

**BLDC Water Wastewater Infrastructure Program
Tender Package # 2F – Pumping Station Upgrades – St. George’s Club, Tiger Bay,
and Market Wharf**

Annex A - Form of Agreement

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CONTRACT - Plant and Design-Build Contract - GENERAL CONDITIONS

The conditions of contract are the **Conditions of Contract for the Short Form of Contract, First Edition 1999**, published by the Federation Internationale des Ingenieurs-Conseils (FIDIC). This document is attached.

The General Conditions of Contract are amended by the Particular Conditions of Contract as listed in **Part A and B** below.

The Contractor acknowledge receiving a copy of the Condition of Contracts referenced above and fully adhere to the terms and conditions stipulated within including Particulars Conditions (Part A and B)

Signature: _____	Authorised to sign on behalf of the Contractor
Name: _____	Date: _____
Capacity: _____	

AGREEMENT

The Employer is

Bermuda Land Development Company Limited
1 Triton House, Longfield Road, Southside, St. David's, DD03
P.O. Box GE 220 St. Georges GE BX, Bermuda

The Contractor is

The Employer desires the execution of certain Works known as

BLDC Water Wastewater
Infrastructure Program Tender
Package # 2F

OFFER

The Contractor has examined the documents listed in the Appendix which forms part of this Agreement and offers to execute the Works in conformity with the Contract for the sum of

(in words)

(in figures)

This offer, of which the Contractor has submitted two signed originals, may be accepted by the Employer by signing and returning one original of this document to the Contractor before

(insert date)

The Contractor understands that the Employer is not bound to accept the lowest or any offer received for the Works.

Signature:

Authorised to sign on behalf of the Contractor

Name:

Date:

Capacity:

ACCEPTANCE

The Employer has by signing below, accepted the Contractor's offer as per submitted Annex B and agrees that in consideration for the execution of the Works by the Contractor, the Employer shall pay the Contractor in accordance with the Contract. This Agreement comes into effect on the date when the Contractor receives one original of this document signed by the Employer.

Signature:

Authorised to sign on behalf of the Ministry of
Public Works

Name:

Date:

Capacity:

Appendix- Particular Conditions of Contract

Particular Conditions of Contract: *Part A - Contract Data*

The following Particular Conditions of Contract (PCC) shall supplement the General Conditions of Contract (GCC) within the FIDIC Short Form, First Edition 1999. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC. These Particular Conditions supplement the General Conditions, and shall modify, delete and/or add to the General Conditions. Where any clause, paragraph, or sub-paragraph in the General Conditions is supplemented, amended and/or deleted/superseded by one of the following paragraphs, the provisions of such clause, paragraph, or sub-paragraph shall remain in effect and the altered or added provisions shall be considered as added, amended, deleted or superseded shall remain in effect. Clause numbers herein refer to the same clause numbers as in the General Conditions.

Ref. GCC Sub-Clauses	Conditions	Data
1.0 General Provisions		
1.1.4.1	Employer's name and address	Bermuda Land Development Company Limited (BLDC) 1 Triton House, Longfield Road, Southside, St. David's, DD03 P.O. Box GE 220 St. Georges GE BX , Bermuda
1.3.1	Documents forming the Contract listed in order of priority	(a) The Contract Agreement (Annex A) with Particulars (Part A & B) (b) Letter of Acceptance (b) Annex B – Pricing Proposal Price breakdown (c) Appendix D – FIDIC Acknowledgement (d) Addenda (e) Annex C -Specifications (f) Drawings (g) any other Annexes and documents forming part of the Contract
1.4.1	Governing Law	Bermuda Arbitration Act 1986
1.4.2	Ruling language /Communications	English
1.6.1	Statutory Obligations	Laws of Bermuda
3.0 Employer's Representative		
3.2.1	Employer's Representative and Engineer's name	Stephen Tucker, BLDC Special Projects Manager
3.2.2	Engineer's & Employer's Representative	Adel Wehbi, Milhouse Eng. Sam Watters, On-Site Eng. Keith Claridge,
7.1 Time for Completion		
7.1.1	Time for Completion	10 Weeks after NTP date Issuance
7.1.2	Form of Programme	Microsoft Project – Electronic Format
7.1.3	Time for access to the Site	<u>14</u> days after Award Issuance
7.1.4	Normal working hours	Bermuda allowed Daytime Working hours.

