3	HYDRAULIC SYSTEM CENTER (HSC POWER SUPPLY 480V, 3 PHASE, 3 WIRE + GRO
4	BONDING CONDUCTOR (CABLE BY 8 AWG TYPE TWH STRANDED
5	UV INTENSITY 4–20mA ANALOG INPUT
6	BANK IN PLACE PROXIMITY SENS 3 CONDUCTOR CABLES (SUPPLIE
7	MODBUS BELDEN 3106A OR EQUIVALENT (ONE LINE PER CHANNEL)
8	DISCRETE LOW LEVEL SIGNAL 12 VDC – 2 CONDUCTORS
9	DISCRETE WATER LEVEL SIGNAL 2 CONDUCTORS
10	LEVEL SENSOR CONTROL BOX (L POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GRO
11	FLOW METER 4–20 mA, DC ANALOG INPUT (BY OTHERS)
12	LAMP CABLES (SUPPLIED BY TRO (ROUTED BY OTHERS)
13	DISCRETE GATE OPEN CONTROL 2 CONDUCTORS DISCRETE GATE CLOSED CONTRO 2 CONDUCTORS DISCRETE OPEN COMMAND OUTPU 2 CONDUCTORS DISCRETE CLOSE COMMAND OUTP 2 CONDUCTORS DISCRETE GATE IN REMOTE MODE 2 CONDUCTORS



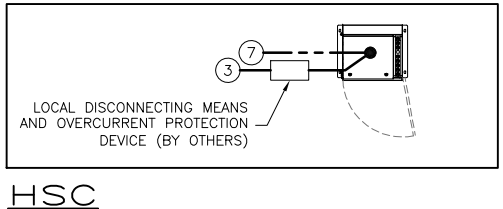
PDC INTERCONNECT DETAIL

SCALE: NOT TO SCALE



AND TROUGH PLAN VIEW

ECTIONS SHOULD BE SIZED TO ALLOW FOR EASY REMOVAL BY SERVICE
MUST BE PROVIDED IN AREA INDICATED TO BLOCK UV LIGHT



HSC INTERCONNECT DETAIL

SCALE: NOT TO SCALE

*** GROUND CONNECTI**

NOTES:

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: CHANNEL WIDTH MUST BE KEP
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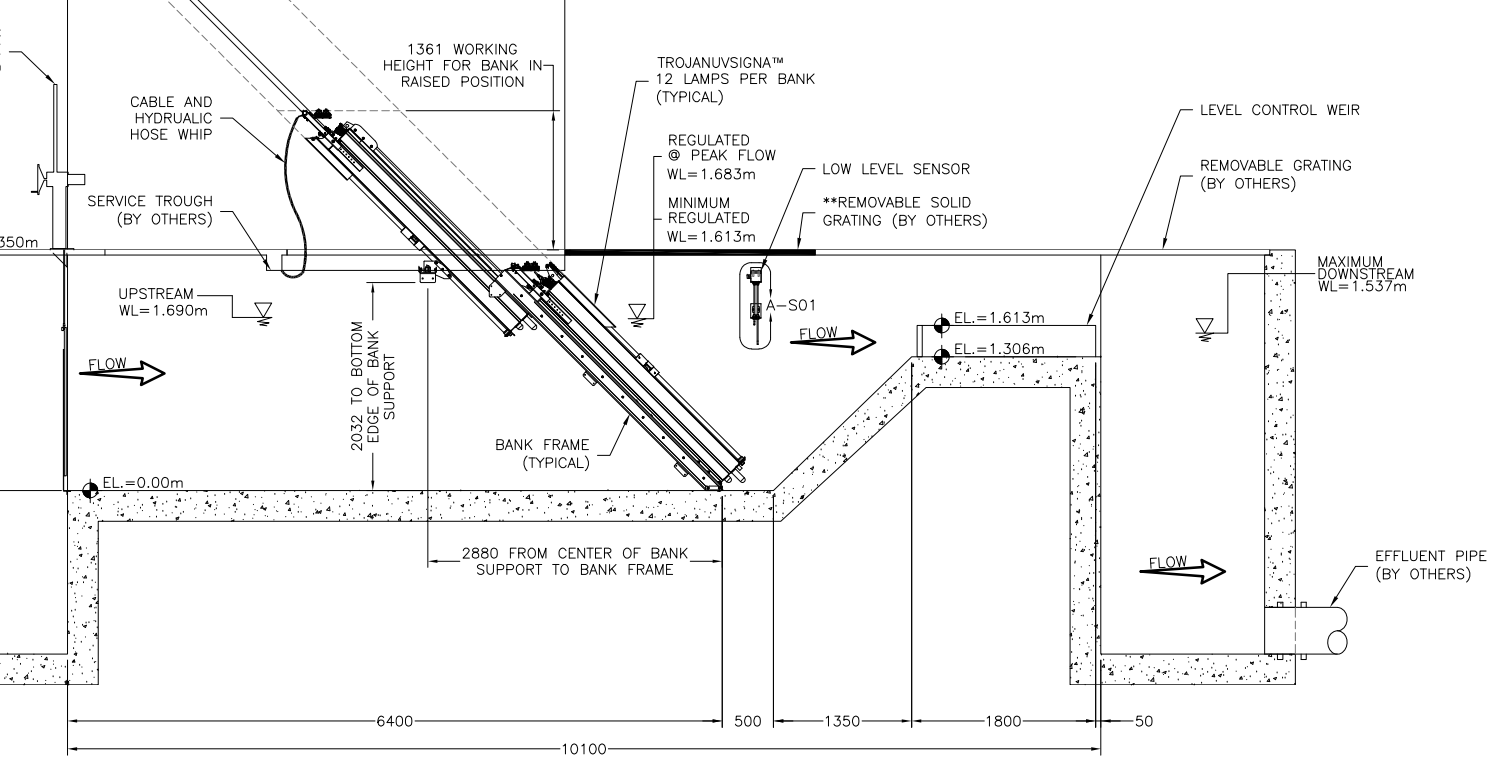
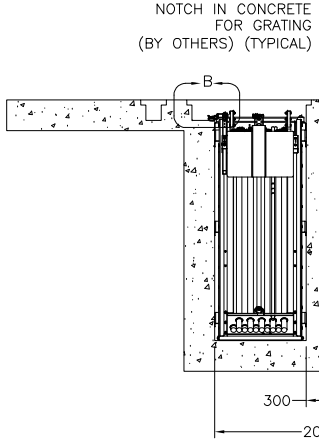
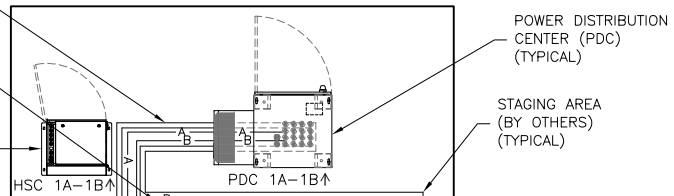


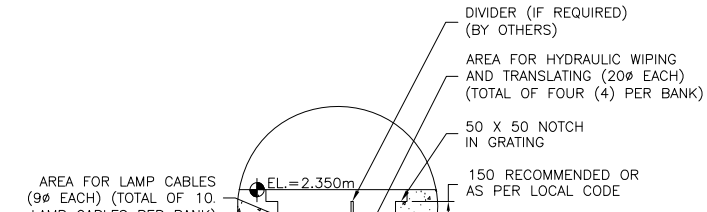


B SECTION
S01 S02 SCALE: AS SHOWN
NOTE: SCC, PDC, HSC AND LEV
NOT SHOWN FOR CLARITY

ECTION
E: AS SHOWN
: SCC, PDC, HSC AND LEVEL SENSOR CONTROL BOX NOT SHOWN FOR CLARITY



LAMP CABLE ROUTING PLAN
CALE:NOT TO SCALE
OTE: HSC NOT SHOWN FOR CLARITY.



DETAIL C
SCALE:NOT TO SCALE
NOTE: REFER TO TROJAN TROUGH CABLE INSTALLATION GUIDELINE DC000601-017 OR LOCAL CODE IF MORE RESTRICTIVE. TROUGH WIDTHS BASED ON SOLID STYLE GRATING.

NOTES:
: DO NOT SLOPE CHANNEL FL
: CHANNEL WIDTH MUST BE K
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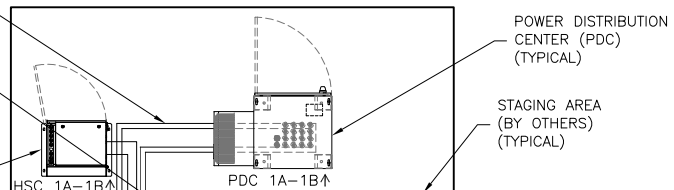
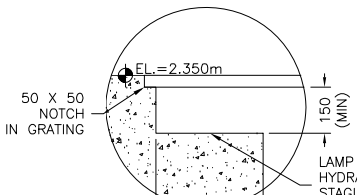




AL INSTRUMENT OR FUNCTION SYMBOLS

LOCATION NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	LOCATION NORMALLY NOT ACCESSIBLE TO OPERATOR
		
		

INDICATES A SINGLE INSTRUMENT OR OTHER COMPONENT HAVING MULTIPLE FUNCTIONS

INDICATES GENERAL OR MISCELLANEOUS HARDWARE INTERLOCK

ABBREVIATION

CC	– SYSTEM CONTROL CENTER
DC	– POWER DISTRIBUTION CENTER
SC	– HYDRAULIC SYSTEM CENTER
H	– CHANNEL
V	– ULTRA VIOLET
SC	– OPEN–STOP–CLOSE
OR	– LOCAL–OFF–REMOTE

INSTRUMENT LINES AND SYMBOLS

–	DISCRETE SIGNAL
–	ANALOG SIGNAL
▬	PROCESS LINE
–	SOFTWARE LINK VIA DATA HIGHWAY
–	INSTRUMENT SUPPLY OR CONNECTION TO PROCESS
–	HYDRAULIC LINE
	ANALOG INPUT
	DISCRETE INPUT

INSTRUMENTATION FUNCTIONAL CODE

	FIRST LETTER		SUCCEEDING LETTER		
	MEASURED OR INITIATING VARIABLE	(MODIFIER)	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	(MODIFIER)
A	ANALYSIS		ALARM		
C			CONTROL		CLOSE
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO			
G			GLASS OR VIEWING DEVICE		
H	HAND (MANUAL)				HIGH (OPENED)
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		PILOT LIGHT		LOW (CLOSED)
M		MOMENTARY			MIDDLE OR INTERMEDIATE
O			ORIFICE		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE			
R	RADIATION		RECORD		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (1)		MULTIFUNCTION (1)	MULTIFUNCTION (1)	MULTIFUNCTION (1)
V	VIBRATION, MECH ANAL.			VALUE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	STATUS				
Y	EVENT, STATE OR PRESENCE			RELAY, COMPUTE OR CONVERT	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL ELEMENT	

TABLE NOTE:–
(1) WHEN USED SYMBOL OR SIGNAL LINE IS ANNOTATED.

DEVICE SYMBOL

– MOTORIZE


– CAPACITAN

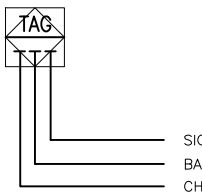

– ULTRA SO

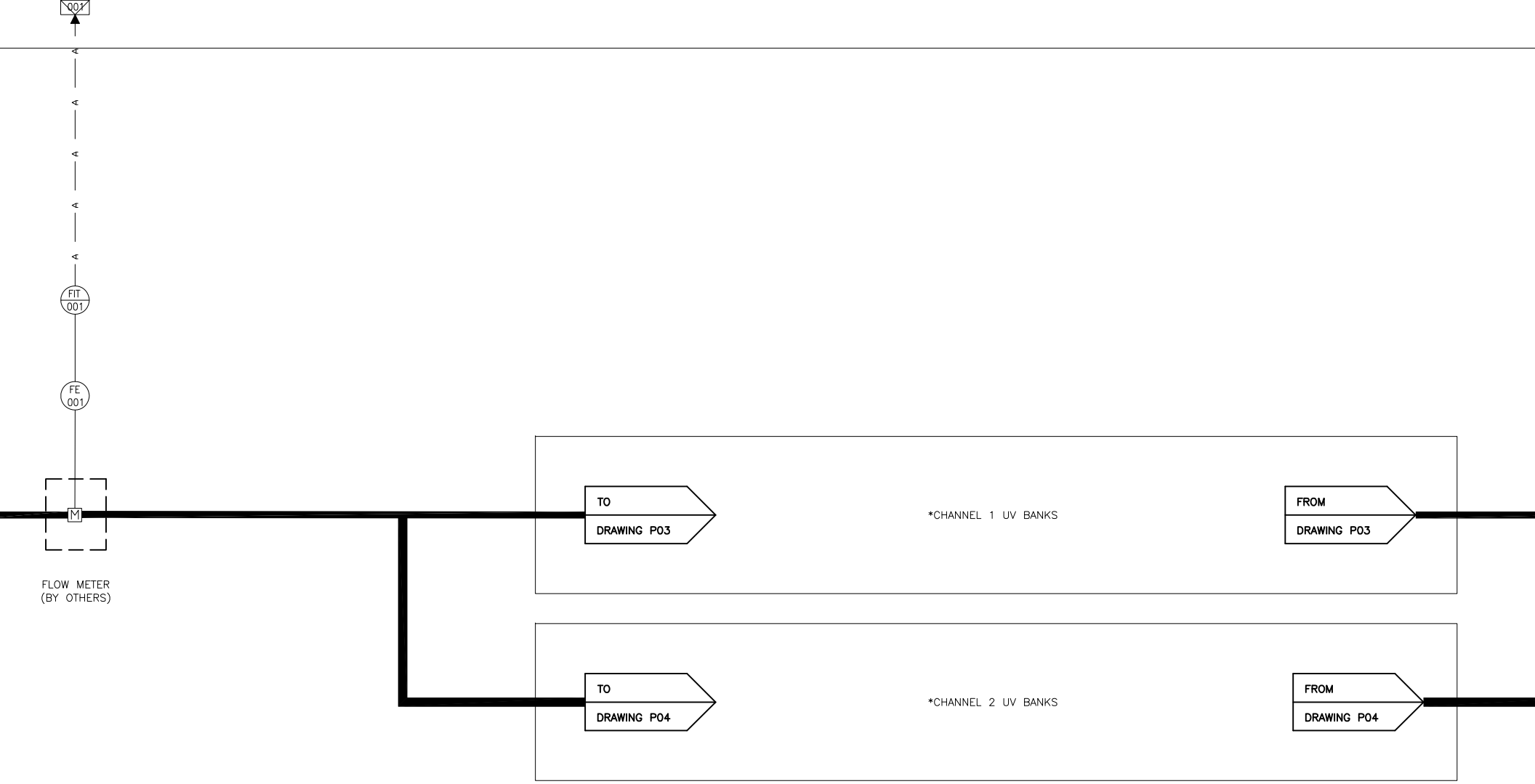

– RECIRCUL


– WEIR


– AUTOMATI

GENERAL INSTRUME




001
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FLOW METER
(BY OTHERS)
TO
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*CHANNEL 1 UV BANKS
FROM
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TO
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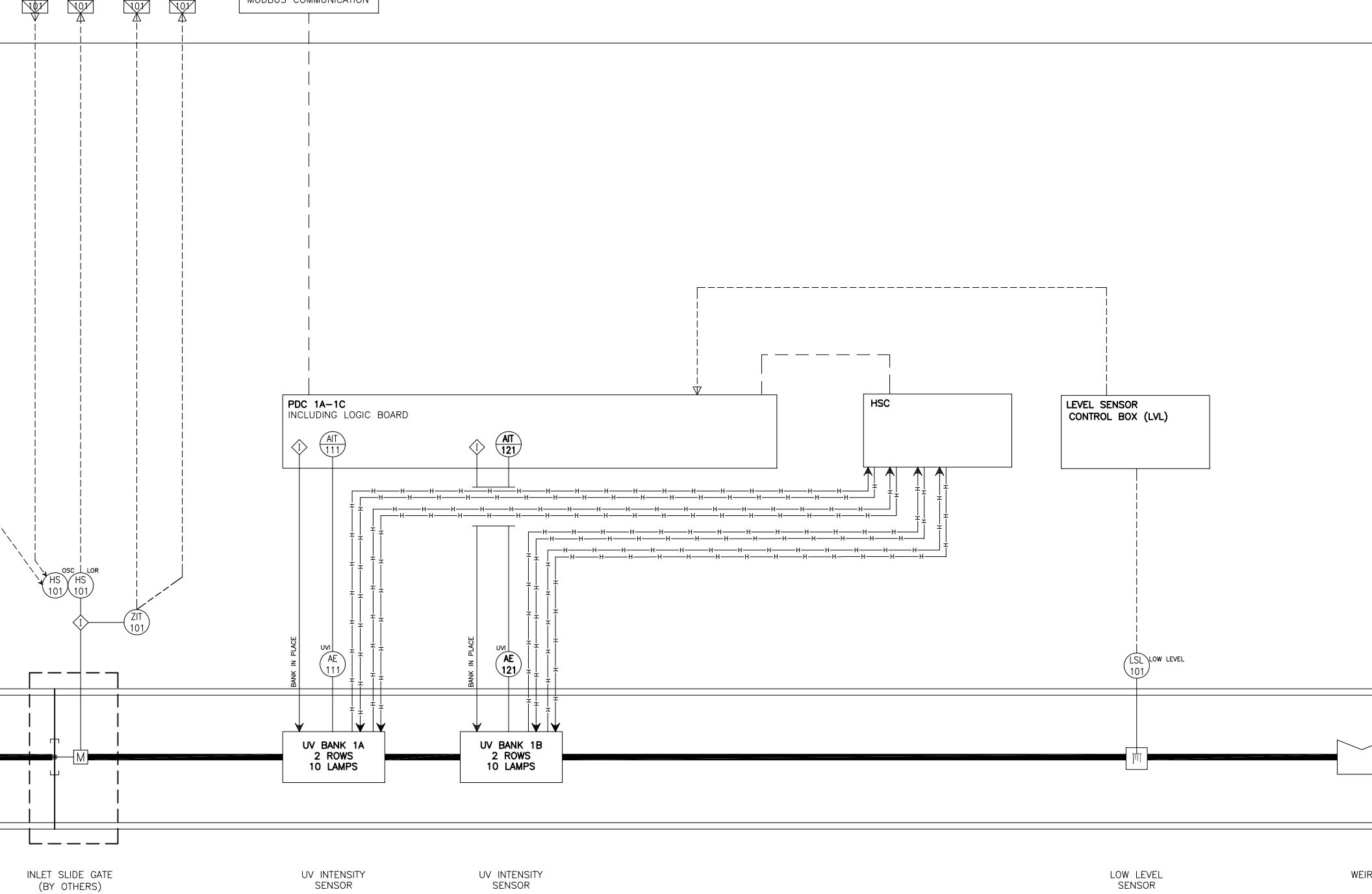
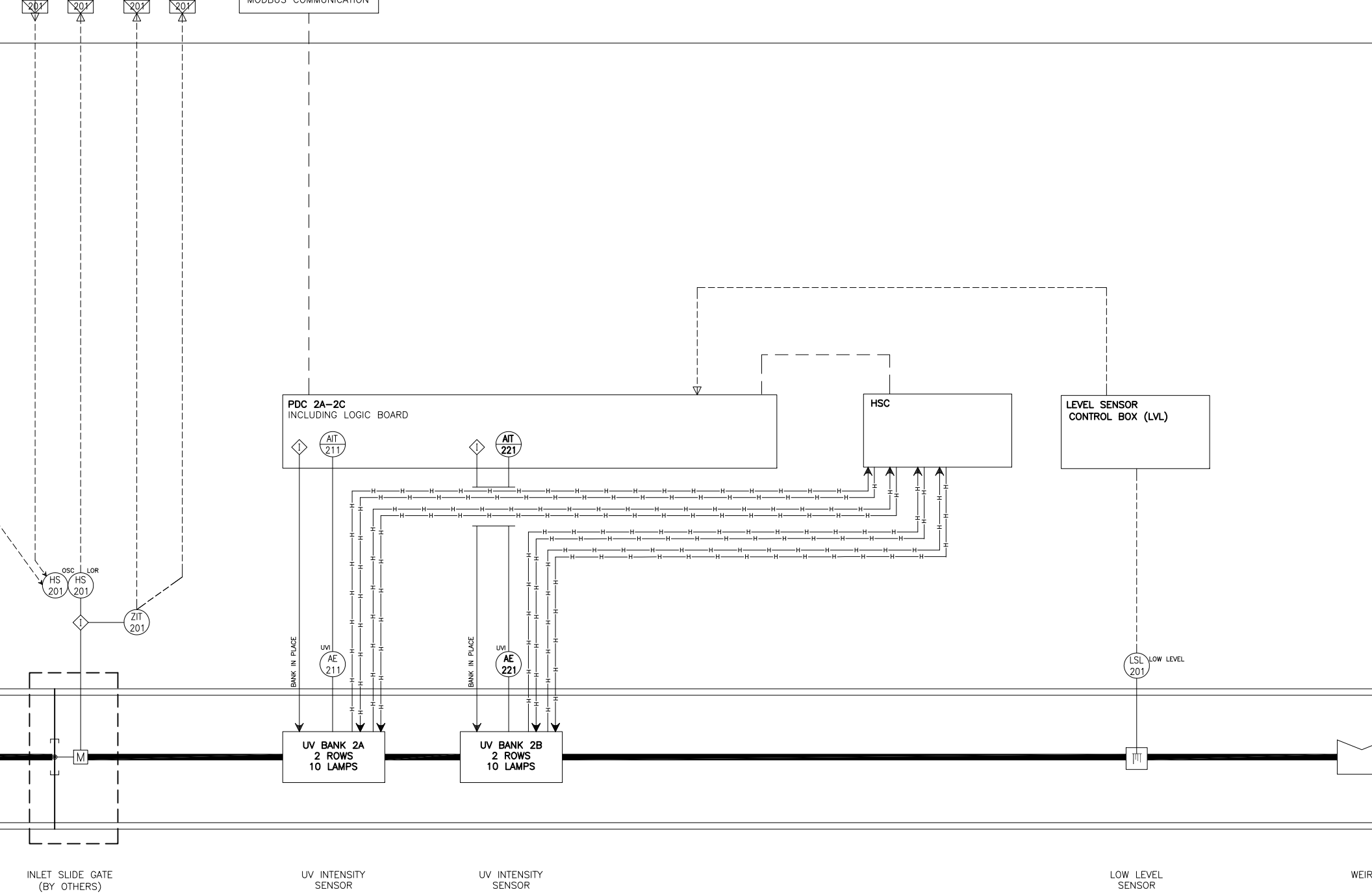
*CHANNEL 2 UV BANKS
FROM
DRAWING P04

