



BARBADOS WATER AUTHORITY

TENDER FOR

THE

SUPPLY AND

INSTALLATION OF A

CHLORINATION SYSTEM

AT THE BRIDGETOWN SEWAGE

TREATMENT PLANT

June 2021

1. GENERAL

The Barbados Water Authority (BWA) is desirous of receiving quotations for the Supply and Installation of a chlorination system at the Bridgetown Sewage Treatment Plant.

BACKGROUND

The purpose of the Bridgetown Sewage Treatment Plant is to treat wastewater from the City of Bridgetown's collection system to a level that is considered acceptable for discharge into the marine environment.

This treatment process involves the use of contact-stabilization activated sludge process in which wastewater flows are combined with activated sludge to remove suspended and dissolved solids.

To minimize the possibility of disease transfer, treated effluent is required to be disinfected prior to discharge to the ocean outfall. Pathogenic organisms must be destroyed before the plant effluent is released into receiving waters. Disinfection of the secondary effluent at the BSTP was achieved through the addition of sodium hypochlorite to the treated effluent before it is discharged into the ocean through the outfall pipe. This sodium hypochlorite was produced next to the raw waste pump wet well by electrolytic generation using seawater and was introduced to the effluent at the effluent chamber.

A fire at the BSTP in 2011 destroyed the majority of chlorination system. However, the area where the chlorination (Chloropac Units) were installed remains occupied by the old pipework of the chlorination system.

The BWA Wastewater Division is currently investigating various process improvements for the previously existing effluent chlorination system at the BSTP, thus resulting in the requirement for the Request for Proposal.

Quotations submitted to the Authority should include a break-down of the materials and labour costs and shall also clearly indicate deliverables, timelines and milestones. Should you have any queries, please do not hesitate to contact Ms. Shenelle Bayley or Mr. Brian

Stuart at (246) 434-4220.

2. INSTRUCTIONS TO TENDERERS

2.1 All bidders must supply the following information in their bids. Failure to provide the information will render the bid null and void: -

- a. Registration number of company;
- b. Country in which company is registered;
- c. The date on which the company was first incorporated and the names and addresses of all company directors. Certified copy must be issued by the Corporate Affairs Registry.
- d. A certified copy of company's Certificate of Incorporation, as evidence that the company is in existence at the date of the bid; Failure to provide the certified copy Certificate of Incorporation will render the tender null and void. Certified copy must be issued by the Corporate Affairs Registry.
- e. Registered office of the company
- f. In the case of sole proprietorships or partnerships, the names and addresses of owners must be supplied. If the business is registered under the Registration of Business Names Act, a copy of the registration must also be provided. Certified copy must be issued by the Corporate Affairs Registry.
- g. Barbadian bidders must provide a copy of their VAT Registration Certificate and Tax Identification Number (TIN).
- h. Bidders should be aware that the labour clauses of (Public Contracts) Act, Cap. 349 shall, in so far as is applicable to the subject of the tender, apply to any contract made in respect of the tender.
- i. The number of calendar days required to start and complete the job once notified.

- j. Tenders should be submitted in a document marked **“Supply and Installation of a chlorination system at the Bridgetown Sewage Treatment Plant”** addressed to:

The Chairman
Tenders Committee
Barbados Water Authority
Pine Commercial Estate
The Pine
St. Michael

to reach the office no later than Friday July 16, 2021 at 4:30pm.

- k. Bidders should first proceed to the receptionist, sign the register, then placed their bids in the Tenders Box which is located at the Barbados Water Authority’s Office at the BWA’s Headquarters at Pine Commercial Estate, St Michael.
- l. No Tender will be considered unless it complies with the conditions set out in this Notice.
- m. The Barbados Water Authority does not bind itself to accept the lowest or any tender.
- n. Any tender delivered after the closing date and time or any extension thereof shall not be considered.
- o. The Barbados Water Authority reserves the right to withdraw this tender notice at any time.
- p. The BWA reserves the right to annul the process at any time prior to the award of Contract without incurring any liabilities.