7.4.5	Maximum amount of delay damages (Penalties)	\$250 per day up to a maximum of 10% of the final Contract Price.
7.4.6	NTP means Construction Field Startup date	Within 14 Days of issuance of Award letter.
Ref. GCC Sub-Clauses	Conditions	Data
9.0 Defects Liability		
9.1.1	Defects Notification Period	365 days After Taking Over Notice Issued by Employer under Sub-Clause 8.2
10.0 Variations and Claims		
10.2	Variations and Claims -Day work rates	Signed Tender Annex B– Contract Price Breakdown for Unit prices And Hourly/Daily Rates
11.0 Contract Price and Payment		
11.1.1	Lump Sum Price Subject to Re-Measurement	Annex B - Proposal Price Breakdown
11.1.2	Currency of payment	Bermuda Dollars
11.2.1	Percentage of Retention	__10__%
11.3.1	Percentage of value of Materials and Plant	Materials 80% Plant 90%
11.7	Rate of Interest	0.5% Per Annum
14.0 Insurance		
14.1.1	The Works, Materials, Plant and fees	The sum stated in the Agreement plus 15%
14.1.2	Contractor's Equipment	Full replacement cost
14.1.3	Third party injury to persons and damage to property	\$ 2,000,000.00
14.1.4	Workers Compensation	\$ 2,000,000.00
14.1.5	Periods for submission of insurance: a. evidence of insurance. b. relevant policies	__14__ days __14__ days
15.0 Claims Disputes and Arbitration		
15.3.1	Rules and Appointing Authority	In accordance with the Bermuda Arbitration Act 1986
15.3.2	Place of Arbitration	Bermuda

Particular Conditions of Contract: *Part B - Special Provisions*

Sub-Clause 1.1: Definitions

- 1.1.1 Delete the whole contents and replace with:
“**Contract**” means the Contract Agreement Annex A, the Letter of Acceptance, the Letter of Tender, these Conditions, the Employer's Design Documents & Specifications, the Schedules, the Contractor's Proposal Annex B, Annex C, Annex D, Annex E, Annex F, Annex F, and the further documents (if any) which are listed in the Contract Agreement Annex A or in the Letter of Acceptance.
- 1.1.1.1 Add the whole Content:
“**Letter of Acceptance**” means the Contract Agreement and the date of issuing or receiving the letter of Acceptance means the date of Contract Agreement.
- 1.1.4.2 Add the whole Content:
“**Employer's Representative**” means the person named as the Employer Representative in the Contract Data and the Engineer, the Engineer's Representative (if Appointed), and all other staff, labor and other employees of the Engineer of the Employer engaged in fulfilling the Employer's obligations under the Contract; and any other personnel identified as Employer's Personnel, by a Notice from Employer or the Engineer to the Contractor.
- 1.1.4.3 Add the Whole Content
“**Engineer**” means the person named in the Contract Data appointed by the Employer to act as the Engineer for the purposes of the Contract.
- 1.1.4.4 Add the whole Content:
“**Engineer's Representative**” means the natural person who may be appointed by Engineer or stated in the Contract Data.
- 1.1.4.5 “Particular Conditions” means the document entitled particular conditions of contract included in the Contract, which consist of Part A – Contract Data and Part B – Special Provisions.
- 1.1.4.6 “**Programme**” Means a detailed time programme prepared and submitted by the contractor to which the Engineer has given (or is deemed to have given) a Notice of No- objection under Sub- Clause 8.3 [Programme]
- 1.1.4.7 “**Time for Completion**” means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [Time for Completion], as stated in the Contract Data as may be extended under Sub-Clause 8.5 [Extension of Time for Completion], calculated from the Commencement Date.

3 Employer's Representative: Add the following Sub-Clauses:

3.3

The Engineer

The Employer shall appoint the Engineer, who shall carry out the duties assigned to the Engineer in the contract. The Engineer shall be vested with all the authority necessary to act as the Engineer under the Contract.

If the Engineer is a legal entity, a natural person employed by the Engineer shall be appointed and authorized to act on behalf of the Engineer under the Contract.