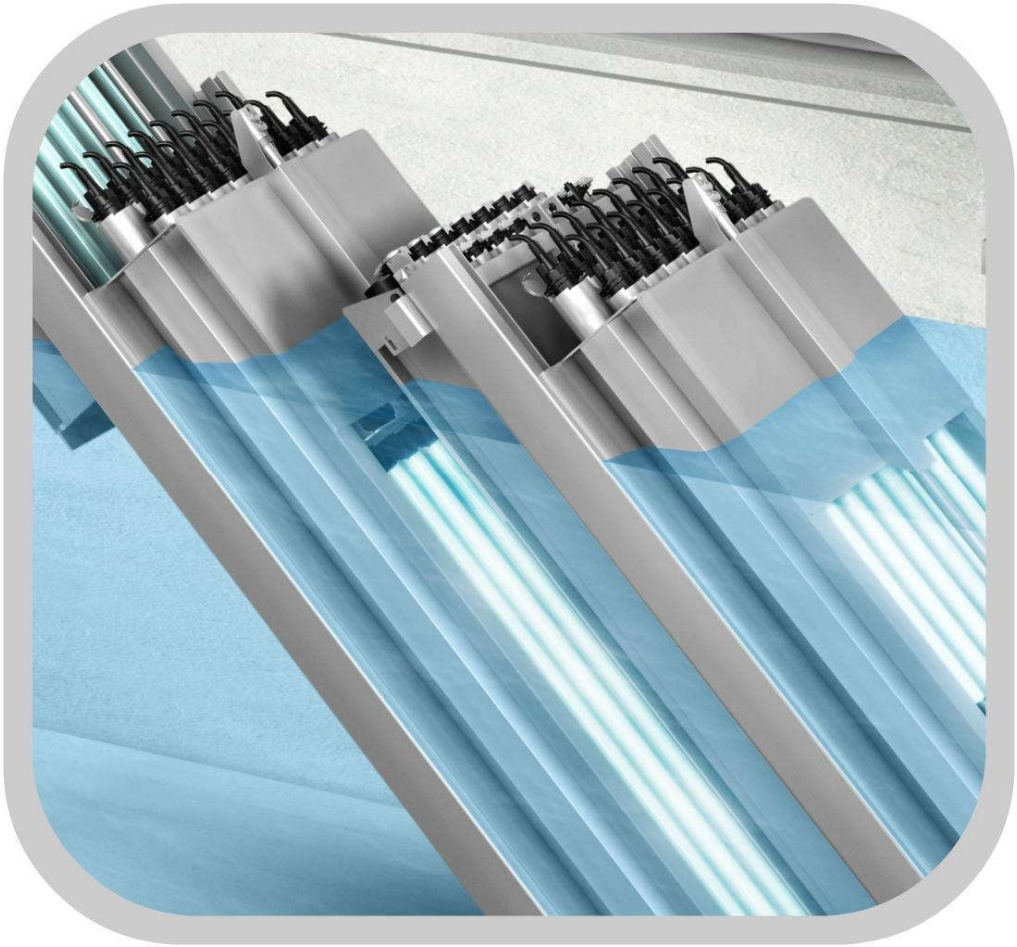


SIGNALS INCLUDE:



SIGNALS INCLUDE:

DEVIATIONS



List of Deviations.

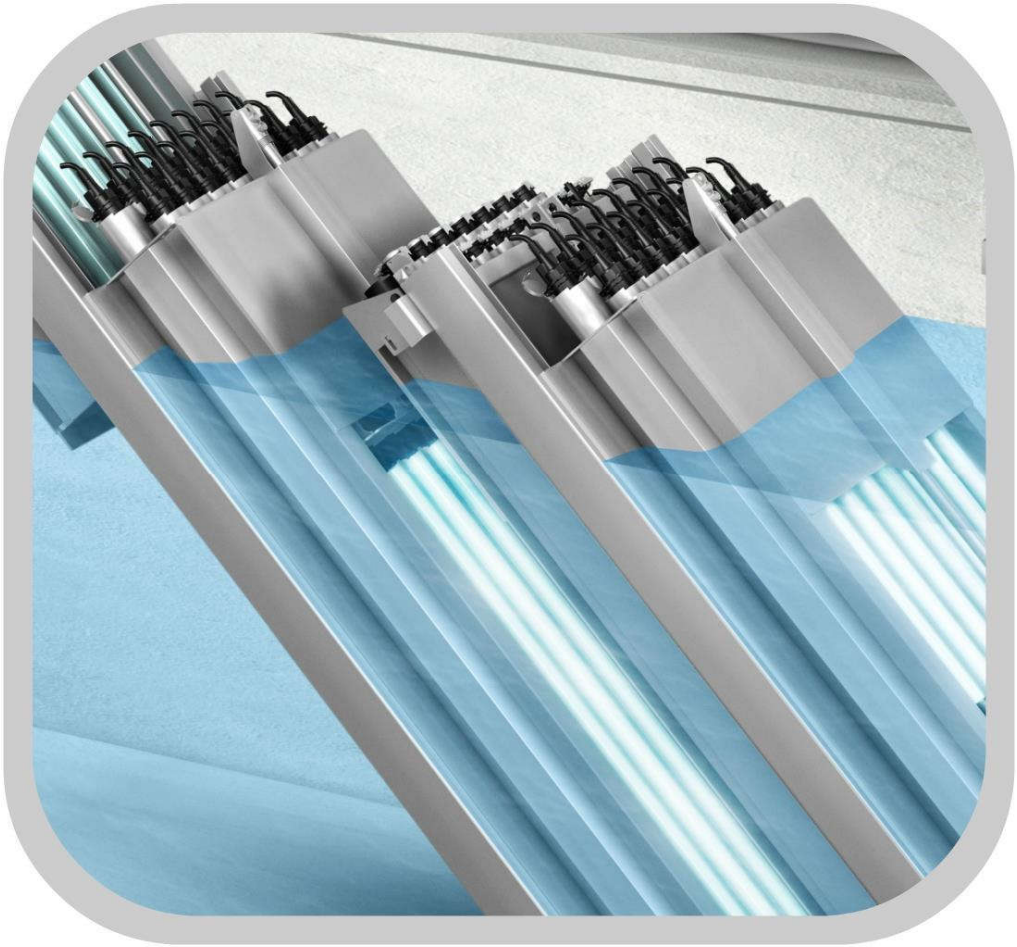
NOTES AND CLARIFICATIONS TO SPECIFICATION

Trojan Technologies appreciates the opportunity to submit this proposal. Our proposal is submitted subject to and based on Trojan's standard terms and conditions, which we have attached as part of our proposal. We believe these terms and conditions are customary in the trade and respectfully reserve the opportunity to negotiate, fair and reasonable contract terms acceptable to both parties, if Trojan is selected for this project.

Section 46 83 00

Part 2.7 – Please note that some spares noted in this section are not applicable for the UVSigna system. A complete module assembly, lamp socket connectors and a portable maintenance rack will not be provided as part of this Scope.

ANNUAL O&M



O&M cost data

System power consumption at average flow.

Operating Condition	Flow (m3/d)	Number of Channels Operating (#)	Number of Banks per Channel Operating (#)	Total System Power Consumption (kW)
Average Flow	5400	1	1	6.2

Operating Conditions

Average Flow: **5,400 m3/d**
UV Transmittance: **55%**
Annual Operating Hours: **8760 hours**
Average Number of Lamps Online: **10**

Power Requirements		Lamp Replacement	
Average Power Draw:	**6.2 kW**	Lamps Replaced per Year:	**6**
Cost per kW Hour:	**$0.10**	Price per Lamp:	**$600**
Annual Power Cost:	**$5,431**	**Annual Lamp Replacement Cost:**	**$3,600**
Total Annual Operating Cost Estimate: $9,031			

This cost estimate is based on the average flow and UV transmittance listed 10,770 above. Actual operating costs may be lower with the TrojanUVSigna automatic dose pacing control system. As UV demand decreases by a change

Recommended Annual Replacement

Description	Maintenance Schedule	Price	Time	Warranty
Lamp	Replace every 15000 hours	$600	5 min	15,000 hrs (prorated after 9,000 hrs)
Sleeve	Only replace if outside shows signs of etching/cracks or inside is fouled	$150	5 min	10 years (prorated after 5 yrs)
Driver/Ballast	Only Replace if fails	$900	5 min	10 years
Wiper Seal	Replace every 2 years (set)	$24	15 min	2 year
Acticlean Gel	Top up acticlean gel every 6 months	$25 gal	10 min/bank	1 year

Ease of maintenance

The Trojan UVSigna™ has the following features which result in ease of maintenance:

- Least number of lamps when compared to all other LPHO vendors.
- Automatic Raising Mechanism (ARM) Can be stopped at different heights to provide the best access to different components for different operators
- ARM is integrated into the controls and activated by a simple pushbutton
- Easily replace lamps, cleaning solution without raising the bank out of the channel
- Easily replace lamp drivers without affecting operation of adjacent banks
- Perform reference sensor checks, and/or replace a sensor without the need to raise a bank or remove lamps and sleeves.
- UV intensity sensor is cleaned the same way as the lamps (vs. a "brush" used on other UVM's system).
- only reference sensors require yearly calibration.
- UV bank can easily slide out of channel and be removed allowing for easy and full channel access.
- ARM lowers the bank back into the channel without complication and is not affected by any debris on the channel floor.

Safety

The features outlined below result in a system that is safe to operate and maintain:

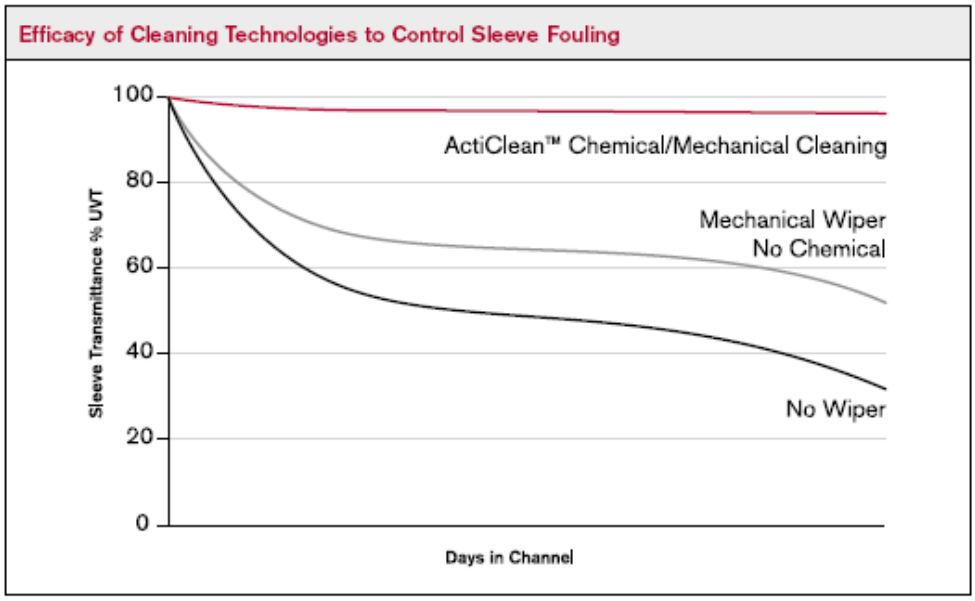
- Safety switch that ensures an operator cannot raise a bank with UV lamps energized.
- Ground fault protection is integral to ballast.
- Lamp plug contains safety interlock so an energized lamp cannot be removed from the bank
- PDC has multiple doors with safety interlock(s) to allow an operator safe access to replace a lamp driver without affecting the other banks.

Ease of Operation

Trojan's ActiClean™ chemical and mechanical cleaning system is able to handle challenging effluents due to several unique features:

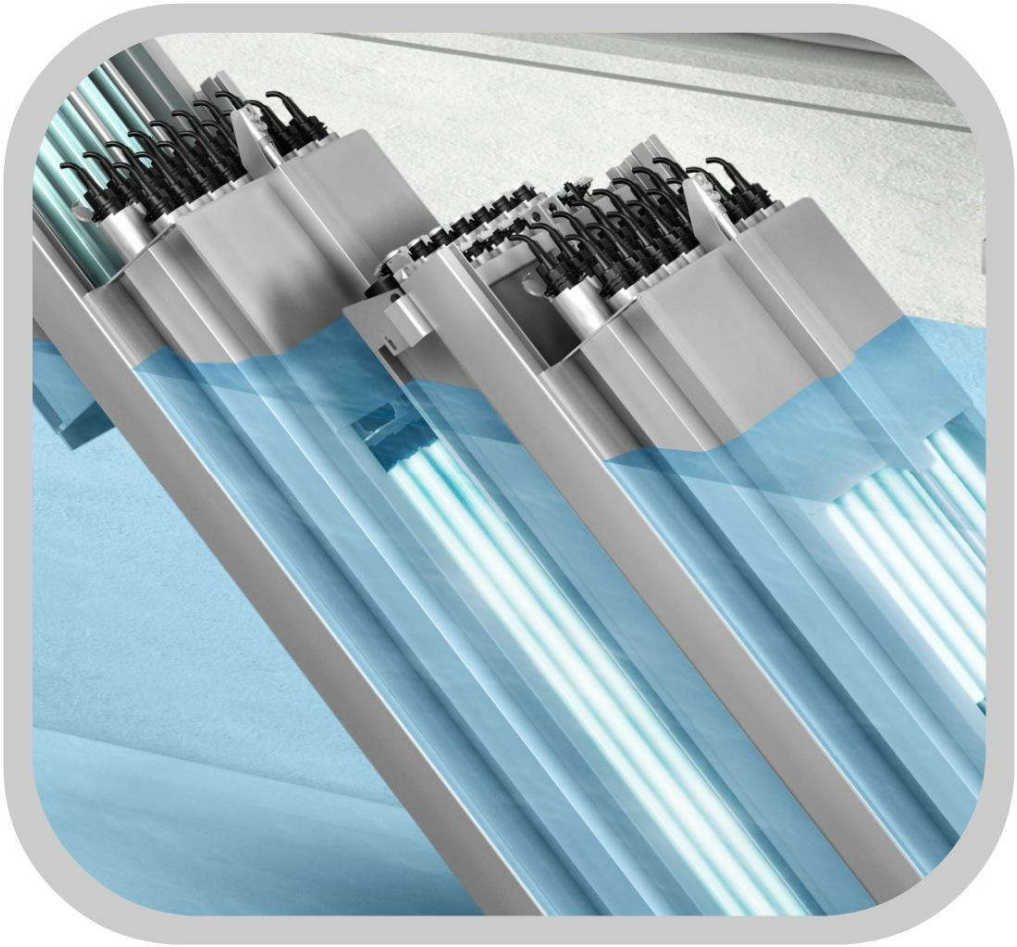
- Submerged pieces are cylindrical (no screws, hard edges to catch debris)
- Wipers are parked out of the effluent when not in use

- Automatic chemical/cleaning with additional debris scraper to push off any debris, algae, latex etc. so the cleaning system can do its job and not get hung up on debris
- The TrojanUVSigna™ incorporates innovative features to reduce O&M costs such as Trojan's revolutionary ActiClean™ system – the industry's only chemical/mechanical sleeve cleaning system.
- The automatic ActiClean™ chemical/mechanical cleaning system maintains sleeve transmittance of at least 94%, and works online (while maintaining disinfection – no down time to chemically clean the sleeves) – eliminating the need to remove modules from the channel. Trojan's ActiClean™ cleaning system has been proven effective in hundreds of systems around the world, including use in plants where heavy fouling had previously prohibited the use of UV disinfection technology. See chart below.



The ActiClean™ Cleaning System (ACS) uses a patented submersible wiper drive to clean the lamp sleeves while they remain submersed in the channel and disinfection continues. The wiper drive is hydraulically actuated by the HSC and programmed through the System Control Center (SCC). Wiper canisters surround the quartz sleeves, and are filled with Trojan's ActiClean™ Gel. The gel uses food grade ingredients and contacts the lamp sleeves between the two wiper seals. Cleaning takes place while the lamps are submerged and while they are operating. The cleaning cycle will be site dependent as the amount of fouling is different for each plant.

ANCILLARY EQUIPMENT



Ancillary Components

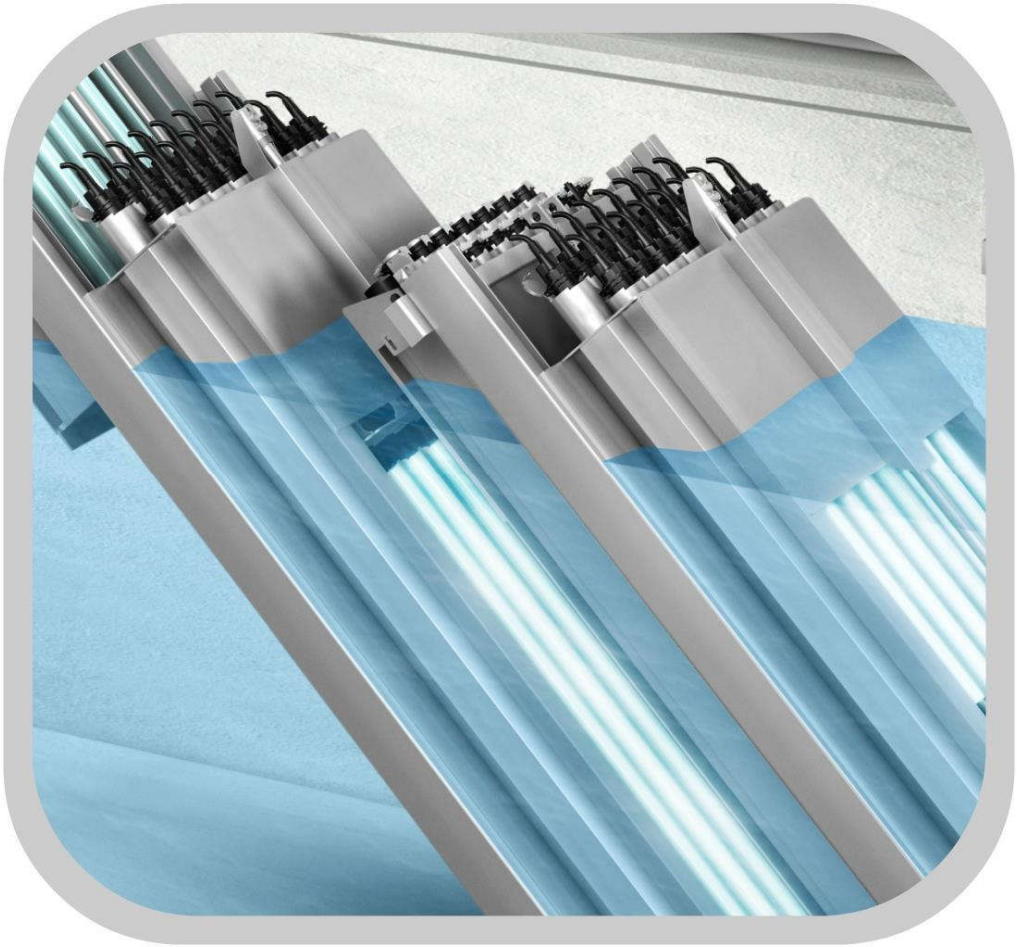
Trojan is providing all necessary equipment for their system except for the transformers for incoming power.

TROJANS RESPONSE:

Transformers:
Incoming power is noted in the spec is 600V-4, 3-phase, 4-wire, 60Hz. Each Trojan UV Signa PDC requires a power source of 480V, 3 phase, 4 wire + GND, 50/60 Hz.

As per Addendum 1, transformers will be sized and provided by others and are not part of Trojan's scope of supply.

INSTALLATIONS/REFERENCES



Experience/Company Information

TrojanUV holds a singular focus: to provide state-of-the-art, efficient, and reliable UV-based solutions for our customers around the world. During our 40 year history, we have designed and developed more UV disinfection equipment platforms than any other company in the world. These innovations define current industry standards, and include, but are not limited to, the following products:

Product Name	Date of Market Introduction	Number of Installations	Sample Installations
TrojanUV4000™	1995	400	Honolulu, HI (150 MGD) – primary wastewater disinfection Birmingham, AL (950 MGD, 2 plants)
TrojanUV3000Plus™	1999	2500	Roseville, CA (45 MGD) – Water Reuse
TrojanUV3000™ & TrojanUV3000PTP™	1990	5000	Small-medium communities treating a combined flow of over 6 BGD
TrojanUVSwift™	2000	500	Victoria, BC (134 MGD) Rotterdam, Netherlands (189 MGD) - Largest DW facility with UV in Europe
TrojanUVSwift™SC	2000	1,900	Norway (74 MGD total, three (3) plants)
TrojanUVFit™	2007	250	Peoria, AZ (30 MGD) – Water Reuse
TrojanUVPhox™	2001	50	Orange County, CA (100 MGD) – Largest UV-Oxidation installation for Indirect Potable Reuse
TrojanUVSwift™ECT	2003	30	PWN, Holland (68 MGD total, two (2) plants) UV Oxidation
TrojanUVTorrent™	2010 (2005: NYC)	15	New York City, NY (2.6 BGD) in 2 plants Eastern Treatment Plant – Melbourne, Australia (187 MGD) Coquitlam - Vancouver, BC (317 MGD) Lakeview - Mississauga, ON (145 MGD) Saskatoon, SK (79 MGD) Cucamonga, CA (60 MGD)
TrojanUVSigna™	2010	150	Little Blue Valley, MO (150 MGD) Auburn, AL (34 MGD)

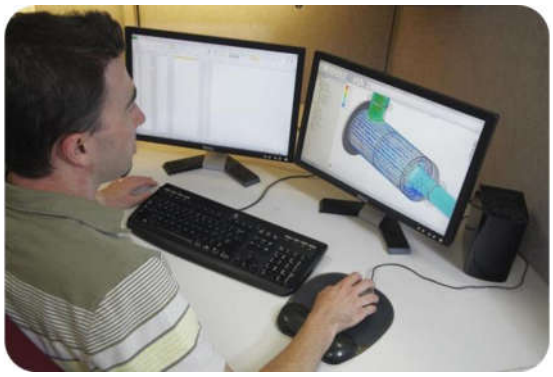
Today, Trojan is recognized around the world as the leader in advanced UV water treatment technology and is committed to protecting public health and delivering sustainable treatment solutions. This is accomplished in a variety of segments including municipal drinking water, municipal wastewater, environmental contaminant treatment and residential applications, as well as the purification of water used in food and beverage manufacturing, pharmaceutical processing, and semi-conductor applications. Trojan's success is evident in more than 8,000 municipal UV disinfection facilities operating in over 100 countries – the largest installed base of UV systems in the world.