2.3 All tenders must be quoted in either **Barbados or US Dollars, CIF Bridgetown Barbados**. Prices quoted in Barbados dollars by local bidders must be **duty free and**

exclusive of VAT. Tenders quoted in US dollars will be evaluated using the prevailing exchange rate at the date of closing of the tender. Payments in US dollars shall be made at the buying rate set by The Central Bank of Barbados at the time of payment. Quotations must include a break-down of costs for materials and labour, and shall also clearly indicate deliverables, timelines and milestones

2.4 **Payment terms and a delivery schedule must be included in your response.**

2.5 The BWA reserves the right to refuse any tender that does not conform to the requirements of this document.

2.6 The successful bidder(s) will be required to enter into a formal contract with the Barbados Water Authority.

3. PENALTIES

The Barbados Water Authority reserves the right to apply and enforce penalties against a tenderer for delays occasioned by him in the execution of these works. The penalty shall apply from the stated completion date of the particular phase. The total penalty shall not exceed 5% of contract sum for the initial first late month, and 10% for any late months thereafter. When the lack of performance directly impacts the BWA's operations penalties in the form of a retention on payments due to the tenderer will be applied.

4. DELIVERY CONDITIONS

The successful Tenderer(s) will be furnished with a delivery schedule with specific dates for the execution of the works as agreed between the tenderer and the BWA. Failure to adhere to the delivery schedule will result in penalties as stated in clause 3. Delivery of the works have to be coordinated with the BWA (e.g. it may be convenient to do most of the work at night) so that disruptions to the water supply to customers is minimized.

CONDITIONS OF TENDERING

1. **Acceptance of Tender and Tenderer's Expenses**

The BWA shall not reimburse the tenderer for any expense incurred in the preparation of this tender.

2. **Firm Price**

No price variation clause may be included in the Tender. Prices must be quoted in Barbados or US dollars (for overseas companies) and such prices shall include r all

materials, labour, plant, equipment, transport, handling of materials and plant, tools and appliances, management fees and all/any other things necessary for the execution of the works. Price(s) quoted in Barbados dollars must also be inclusive of VAT and any taxes that may apply at the time of contract signing.

3. **Payments**

Payments may be made after the completion of each item of work or when the entire job is completed. The method to be followed shall be agreed by the BWA and the Contractor prior to the starting of the contract. Prior to any payment, the Contractor shall submit to the BWA a statement in a form acceptable to the BWA, signed by the Contractor the cumulative amounts and value of work carried out as of the date of the statement and accompanied by schedules and other such data to assist the BWA in evaluating the value of work carried out. The statement shall also show the cumulative amount and value of work paid by the BWA as of the date of the statement and the balance amount and value of work claimed by the Contractor.

4. **Insurance**

The Contractor shall obtain adequate insurance and shall indemnify the BWA against all claims for death, injuries, damage to property and losses sustained by the Contractor during the performance of duties under this Contract.

5. **Addenda**

Any interpretation of, or change in the Tender Document prior to the specified closing date, will be made only by Addendum issued by the Barbados Water Authority to each Bidder to whom the Tender Document has been issued and it shall become part of the Tender Document.

6. **Contract Documents**

The Contract documents will comprise of the following:

- (a) The Schedule of Requirements
- (b) The Conditions of Contract
- (c) The Technical Specifications

7. **Compliance with Conditions of Tendering**

The Tenderer must comply with all the above Conditions of Tendering. Failure to comply with or breach of any of the Conditions shall disqualify the Tender.

8. **Performance Security**

8.1 The successful Tenderer(s) shall furnish the performance security for the performance of the contract in a form acceptable to the BWA within twenty-seven (27) days of the receipt of notification of award from the BWA. The performance security shall be in a sum equivalent to ten percent (10%) of the contract price. The proceeds of the performance security shall be payable to the Barbados Water Authority as compensation for any loss resulting from the successful tenderer's failure to complete its obligations under the contract. If the tenderer shall be in default of any of the terms and conditions of the contract, the BWA shall be entitled to make a claim against the performance security. The claim shall be in writing to the agency, bank or insurance company that issues the performance security.

8.2 The performance security shall be valid for one (1) year after the date for completion of the tenderer's obligations, and shall be denominated in the currency of the contract or in a freely convertible currency acceptable to the BWA and shall be in one of the following forms:-

- a) A bank guarantee irrevocable letter of credit, issued by a bank located in Barbados, acceptable to the BWA and in the form provided in the Bidding Document or another form acceptable to the BWA; or
- b) A cashier's or certified cheque payable to the BWA.