3.4

The Engineer's Representative

The Engineer may appoint an Engineer's Representative and delegate to him/her in the authority necessary to act on the Engineer's behalf at the Site,

The Engineer's Representative (if appointed) shall be based at the Site the whole time that the Works are being executed at the Site. If the Engineer's representative is to be temporarily absent from the Site during the execution of the Works, an equivalently qualified, experienced and competent replacement shall be appointed by the Engineer, and the Contractor shall be given a Notice of such replacement

3.5

Engineer's Instructions

The Engineer may issue to the Contractor (at any time) instructions which may be necessary for the execution of the Works, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from the Engineer's Representative (if appointed) or an assistant to whom the appropriate authority to give instruction has been delegated to.

Subject to the following provisions of this Sub-Clause, the Contractor shall comply with instructions given by the Engineer or the Engineer's Representative (if appointed) or delegated assistant, on any matter related to the contract.

If an instruction states that it constitute a Variation, Sub-Clause 10.1{*Right to Vary*} shall apply.

If not so stated, and the Contractor considers that the instruction:

- (a) Constitutes a Variation (or involves work that is already part of an existing Variation); or
- (b) Does not comply with applicable Laws or will reduce the safety of the Works or is technically impossible

The Contractor Shall immediately, and before commencing any work related to the instruction, give a Notice to the Engineer with reasons. If the Engineer does not respond within 7 days after receiving this Notice, by giving a Notice confirming, reversing or varying the instruction, the Engineer shall be deemed to have revoked the instruction. Otherwise the Contractor shall comply with and be bound by the terms of the Engineer's response.

4The Contractor

Add the following Sub-Clauses:

4.5 Protection of Utilities	The Contractor shall carry out the Works so that there is the minimum of interruption to the supply of water, data/communications, electricity and other services through existing mains and services. Work involving interference with existing works of any kind shall only be carried out with the permission of and during such times and in such a manner as are agreed in writing by the Employer.
4.6 Electricity Water & Gas	<p>The Contractor shall be responsible for the provision of all, power water and other services that he may require for the Works and shall pay and bear all costs associated therewith.</p> <p>The Contractor shall carry out the Works so that there is the minimum of interruption to the supply of water, telephone, electricity and other services through existing mains and services. Work involving interference with existing works of any kind shall only be carried out with the permission of and during such times and in such a manner as are agreed in writing by the Engineer or competent Authority</p>
4.7 Reporting of Errors	The Contractor shall examine and compare the Contract Documents and shall report any errors, inconsistencies, or omissions he may find to the Employer immediately.
4.8 Damage to Persons & Property	<p>The Contractor shall, immediately on occurrence of any incident involving loss or injury at or about the Site, or in connection with the execution of the Works, report such incident to the Engineer or the Engineer's Representative. The Contractor shall also report such incident to the appropriate Authority whenever such report is required by Law.</p> <p>.</p>
4.9 Rates, Wages, Hours and Conditions of Labour	The Contractor shall pay to all Foremen, Craftsmen, and Labourers not less than the rates of wages for the various Foremen, Craftsmen, and Labourers that prevail in Bermuda, and comply with such requirements relating to hours of work and conditions of labour as are or may be laid down from time to time by the Laws of Bermuda.
4.10 Facilities for Staff & Labour	The Contractor shall provide such accommodation and amenities as he may consider necessary for all his expatriate staff and labour, employed for the purposes of or in connection with the Contract. The Contractor shall comply with all local statutes and regulations and any amendments thereto with regard to the health and safety of his employees and others, and shall provide adequate latrines for his workers on the Site to conform to the requirements of the Department of Health.
4.11 Display of Notices	The Contractor shall post notices to inform the workers of their conditions of work in conspicuous places at the establishments and work places concerned.
4.12 Alcoholic Liquor & Drugs	The Contractor shall not, otherwise than in accordance with the Statutes, Ordinance and Government Regulations or Orders for the time being in force, import, sell, give, barter, or otherwise dispose of any alcoholic liquor, or drugs, or permit, or suffer any such importation, sale, gift, barter, or disposal by his sub-contractors, agents, or employees.

4.13 Arms and Ammunition The Contractor shall not give, barter, or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same aforesaid.

4.14 Festivals & Religious Festivals The Contractor shall in all dealings with labour in his employment have due regard to all recognized festivals, public holidays, days of rest, and religious or other customs.

4.15 Epidemics In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders, and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.