Trojan is headquartered in London, Ontario, Canada, and also has offices in the U.K., Germany, Netherlands, Spain, Australia, and the United States. Trojan services a growing customer base around the globe through an extensive network of dealers and representatives. This strong distribution network allows us to provide unparalleled levels of service and support to customers regardless of location.

Trojan's advanced manufacturing facilities ensure a high level of quality control at every stage of the process, from initial design to final installation. Since 1998, Trojan has received the ISO 9001 designation – an internationally recognized model for quality assurance in design, development, production, installation and service.

Recognized as being the most experienced and knowledgeable professionals in the industry, Trojan scientists and engineers have introduced many of today's global innovations in UV technology. Our record of accomplishment for innovation has set us apart and with more than 190 Trojan patents granted or pending, we are well positioned to continue leading the way to safer, more efficient water disinfection techniques.

Design/Engineering Support



Beyond our role as a manufacturer, Trojan offers many additional services to existing and prospective customers. During the project design phase, Trojan offers engineering support by ensuring that each UV disinfection system is appropriately sized for the application, and provides detailed, site-specific CAD drawings showing the new equipment placement within the treatment plant. Trojan's engineering department has over 100 Research and Engineering staff.

Design engineers provide production support and work closely with the Quality Assurance team to ensure the best manufactured parts possible are used in Trojan's UV system assemblies. Each new vendor goes through a rigorous review process where QA provides engineering with sample parts, where they are checked for accuracy. Even after a supplier is approved as acceptable, they must undergo further scrutiny.

Included in Trojan's Engineering department is a Controls team. This team has the capability to support control's integration of Trojan's equipment along with the capability and extensive experience of supporting integration into plant networks.

Certified Service & Support

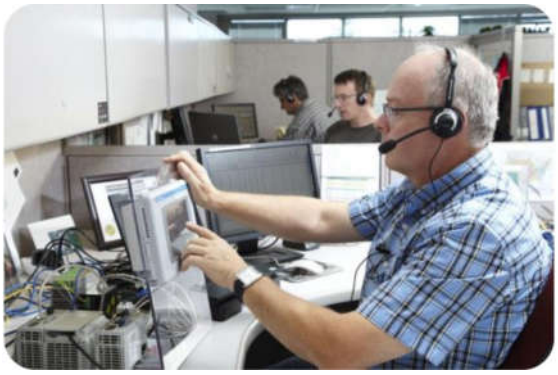
Trojan maintains a staff of highly-trained Service Technicians to provide installation support, start-up assistance, operator training, and routine and emergency service. Trojan's service team includes technicians who are deployed from Trojan's head office in London, Ontario, and numerous Trojan-employed technicians based throughout the world. The bulk of Trojan's

resources for local service and support are provided through our international network of Manufacturer's Representatives and service contractors.

To be eligible to offer Trojan Certified Service, all Trojan service representatives must undergo a comprehensive certification process that involves classroom training at Trojan's head office and extensive field training, led by Trojan's experienced technicians.

24/7 Telephone Support and Remote Troubleshooting

Trojan provides over-the-phone assistance from our Technical Assistance Center (TAC) in London, Ontario. Trojan Service Technicians staff our call center Monday to Friday, 8:00 am to 5:00 pm (EST). After hours emergency support is available 24 hours a day, seven days a week through a toll-free number. All Service Technicians within the Call Center have field experience and are thoroughly trained to provide installation support, start-up assistance, and equipment troubleshooting. The Technical Assistance Team consists of seven (7) Product Specialists and three (3) Control's Specialists. The specialists in this team have over forty (40) years of experience on UV systems.



The Trojan Technical Assistance Center is also equipped with sophisticated capabilities to connect with the PLCs of our installations in order to monitor, upload programs, and troubleshoot systems remotely. This access allows faster response in diagnosing system irregularities, and can expedite service times. It's quick, convenient and, in many instances, can save the expense of a service call.

Manufacturing Staff

Approximately 50 of Trojan's employees are dedicated to production requirements and support staff. Through the support of Danaher, Trojan is continuously improving every manufacturing cell by improving work-flow, increasing throughput and ultimately reducing product ship times. Visual management is a large part of Danaher's business philosophy and practiced by Trojan enabling anyone to track project ship times at a glance.

During post assembly, test technicians complete extensive test checklists performed on every piece of equipment before it leaves Trojan and travels to site. A record is kept of all project checklists so trends may be tracked, identified and addressed in a timely fashion.

Trojan UVSigna Installations

Project Name	State/Prov	Ctry	MGD	Lamps	Delivered
MWRDGC -Terrence J. O'Brien WRP	IL	US	530.00	896	3/10/2015
Clark County Central Filtration Plant	NV	US	240.00	492	2/18/2016
RM Clayton	GA	US	200.00	528	12/20/2018
Little Blue Valley Sewer District	MO	US	150.00	495	5/23/2013
Fairfax County - Noman Cole PCP	VA	US	133.00	340	11/14/2019
Utoy Creek	GA	US	86.50	150	2/27/2019
South River	GA	US	83.01	144	2/13/2019
Youngstown	OH	US	80.00	216	2/15/2019
Wichita Plant #2 Replacement	KS	US	80.00	168	10/1/2015
LOTT Olympia Replacement	WA	US	75.00	180	6/28/2019
Topeka - Oakland WWTP	KS	US	75.00	240	4/18/2019
Gatineau	QC	CA	71.85	240	12/12/2014
Ten Mile Creek	TX	US	65.00	240	7/30/2020
Murfreesboro	TN	US	60.00	132	5/12/2016
ELKHART	IN	US	60.00	144	3/17/2015
Ewing Lawrence Sewerage Authority	NJ	US	56.00	152	2/4/2016
Fargo	ND	US	50.00	288	4/15/2019
Cape Girardeau	MO	US	50.00	112	6/27/2013
Evansville - Westside WWTP	IN	US	45.00	192	11/22/2019
Hot Springs - Davidson WWTP	AR	US	44.00	132	6/29/2017
Findlay Upgrade	OH	US	40.00	96	12/18/2019
Elyria WWTP	OH	US	40.00	108	11/20/2018
Rapid City Replacement	SD	US	40.00	204	1/22/2015
Cullman	AL	US	40.00	104	10/31/2017
St-Jean-sur- Richelieu, QC	QC	CA	39.63	216	2/15/2018
Waukesha	WI	US	39.00	72	12/28/2015
Ticonderoga WWTP	NY	US	38.00	90	9/24/2018
Adams Field WWTP	AR	US	36.00	84	5/15/2019
Jonesboro East	AR	US	36.00	84	6/14/2019
North Henderson	KY	US	36.00	120	6/25/2014
Lake Charles 18th St,	LA	US	35.00	64	3/23/2017
AUBURN	AL	US	34.20	116	6/26/2012
Abbotsford JAMES WWTP	BC	CA	33.55	120	6/27/2018
Wheaton	IL	US	33.00	64	12/13/2019
East Richland County Public Service District	SC	US	32.00	98	6/18/2013
Central Kitsap	WA	US	31.10	84	8/7/2018
Sand Island Expansion	HI	US	30.00	243	9/6/2018

Camp Lejeune (Replacement)	NC	US	30.00	96	12/2/2019
Wilmington South Side	NC	US	30.00	192	6/17/2019
Grand Forks	ND	US	30.00	72	12/17/2018
Newport, RI	RI	US	30.00	240	12/28/2017
South Milwaukee	WI	US	30.00	48	5/30/2013
Puyallup	WA	US	28.02	80	6/2/2020
Greenville	MS	US	26.00	78	12/15/2016
Gloversville-Johnstown	NY	US	25.00	110	10/26/2018
Harpeth Valley UD	TN	US	25.00	48	8/2/2018
Provo	UT	US	25.00	100	10/15/2015
Plum Creek Replacement	CO	US	24.60	108	5/10/2019
Sarnia Replacement	ON	CA	24.04	44	1/29/2019
Williston	ND	US	24.00	64	3/10/2016
Mill Cove	NS	CA	22.50	160	3/22/2017
Twelve Mile Creek	NC	US	22.50	96	6/28/2018
Milton Street WWTP - Chemung County, NY	NY	US	20.00	64	11/20/2019
Greeneville	TN	US	20.00	56	7/22/2019
Statesboro	GA	US	20.00	96	3/27/2019
East Valley - SNRC	CA	US	19.40	192	6/17/2020
Cincinnati MSD - Polk Run WWTP	OH	US	18.00	64	2/15/2019
Phillipsburg	NJ	US	17.74	50	6/24/2015
Centennial - Marcy Gulch	CO	US	16.50	108	9/9/2020
Collingwood	ON	CA	16.09	36	10/18/2018
Beatties Bluff WWTP	MS	US	16.00	36	12/5/2019
Rome WWTP	NY	US	16.00	72	3/22/2019
Short Fork WWTP	MS	US	16.00	32	6/21/2016
San Diego SBWRP	CA	US	15.00	192	12/19/2019
Pullman Wastewater Treatment Plant	WA	US	15.00	60	6/19/2019
Duckett Creek Plant #2	MO	US	15.00	96	10/26/2017
Brownsburg	IN	US	15.00	48	9/21/2017
Avon Lake	OH	US	15.00	64	12/28/2016
Moultrie	GA	US	15.00	30	11/19/2015
Carriage Estates III WWTP	IN	US	14.40	28	6/27/2018
Russellville UV System Replacement	AL	US	14.00	30	1/21/2020
Newton	IA	US	14.00	36	6/8/2018
Bedford, MI	MI	US	13.20	36	5/23/2019
Tiffin	OH	US	13.00	32	6/1/2020
SYCAMORE	IL	US	12.42	20	6/17/2020
Honouliuli Replacement	HI	US	12.00	180	9/25/2018
Brookville WWTP	PA	US	12.00	32	11/29/2017

Oberlin Upgrade	OH	US	11.50	24	3/6/2020
Clear Lake	IA	US	11.40	28	8/3/2018
Abington Regional WWA	PA	US	11.00	22	5/12/2014
Upper Sandusky	OH	US	10.00	24	3/16/2020
Hahnville (Replacement)	LA	US	10.00	30	3/6/2019
Farmington	NY	US	10.00	36	12/19/2017
Durango	CO	US	9.80	48	9/13/2018
Troutdale WWTP 4000 replacement	OR	US	9.60	32	6/27/2019
Charleroi - Dunlevy CSO	PA	US	9.00	72	12/13/2018
Fuquay Varina	NC	US	9.00	48	2/24/2017
Niskayuna	NY	US	9.00	40	5/17/2017
Bryan	OH	US	9.00	24	11/14/2017
American Samoa - Utulei	AS	US	8.30	72	7/30/2015
Coralville	IA	US	8.00	32	12/21/2018
Paradise NL Signa	NL	CA	7.93	36	12/28/2017
Longs WWTP	SC	US	7.50	28	12/16/2020
Grovetown	GA	US	7.50	24	8/27/2018
Antrim Township Upgrade	PA	US	7.20	48	10/30/2018
Whitefish	MT	US	6.77	20	1/6/2021
Sioux Center	IA	US	6.75	24	2/15/2019
Springville WRF	UT	US	6.60	32	9/13/2018
Gander NL	NL	CA	6.29	40	8/15/2019
American Samoa - Tafuna	AS	US	6.00	128	7/30/2015
Paragould	AR	US	6.00	24	12/21/2015
Evans WWTP	CO	US	5.86	40	11/21/2017
Sheldon WWTP	IA	US	5.30	20	5/13/2019
Pierre	SD	US	5.20	28	12/28/2017
Miramichi, NB Signa	NB	CA	4.60	24	1/5/2018
Salem City	UT	US	4.40	48	3/22/2019
Snowmass	CO	US	4.30	24	3/28/2019
La Junta	CO	US	4.13	16	6/1/2018
Albion, NY	NY	US	4.00	28	3/20/2020
Silver Creek WRF	UT	US	4.00	32	2/15/2018
Jackson	CA	US	4.00	80	5/24/2018
Paso Robles	CA	US	3.66	96	11/21/2017
Thompson, MB	MB	CA	3.65	16	6/5/2018
Caraquet	NB	CA	3.06	20	8/23/2018
Cape Elizabeth	ME	US	2.75	36	3/15/2019

REFERENCES

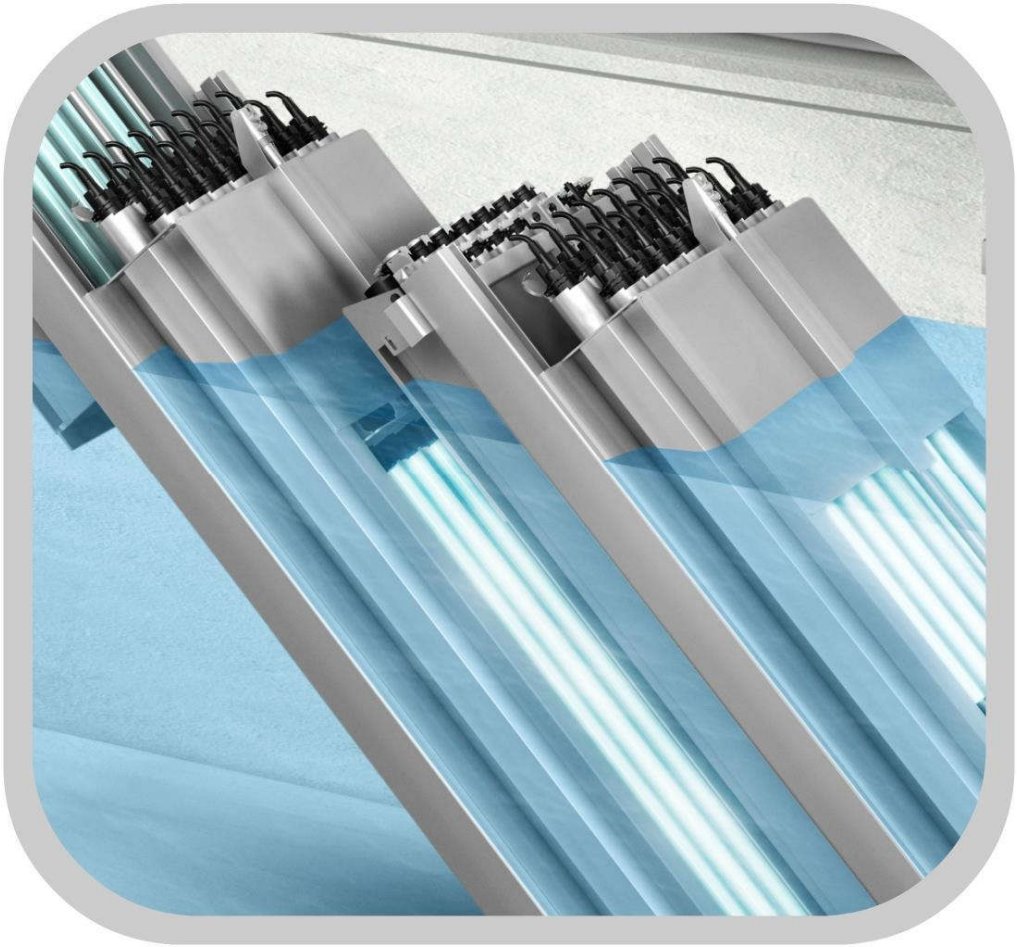
Trojan UVSigna References

Project Name	State/Prov.	Country	Flow (MGD)	# Channels	Lamps	UVT	Product	System Type	Value	Install Date	Contact Name	Contact Number	Email
Sarnia	ON	CA	24.0	1	44	65	UVSigna	2 Row	[redacted]	Apr. 2019	Dave Johnston	519-344-8507	djohnston@sarnia.ca
Collingwood	ON	CA	16.0	1	36	65	UVSigna	2 Row		Jun. 2019	Jennifer Adams	705-445-1581	jadama@cillingwood.ca
Mill Cove	NS	CA	22.5	1	160	40	UVSigna	2 Row		Mar. 2016	Rob Gillis	902-497-1740	robg@halifaxwater.ca
Avon Lake	OH	US	15.0	1	64	65	UVSigna	2 Row		Dec. 2016	Steve Baytos	440-933-3185	sbaytos@avonlakewater.org
Paragould	AR	US	6.0	1	24	65	UVSigna	2 Row		Dec. 2015	Lisa Ellington	870-239-7700	lellington@paragould.com
Hot Springs - Davidson WWTP	AR	US	44.0	2	132	65	UVSigna	2 Row		Jun. 2017	Gordon Yates	501-262-1125	gyates@cityhs.net
Auburn	AL	US	34	2	116	65	UVSigna	4 Row		Jun. 2012	Matt Dunn	334-501-3060	mdunn@auburnalabama.org
Cape Girardeau	MO	US	50.0	2	112	65	UVSigna	4 Row		Jun. 2013	Todd Fulton	573-339-6641	TFulton@CityofCapeGirardeau.org
Gills Creek - East Richland	SC	US	32.0	1	98	65	UVSigna	4 Row		Jun. 2013	Bobby Tillman	803-600-9206	ercpsdbmt@aol.com
MWRDGC -Terrence J. O'Brien WRP	IL	US	530.0	7	896	65	UVSigna	4 Row		Mar. 2015	Lynn Kohlhaas	847-568-8315	KohlhaasL@mwrd.org
Oakland	KS	US	75	2	240	55	UVSigna	2 Row		Apr. 2019	Isaac T. Crabtree	785-272-2252	isaac.crabtree@bartwest.com
Abbotsford	BC	CA	127.0	2	120	55	UVSigna	2 Row		Jun, 2018	Ron Bernier	604-864-5662	rbernier@abbotsford.ca
Statesboro	GA	US	20.0	2	96	65	UVSigna	2 Row		Jun. 2012	Matt Aycock	912-536-7657	matt.aycock@statesboroga.gov
Fuquay-Varina	NC	US	9.0	2	48	68	UVSigna	2 Row		Feb. 2017	Adam Stephenson	919-552-1414	astephenson@fuquay-varina.org

Trojan UV3000 Plus References

Project Name	State/Prov.	Country	Flow (MGD)	# Channels	Lamps	UVT	Product	System Type	Value	Install Date	Contact Name	Contact Number	Email
Kaw Point	KS	US	48	3	1152	50	UV3+	07	[redacted]	Dec. 2013	John A Keller	913-458-2000	KellerJA@BV.com
Leavenworth	KS	US	30	3	1440	45	UV3+	07		July. 2012	John A Keller	913-458-2000	KellerJA@BV.com
Shediac	NB	CA	5.1	1	112	40	UV3+	07		Apr. 2010	Joey Frenette	506-532-7025	joey@gssc-cesb.ca
Saint John - Eastern WWTP	NB	CA	21.3	1	160	65	UV3+	07		Jun.2009	Adam Newman	506-658-4798	adam.newman@saintjohn.ca
Middleton	NS	CA	3.5	1	64	40	UV3+	07		Jun.2009	Stanley Walker	902-824-0776	swalker@town.middleton.ns.ca

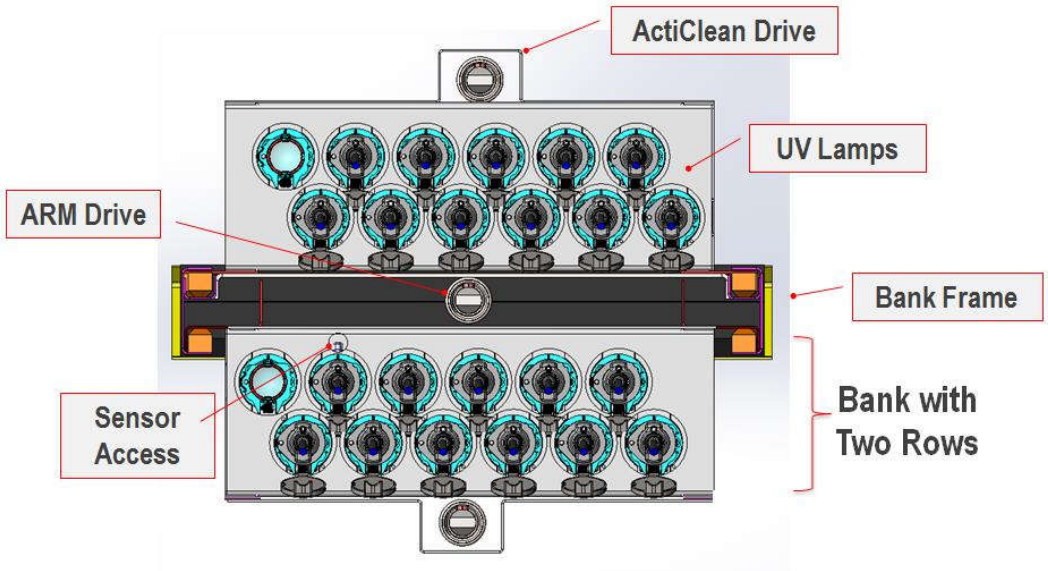
SYSTEM OVERVIEW



TROJANUVSIGNA SYSTEM OVERVIEW

The TrojanUVSigna™ incorporates Trojan's latest innovations, including the TrojanUV Solo Lamp™ Technology to reduce the total cost of ownership and drastically simplify operation & maintenance. The TrojanUVSigna™ system consists of several components:

- UV Bank - Contains germicidal lamps, ActiClean™ Cleaning System, lightlocks and an automatic raising mechanism
- System Control Center (SCC) - Controls and monitors the functions of the UV Banks
- Power Distribution Center(s) (PDC) - Provides power to each UV Bank and houses the electronic lamp drivers
- ActiClean™ Cleaning System (ACS) and Hydraulic System Center (HSC) - Automatically cleans the quartz sleeves to ensure proper disinfection. This cleaning system is hydraulically driven by the HSC
- UV Sensor(s) - Measures the UV intensity and provide system feedback
- On-line UV Transmittance Controller and Sensor (optional) - Measures the UV Transmittance of the water. The SCC uses this information and adjusts the lamp parameters to maintain UV dose and disinfection.
- Water Level Sensor – Provides alarm feedback if water level is too low
- Water Level Controller - Maintains effluent level within UV channel



SYSTEM COMPONENTS

UV BANK

The UV bank is one of the core components of the TrojanUVSigna™ system. A bank consists of UV lamps in a staggered inclined array with rows of lamps spanning the channel width. The bank has integral outside walls to simplify installation and prevent short-circuiting at the channel walls.