8.3 The performance security will be discharged by the BWA and returned to the tenderer not later than one (1) year following the date of completion of the tenderer's performance obligations, including any warranty under the Contract.

9. **Evaluation Criteria:**

The BWA will seek to select the most economically and technically advantageous

tender with the optimum price/quality split. The Tenderer with the lowest initial quote will not necessarily be selected since the BWA will consider the whole life cycle costs of the goods to include cost of spare parts, maintenance, energy consumption and disposal.

The BWA may make its final determination on a combination of the following:

- (a) Experience of the proposed personnel relative to the project requirements
- (b) Equipment Specifications
- (c) Cost
- (d) Project Execution Plan

1. **Termination of Contract**

This Contract shall be terminated by any one of the parties to the Contract by a written notice of sixty (60) calendar days. The BWA shall be entitled to terminate this Contract and to recover from the Contractor the amount of any loss resulting from such determination due to non-performance by the Contractor.

SCOPE OF WORKS

1.1 Chlorination System

The following provides the general requirements for a new Chlorination system:

- The chlorination system should be designed so that the travel time from the effluent chamber to the outfall provides sufficient contact time for disinfection to occur.
- The system should be designed so that a chlorine residual of 0.5 mg/L to 2.0 mg/L is achievable at the chlorine residual testing point at Trevor's Way.
- The supply and installation of three 10lbs/hr sodium hypochlorite generators connected via parallel piping to a common discharge pipe.
- Generators should be rated to handle 12-50 US gpm with an average of 25 US gpm.
- Units should be installed with all the necessary electrical components, and each generator shall be equipped with its own controller, inlet and outlet valves, as well as inlet flow meter and flow switch.
- Units should be compatible with public electricity supplied by the Barbados Light and Power Company.
- Units should be capable of being controlled automatically or manually.

- Submission shall include any and all civil and electrical works required to make the chlorination system fully operable.

1.2 Design Criteria

- BSTP Station Peak Design Flow: 9.6 US MGD
- BSTP Average Daily Design flow: 2.4 US MGD
- All on-site measurements to be confirmed by the contractor

1.3 Specific Requirements

See Appendix

1.4 RECONNAISSANCE AND FIELD SURVEYS

- Supplier/Contractor to define and analyse the feasibility of proposed alternatives, identify impacts and discuss as appropriate.
- Supplier/Contractor to prepare draft layout plans for the proposed project alternatives addressing desired objectives, process changes, and construction phases.
- Supplier/Contractor to perform field reconnaissance and prepare a record of site conditions.
- Supplier/Contractor to obtain and review available information relevant to this project from the BWA's Wastewater Division, inclusive of base maps and drawings pertinent to project and adjacent areas and as-built plans.
- Supplier/Contractor to perform field data collection surveys to obtain the location of plumbing fixtures, piping, and electric conduit, etc. that may pose challenges to the project.
- Supplier/Contractor to perform exploratory digs as needed to verify the exact location and depth of existing utilities so as to avoid conflicts with all proposed improvements.
- Supplier/Contractor shall coordinate all details of the equipment with other related parts of the work.
- Supplier/Contractor shall verify that all structures, piping, wiring, and equipment components are compatible. Contractor shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions or other characteristics from these specifications.

1.5 SUBMITTALS

- The Supplier shall submit four (4) copies of the following information at a minimum for review and approval:
- Certified general arrangement drawings showing all important details including materials of construction, dimensions, loads on supporting structures, and anchor bolt locations.
- Descriptive literature, bulletins and/or catalogs of the equipment.
- Complete data on motors and gear reducers.
- Wiring diagrams and electrical schematics for all control equipment to be furnished.

1.6 WARRANTY

- A written supplier's warranty shall be provided for the equipment specified in this section. The warranty shall be for a minimum period of one (1) year from start-up or 18 months from time of equipment shipment, whichever comes first. Such warranty shall cover all defects or failures of materials or workmanship which occur as the result of normal operation and service.

Should you have any queries, please do not hesitate to contact Ms. Shenelle Bayley or Mr. Brian Stuart at shenelle.bayley@bwa.gov.bb or brian.stuart@bwa.gov.bb.