7.0 Time for Completion Delete Sub-Clauses 7.2, and replace with the following:

7.2 Programme

The Contractor shall submit an initial programme for the execution of the Works to the Engineer within 28 days after receiving the Notice under Sub-Clause [Commencement of Works]. This programme shall be prepared using programming software stated in the Specification (if not stated, the programming software acceptable to the Engineer). The Contractor shall also submit a revised programme which accurately reflects the actual progress of Works, whenever any programme ceases to reflect actual progress or is otherwise inconsistent with the Contractor's obligations.

The initial programme and each revised programme shall be submitted to the Engineer in one paper copy, one electric copy and additional paper copies (if any) as stated in the Contract Data, and shall include:

- a) The Commencement Date and the Time for Completion, of the Works and of each Section (if any);
- b) The date right of access to and possession of (each part of) the Site is to be given to the Contractor in accordance with the time (or times) stated in the Contract Data. If not stated, the dates the Contractor requires the Employer to give right of access to and possession of (each part of) the Site;
- c) The sequence and timing of inspections and test specified in, or required by, the Contract;
- d) For a revised programme: the sequence and timing of the remedial work (if any) to which the Engineer has given a Notice of No-objection under Sub- Clause [Defects & Rejection] and/or the remedial work (if any) instructed under Sub- Clause [Remedial Work];
- e) All activities (to the level of detail stated in the Specification), logically linked and showing the earliest and the latest start and finish dates for each activity, the float (if any), and critical path(s);
- f) The dates of all locally recognized days of the rest and holiday periods (if any);
- g) All key delivery dates of Plant and Materials;

- h) For a revised programme and for each activity: the actual progress to date, any delay to such progress and the effects of such delay on other activities (if any); and
- i) If a revised programme, identification of any significant change(s) to the previous programme submitted by the Contractor; and
- j) The Contractor's proposals to overcome the effects of any delay(s) on the progress of the Works.

10.0 Variations and Claims

Delete Sub-Clauses 10.1 & 10.5, and replace with the following and Add Sub-Clause 10.6

10.1 Right to Vary

Variations may be initiated by the Engineer at any time before the issue of the Taking-Over Certificate for the Works

The Contractor shall be bound by each Variation instructed and shall execute the Variation with due expedition and without delay, unless the Contractor promptly gives a notice to the Engineer stating (with detailed supporting particulars) that;

- a) The varied work was Unforeseeable having regard to the scope and nature of the Works described in the Specification;
- b) The contractor cannot readily obtain the Goods required for the Variation;

10.5 Variation & Claim Procedure

Variation Procedure

10.5.1

The Engineer may instruct a Variation by giving a Notice (describing the required change and stating any requirements for the recording of Costs) to the Contractor in accordance with the Sub- Clause 3.5 [Engineer's Instructions].

The Contractor shall proceed with execution of the Variation and shall within 28 days (or other period proposed by the Contractor and agreed by the Engineer) of receiving the Engineer's instruction, submit to the Engineer detailed particulars including:

- a) A description of the varied work performed or to be performed, including details of the resources and method adopted or to be adopted by the Contractor;
- b) A programme for its execution and the Contractor's proposal for any necessary modifications if any) to the Programme according to Sub-Clause [Programme] and to the Time for Completion; and
- c) The Contractor's proposal for adjustment to the Contract Price by valuing the Variation in accordance with Clause 11 [Contract Price and Payment], with supporting particulars (which shall include identification of any estimated quantities and, if the Contractor incurs or will incur Cost as a result of any necessary modification to the Time for Completion, shall show the additional payment (if any) to which the Contractor considers that the Contractor is entitled) If the Parties have agreed to the omission of any work which is to be carried out by others, the Contractor's proposal may also include the amount of any

loss of profit and other losses and damages suffered (or to be suffered) by the Contractor as a result of the omission.

Thereafter, the Contractor shall submit any further particulars that the Engineer may responsibly require.

The Engineer shall then proceed under Sub- Clause [Agreement or Determination] to agree or determine:

- a) EOT, if any; and/or
- b) The adjustment to the Contract Price (including valuation of the Variation in accordance with Clause 11 [Contract price and Payment] using measured quantities of the varied work)

10.5.2 **Claims**

The claiming Party shall give a Notice to the Engineer, describing the event or circumstance giving rise to the cost, loss, delay for which the Claim is made as soon as practicable, and no later than 28 days after the claiming Party became aware, or should have become aware, of the event or circumstance (the "Notice of Claim" in these Conditions).