In general, all welded metal components in contact with effluent are Type 316L stainless steel and all metal components above the effluent are Type 304 stainless steel.

Each UV bank has a rating of Type 6P, and is supported by a type 316L stainless steel frame. The UV bank includes:

- UV lamps encased in quartz sleeves
- Lamp plugs with LED status indicators and integral safety interlock to prevent accidental removal of an energized lamp
- UV Sensor to provide reactor performance feedback
- Automatic Mechanical / Chemical Wiping System to remove and prevent quartz fouling
- Light locks to control the water depth within the bank and optimize disinfection performance
- Integral bank walls to maximize disinfection performance and prevent short-circuiting at the sides and bottom of the bank

State-of-the-art low pressure, high intensity amalgam lamps (TrojanUV Solo Lamps) are in a staggered inclined array. A quartz sleeve and sealed lamp plug assembly protect the UV lamps from water penetration. The number of lamps required in a UV bank depends upon the effluent being treated. This will be determined by Trojan Technologies based on relevant site-specific design information.

The ActiClean™ Cleaning System (ACS) uses a robust wiper system to clean the UV lamp sleeves while they remain submerged in the channel. The hydraulics for the ACS are powered from the Hydraulic System Center (HSC) which houses the pump, solenoid two way directional valve, reservoir, and associated equipment.

LAMP AND LAMP SLEEVES

DESCRIPTIONS AND SPECIFICATIONS

The lamps are designed to produce zero levels of ozone, withstand shock and vibration and are constructed of materials resistant to UV. The lamps are amalgam TrojanUV Solo Lamps™. The revolutionary Solo Lamps™ combine the best of medium-pressure lamps (i.e. high UV output) and the best of low-pressure lamps (i.e. high-energy efficiency and lower power consumption). These 1 kW lamps allow UV systems to be sized with fewer lamps, thereby reducing the footprint of UV reactor and panel.

Item	Value
LampType	Amalgam
Outside Diameter	38 mm
Arc Length	2000 mm
Power per lamp	1,000 Watts

Lamps are operated by an electronic driver with variable output settings from 100 to 30% in 1% increments. Electrical connections are at one end of the lamp to simplify maintenance. Lamps are preheated to extend the life of the lamp filament. Each UV lamp is enclosed in its individual quartz sleeve, and each sleeve is rated for continuous submergence.

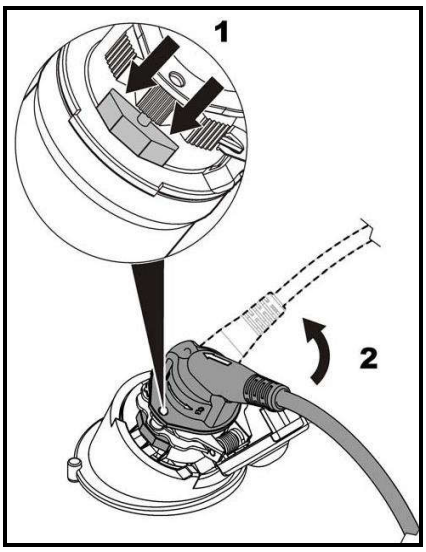
LAMP MAINTENANCE

The System Control Center (SCC) tracks each lamp's age (hours of operation) and monitors lamp status. An End of Lamp Life Alarm condition is initiated when lamp runtime hours exceeded the recommended value.

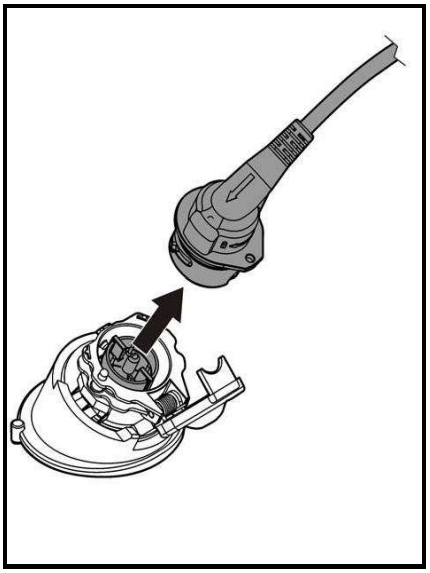
LAMP REMOVAL

Tools required for lamp removal and replacement include clean gloves (cotton, vinyl or non-coated latex). Hold the lamp connector with one hand and the UV lamp with the other hand during UV lamp removal or installation. As shown in Figure 1 (and Step 1), lamps are easily disconnected by a quarter-turn on the connector.

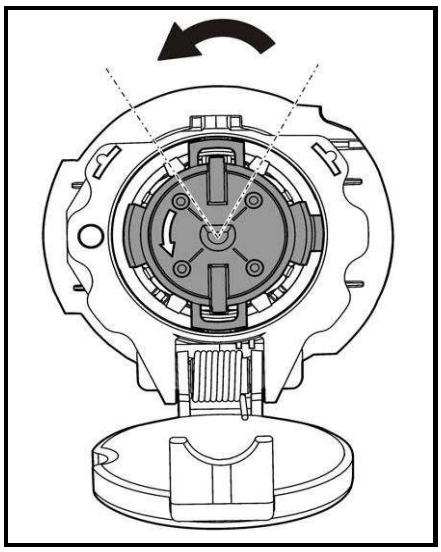
STEP 1: Unclick lamp connector



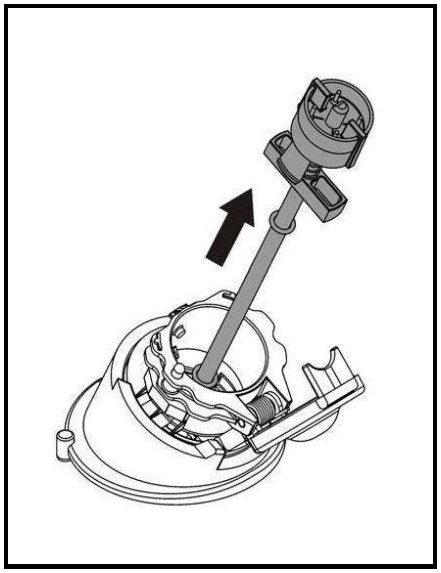
STEP 2: Remove lamp connector



STEP 3: Reset lock



STEP 4: Remove and Replace Lamp



SYSTEM CONTROL CENTER (SCC)

The SCC contains all of the hardware required to control the UV system. It includes a PLC, Operator Interface, input/output connections and communication hardware. The SCC is also equipped with an extensive alarm reporting system to enable fast and accurate diagnosing of system processes and maintenance alarms. The SCC is a standalone unit mounted on a wall/pedestal.

POWER DISTRIBUTION CENTER (PDC)

The PDC contains and provides power to the lamp drivers. Drivers are installed in a 19” rack allowing for easy lamp driver removal and replacement if required. Lamp wiring runs from the PDC to each bank of lamps. The PDC is typically constructed of 304 stainless steel and has a rating of Type 4X. The PDC panel may be installed outdoors or indoors.

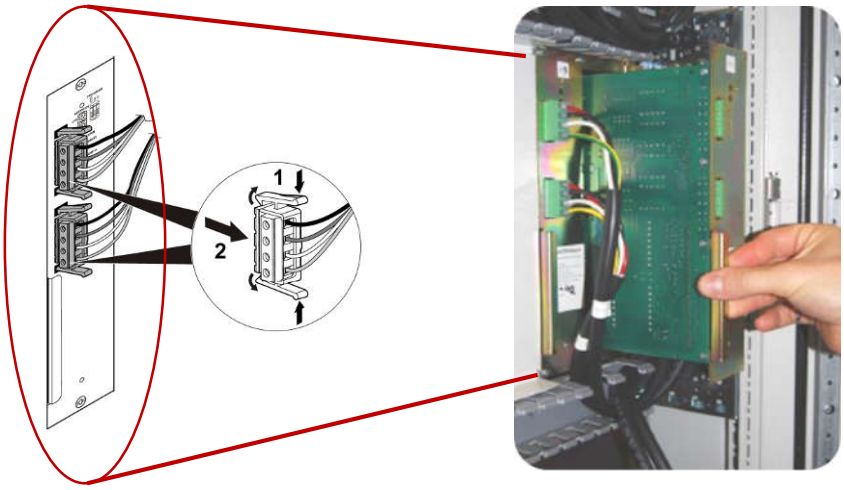
ELECTRONIC LAMP DRIVERS

The TrojanUVSigna™ utilizes state of the art electronic lamp drivers to energize the germicidal lamps. The electronic lamp drivers are located within the Power Distribution Center (PDC). Key features of the lamp drivers are:

- Eight (8) lamp drivers are installed in a 19 inch sub rack
- Power & communication is distributed on the back plate of the rack.
- Each lamp driver powers two lamps.
- Lamp drivers are easy to replace (if required)
- Communication & control is achieved via Modbus RS485

REMOVAL AND REPLACEMENT OF LAMP DRIVERS

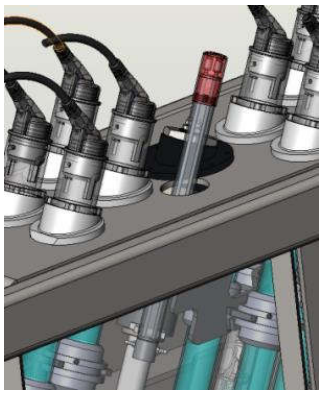
1. Disconnect the power as per procedures
2. Ensure Lock Out and Tag requirements have been applied
3. Open Panel Door
4. Remove lamp connectors
5. Remove driver card and two (2) screws
6. Slide the card out of the rack while observing ESD precautions
7. Slide the new card in the rack gently until fully mated with the connectors on the back plate
8. Take note of the Rotary Switch settings for Switch 0 and 1 (found through the opening in the front panel of the card)
9. On the new driver, set the Rotary Switches the same as on the old driver or consult the drawings
10. Install the two (2) screws securing the driver card to the rack frame
11. Reattach lamp cables to new driver
12. Close Panel Door when finished
13. Remove Lock-outs and tags
14. Re-engage the power supply



AUTOMATIC RAISING MECHANISM

An integrated UV bank raising system is provided within each UV bank. This mechanism allows the entire bank to be lifted out of the channel at a push of a button. While routine maintenance procedures are accomplished without having to raise the bank (e.g. replace lamps) the raising mechanism assists with tasks such as winterization, channel cleaning.

ACTICLEAN™ CLEANING SYSTEM (ACS) AND HYDRAULIC SYSTEMS CENTER (HSC)



A magnetically coupled submersible wiper drive(s) is supplied on each bank. This design drives a wiper carriage assembly with attached wiper canisters along the quartz sleeves. The wiper canisters surround each quartz sleeve and are filled with a Trojan- approved cleaning solution. The cleaning fluid in the wiper canisters contacts the lamp sleeves between two wiper seals, removes fouling and maintains the sleeve transmittance to ensure disinfection.

Cleaning is achieved mechanically with the scraping action of the wiper seals and chemically by the chemical reaction between the cleaning agent and the build-up on the sleeves. The cleaning takes place while the lamps are submersed and operating.

All the lamp sleeves within the bank are cleaned simultaneously. The frequency of cleaning is adjustable at the Operator Interface on the SCC. The ACS is hydraulically actuated by the HSC, which is located in close proximity to the UV channel. The HSC contains the pump and valves.

Operators are able to refill the cleaning solution from the top of the UV bank. This advancement in automatic cleaning reduces labor and saves operator's time. The wiper refill system also acts as a wiper indicator to provide a visual indication that the wiping system is functioning.

UV SENSOR

The patented UV Sensor measures the UV intensity within each Bank.

The UV Sensor incorporates a radiant collector that detects light from the adjacent lamps. The light is funneled to the photosensitive material and is converted into a digital signal displayed in milliwatts per square centimeter at the Operator Interface on the SCC.

The UV sensor continuously measures the UV intensity. The purpose of the UV sensor is to indicate changes in UV output due to fluctuations in water quality or due to a drop in UV lamp output which is typically caused by a combination of lamp aging, sleeve fouling, and reduced lamp driver power. There is one (1) sensor per UV bank.

The UV intensity sensor converts the UV light into a Modbus signal. This signal is continuously displayed on the operator interface in mW/cm^2 and used in dose control. The sensor is grounded and shielded. The connection to the sensor board is through a shielded cable and twisted pair wire to minimize susceptibility to noise.

LEVEL CONTROLLER - WEIR

Water level control is maintained with a fixed weir. To achieve disinfection, the top of the weir is set at an elevation to control the depth of water above the top UV lamp. The weir height will make sure that the UV lamps remain submerged in zero or low flow conditions.

WATER LEVEL SENSOR

A Low Water Level Sensor is standard and a High Water Level Sensor is optional. These sensors are positioned in each channel downstream of the UV banks. A high or low water level will trigger an alarm at the SCC and shutdown the UV system.

Low Water Level Sensor

ON-LINE UV TRANSMITTANCE CONTROLLER AND SENSOR

The optional Hach UV Transmittance instrument samples and measures the percent of UV transmittance (%UVT) in the effluent. The results are communicated to the SCC and are used to adjust the UV dose in conjunction with flow signals and lamp age to maintain disinfection and minimize power consumption. In systems that do not use the UV Transmittance Controller and Sensor, the percent transmittance is measured by other means (e.g. UV Photometer) and a single value is entered into the SCC at the Operator Interface.

Hach UVAS sc Sensor

ACTICLEAN ™ CLEANING SYSTEM

The frequency of ActiClean™ cleaning is set by the operator and then implemented by the SCC. Cleaning frequency is adjusted depending on the fouling rates (site specific) and may be programmed to operate as frequently as every 2 hours. The recommended cleaning schedule for typical conditions is once every 12 hours.

The cleaning system can also be manually controlled using the Wiper Selector switches located on the HSC.

All quartz sleeves in a bank are cleaned simultaneously. Each bank is fitted with a robust magnetically coupled wiper drive and one wiping canister per lamp. Hydraulic fluid pushes the rods internal piston to extend or retract depending on the direction of flow. During a cleaning sequence, a solenoid opens and distributes hydraulic fluid from the HSC to the hydraulic extend line

SERVICES OFFERED

FIELD SERVICE CAPABILTIES

Technical service and support for Ingleside WWTP will be provided by H2Flow Equipment, Trojan's local certified Manufacturer Representative located in Vaughan, ON as well as Trojan service technicians. Currently there are 9 service technicians on staff at Trojan as well as over 53 factory trained and certified local service providers at various locations throughout North America. Post installation technical services, replacement parts and problem-solving assistance is available to any customer regardless of the location or the size of the project. If the site problem is classified as a critical issue, a Service Technician can be at the site within 24 hours of notification.

For post installation services, Trojan's Service Coordinator will make the necessary arrangements to have a qualified technician and any required parts available.

For parts requirements, the plant operators can call our dedicated toll-free Trojan Service number to purchase or order warranty parts as required. Depending on the severity of the issue, parts can be shipped for next-day delivery. Trojan currently has parts warehouses that we ship from located in London, Ontario.

For problem solving assistance, a Trojan Service Technician is available through the toll-free number 24 hours a day, 7 days a week. Trojan's call center is staffed with five qualified former field-service technicians to answer any questions and assist in troubleshooting.

A fully trained Trojan Service Technician will provide training upon successful commissioning of the system. The operators will also receive a training manual.

System Start-Ups

Trojan Technologies authorizes only certified Service Technicians to perform start-up procedures, warranty, or post-warranty work on the UV equipment. Trojan's authorized Service Technicians possess relevant post-secondary education, several years' related experience, and at least 12 weeks of formal classroom/on-the-job training.

Qualifications and Functions

Typical qualifications are as follows:

- Post-secondary accreditation in an Electrical/Electronics discipline
- 3-5 years field experience
- Excellent written and verbal communication skills
- Formally trained to service all components of Trojan UV disinfection equipment including electrical and mechanical systems, hydraulic and cooling systems, and control systems.

Functions:

- Provides on-site service during start-up, warranty and post-warranty phases for all Trojan equipment. The on-site service work includes electrical, mechanical, microbiological, and service reporting, as well as training for the plant, contractor, and consultant personnel.
- Provides information to the Engineer, Contractor, or Owner as necessary to ensure that the site is prepared in accordance with the equipment specifications, including all relevant dimensions and power requirements, and carries out and/or supervises equipment start-up procedures as specified in the scope of supply documents.
- Conducts comprehensive training of the Owner's personnel at the site of equipment installation. This training is to covers subjects relating to the theory of UV disinfection, electrical and mechanical details of the installed system, procedures for microbiological testing of treated effluent, operation and maintenance of the system and basic troubleshooting and repair work.
- Diagnoses repairs to installed equipment in the field. Implements parts replenishment initiatives as required.
- Assesses nature of repair work required – warranty or invoiceable to customer accounts - and reports on the procedures.
- Prepares start-up and service reports for all work completed in the field.
- Trains staff of Subcontractors: i.e., manufacturers' representatives in the latest troubleshooting techniques, grounding regimes and/or general equipment serviceability issues.

- Develops and maintains over time, effective working relationships in the field with customer personnel and contractors.

Trojan's Technical Assistance Center (TAC)
1-800-291-0213
7 days/week – 24 hours/day

Please see the recommended maintenance and associated frequency for the TrojanUVSigna.

System component	Task	Daily	Monthly	Annually	On Removal	As Necessary
SCC user interface	Check the Active tab of the Alarms screen for new alarms. Record and report new alarms. For the best system performance, correct every alarm condition as it occurs	X				
	Check the History tab of the Alarms screen to get an overview of past faults and identify trends.	X				
Water Level Sensor	Inspect the water level sensor(s) rods for debris, algae or damage. Clean the sensor rods as necessary.		x			
HSC	Inspect the Hydraulic System Center.		x			
	Replace the hydraulic fluid in the reservoir.			Initially after 50 hours and there after every 2 years		
	Replace the hydraulic fluid filter.			x		
Wiper	Add grease to the hydraulic cylinder(s).			x		
	Refill Cleaning Solution		6 months			
	Replace the wiper seals			2 years		
	Inspect all the wiper components that can be seen. Remove debris and clean components as necessary..				x	
UV bank	Inspect the UV Bank seal when the UV Bank is pivoted into the service position. Ensure the seal is clean from debris. Inspect for cracks and ensure it is not damaged or worn.				X When UV Bank is pivoted	
Lamp plug	Inspect the lamp plug O-RingO-Rings. Ensure the O-Ring is not rolled or twisted and fits in the groove. Replace O-Ring that is damaged or worn.				x	
UV lamp	Replace a lamp					Every 15,000 hours, when

						damaged or after failure
UVI sensor	Clean the UVI sensor with a mild acidic solution.					X
	Inspect the accuracy of a UVI sensor.					X
	Replace the UVI sensor.					X
Lamp Sleeve	Replace a lamp sleeve					X
	Clean a lamp sleeve manually.					x
Wiper	Replace a hydraulic hose					x
Lamp driver	Replace a lamp driver					x
Power Distribution Center	Air Conditioner or Optional Forced air filters to be flushed with warm running water with clean side up. If the accumulated dirt is oily, washing in a detergent bath is recommended followed by a warm water wash.					x

Trojan's End of Lamp Life Letter

Engineers...Working Wonders With Water®

December 23, 2011

Gang Fang, Ph.D., P.Eng
Senior Research Scientist
Trojan Technologies

Subject: End Of Lamp Life (EOLL) Factor for the Trojan UV Solo Lamp™ (Trojan Part Number 908016-200)

Dear Dr. Fang:

The purpose of this letter is to summarize the lamp aging data for the 1 kilowatt Trojan UV Solo Lamp™ (Trojan part number 908016-200) used by Trojan Technologies. Hereafter, this lamp will be referred to as the Solo lamp. The full analysis is detailed in the report titled "*15,000-Hour Solo Lamp Age Factor Report, Final, December 2011*" by Carollo Engineers.

During this testing, the Solo lamps were aged in a full-scale temperature-controlled Trojan UV reactor in London, Ontario, Canada. All lamps were aged simultaneously at 100 percent power. The *Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse* (National Water Research Institute [NWRI]/American Water Works Association Research Foundation [AwwaRF], May 2003), hereafter called the 2003 UV Guidelines, require that lamp output data be collected at 20 percent of the expected lamp life intervals. Twelve lamps were aged and measured at no more than a 2,400-hour time interval until the lamps reached at least 15,000 hours of operating time.

The analyses contained herein indicate that the lamp output from the Solo lamp after 15,000 hours of operation is 86 percent of the output from a new Solo lamp.The testing was based on the requirements of the 2003 UV Guidelines. The findings of this work pertain only to the Solo lamp described above, and are valid for the application of the Solo lamp to various Trojan UV systems, assuming all electrical components are as detailed in the aforementioned report.