APPENDIX 1

CHLORINATION SYSTEM SPECIFIC REQUIREMENTS

PART 1: GENERAL

1. Contractor shall furnish and install three (3) skid mounted 10lbs/hr sodium hypochlorite generators connected via parallel piping to a common discharge pipe.
2. The system shall be equipped with technology proven to minimise the growth of aquatic species.
3. System shall produce sodium hypochlorite (NaOCl) on-site and on demand using Concentric Tube Electrode (CTE) electrolysis technology.

PART 2: DESIGN DATA

1. Nominal Output15Kg/L (Chlorine Equivalent)
2. Nominal NAOCL Concentration1071 mg/L
3. Nominal System Flowrate14,000 L/hr
4. Minimum/Maximum Feed Pressure75 psi to 275 psi
5. Feed Water Temperature>4°C to <35°C
6. Feed Water Slainity>15g/L Chloride

Equipment to consist of the following:

- Concentric Tube Electrode (CTE) electrolysis module
- Transformer Rectifier (T/R) module
- Continuous dosing and shock dosing pumps module with dosing manifold
- Storage tank/vent with de-gassifier system
- Control Panel for locating in customer-furnished control room

Skid Equipment Specifications

Skid Fabrication		316 Stainless Steel
High Pressure Process Pipework	1,900 kPa	Titanium Grade 2
High Pressure Process Valves		Aluminium Bronze ANSI 150 or Similar
Low Pressure Process Pipework	PN10	PVC-C +GF+ or Similar
Low Pressure Process Valves	Butterfly	PN10 Rated– EPDM Lined
	Diaphragm	PN10 Rated – PVC-C
	Ball	PN10 Rated – PVC-C
Control Valves	Globe	Lined Cast Valve PN 16
Pressure Relief Valve		Aluminium Bronze ANSI 150 or Similar
Instruments	Pressure	Siemens Sistrans, Emerson or Similar
	Flow	Siemens Mag3100, Emerson or Similar
Pneumatic Pipework		316SS 6mm
Degassing Fan		1,200 m3 /hr direct-drive centrifugal
Chlorine Dosing Pump	5.0 Bar	Simplex Grundfos CRT Titanium Range or similar

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PART 3: DESIGN & MANUFACTURING STANDARDS

Standards Structural Frameworks and Skids

- Designed in accordance with Eurocode 3
- Materials of Manufacture:
 - Stainless Steel 316

- Welding:
 - Procedure: ISO 15614-1 / ASME IX or equivalent
 - ISO 9606-1 / ASME IX or equivalent

Transformer Rectifiers

Designed in accordance with BS EN 60146-1-1 and –3 Low Voltage Directive for Installation in a Safe Area.

Electrolyser Systems

ATEX Models:

- Exe ib IIC T6 Gb Tamb -20°C to + 40°C
- IEC 60079-0:2011
- IEC 60079-11:2011
- IEC 60079-7:2006-7
- Directive 94/9/EC and EN ISO/IEC 80079-34

Degassing Tank

Manufactured in accordance with BS EN 13121-3:2016

Process Pipework

Titanium Grade 2

- Pipe ASTM B 861
- Fittings ASTM B 363 / B381 / B265
- Flanges ANSI 150#

C-PVC PN16

- Pipe DIN 8079
- Fittings DIN 8063
- Flanges BS EN 1092

Process Valves

- Globe PCV / LCV : EN 60534-2-1 and ISA 75.01
- Manual PVC Ball : ASTM F 1970
- Manual PVC Diaphragm : ISO 15493, KIWA 49 and 549, DIN 8062 and 8063
- PSV : Pressure Equipment Directive 97/23/EC of May 97
Set pressure (ASME), leak test (API 527) & hydro test (ASME B16.34)

Degassing Fans [2 x 100% Duty/Standby]

In accordance with Directive 94/9/EC [EEx d, EEx e and EEx n certification], Tested to BS EN 848

Dosing Pump [1 x Duty]

Vertical, multistage centrifugal pump. Materials in contact with the liquid are in Titanium. EEx d rated 3 Phase motor.

PART 4: DELIVERY, STORAGE, AND HANDLING OF EQUIPMENT

- A. All equipment shall be shipped and delivered fully assembled, except where partial disassembly is required in order to conform to transportation regulations or for the protection of components.
- B. Contractor shall be responsible for unloading of the machinery and shall have equipment on-site available at the time of delivery permitting proper hoisting of the equipment.