If the claiming Party fails to give a Notice Claim within this period 28 days, the claiming Party shall not be entitled to any additional payment, the Contract Price shall not be reduced (in the case of the Employer as the claiming Party), the Time for Completion (in case of the Employer as the claiming Party) shall not be extended, and the other Party shall be discharged from any liability in connection with the event or circumstance giving rise to the Claim.

After Notification to the Engineer, Contractor shall submit a "fully detailed Claim" means a submission which includes:

- a) A detailed description of the event or circumstance giving rise to the Claim;
- b) A statement of the contractual and/or other legal basis of the Claim;
- c) All contemporary records on which the claiming Party relies; and
- d) Detailed supporting particular of the amount of additional payment claimed (or amount of reduction of the Contract Price in the case if the Employer as the claiming Party), and/or EOT claimed (in case of the contractor)

10.6 Value Engineering

The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted:

- a) Accelerate completion
- b) Reduce the cost to the Employer of executing, maintaining or operating the Works,
- c) Improve the efficiency or value to the Employer of the completed Works; or
- d) Otherwise be of behalf to the Employer

The proposal shall be prepared at the cost of the Contractor and shall include the details as stated in the sub-paragraph a to c of the Sub-Clause [Variation by Instruction]

The Engineer shall, as soon as practicable after receiving such a proposal,

respond by giving a Notice to the Contractor stating his/her consent or otherwise. The Engineer's consent or otherwise shall be at the sole discretion of the Employer. The Contractor shall not delay any work while awaiting a response.

If a proposal under his Sub-Clause, to which the Engineer gives his/her consent, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

- i. The Contractor shall design this part at his/her cost; and
- ii. Sub-clause 5.1 & 5.2 [Design by Contractor] shall apply

11.0 Contract Price And Payment

Delete Sub-Clauses 11.1, and replace with the following and Add Sub-Clause 11.1.1:

11.1

Valuation of the Works

Except as otherwise stated in the Contract, the Engineer shall value each item of work by applying the measurement agreed or determined in accordance with Sub-Clause [method Of Measurement], and the appropriate rate or price for the item.

For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the Bill of Quantities in "Annex B" or other Schedule or, if there is no such an item, specified for similar work.

Any item for work which is identified in the Bill of Quantities in "Annex B" or other Schedule, but for which no rate or price is specified, shall be done deemed to be included in other rates and prices in the Bill of Quantities in "Annex B" or other Schedules(s)

A new rate or price shall be appropriate for an item of work if:

- a) The item is not identified in, and no rate or price for this item is specified in, the Bill of Quantities or other Schedule and no specified rate or price is appropriate because the item of work is not of similar character, or is not executed under similar conditions, as any item in the Contract;
- b) The work is instructed under Clause 13 [Variations and Adjustments] and sub-paragraph (a) or (b) above applies

11.1.1

Method of Measurement

The method of measurement shall be as stated in the Contract Data or, if not so stated, that which shall be in accordance with the Bill of Quantities in "Annex B" or other applicable Schedule(s).

Except as otherwise stated in the Contract, measurement shall be made of the net actual quantity of each item of the Permanent Works and no allowance shall be made bulking, shrinkage or waste.

15.0 Resolution of Disputes

Delete Sub-Clauses 15.1, 15.2 & 15.3 in its entirety and replace with the following:

15.1

Agreement or Determination

When carrying out his/her duties under this Sub-Clause, the Engineer shall act neutrally between the Parties and shall not be deemed to act for the Employer. Whenever these Conditions provide that the Engineer shall proceed under this Sub-Clause to agree or determine any matter of Claim, the following procedure shall apply:

15.1.1 **Consultation to reach agreement**

The Engineer shall consult with both Parties jointly and/ or separately, and shall encourage discussion between the Parties in an endeavor to reach agreement. The Engineer shall commence such consultation promptly to allow adequate time to comply with the time limit for agreement under Sub-Clause [Time Limits]. Unless otherwise proposed by the Engineer and agreed by both parties, the Engineer shall provide both Parties with a record of the consultation.

If agreement is achieved, within the time limit for agreement under Sub-Clause [Time Limits], the Engineer shall give a Notice to both Parties.

15.1.2 **Engineer's Determination**

The Engineer shall make a fair determination of the matter or Claim, in accordance with the Contract, taking due regard of all relevant circumstances.