CAROLLO ENGINEERS, INC.

Andrew T. Salveson, P.E.
Associate Vice President
Chief Technologist, Water Reuse

Trojan's Sleeve Fouling letter

HDR | HydroQual

April 29, 2013

Steve McDermid
Validation and Research Services
Trojan Technologies
3020 Gore Rd.
London, Ontario, Canada N5V 4TV

Re. UV Quartz Sleeve Cleaning System Performance for the TrojanUVSigna™ and TrojanUVSonus™ UV Disinfection Systems

This letter serves to verify that HDR | HydroQual has provided third party witness on the UV lamp sleeve cleaning system performance test conducted by Trojan Technologies at the Greenway Pollution Plant (London, ON, Canada) for the quartz sleeves used in the TrojanUVSigna™ and TrojanUVSonus™ reactors. The test protocol used conformed to the Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (National Water Research Institute [NWRI]/American Water Works Association Research Foundation [AwwaRF], May 2003). HDR | HydroQual has analyzed the associated data comprising of UV lamp sleeve transmittance measurements (at 254 nm), and can verify that the average sleeve fouling factor is 0.94.

Chengyue Shen, Ph.D., P.E.
Technical Director of the UV Center
chengyue.shen@hdrinc.com

Trojan's Validation Certificate.
A full Validation Report can be made available upon sussessful pre-selection.

carollo
Engineers...Working Wonders With Water®

November 25, 2016

Wayne Lem, P.Eng.
Trojan Technologies
3020 Gore Road
London, ON N5V 4T7

Subject: Validation Test Certification
TrojanUVSigna™ (2-Row) Ultraviolet Disinfection System

Dear Wayne:

This letter certifies that the bioassay validation testing was completed for the TrojanUVSigna™ 2-Row UV disinfection system in September 2016. The validation was completed in general accordance with the protocols outlined in the Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (National Water Research Institute [NWRI]), the Uniform Protocol for Wastewater UV Validation Applications (International Ultraviolet Association [IUVA], 2011), as well as the Ultraviolet Disinfection Guidance Manual for the Final Long Term 2 Enhanced Surface Water Treatment Rule (USEPA, November 2006).

All microbiological enumerations were completed by GAP EnviroMicrobial Services Ltd. (London, Ontario, Canada). Carollo witnessed all aspects of the validation, including dimensional verification of the test set up and UV reactor, operational conditions for each test, and sampling. UV sensor responses were also witnessed, as they will be used to develop the sensor based performance equations for the system.

The final validation report, which will be available in December 2016, will document the validated ranges for the TrojanUVSigna™ 2-Row as well as the Reduction Equivalent Dose (RED) performance equation. A summary of the operating range is presented in Table 1 below. Two challenge microbes were used for the validation testing, MS2 coliphage and T1 coliphage. These organisms have a UV sensitivity that ranges from 4.8 - 24.6 mJ/cm^2 per log inactivation.

2700 Ygnacio Valley Road, Suite 300, Walnut Creek, California 93711
P. 925.932.1710
carollo.com

carollo
Engineers...Working Wonders With Water®

Table 1 Operating Range for Use of the RED_{calc} Equations		
Validated Conditions		
Flow Rate Range [1]	**UVT Range** [2]	**Lamp Power Operating Range**
≤ 1,227 US gpm/lamp	29.8 - 80.0 %	30 - 100 %

Notes:

(1) At flow rates below 98 US gpm/lamp, this value (98 gpm/lamp) should be used as the default value in the RED calculation. The flow rate is calculated by dividing the total flow rate in a channel by the number of lamps in one bank. For this validation testing, one bank was comprised of eight (8) UV lamps.

(2) At UVT values above 80.0 percent, this value (80.0 percent UVT, or 0.097 A_{254}) should be used as the default value in the RED calculation.

Please feel free to distribute this letter to your potential customers.

Regards,

CAROLLO ENGINEERS, INC.

Bill Sotirakos, P.Eng.
Principal UV Technologist

2700 Ygnacio Valley Road, Suite 300, Walnut Creek, California 93711
P: 925.932.1710
carollo.com

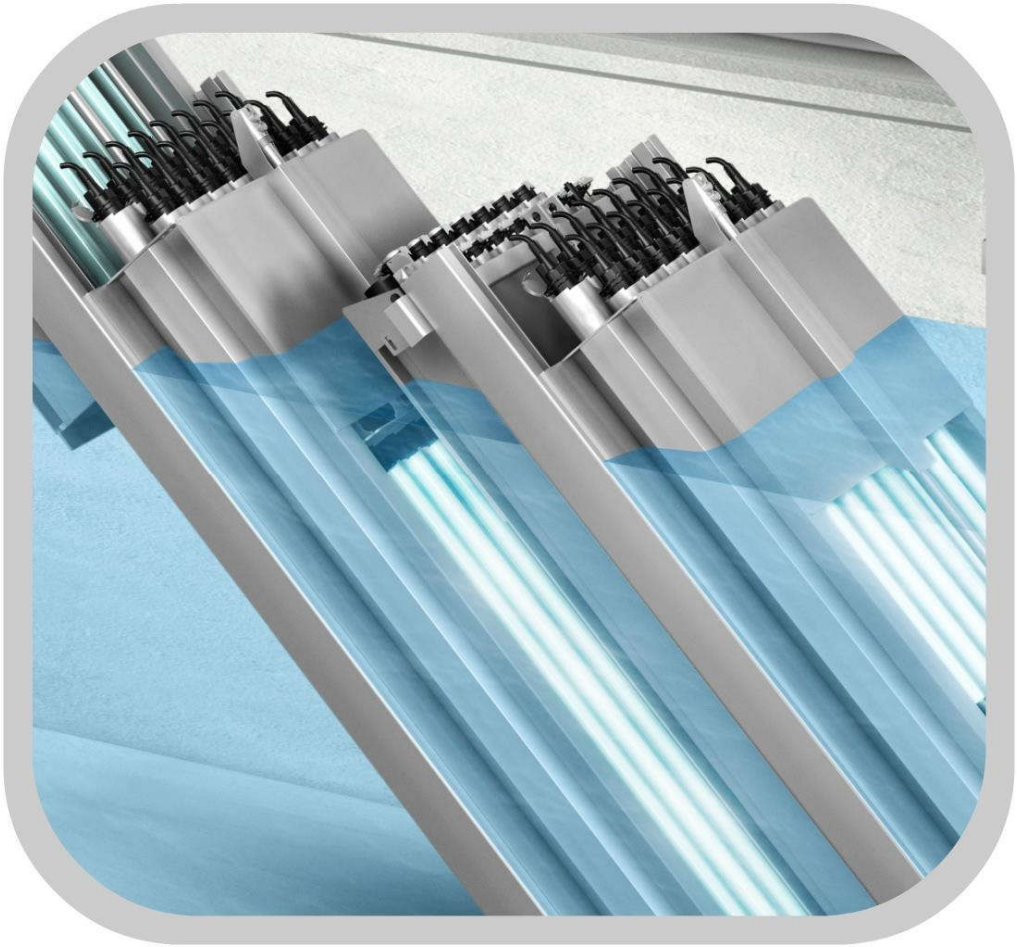
Trojan Project Team

	Name	Location	E-Mail
Regional Manager	Rob Jansen	London, Ontario	rjansen@trojanuv.com
Project Manager	Stephanie Ouellette	London, Ontario	souellette@trojanuv.com
Process Designer	Una Duncan	London, Ontario	uduncan@trojanuv.com

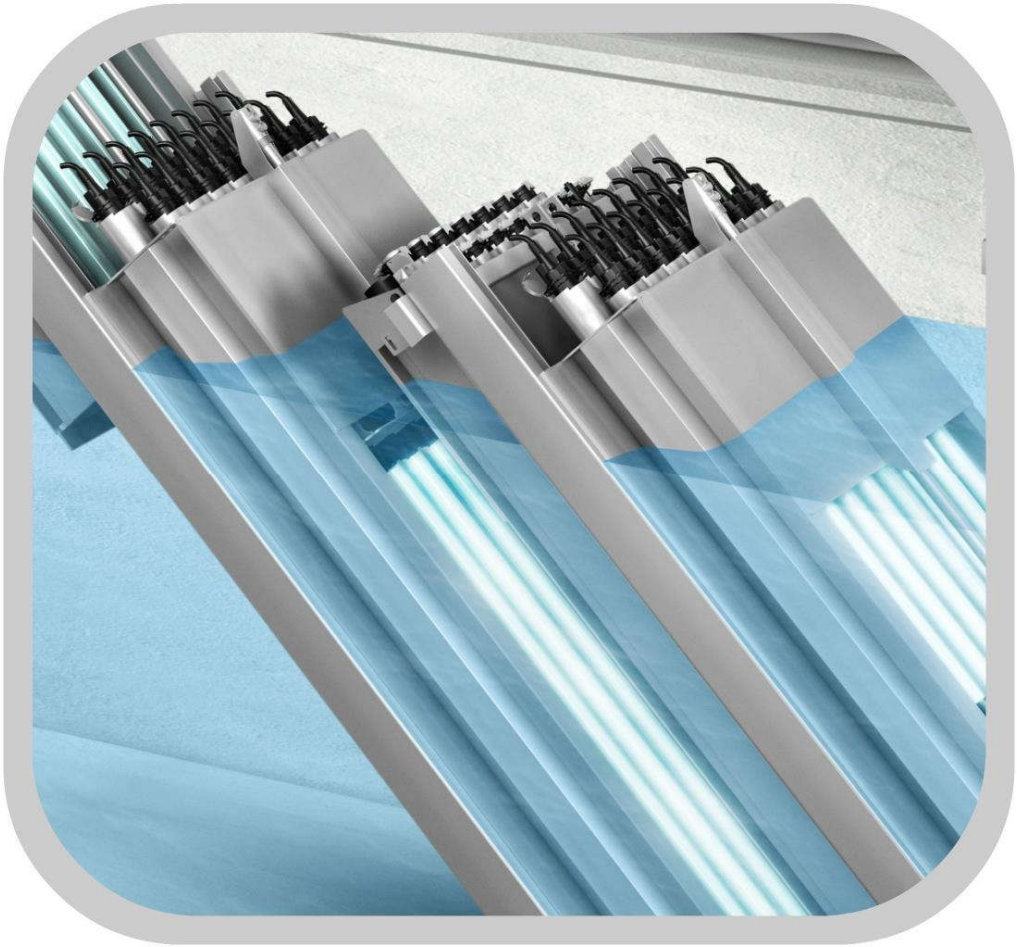
Local Representative

Albert Wakim
H2Flow Equipment
580 Oster Lane,
Vaughan, ON L4K 2C1
905-660-9775
albert@h2flkow.com

ALTERNATE PROPOSAL



FORM OF PROPOSAL – ALTERNATE BID



F. System #5 Submission Forms - Ultraviolet Disinfection

Trojan Technologies Alternate Bid

PART 1 FORM OF QUOTATION

(See Clause 24 in General Terms and Conditions for Instructions)

BY: Trojan Technologies Group ULC

TO:

c/o Jamie Baker
Project Manager
EVB Engineering
800 Second Street West
Cornwall, ON K6J 1H6

FOR:

Pre-Selection of System #7: Supply, delivery and commissioning of the Ultraviolet Disinfection System for the Ingleside WWTP, Township of South Stormont.

P1.0 We, the above-named Equipment Supplier, having carefully examined the quotation documents issued by the Engineer, including the General Terms and Conditions, Specifications and other related documents if any, herewith submit in duplicate and in accordance with the Terms and Conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

P2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit, together with this Form of Quotation & Schedule and the Terms and Conditions set out in the quotation documents issued by the Engineer, the provisions of the latter documents shall take precedence and shall govern.

P3.0 We agree to the following requirements as noted in the Owners General Terms and Conditions For Preselected Equipment.

.1 Validity period of this Quotation shall be **240 days** from closing date for quotations.

.2 Manuals and Parts Lists are to be supplied as listed in the specifications.

.3 Shop drawings are to be supplied as listed in the specifications.

.4 Services required at site: The Supplier shall be responsible for verifying site conditions including accessibility and minimum clearances for sizing of equipment as well as assistance in commissioning the equipment.

P4.0 The proposal documents include the Submission Form, the Form of Proposal, including all Financial and Technical Details, Schedule, reference sheet from Supplier's recent installation, the General Terms and Conditions, the Request for Proposal documentation and the Technical Specifications.

Trojan Technologies Group ULC
Name of Supplier

Witness (Name & Signature)
Jona Thier Executive Assistant

Jona Theresa Thier, Notary Public, County of Middlesex, limited to the attestation of instruments and the taking of affidavits, for Trojan Technologies Group ULC and its subsidiaries, associated companies and affiliates Expires September 20, 2020

Signature of Authorized Officer
Jo Anne VanHooydonk, VP of Finance and CFO

September 14, 2020
Date
September 14, 2020

Company Seal

Trojan Technologies Group ULC

1.1 FINANCIAL DETAILS

1. Supply and delivery of the UV Disinfection System and the associated equipment complete as specified. 1a. UV Disinfection Systems	[redacted]
2. Preparation and delivery of Shop Drawings.	
3. Services at site, including all expenses, as specified in the Technical Specification (46 43 00, 3.4) and Clause 15.0 (Category 2) Commissioning of the Installation for the UV Disinfection Systems.	
Total Quoted Price (1+2+3)	
Per diem rate for additional field work not included in the above	
Total Price Valid For	240 Days
Delivery of Shop Drawings	4-6 Weeks
Delivery of Equipment for Each Phase (after approved shop drawings)	16 - 20 Weeks
*Amount of Currency Exchange USD/CAD	[redacted]
*Additional Amount of Duty Paid (if applicable)	
Percent of Imported Components (if greater than 10%)	

*Actual cost in dollars carried in bid must be placed in the spaces provided.
*Proponents wishing to submit multiple designs shall complete this form for each submission.
*Pricing to be quoted in Canadian Funds.

1.2 PROPOSAL DETAILS

.1 UV Disinfection System Description

Parameter	Description
Manufacturer of UV system	Trojan Technologies
UV Reactor Model:	UVSigna
Total Number of UV ~~Reactors~~ Banks (Duty + Standby)	1 Channel 3 Banks (2 Duty, 1 Standby)
Number of ~~Modules~~ Banks per ~~Reactor~~ Channel	2
Number of Lamps per ~~Module~~ Bank	10
Total Number of Lamps	30 (includes 10 redundant lamps)
Effective Range of Flow Rates	0 L/s to 240 L/s (with 2 banks in service)
Confirm Maximum UV Delivered Dose at design peak flow	30,600 $\mu Ws/cm^2$
Minimum Guaranteed Lamp Operating Life	15,000 hours
Minimum Guaranteed Ballast Life	10 years
Minimum Quartz Sleeve Life	10 years
Cost for Replacement Parts: • Lamps • Ballasts • Quartz Sleeves	$ 600 ea $ 900 ea $ 160 ea
Required Channel Dimensions • Width of Channel • Total Depth of Channel • Side Water Level Depth in Channel (maximum upstream water level)	895 mm 2350 mm (Layout drawing available upon request) 1642 mm
Provide Description of Water Level Controls	Fixed weir provided
Provide Description of Cleaning System, Cleaning System Options	Automatic mechanical and chemical (in situ)
Provide Electrical Power Requirements and Equipment Description	Max power consumption is 31.6 kW, P&ID - available upon request

.1 A detailed list of spare parts and parts cost estimate is enclosed. Yes / No (circle one)

.2 All drawings, technical data and supporting documentation that fully describe and demonstrate that this quotation meets the required specifications are attached. Yes / No (circle one) Generic Drawings supplied for alternate proposal

.3 Deviations and/or alternatives are separately noted. Yes / No (circle one)

.4 Provide a detailed estimate of the annual operation and maintenance costs of running the equipment. Yes / No (circle one)

.5 Provide a list of all ancillary components required for a complete operating system which are not supplied with this quotation. State the required design capacity and any pertinent design characteristics for any equipment that must be supplied by the Owner. Yes / No (circle one)

.6 Provide a list of a minimum of five (5) previous installations, noting the closest installation to the Owner, that have been in operation for a minimum of five (5) years, with design conditions similar to those required herein, where possible. Provide the following information for each installation:

.1 Owner

.2 Owner contact information

.3 Contract contact information

.4 Brief description of the equipment provided

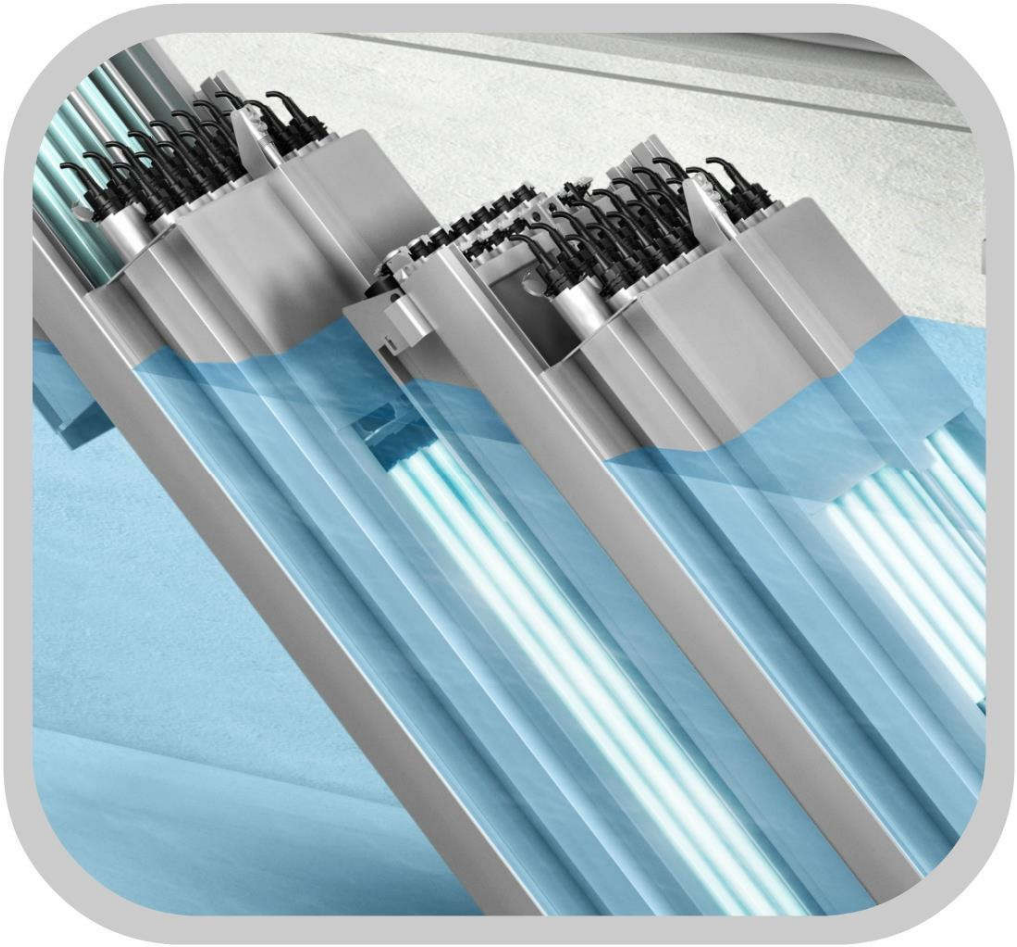
.5 Capacity of equipment

.6 Year the equipment was put into operation

.7 Value of supply contract

END OF SECTION

SCOPE OF SUPPLY – ALTERNATE BID



SCOPE OF SUPPLY FOR INGLESIDE WASTEWATER TREATMENT PLANT
ULTRAVIOLET DISINFECTION EQUIPMENT – TROJANUVSigna™

Prepared for: All Bidding Contractors

Specification Section: 46 83 00

Addendum: 1-3X 4

Submitted by: Rob Jansen

Trojan Quote: 226368

Design Criteria:

Current Peak Design Flow:	20,200 m3/d
Average Flow:	5,400 m3/d
UV Transmission:	55 % minimum
Total Suspended Solids:	25 mg/l (Maximum, grab sample)
Minimum Dose:	30 mJ/cm^2 MS2 Red
Discharge Limit:	200 Fecal Coliform/100ml (based on a 30 Day Geometric Mean)
Redundancy:	Two (2) Duty Banks and One (1) Bank

We are pleased to submit the following scope of equipment based on the above criteria.

The purchaser is responsible for reading all information contained in this Supply Contract. Trojan will not be held accountable for the supply of equipment not specifically detailed in this document. Detailed installation instructions are provided with the shop drawings and are available earlier upon request. Changes to this Scope of Supply that affect selling price will be handled through a change order.

Please refer inquiries to Trojan Manufacturer's Representative:

Representative: Albert Wakim
H2Flow Equipment Inc.
Phone: 905-660-9775 ex. 23
Email: albert@h2flow.com

This proposal has been respectfully submitted by,
Trojan Technologies

Rob Jansen
Regional Sales Manager

GENERAL CONFIGURATION

The TrojanUVSigna equipment described in this Scope of Supply consists of One (1) channels with three (3) UV banks total (two (2) duty banks, one (1) redundant bank).

Channel Dimensions:	Length:	12000mm (approx.)
	Width:	895mm
	Depth:	2350mm

Note: Dimensions do not include inlet or outlet structures upstream or downstream of the UV channel.

Unless otherwise indicated in this proposal all anchor bolts, conduit, conductors, local disconnects and transformers (if required) are the responsibility of the Installation Contractor and are not included in Trojan's Scope of Supply. Specific cable types listed below are for reference only. Selecting cables that are appropriate for the installation environmental conditions and in compliance with local code is the responsibility of the Installation Contractor.

Site to provide approved (engineered) anchor points for personnel to use as part of their fall restraint system around open channels. The anchor points must be positioned so that the preferred retractable lifeline of 8 ft (2.4 m) is of sufficient length to access the work at the channel. Refer to local safety regulation.

UV BANKS

Trojan's Responsibility:
Each bank supplied will consist of TrojanUV Solo Lamps™, quartz sleeves, supporting structures, ActiClean™ chemical/mechanical cleaning system and an automatic bank lifting mechanism. UV lamps are powered from an individual electric feed from a lamp driver located in a Power Distribution Center (PDC).

Model and Make:	TrojanUVSigna™
Quantity:	Three (3) UV Banks Each bank will be supplied with 12 UV lamps and quartz sleeves, one (1) UV intensity sensor, one (1) ActiClean chemical-mechanical wiping system and one (1) automatic bank lifting mechanism
Rating:	Type 6P / IP68 (lamp sleeve assemblies)
Approximate Weight:	10 Lamp - 410 lbs (186kg)

Installation Contractor's Responsibility:
The Installation Contractor shall install, align, secure, and seal (grout) each UV bank and lifting system in the channel per the instructions provided. The Installation Contractor shall provide solid grating downstream of the UV bank to block out UV light. Please refer to the supplied Trojan-supplied drawings for details.

SYSTEM CONTROL CENTER

Trojan's Responsibility:
A System Control Center (SCC) shall be supplied to monitor and control the UV disinfection System. Trojan will provide a PLC I/O and soft address map to aid the Installation Contractor with integration of the UV PLC and SCADA system.
Note: if Trojan is required to provide a managed switch in the SCC, the Plant's IT department or System Integrator will be responsible for configuring the switch to meet the Plant's security and traffic routing requirements.
The UV SCC shall consist of the following:

Quantity Supplied:	One (1) SCC will be supplied
Location:	PLC Wall Mount
Controller Type:	CompactLogix L33ER
Operator Interface:	SCC HMI AB Panelview Plus 7 - 15" (Indoor Rated)

Material / Rating:	316 Stainless Steel (Type 4X, IP 66)
Approximate Weight:	200 lbs (91 kg)
UPS:	24 VDC w/ 20 minutes of back up
SCADA:	EtherNet/IP
Surge Protection:	TVSS

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for mounting the SCC as indicated on the drawings. Unless otherwise indicated, the Installation Contractor to be responsible for the supply, installation and connection of the following at the SCC:

1. One (1) 110-240V, 50/60 Hz, 1 Phase, 2 Wire + GND, 1.8kVA (maximum)
2. One (1) bond link to plant ground, in accordance with applicable codes and standards
3. One (1) Modbus communication link, Belden 3106A (or equivalent), to PDCs (daisy chained)
4. One (1) Modbus communication link, Belden 3106A (or equivalent), to HSCs (daisy chained)
5. One (1) Cat 5e Ethernet communication link to SCADA
6. One (1) 4-20 mA analog shielded twisted pair from plant flow meter
7. One (1) 4-20 mA analog shielded twisted pair from online UV Transmittance monitor
8. Control signal conductors (as required by actuator) for control of inlet gate

POWER DISTRIBUTION CENTERS

Trojan's Responsibility:
The Power Distribution Center (PDC) distributes power to the UV lamps and shall consist of the following:

Quantity Supplied:	One (1) PDC will be supplied
Method of Cooling:	Air-conditioning
Material / Rating:	304 Stainless Steel
Approximate Weight:	AC Included PDC (Single Wide) – 1213 lbs (550 kg)

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for setting in place and bolting the PDC in location. The Installation Contractor to be responsible for the supply, installation and connection of the following at each PDC:

1. One (1) 480 / 277V, 50/60 Hz, 3 phase, 4 wire + GND, 33.8 kVA power feed with local disconnect to each of PDC
   Please note: Any transformers required are not included in this Scope and should be supplied by the Contractor.
2. One (1) bond link to plant ground, in accordance with applicable codes and standards (to underside of panel)
3. One (1) bond link from each UV bank to the corresponding PDC in accordance with the applicable drawings, specifications, codes, and standards
4. One (1) bank-in-place sensor cable (by Trojan) from each UV bank to corresponding PDC
5. One (1) UV intensity sensor cable (by Trojan) from each UV bank to corresponding PDC
6. One (1) Modbus communication link, Belden 3106A (or equivalent), from the SCC
7. One (1) discrete, 2 conductor, cable from level sensor control box for low water level signal
8. Installation and termination of lamp cables from the UV banks to each PDC. (Qty: 12 per UV Bank – supplied by Trojan)

HYDRAULIC SYSTEM CENTER

Trojan's Responsibility:
The Hydraulic System Center (HSC) houses the ancillary equipment required to operate the quartz sleeve cleaning system and automatic bank lifting mechanism.

Quantity Supplied:	One (1) HSCs will be supplied
Materials / Rating:	304 Stainless Steel (Type 4X, IP 66)
Hydraulic Fluid:	PureDrive
Approximate Weight:	500lbs (228 kg)

Installation Contractor's Responsibility:
The Installation Contractor shall be responsible for setting in place and bolting the HSC's as shown on the Trojan drawings. The HSC's must be located within 50 ft (15 m) of the furthest PDC. The Installation Contractor shall be responsible for the supply, connection and installation of the following at each HSC:

1. One (1) 480V 60Hz, 2.5 kVA power feed with local disconnect
2. One (1) bond link to plant ground, in accordance with applicable codes and standards
3. One (1) Modbus communication link, Belden 3106A (or equivalent), from the SCC
4. Cut and crimp hydraulic hoses (coordination with Parker Store) (hoses and connections supplied by Trojan)
5. Connection of the hydraulic hoses, total of four (4) per UV bank

WATER LEVEL CONTROLLER

Trojan's Responsibility
A level control device is required to maintain and control the effluent level in the channel, regardless of flow rate.

Quantity Supplied:	One (1) Fixed Weir
Material of Construction:	304 Stainless Steel
Effective Weir Length:	7082mm per weir

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for setting in place, bolting, grouting and sealing each level control weir trough as per Trojan's and Engineer's drawings.

LOW WATER LEVEL SENSORS

Trojan's Responsibility:
A Low Water Level Sensor is required downstream of the UV System to generate a low water level signal that will shut down and protect the UV System if the water level in the channel drops too low.

Quantity Supplied:	One (1) of each water level sensor to be supplied per channel
Approximate Weight:	10 lbs (22 kg) (panel)

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for setting in place and bolting the water level sensor panel to the effluent channel wall as per Trojan's and Engineer's drawings.

LEVEL SENSOR CONTROL BOX

Trojan's Responsibility:

Trojan will provide a wall mounted Level Sensor Control Box 24 x 14 x 6 in (61 x 36 x 15 cm) to provide power and relays for low level sensors.

Quantity Supplied:	One (1) Level Sensor Control Box per channel
Materials / Rating:	304 Stainless Steel (Type 4X)
Approximate Weight:	40 lbs (18 kg)

Installation Contractor's Responsibility:
The Installation Contractor to be responsible for mounting the Level Sensor Control Box as indicated on the drawings. The Installation Contractor shall also be responsible for supplying mounting hardware, watertight conduit and for the supply, installation and connection of the following at each Control Box:

1. One (1) 120 Volt, 1 phase, 2 wire + GND 72 VA power supply
2. One (1) discrete, 2 conductor cable from the Low Level Sensor to the level sensor control box
3. One (1) discrete, 2 conductor cable from the level sensor control box to each PDC

SPARE PARTS AND ADDITIONAL EQUIPMENT

Trojan's Responsibility:
The following equipment will be supplied with the UV system:

Description	Qty
908081-003 1000W Solo Lamp	3
916841 2kW Solo Lamp Driver	2
337863 Signa 2 Row - Wiper Seal Kit Assembly (2 seals, springs, cage, spacers) – includes lamp end seals	6
338229G 1000W Solo Sleeve	3
906002 UV Face Shield (Spare)	1
907666-020P Pure Drive Hydraulic Fluid (Spare)	1
Operator Kit (includes gloves, faceshield, goggles)	1
Warning Signs	2

NOTES AND CLARIFICATIONS TO SPECIFICATION

Trojan Technologies appreciates the opportunity to submit this proposal. Our proposal is submitted subject to and based on Trojan's standard terms and conditions, which we have attached as part of our proposal. We believe these terms and conditions are customary in the trade and respectfully reserve the opportunity to negotiate, fair and reasonable contract terms acceptable to both parties, if Trojan is selected for this project.

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Part 2.7 – Please note that some spares noted in this section are not applicable for the UVSigna system. A complete module assembly, lamp socket connectors and a portable maintenance rack will not be provided as part of this Scope.

MICROBIOLOGICAL PERFORMANCE TESTING

Trojan's Responsibility:
Trojan will conduct performance testing (5 days duration w/samples taken with 3 samples per day); protocol to be forwarded to the Engineer for approval. Trojan will produce the final test report (based on data supplied by the independent lab) and will forward the final report to the Contractor.

DOCUMENTATION (SHOP DRAWINGS AND O&M MANUALS)

The following documentation will be supplied by Trojan per the following schedule:

- One (1) electronic copy of Trojan Shop Drawing Submittals 4 - 6 weeks after receipt of written purchase order (hardcopies available upon request)
- One (1) electronic copy of Trojan Standard O&M manuals at time of equipment delivery (hardcopies available upon request)

DELIVERY, START-UP AND TRAINING

Equipment shipped **16-20** weeks after approval of Shop Drawings.

Installation Contractor's Responsibility:
The Contractor is responsible for:

- Un loading of the components supplied by Trojan, storage of all components, if required in a clean dry environment
- Installing the equipment outlined in the scope of Supply in accordance with contract drawings, Trojan's shop drawings, instructions and installation checklist.
- Supplying all conduits and conductors and components per the sites state regulations and components indicated as supplied by others,
- Completing the Checklist and returned at least two (2) weeks prior to date requested for commissioning.

The following start-up services will be provided by Trojan-certified technicians:

- Installation assistance as required by phone or fax. Technical Assistance Center 1-866-388-0488 or tac@trojanuv.com
- Inspection of the final installation prior to start-up, **2 days, 2 trips**
- Start-up and testing of the installed UV equipment. **5 days, 2 trips**
    - If the Trojan's Certified Service Technician determines the Contractor work is not complete and the start-up cannot be completed in the allotted time a return visit will be scheduled at the Contractors expense.
- Classroom and/or jobsite training for operations staff **2 days, included in start-up trips**
    - If trainees are not available a return visit will be scheduled at the Contractors expense.
- Performance testing**, 5 days, 1 trip**

WARRANTY

Trojan will warrant the equipment and parts for 24 months from Substantial Completion. Refer to attached Terms and Conditions for additional details.

- UV lamps shall be warranted for 15,000 hours prorated after 9,000 hours.
- Lamp drivers shall be warranted for 10 years, prorated after 1 year.

PAYMENT TERMS

30% upon approval of Shop Drawings
60% upon delivery of equipment to job site
5% upon 90 days after delivery or upon installation (whichever happens first)
5% upon performance testing and acceptance
Net 30 Days

If UV System Start-up is required within 30 days of shipment, Trojan requires 95% payment unless agreed upon in writing before authorizing system Start-up.

Trojan Technologies appreciates the opportunity to submit this proposal. Our proposal is submitted subject to and based on Trojan Technologies standard terms and conditions, which we have attached as part of our proposal. We believe these terms and conditions are customary in the trade and respectfully reserve the opportunity to negotiate, fair and reasonable contract terms acceptable to both parties, if Trojan Technologies is selected for this project.

TERMS & CONDITIONS

See Trojan's Terms and Conditions attached.

Terms and Conditions of Sale

This document sets forth the Terms & Conditions of Sale for goods manufactured and/or supplied, and services provided, by the seller entity identified on the purchase order ("SELLER") and sold to the original purchaser thereof ("BUYER"). The term "SELLER" includes only SELLER, and none of its affiliates. Unless otherwise specifically stated in a previously-executed written purchase agreement signed by authorized representatives of SELLER and BUYER, these Terms & Conditions of Sale establish the rights, obligations and remedies of SELLER and BUYER which apply to this offer and any resulting order or contract for the sale of SELLER's goods and/or services ("Products").

1. APPLICABLE TERMS & CONDITIONS: These Terms & Conditions of Sale are contained directly and/or by reference in SELLER's proposal, offer, order acknowledgment, packing slip, and/or invoice documents. The first of the following acts constitutes an acceptance of SELLER's offer and not a counteroffer and creates a contract of sale ("Contract") in accordance with these Terms & Conditions of Sale: (i) BUYER's issuance of a purchase order document against SELLER's offer; (ii) acknowledgement of BUYER's order by SELLER; or (iii) commencement of any performance by SELLER pursuant to BUYER's order. Provisions contained in BUYER's purchase documents (including electronic commerce interfaces) that materially alter, add to, or subtract from the provisions of these Terms & Conditions of Sale are not a part of the Contract.

2. CANCELLATION AND RETURN: The whole or any part of this order may be cancelled only with the prior written consent of SELLER. If SELLER does consent to a cancellation, such consent will be given only upon payment of reasonable cancellation charges in an amount determined by SELLER. In addition, with respect to any Products returned on cancellation, BUYER will pay SELLER's cost of placing the returned Products in a saleable condition, sales expenses incurred by SELLER in connection with such returned Products, a reasonable restocking charge and freight costs incurred in connection with the original shipment and in connection with returning such Products to SELLER, all in such amounts as are advised to the BUYER by SELLER.

3. DELIVERY: Delivery will be accomplished EXW or CIP at the point of shipment (Incoterms 2020), unless otherwise expressly agreed between the parties. Legal title and risk of loss or damage pass to BUYER upon transfer to the first carrier, regardless of final destination and mode of transit. SELLER will use commercially reasonable efforts to deliver the Products ordered herein within SELLER's normal lead-time necessary for SELLER to deliver the Products sold hereunder. Products will be boxed or crated as determined appropriate by SELLER for protection against normal handling and there will be an extra charge to the BUYER for additional packaging required by the BUYER with respect to waterproofing or other added protection. BUYER has sole responsibility for off-loading, storage and handling of the Products at the site. Where Buyer is responsible for any delay in the delivery date or installation date, the earlier of the date of delivery or the date on which the Products are ready for shipment by SELLER may be treated as the delivery date for purposes of determining the time of payment of the purchase price. Moreover, BUYER will be responsible for reasonable storage and insurance expenses with respect to such Products. Should BUYER fail to effect pick-up of Product as previously agreed in a timely manner, SELLER may, at its discretion, assess reasonable storage charges to the account of BUYER.

4. INSPECTION: BUYER will promptly inspect and accept any Products delivered pursuant to this Contract after receipt of such Products. In the event the Products do not conform to any applicable specifications, BUYER will promptly notify SELLER of such nonconformance in writing. SELLER will have a reasonable opportunity to repair or replace the nonconforming Product at its option. BUYER will be deemed to have accepted any Products delivered hereunder and to have waived any such nonconformance for such Products unless a written notification pursuant to this paragraph is received by SELLER within thirty (30) days of delivery to BUYER destination on order.

5. PRICES & ORDER SIZES: Prices do not include any charges for services such as insurance; brokerage fees; sales, use, inventory, or excise taxes; import or export duties; special financing fees; value added tax, income, or royalty taxes imposed outside the U.S. or Canada; consular fees; special permits or licenses; or other charges imposed upon the production, sale, distribution, or delivery of Products. BUYER will either pay any and all such charges or provide SELLER with acceptable exemption certificates, which obligation survives performance under this Contract. Installation, maintenance and any other services which relate to the Products are not included unless specifically set forth in the quotation. SELLER reserves the right to establish minimum order sizes and will advise BUYER accordingly. Any orders below the minimum order size are subject to a fee as set out by SELLER. If SELLER's delivery of Products surpasses one (1) year in length, then at least on an annual basis, or if changes to the Products are requested or needed, the parties shall conduct good faith discussions regarding changes to the prices for the Products, to reflect SELLER's increased costs for which SELLER shall be entitled to additional fair and appropriate compensation.

6. PAYMENTS: All payments must be made in agreed-to currency, normally Canadian or U.S. Dollars. Unless other payment terms are expressly set forth in the purchase order or otherwise required by the Seller, invoices are due and payable NET 30 DAYS from date of the invoice, without regard to delays for inspection or transportation, with payments to be made by check to SELLER at the address listed in the purchase order or by bank transfer to the account obtainable from SELLER's Accounts Receivable Manager. In the event payments are not made or not made in a timely manner, SELLER may, in addition to all other remedies provided at law, either: (a) declare BUYER's performance in breach and terminate this Contract for default; (b) withhold future shipments until delinquent payments are made; (c) deliver future shipments on a cash-with-order or cash-in-advance basis even after the delinquency is cured; (d) charge interest on the outstanding balance at a rate of 1.5% per month or the maximum rate permitted by law, if lower, for each month or part thereof that there is an outstanding balance plus applicable storage charges and/or inventory carrying charges; (e) repossess the Products for which payment has not been made; (f) pursue other collection efforts and recover all associated costs including reasonable attorney's fees; or (g) combine any of the above rights and remedies as is practicable and permitted by law. BUYER is prohibited from setting off any and all monies owed under this Contract from any other sums, whether liquidated or not, that are or may be due to the BUYER, which arise out of a different transaction with SELLER or any of its affiliates. Should BUYER's financial condition become unsatisfactory to SELLER in its discretion, SELLER may require payment in advance or other security. If BUYER fails to meet these requirements, SELLER may treat such failure as reasonable grounds for repudiation of this Contract, in which case reasonable cancellation charges shall be due to SELLER. BUYER hereby grants SELLER a security interest in the Products, wherever located, and whether now existing or hereafter arising or acquired from time to time, and in all accessions thereto and replacements or modifications thereof, as well as all proceeds of the foregoing, to secure payment in full of all amounts to Seller, which payment releases the security interest but only if such payment could not be considered an avoidable transfer under applicable laws. The security interest granted hereby constitutes a purchase money security interest under the applicable Uniform Commercial Code or Personal Property Security Act or other applicable law, and SELLER is authorized to make whatever registration or notification or take such other action as SELLER deems necessary or desirable to perfect such security interest. BUYER's insolvency, bankruptcy, assignment for the benefit of creditors, or dissolution or termination of the existence of BUYER, constitutes a default under this Contract and affords SELLER all of the remedies of a secured creditor under applicable law, as well as the remedies stated above for late payment or non-payment.

7. LIMITED WARRANTY: Unless specifically provided otherwise in SELLER's quotation, SELLER provides the following Limited Warranty. SELLER warrants that Products sold hereunder will be free from defects in material and workmanship and will, when used in accordance with the manufacturer's operating and maintenance instructions, conform to any express written warranty pertaining to the specific goods purchased, which for Products is for a period of twelve (12) months from delivery. SELLER warrants that services furnished hereunder will be free from defects in workmanship for a period of ninety (90) days from the completion of the services. Products repaired or replaced are not covered by any warranty except to the extent repaired or replaced by SELLER, an authorized representative of SELLER, or under specific instructions by SELLER, in which cases, the Products will be covered under warranty up to the end of the warranty period applicable to the original Products. The above warranties do not include the cost of shipping and handling of returned items. Parts provided by SELLER in the performance of services may be new or refurbished parts functioning equivalent to new parts. Any non-functioning parts that are repaired by SELLER shall become the property of SELLER. No warranties are extended to consumable items such as, without limitation, light bulbs, and for normal wear and tear. All other guarantees, warranties, conditions and representations, either express or implied, whether arising under any statute, law, commercial usage or otherwise, including implied warranties of merchantability and fitness for a particular purpose, are hereby excluded. The sole remedy for Products not meeting this Limited Warranty is replacement, credit or refund of the purchase price, as determined by SELLER in its sole discretion. This remedy will not be deemed to have failed of its essential purpose so long as SELLER is willing to provide such replacement, credit or refund. To make a warranty claim, BUYER must notify SELLER in writing within 5 days of discovery of the defect in question. This notification must include a description of the problem, a copy of the applicable operator's log, a copy of BUYER's maintenance record and any analytical results detailing the problem. Any warranty hereunder or performance guarantees shall only be enforceable if (a) all equipment is properly installed, inspected regularly, and is in good working order, (b) all operations are consistent with SELLER recommendations, (c) operating conditions at the installation site have not materially changed and remain within anticipated specifications, and (d) no reasonably unforeseeable circumstances exist or arise.

8. INDEMNIFICATION: Indemnification applies to a party and to such party's successors-in-interest, assignees, affiliates, directors, officers, and employees ("Indemnified Parties"). SELLER is responsible for and will defend, indemnify and hold harmless the BUYER Indemnified Parties against all losses, claims, expenses or damages which may result from accident, injury, damage, or death due to SELLER's breach of the Limited Warranty. BUYER is responsible for and will defend, indemnify and hold harmless SELLER Indemnified Parties against all losses, claims, expenses, or damages which may result from accident, injury, damage, or death due to the negligence or misuse or misapplication of any Products or the breach of any provision of this Contract by the BUYER or any third party affiliated or in privity with BUYER.

9. PATENT PROTECTION: Subject to all limitations of liability provided herein, SELLER will, with respect to any Products of SELLER's design or manufacture, indemnify BUYER from any and all damages and costs as finally determined by a court of competent jurisdiction in any suit for infringement of any U.S. or Canadian patent (or European patent for Products that SELLER sells to BUYER for end use in a member state of the E.U.) that has issued as of the delivery date, solely by reason of the sale or normal use of any Products sold to BUYER hereunder and from reasonable expenses incurred by BUYER in defense of such suit if SELLER does not undertake the defense thereof, provided that BUYER promptly notifies SELLER of such suit and offers SELLER either (i) full and exclusive control of the defense of such suit when Products of SELLER only are involved, or (ii) the right to participate in the defense of such suit when products other than those of SELLER are also involved. SELLER's warranty as to use patents only applies to infringement arising solely out of the inherent operation of the Products according to their applications as envisioned by SELLER's specifications. In case the Products are in such suit held to constitute infringement and the use of the Products is enjoined, SELLER will, at its own expense and at its option, either procure for BUYER the right to continue using such Products or replace them with non-infringing products, or modify them so they become non-infringing, or remove the Products and refund the purchase price (prorated for depreciation) and the transportation costs thereof. The foregoing states the entire liability of SELLER for patent

infringement by the Products. Further, to the same extent as set forth in SELLER's above obligation to BUYER, BUYER agrees to defend, indemnify and hold harmless SELLER for patent infringement related to (x) any goods manufactured to the BUYER's design, (y) services provided in accordance with the BUYER's instructions, or (z) SELLER's Products when used in combination with any other devices, parts or software not provided by SELLER hereunder.