Within the time limit for determination under Sub-Clause 15.1.3 [Time Limits], the Engineer shall give a Notice to both Parties of his/her determination. The Notice shall state that it is a "Notice of the Engineer's Determination", and shall describe the determination in detail with reasons and detailed supporting particulars.

15.1.3 **Time Limits**

The Engineer shall give the Notice of agreement, if agreement is achieved, within 42 days or within such other time limit as may be proposed by the Engineer and agreed by both Parties (the "time limit for agreement" in these Conditions), after:

- a) In the case of a matter to be agreed or determined (not a Claim), the date of commencement of the time limit for agreement as stated in the applicable Sub-clause of these Conditions;
- b) In the case of a Claim under Sub-Clause 10.5.2 [Claims], the date the Engineer receives a Notice under Sub-Clause 10.5.2 from the claiming party;

15.1.4 **Effect of the agreement or determination**

Each agreement or determination shall be binding on both Parties (and shall be complied with by the Engineer) unless and until corrected under this Sub-Clause or, in the case of a determination, it is revised by Engineer's Instruction.

If an agreement or determination concerns the payment of an amount from one Party to the other Party, the Contractor shall include such an amount in the next Statement and the Engineer shall include such amount in the Payment Certificate that follows that Statement.

If, within 14 days after giving or receiving the Engineer's Notice of agreement or determination, any error of a typographical or clerical or arithmetical nature is found:

- a) By the Engineer: then he/she shall immediately advise the Parties accordingly; or
- b) By a Party: then that Party shall give a Notice to the Engineer, stating that it is given under this Sub-Clause and clearly identifying the error. If the Engineer does not agree there was an error, he/she shall immediately advise the Parties accordingly

15.2

Dissatisfaction with Engineer's determination

If either Party is dissatisfied with a determination of the Engineer:

- a) The dissatisfied Party may give a Notice of Dissatisfaction (NOD) to the Engineer
- b) This NOD shall state that it is a "Notice of Dissatisfaction with the Engineer's Determination" and shall set out the reason(s) for dissatisfaction
- c) This NOD shall be given within 28 days after receiving the Engineer's Notice of the determination under Sub-Clause [Engineer's Determination] of, if applicable, his/her Notice of the corrected determination under Sub-Clause [Effect of the agreement or determination] (or, in the case of a deemed determination rejecting the Claim, within 28 days after the time limit of determination under Sub-Clause [Time Limits] has expired); and
- d) Thereafter, either Party may proceed under sub-Clause 15.3 [Arbitration]

In the event that a Party fails to comply with an agreement if the Parties under this Sub-Clause or a final and binding determination of the Engineer, the other Party may, without prejudice to any other rights it may have, refer the failure itself directly to arbitration under Sub-Clause 15.3 [Arbitration].

15.3

Arbitration

This clause is deleted in its entirety and replaced by:

Unless settled amicably, any dispute shall be finally settled by arbitration, unless otherwise agreed by both Parties:

- a) the dispute shall be finally settled in accordance with the Bermuda Arbitration Act 1986
- b) the dispute shall be settled by arbitrators appointed in accordance with the said Act, and
- c) the arbitration shall be conducted in the English language.

The arbitrator(s) shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute. Nothing shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence nor did arguments previously put before the Engineer to obtain his decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the Engineer shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works, by mutual agreement. The obligations of the Parties and the Engineer shall not be altered by reason of any arbitration being conducted during Works.

C. Additional Clauses to be added to the GENERAL CONDITIONS

16.0

Plant, Materials and Workmanship

Add the following sections :

16.1

Manner of Execution

The Contractor shall carry out the manufacture, supply, installation, testing and commissioning and/or repair of Plant, the production, manufacture, supply and testing of Materials, and all other operations and activities during the execution of the Works:

- a) in the manner (if any) specified in the Contract;
- b) in a proper workmanlike and careful manner, in accordance with recognized good practice; and
- c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

16.2

Inspection

The Employer's Personnel shall, during all the normal working hours stated in the Contract data and at all other reasonable times:

- a) have full access to all parts of the Site and to all places from which natural Materials are being obtained;
- b) during production, manufacture and construction (at the Site and elsewhere), be entitled to:
 - i. examine, inspect, measure and test (to the extent stated in the Specification) the Materials, Plant and Workmanship,
 - ii. check the progress of manufacture of Plant and production and manufacture of Materials, and
 - iii. make records (including photographs and/or video recordings); and
- c) carry out other duties and inspections, as specified in these Conditions and the Specification

The Contractor shall give the Employer's Personnel full opportunity to carry these activities, including providing safe access, facilities, permissions and safety equipment.

The Contractor shall give a Notice to the Engineer whenever any Materials, Plant or work is ready for inspection, and before it is to be covered up, put out of sight, or packaged for storage or transport. The Employer's Personnel shall then either carry out examination, inspection, measurement or testing without unreasonable delay, or the Engineer shall promptly give a Notice to the Contractor that the Employer's Personnel do not require to do so.

If the Contractor fails to give a Notice in accordance with this Sub-Clause, the Contractor shall, if and when required by the Engineer, uncover the work and therefor reinstate and make good, all the Contractor's risk and cost.

16.3**Testing by the Contractor**

This Sub-Clause shall apply to all tests specified in the Contract, other than the tests after Completion (if any)

The Contractor shall provide all apparatus, assistance, documents and other information, temporary supplies of electricity and water, equipment, fuel, consumables, instruments, labor, materials and suitably qualified, experienced and competent staff, as are necessary to carry out the specified tests efficiently and properly. All apparatus, equipment and instruments shall be calibrated in accordance with the standards stated in the Specification or defined by applicable Laws and, if requested by the Engineer, the Contractor shall submit calibration certificates before carrying out testing.

The Contractor shall give a Notice to the Engineer, stating the time and place for the specified testing of any Plant, materials and other parts of the Works. The Notice shall be given in the reasonable time, having regard to the location of the testing, for the Employer's Personnel to attend.

16.4**Defects and Rejection**

If, as a result of an examination, inspection, measurements or testing, any Plant, materials, Contractor's design (if any) or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer shall give a Notice to the Contractor describing the item of Plant, Materials, design or workmanship that has been found to be defective. The Contractor shall then promptly prepare and submit a proposal for necessary remedial work.

If the Contractor fails to promptly submit a proposal (or revised proposal) for remedial work, or fails to carry out the proposed remedial work to which the Engineer has given (or is deemed to have given) a Notice of No-objection, the Engineer may:

- a) instruct the Contractor under sub-paragraph (a) and/or (b) of Sub-Clause [Remedial Work]; or
- b) Reject the Plant, Materials, Contractor's design (if any) or workmanship by giving a Notice to the Contractor, with reasons, in which case sub-paragraph (a) of Sub-Clause [Failure to Remedy Defects] shall apply.

17.0**Taxation**

The Contractor shall be required to pay Bermudian Taxes on all Contractor's Equipment (except as described in the Fifth Schedule, Section 2 of the Customs Tariff Act 1970) materials and other things of whatsoever nature brought into Bermuda for the purpose of Contract.

18.0**Bribery**

Any commission, advantage, gift, gratuity, reward, or bribe given, promised, or offered by or on behalf of the Contractor or his agent or servant or any person on his or their behalf to any officer, servant, representative, or agent of the Employer or Engineer or to any person on their behalf or on behalf of any of them in relation to the obtaining or to the execution of this or of any other Contract with the Employer shall in addition to any criminal liability which may be thereby incurred subject the Contractor to the cancellation of this and of all other contracts which he may have entered into with the Employer and also to the payment of any loss or damage resulting from such cancellation.

19.0**Debt Recovery**

The Employer shall be entitled upon a certificate in writing of the Engineer to deduct the amounts so certified from any monies or otherwise due to the Contractor under this or any other contract or to recover the said amounts as a debt due or partly the one and partly the other as the Employer shall deem advisable.

20.0**Strikes and Lock-Outs**

The Contractor shall forthwith notify the Employer of the commencing of any strike or lock-out and the Employer, on account of any delay caused thereby, may grant such extension of time as he considers reasonable, without prejudice to the right of the Employer to exercise after the expiration of such reasonable extension of time the rights and powers under these Conditions in case of default by the Contractor.

21.0**Laws, Regulations and Orders**

The Contractor shall make himself fully acquainted with the Laws, Regulations and Orders of Bermuda and of any competent/statutory Authority and shall conform in all respects therewith during the continuance of the Contract. He shall conform similarly with any such Laws, Regulations and Orders which may come in to force after the date of this Agreement.