10. TRADEMARKS AND OTHER LABELS: BUYER agrees not to remove or alter any indicia of manufacturing origin or patent numbers contained on or within the Products, including without limitation the serial numbers or trademarks on nameplates or cast, molded or machined components.

11. SOFTWARE AND INTELLECTUAL PROPERTY: All licenses to SELLER's separately provided software products are subject to the separate software license agreement(s) accompanying the software media. In the absence of such express licenses and for all other software, SELLER grants BUYER only a personal, non-exclusive license to access and use the software provided by SELLER with Products purchased hereunder solely as necessary for BUYER to enjoy the benefit of the Products. A portion of the software may contain or consist of open source software, which BUYER may use under the terms and conditions of the specific license under which the open source software is distributed. BUYER agrees that it will be bound by all such license agreements. Title to software remains with the applicable licensor(s). All SELLER contributions to the Products, the results of the services, and any other work designed or provided by SELLER hereunder may contain or result in statutory and non-statutory Intellectual Property, including but not limited to patentable subject matter or trade secrets; and all such Intellectual Property remains the sole property of SELLER; and BUYER shall not disclose (except to the extent inherently necessary during any resale of Product sold hereunder), disassemble, decompile, or any results of the Services, or any Products, or otherwise attempt to learn the underlying processes, source code, structure, algorithms, or ideas.

12. PROPRIETARY INFORMATION AND PRIVACY: "Proprietary Information" means any information, technical data, or know-how in whatever form, whether documented, contained in machine readable or physical components, mask works or artwork, or otherwise, which SELLER considers proprietary, including but not limited to service and maintenance manuals. BUYER and its customers, employees, and agents will keep confidential all such Proprietary Information obtained directly or indirectly from SELLER and will not transfer or disclose it without SELLER's prior written consent, or use it for the manufacture, procurement, servicing, or calibration of Products or any similar products, or cause such products to be manufactured, serviced, or calibrated by or procured from any other source, or reproduce or otherwise appropriate it. All such Proprietary Information remains SELLER's property. No right or license is granted to BUYER or its customers, employees or agents, expressly or by implication, with respect to the Proprietary Information or any patent right or other proprietary right of SELLER, except for the limited use licenses implied by law. In respect of personal data supplied by BUYER to SELLER, BUYER warrants that is duly authorized to submit and disclose these data, including but not limited to obtaining data subjects´ informed consent. SELLER will manage BUYER's information and personal data in accordance with its Privacy Policy, a copy of which is available to Buyer upon request. In respect of other data and information that SELLER may receive in connection with BUYER´s use of the Products including without limitation data that are captured by the Products and transmitted to SELLER, BUYER hereby grants SELLER a non-exclusive, worldwide, royalty-free, perpetual, non-revocable license to use, compile, distribute, display, store, process, reproduce, or create derivative works of such data as needed for Product operation and maintenance, and to aggregate such data for use in an anonymous manner, solely to facilitate marketing, sales and R&D activities of SELLER and its affiliates.

13. SPECIAL TOOLS, DIES, JIGS, FIXTURES AND PATTERNS: Any tools, dies, jigs, fixtures, patterns and similar items which are included or required in connection with the manufacture and/or supply of the Products will remain the property of SELLER without credit to the BUYER. SELLER assumes the cost for maintenance and replacement of such items and shall have the right to discard and scrap any such item after it has been inactive for a minimum of one year, without credit to the BUYER.

14. CHANGES AND ADDITIONAL CHARGES: SELLER reserves the right to make design changes or improvements to any products of the same general class as Products being delivered hereunder without liability or obligation to incorporate such changes or improvements to Products ordered by BUYER unless agreed upon in writing before the Products' delivery date.

15. SITE ACCESS / PREPARATION / WORKER SAFETY / ENVIRONMENTAL COMPLIANCE: In connection with services provided by SELLER, BUYER agrees to permit prompt access to equipment. BUYER assumes full responsibility to back-up or otherwise protect its data against loss, damage or destruction before services are performed. BUYER is the operator and in full control of its premises, including those areas where SELLER employees or contractors are performing service, repair, and maintenance activities. BUYER will ensure that all necessary measures are taken for safety and security of working conditions, sites, and installations during the performance of any services. BUYER is the generator of any resulting wastes, including without limitation hazardous wastes. BUYER is solely responsible to arrange for the disposal of any wastes at its own expense. BUYER will, at its own expense, provide SELLER employees and contractors working on BUYER's premises with all information and training required under applicable safety compliance regulations and BUYER's policies. SELLER has no responsibility for the supervision or actions of BUYER's employees or contractors or for non-SELLER items (e.g., chemicals, equipment) and disclaims all liability and responsibility for any loss or damage that may be suffered as a result of such actions or items, or any other actions or items not under SELLER's control.

16. LIMITATIONS ON USE: BUYER will not use any Products for any purpose other than those identified in SELLER's catalogs and literature as intended uses. Unless SELLER has advised the BUYER in writing, in no event will BUYER use any Products in drugs, food additives, food, or cosmetics, or medical applications for humans or animals. In no event will BUYER use in any application any Product that requires FDA 510(k) clearance unless and only to the extent the Product has such clearance. BUYER will not sell, transfer, export, or re-export any SELLER Products or technology for use in activities which involve the design, development, production, use, or stockpiling of nuclear, chemical, or biological weapons or missiles, nor use SELLER Products or technology in any facility which engages in activities relating to such weapons. Unless the "ship-to" address is in California, U.S.A., the Products are not intended for sale in California and may lack markings required by California Proposition 65; accordingly, unless BUYER has ordered Products specifying a California ship-to address, BUYER will not sell or deliver any SELLER Products for use in California. Any warranty granted by SELLER is void if any goods covered by such warranty are used for any purpose not permitted hereunder.

17. EXPORT AND IMPORT LICENSES AND COMPLIANCE WITH LAWS: Unless otherwise expressly agreed, BUYER is responsible for obtaining any required export or import licenses necessary for Product delivery. BUYER will comply with all laws and regulations applicable to the installation or use of all Product, including applicable import and export control laws and regulations of the U.S., E.U., and any other country having proper jurisdiction, and will obtain all necessary export or import licenses in connection with any subsequent export, re-export, transfer, and use of all Product and technology delivered hereunder. BUYER will not sell, transfer, export, or re-export any SELLER Product or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical, or biological weapons or missiles, nor use SELLER Product or technology in any facility which engages in activities relating to such weapons. BUYER will comply with all local, national, and other laws of all jurisdictions globally relating to anti-corruption, bribery, extortion, kickbacks, or similar matters which are applicable to BUYER's business activities in connection with this Contract, including but not limited to the U.S. Foreign Corrupt Practices Act of 1977, as amended (the "FCPA"). BUYER agrees that no payment of money or provision of anything of value will be offered, promised, paid, or transferred, directly or indirectly, by any person or entity, to any government official, government employee, or employee of any company owned in part by a government, political party, political party official, or candidate for any government office or political party office to induce such organizations or persons to use their authority or influence to obtain or retain an improper business advantage for BUYER or for SELLER, or which otherwise constitute or have the purpose or effect of public or commercial bribery, acceptance of or acquiescence in extortion, kickbacks, or other unlawful or improper means of

obtaining business or any improper advantage, with respect to any of BUYER's activities related to this Contract. SELLER asks BUYER to "Speak Up!" if aware of any violation of law, regulation, or our Code of Conduct ("CoC") in relation to this Contract. See www.danaherintegrity.com and www.danaher.com/how-we-work/integrity-and-compliance for a copy of the CoC and for access to our Helpline portal.

18. RELATIONSHIP OF PARTIES: BUYER is not an agent or representative of SELLER and will not present itself as such under any circumstances, unless and to the extent it has been formally screened by SELLER's compliance department and received a separate duly-authorized letter from SELLER setting forth the scope and limitations of such authorization.

19. FORCE MAJEURE: SELLER is excused from performance of its obligations under this Contract to the extent caused by acts or omissions that are beyond its control, including but not limited to Government embargoes, blockages, seizures or freezing of assets, delays, or refusals to grant an export or import license, or the suspension or revocation thereof, or any other acts of any Government; fires, floods, severe weather conditions, or any other acts of God; quarantines; labor strikes or lockouts; riots; strife; insurrections; civil disobedience or acts of criminals or terrorists; war; material shortages or delays in deliveries to SELLER by third parties. In the event of the existence of any force majeure circumstances, the period of time for delivery, payment terms, and payments under any letters of credit will be extended for a period of time equal to the period of delay. If the force majeure circumstances extend for six months, SELLER may, at its option, terminate this Contract without penalty and without being deemed in default or in breach thereof.

20. NON-ASSIGNMENT AND WAIVER: BUYER will not transfer or assign this Contract or any rights or interests hereunder without SELLER's prior written consent. Failure of either party to insist upon strict performance of any provision of this Contract, or to exercise any right or privilege contained herein, or the waiver of any breach of the terms or conditions of this Contract, will not be construed as thereafter waiving any such terms, conditions, rights, or privileges, and the same will continue and remain in force and effect as if no waiver had occurred.

21. FUNDS TRANSFERS: BUYER and SELLER both recognize that there is a risk of banking fraud when individuals impersonating a business demand payment under new mailing or banking transfer instructions. To avoid this risk, BUYER must verbally confirm any new or changed mailing or banking transfer instructions by calling SELLER and speaking with SELLER's Accounts Receivable Manager before transferring any monies using the new instructions. Both parties agree that they will not institute mailing or banking transfer instruction changes and require immediate payment under the new instructions, but will instead provide a ten (10) day grace period to verify any mailing or banking transfer instruction changes before any new or outstanding payments are due using the new instructions.

22. LIMITATION OF LIABILITY: None of SELLER, its successors-in-interest, assignees, affiliates, directors, officers, and employees will be liable to BUYER under any circumstances for any special, treble, incidental, or consequential damages, including without limitation, damage to or loss of property other than for the Products purchased hereunder; damages incurred in installation, repair, or replacement; lost profits, revenue, or opportunity; loss of use; losses resulting from or related to downtime of the Products or inaccurate measurements or reporting; the cost of substitute products; or claims of BUYER's customers for such damages, howsoever caused, and whether based on warranty, contract, and/or tort (including negligence, strict liability or otherwise). The total liability of SELLER, its successors-in-interest, assignees, affiliates, directors, officers, and employees arising out of the performance or nonperformance hereunder, or SELLER's obligations in connection with the design, manufacture, sale, delivery, and/or use of Products, will in no circumstance exceed the amount actually paid to SELLER for Products delivered hereunder.

23. APPLICABLE LAW AND DISPUTE RESOLUTION: All issues relating to the construction, validity, interpretation, enforcement, and performance of this agreement and the rights and obligations of SELLER and the BUYER hereunder shall be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein. Any provisions of the International Sale of Goods Act or any convention on contracts for the international sale of goods shall not be applicable to this agreement. The parties submit to and consent to the non-exclusive jurisdiction of courts located in the Province of Ontario.

24. ENTIRE AGREEMENT & MODIFICATION: These Terms & Conditions of Sale constitute the entire agreement between the parties and supersede any prior agreements or representations, whether oral or written. No change to or modification of these Terms & Conditions shall be binding upon SELLER unless in a written instrument specifically referencing that it is amending these Terms & Conditions of Sale and signed by an authorized representative of SELLER. SELLER rejects any additional or inconsistent Terms & Conditions of Sale offered by BUYER at any time, whether or not such terms or conditions materially alter the Terms & Conditions herein and irrespective of SELLER's acceptance of BUYER's order for the described goods and services.

Terms and Conditions Covering Sales of Configured-to-Order Projects and Systems

In addition to all terms and conditions above, the following sections apply to sales of Configured-to-Order Projects, Systems, and the like:

101. PAYMENT.

101.1 Payments will be made per the schedule of payment events set forth in Seller's Quotation; provided that if the Start-Up Date (as defined below) is less than 30 days after the Acceptance Date, 90% of the purchase price is due on or before the Start-Up Date.

101.2. In the event that achievement of a scheduled payment event is delayed or suspended due to the Buyer's convenience or other reasons for which the Buyer or its representatives is responsible, such payment event will be deemed to have occurred and Seller shall be entitled to invoice Buyer as if achievement of such payment event had been achieved. In such circumstances, Buyer must notify Seller in writing of the reasons for the delay and anticipated duration of the delay. Seller will mark the Products (or parts thereof) as the Buyer's property and shall store the Products (or parts thereof) in a segregated area until actual delivery.

102. DELIVERY

102.1 SELLER will request the BUYER to provide a firm date for delivery of the Products to the project site (the "Delivery Date") which SELLER will then use to establish the production schedule for the Products. The Delivery Date will then be binding on the BUYER except for any changes made in accordance with the provisions below.

102.2 The BUYER can request a rescheduling of the Delivery Date on one occasion only by notifying SELLER in writing not less than four weeks prior to the scheduled Delivery Date. The BUYER may request that the Delivery Date be extended by a period up to six weeks, without penalty, but may not request that the Delivery Date be moved forward. The BUYER may also request that the Delivery Date be extended beyond a six-week period but, SELLER may not agree to such extension, beyond the maximum six-week extension period

102.3 SELLER may, in its sole discretion, agree to change the Delivery Date on more than one occasion or if less than four weeks' prior notice is provided of a requested change, but is under no obligation to do so.

102.4 SELLER reserves the right to reschedule the Delivery Date to a date prior to or subsequent to the scheduled Delivery Date in order to accommodate its shipping, production or other requirements. This right to reschedule will be applicable unless otherwise agreed in writing by an authorized officer of SELLER. SELLER will provide the BUYER or its representative with a minimum of 24 hours' notice of any such rescheduling.

102.5 Where any change to the Delivery Date is made at BUYER's request, for all purposes with respect to the warranty and payment provided by SELLER in connection with the Products, the initial Delivery Date will be considered to be the Delivery Date regardless of any change later made to the Delivery Date.

103. ACCEPTANCE

103.1 During the period between the Delivery Date and the Start-up Date, the BUYER shall prepare the Products and the project site for installation and start-up and, unless otherwise agreed in writing by an authorized representative of SELLER, shall complete acceptance testing with respect to the Products. The Products shall be deemed to be accepted on the earliest to occur of the following dates (the "Acceptance Date"): (a) that date on which the Products can function in either manual or automatic operation and provide disinfection in accordance with criteria specified in the Quotation, or (b) 60 days after the Delivery Date.

103.2 All amounts which remain owing by the BUYER for the Products, including any amount which is specified to be payable on the Acceptance Date, will be paid by the BUYER to SELLER within 30 days after the Acceptance Date, unless otherwise agreed in writing by an authorized representative of SELLER.

103.3 Written notification must be given by the BUYER to SELLER within seven days after the Acceptance Date listing any outstanding deficiencies with respect to the Products and SELLER will use all reasonable efforts to correct such deficiencies promptly.

104. START-UP

104.1 SELLER will request a firm date for start-up of the Equipment (the "Start-Up Date"). Trojan will then schedule its technician to be on-site for the Start-up Date. The Start-up Date is binding except for any changes made in accordance with the provisions below.

104.2 On the Start-up Date, BUYER must have the Equipment and site ready as provided in the Installation Preparation Checklist contained in the Contractor Installation Package sent to BUYER and must have paid all amounts then due and payable to SELLER.

104.3 BUYER can request a rescheduling of the Start-up Date by notifying SELLER in writing not less than three weeks prior to the Start-up Date. BUYER may request that the Start-up Date be extended but may not request that the Start-up Date be moved forward. SELLER requires a minimum extension period of two weeks between the existing Start-up Date and the requested new Start-up Date in order to reschedule its technician.

104.4 SELLER may, in its sole discretion, agree to reschedule the Start-up Date where a BUYER requests less than a two-week extension but is under no obligation to do so. In the event that SELLER does agree to less than a two-week extension or that BUYER requests more than two changes to the Start-up Date, BUYER will be charged an administration fee in an amount determined by SELLER.

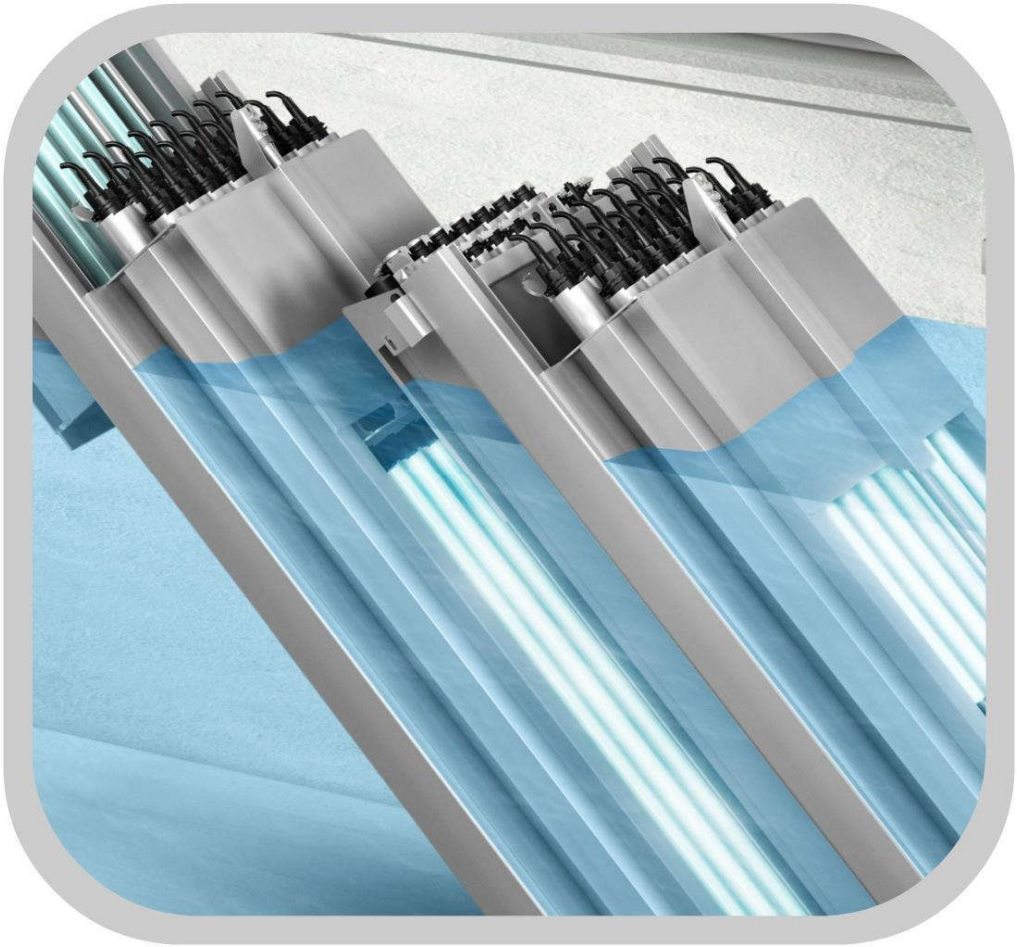
104.5 SELLER reserves the right to reschedule the Start-up Date to a date which is prior to or subsequent to the scheduled Start-up Date in order to accommodate its resource availability. This right to reschedule will be applicable unless otherwise agreed in writing by an authorized officer of SELLER. SELLER will provide BUYER or its representative with a minimum of 72 hours' notice of any such change to the Start-up Date.

104.6 In the event that SELLER'S technician arrives at the project site and finds that the Equipment or the project site is not ready for start-up as defined in the Contractor Installation Package, or any amounts then due and payable to SELLER remain unpaid, BUYER may either:

(a) provided all amounts then due and payable to SELLER have been paid, issue a purchase order for all costs involved in having SELLER correct the deficiencies, or

(b) have SELLER'S technician leave the site and then reschedule the Start-up Date to a date when all deficiencies will be corrected, and the Equipment will be ready for start-up as defined in the Contractor Installation Package. If BUYER selects this option, the cost of rescheduling will be not less than a minimum amount specified by SELLER, with the final cost being determined by SELLER based on its costs and expenses incurred in connection with the rescheduling.

ANNUAL O&M - ALTERNATE



O&M cost data – Alternate Bid

System power consumption at average flow.

Operating Condition	Flow (m3/d)	Number of Channels Operating (#)	Number of Banks per Channel Operating (#)	Total System Power Consumption (kW)
Average Flow	5400	1	1	6.2

Operating Conditions

Average Flow: **5,400 m3/d**
UV Transmittance: **55%**
Annual Operating Hours: **8760 hours**
Average Number of Lamps Online: **10**

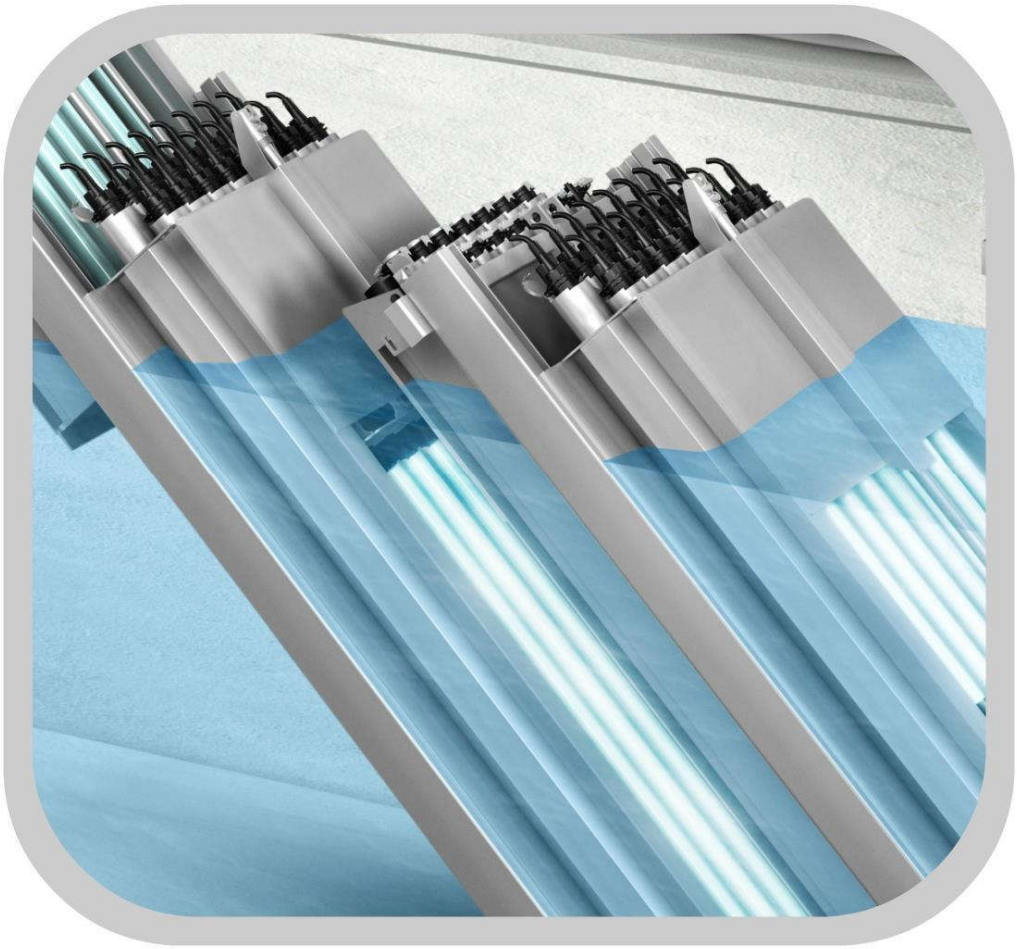
Power Requirements		Lamp Replacement	
Average Power Draw:	**6.2 kW**	Lamps Replaced per Year:	**6**
Cost per kW Hour:	**$0.10**	Price per Lamp:	**$600**
Annual Power Cost:	**$5,431**	**Annual Lamp Replacement Cost:**	**$3,600**
Total Annual Operating Cost Estimate: $9,031			

This cost estimate is based on the average flow and UV transmittance listed 10,770 above. Actual operating costs may be lower with the TrojanUVSigna automatic dose pacing control system. As UV demand decreases by a change

Recommended Annual Replacement

Description	Maintenance Schedule	Price	Time	Warranty
Lamp	Replace every 15000 hours	$600	5 min	15,000 hrs (prorated after 9,000 hrs)
Sleeve	Only replace if outside shows signs of etching/cracks or inside is fouled	$150	5 min	10 years (prorated after 5 yrs)
Driver/Ballast	Only Replace if fails	$900	5 min	10 years
Wiper Seal	Replace every 2 years (set)	$24	15 min	2 year
Acticlean Gel	Top up acticlean gel every 6 months	$25 gal	10 min/bank	1 year

DEVIATIONS ALTERNATE PROPOSAL



Deviations for Alternate Proposal

TROJANS RESPONSE:

NOTES AND CLARIFICATIONS TO SPECIFICATION

Trojan Technologies appreciates the opportunity to submit this proposal. Our proposal is submitted subject to and based on Trojan's standard terms and conditions, which we have attached as part of our proposal. We believe these terms and conditions are customary in the trade and respectfully reserve the opportunity to negotiate, fair and reasonable contract terms acceptable to both parties, if Trojan is selected for this project.

Section 46 83 00

Part 2.7 – Please note that some spares noted in this section are not applicable for the UVSigna system. A complete module assembly, lamp socket connectors and a portable maintenance rack will not be provided as part of this Scope.

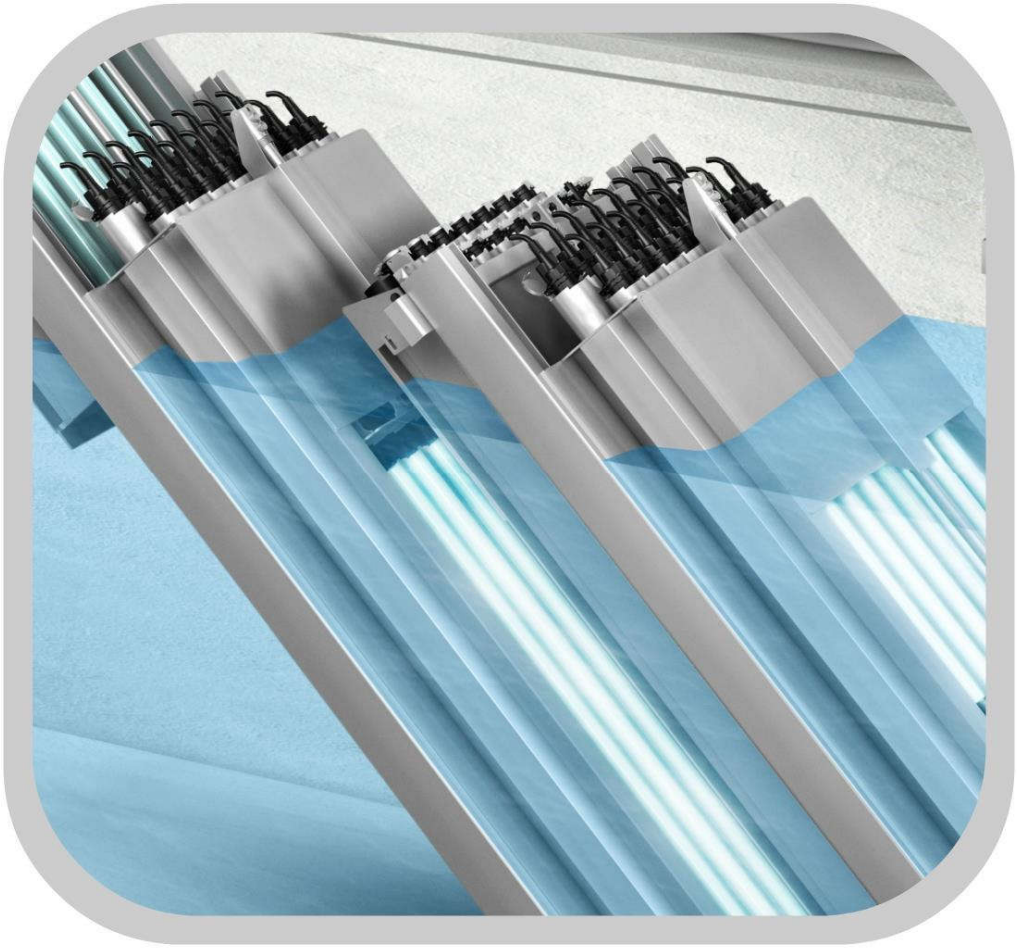
ALTERNATE PROPOSAL

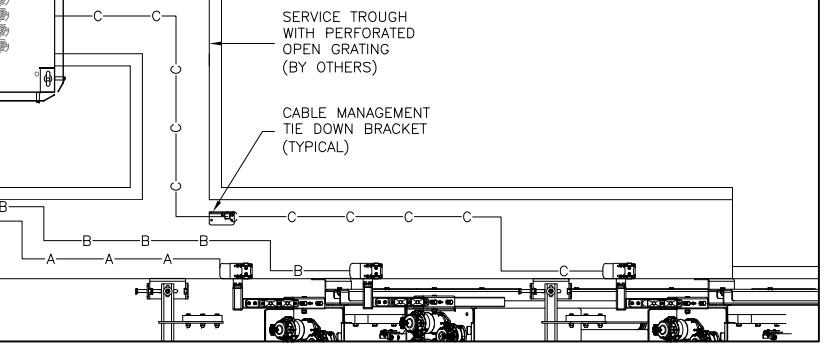
Trojan is pleased to offer an alternate design option for your consideration. Both the base design and the alternate design meet the technical requirements of the specification. All parts pricing as stated on the pricing sheet would also be applicable to the alternate design. Please feel free to contact us if you would like to discuss in further detail the alternate design option offered.

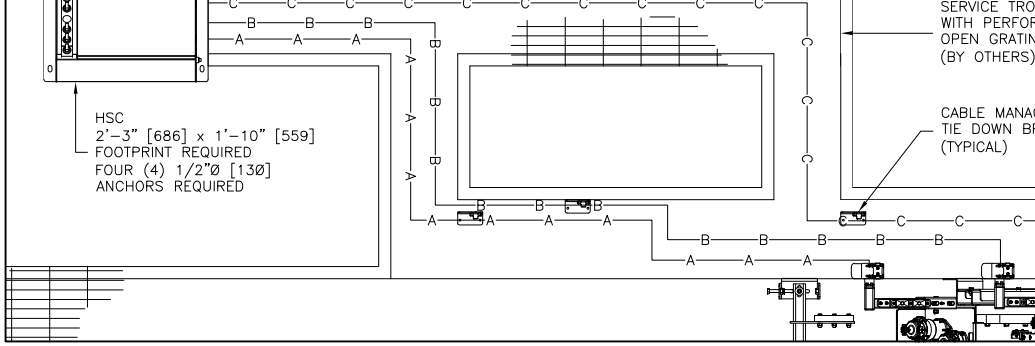
The deviation from the specification in the alternate is that the UV system layout would be revised to use only one (1) channel with 2 duty, 1 redundant bank, still providing required redundancy. Each bank has (10) lamps and the system has a total of (30) lamps. This option would reduce the total installed costs by reducing civil construction, the number of banks, and the number of PDC,s.

The alternate design results not only in a reduction in capital price but also a significant reduction in long term operating costs through reduced operations and maintenance.

DRAWINGS – ALTERNATE PROPOSAL – GENERIC DRAWINGS





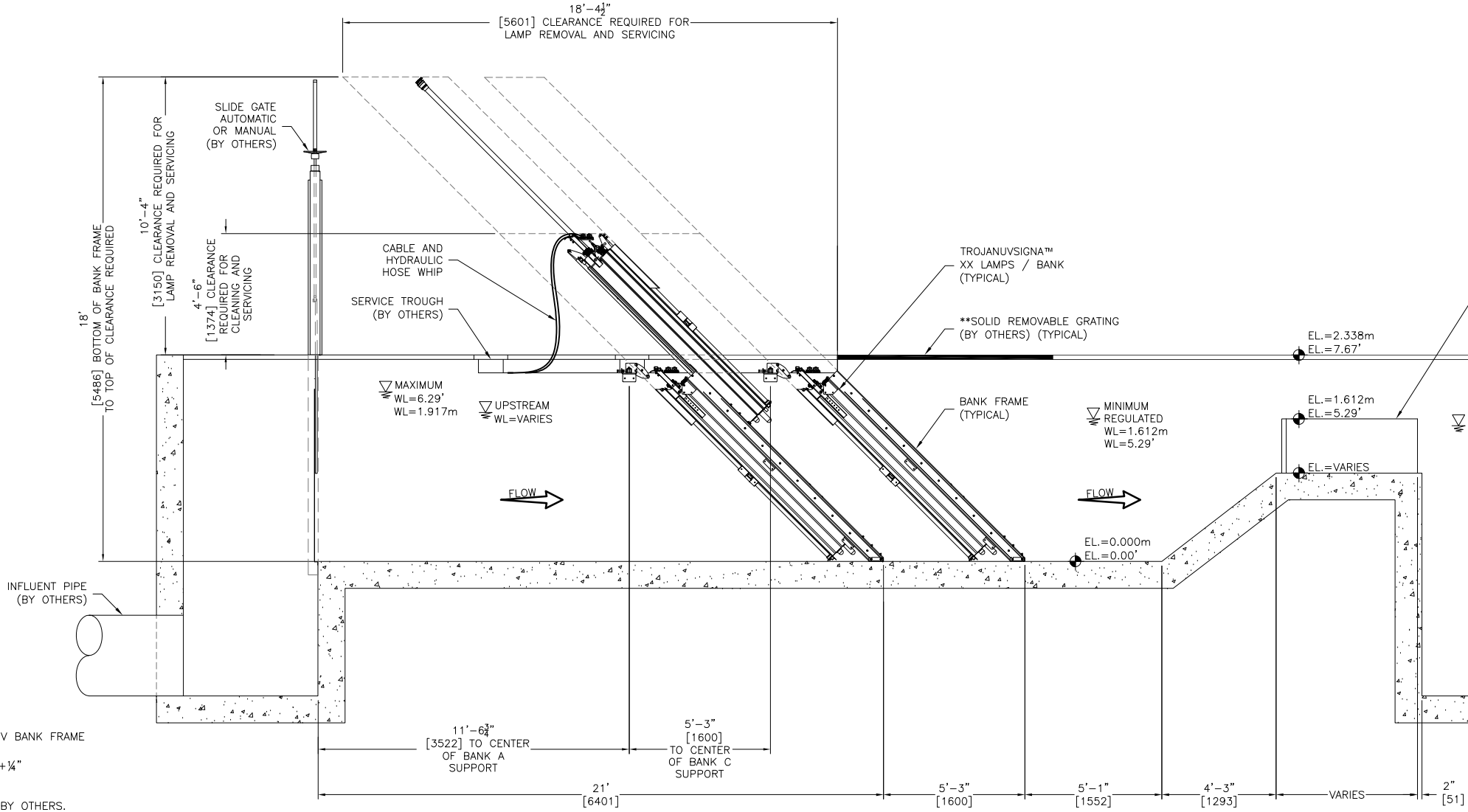


ROUTING PLAN

DELINE
RUCTION.

HYDRAULIC HOSE ROUTING PLAN

SCALE: NOT TO SCALE

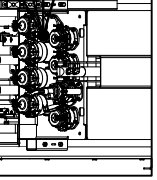


OF −/+1½" AT UV BANK FRAME

LERANCE OF −/+¼"

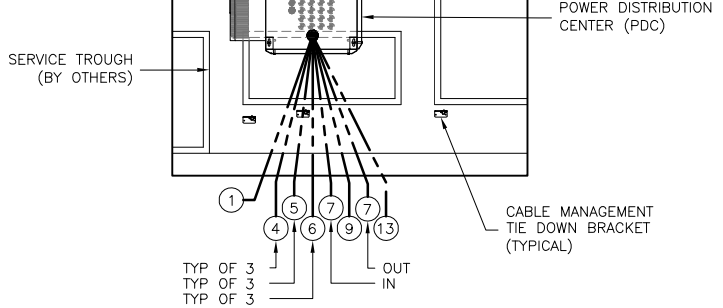
LOGIES,
RCONNECTIONS BY OTHERS.
OJAN UV EQUIPMENT ONLY.
VED BY ONE PERSON.
ORDANCE WITH

(A) SECTION



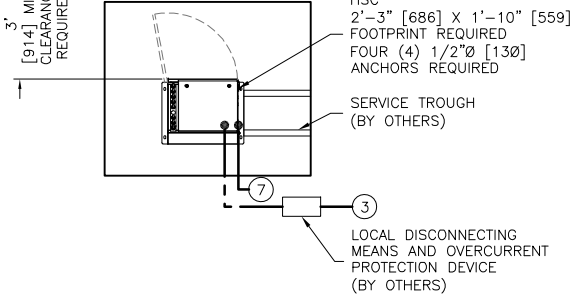
K
ONNECT

UV BANKS.
OWN FOR CLARITY.



PDC INTERCONNECT DETAIL

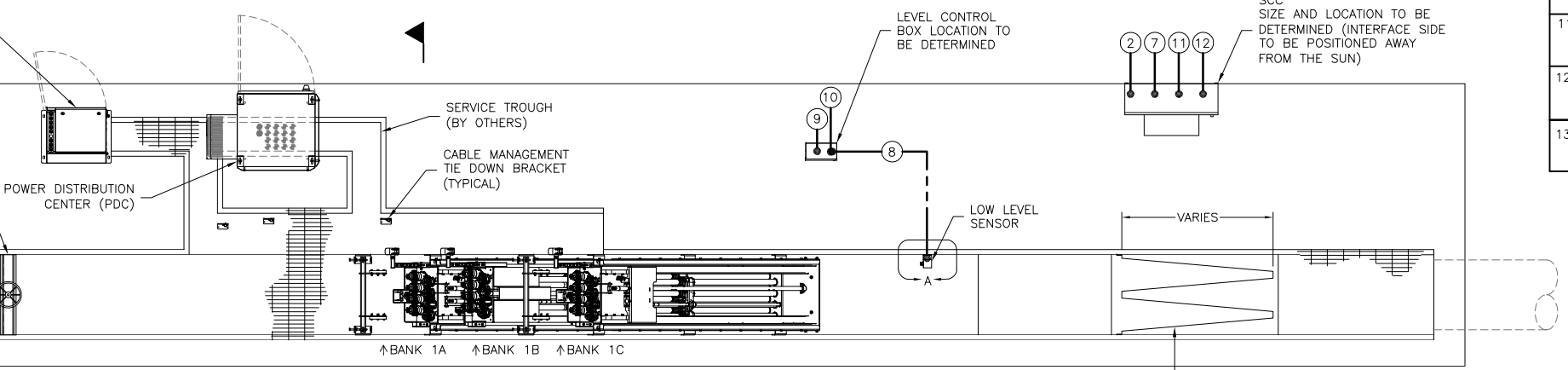
SCALE:NOT TO SCALE



HSC INTERCONNECT DETAIL

SCALE:NOT TO SCALE

	XX AMPS MAXIMUM CURRENT/PH XX kVA/PDC POWER DRAW
2	SYSTEM CONTROL CENTER (SCC)* POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROU
3	HYDRAULIC SYSTEM CENTER (HSC POWER SUPPLY 480V, 3 PHASE, 3 WIRE + GROU
4	BONDING CONDUCTOR (CABLE BY 8 AWG TYPE TWH STRANDED
5	UV INTENSITY 4–20mA ANALOG INPUT
6	BANK IN PLACE PROXIMITY SENS 3 CONDUCTOR CABLES (SUPPLIE
7	MODBUS BELDEN 3106A OR EQUIVALENT (1 LINE PER CHANNEL)
8	DISCRETE LOW LEVEL SIGNAL 12 VDC – 2 CONDUCTORS
9	DISCRETE WATER LEVEL SIGNAL 2 CONDUCTORS
10	LEVEL SENSOR CONTROL BOX (L POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROU
11	FLOW METER 4–20 mA, DC ANALOG INPUT (BY OTHERS)
12	ETHERNET/IP COMMUNICATION
13	LAMP CABLES (SUPPLIED BY TRO (ROUTED BY OTHERS)



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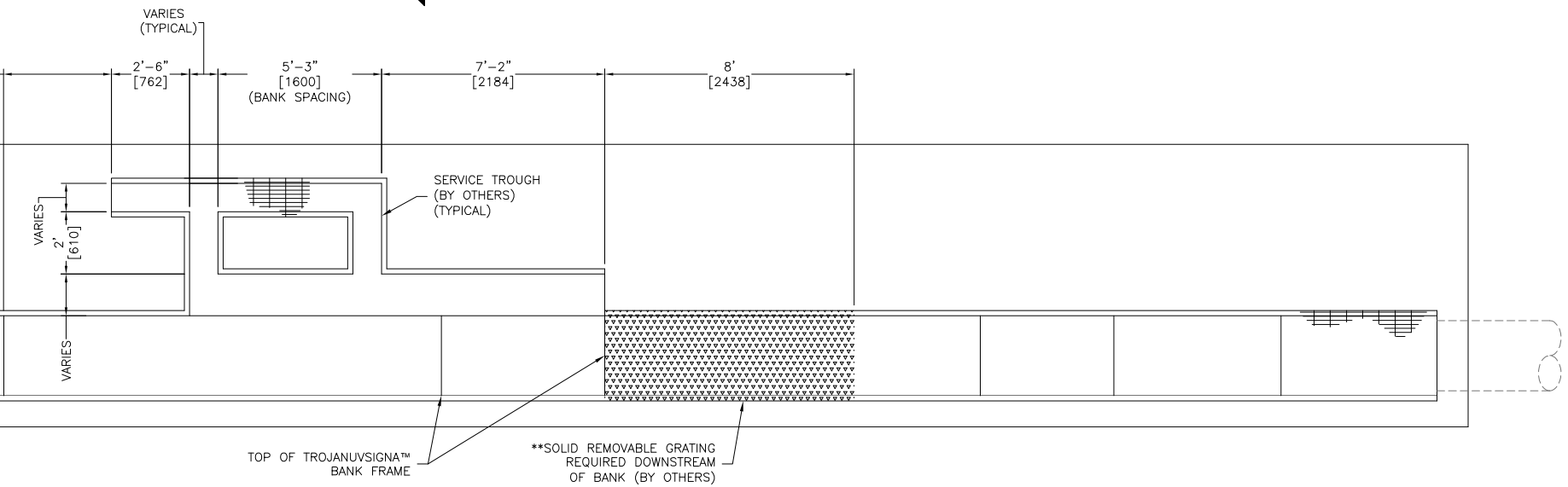
D01 D03



NOTES:

: DO NOT SLOPE CHANNE
: CHANNEL WIDTH MUST E
AND –/+¼" FOR REST
: ALL CHANNEL ELEVATION
AGAINST A COMMON DA
: ANCHOR BOLTS ARE NO
: SYSTEM CONDUIT, WIRIN
: ELECTRICAL REQUIREMEN
: REMOVABLE GRATING SE
MAXIMUM WEIGHT OF TH
REQUIREMENTS OF THE
: CONTRACTOR TO REVIEW
INSTRUCTIONS PRIOR TO
: EFFLUENT LEVELS SHOW
EFFLUENT LEVELS MAY
: HYDRAULIC HOSE ELEVA
: SITE TO PROVIDE APPRO
AS PART OF THEIR FAL
POINTS MUST BE POSIT
FEET IS OF SUFFICIENT
** SOLID GRATING REQUIR**

LOW LEVEL SENSOR -

ONE PROBE IS TO BE
CUT AT APPROPRIATE
LENGTH BY TROJAN
TECHNICIAN ONLY
(63.5" FROM CHANNEL
FLOOR)

3" RECOMMENDED -

6" RECOMMENDED -