22.0**Construction of Contract**

The Contract shall in all respects be constructed and operated in conformity with the Laws of Bermuda and the respective rights and liabilities of the Parties shall be in accordance with the Laws for the time being in force.

23.0**Members and Staff of Employer and Engineer not Personally Liable**

Neither the members nor the staff of the Employer shall be in any way personally bound or liable for the acts or obligations of the Contractor under the Contract or answerable for any default or omission in the observance or performance of any of the acts, matters or things which are herein contained.

24.0**Details to be Confidential**

The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the previous consent in writing of the Employer. If any dispute arises as to the necessity or disclosure for the purpose of the Contract the same shall be referred to the decision of the Employer whose award shall be final.

25.0**Rights and Remedies Not Waived**

In no event shall the making by the Employer of any payment to the Contractor constitute or be construed as a waiver by the Employer of any breach of Contract, or any default which may then exist, on the part of the Contractor, and the making of any such payment by the Employer while any such breach or default exists shall in no way impair or prejudice any right or remedy available to the Employer in respect of such breach or default.

END OF CONTRACT DOCUMENTS

SHORT FORM of Contract

GENERAL CONDITIONS

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FEDERATION INTERNATIONALE DES INGENIEURS-CONSEILS
INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS
INTERNATIONALE VEREINIGUNG BERATENDER INGENIEURE
FEDERACION INTERNACIONAL DE INGENIEROS CONSULTORES



Initials: -----

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General Conditions

1 General Provisions

1.1

Definitions

In the Contract as defined below, the words and expressions defined shall have the following meanings assigned to them, except where the context requires otherwise:

The Contract

1.1.1 "**Contract**" means the Agreement and the other documents listed in the Appendix.

1.1.2 "**Specification**" means the document as listed in the Appendix, including Employer's requirements in respect of design to be carried out by the Contractor, if any, and any Variation to such document.

1.1.3 "**Drawings**" means the Employer's drawings of the Works as listed in the Appendix, and any Variation to such drawings.

Persons

1.1.4 "**Employer**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the Contractor) any assignee.

1.1.5 "**Contractor**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the Employer) any assignee.

1.1.6 "**Party**" means either the Employer or the Contractor.

Dates, Times and Periods

1.1.7 "**Commencement Date**" means the date 14 days after the date the Agreement comes into effect or any other date agreed between the Parties.

1.1.8 "**day**" means a calendar day.

1.1.9 "**Time for Completion**" means the time for completing the Works as stated in the Appendix (or as extended under Sub-Clause 7.3), calculated from the Commencement Date.

Money and Payments

1.1.10 "**Cost**" means all expenditure properly incurred (or to be incurred) by the Contractor, whether on or off the Site, including overheads and similar charges, but does not include profit.

Other Definitions

1.1.11 "**Contractor's Equipment**" means all apparatus, machinery, vehicles, facilities and other things required for the execution of the Works but does not include Materials or Plant.

1.1.12 "**Country**" means the country in which the Site is located.

1.1.13 "**Employer's Liabilities**" means those matters listed in Sub-Clause 6.1.

1.1.14 "**Force Majeure**" means an exceptional event or circumstance: which is beyond a Party's control; which such Party could not reasonably have



provided against before entering into the Contract; which, having arisen, such Party could not reasonably have avoided or overcome; and, which is not substantially attributable to the other Party.

- 1.1.15 **"Materials"** means things of all kinds (other than Plant) intended to form or forming part of the permanent work.
- 1.1.16 **"Plant"** means the machinery and apparatus intended to form or forming part of the permanent work.
- 1.1.17 **"Site"** means the places provided by the Employer where the Works are to be executed, and any other places specified in the Contract as forming part of the Site.
- 1.1.18 **"Variation"** means a change to the Specification and /or Drawings (if any) which is instructed by the Employer under Sub-Clause 10.1.
- 1.1.19 **"Works"** means all the work and design (if any) to be performed by the Contractor including temporary work and any Variation

1.2 **Interpretation** Words importing persons or parties shall include firms and organisations. Words importing singular or one gender shall include plural or the other gender where the context requires.

1.3 **Priority of Documents** The documents forming the Contract are to be taken as mutually explanatory of one another. If an ambiguity or discrepancy is found in the documents, the Employer shall issue any necessary instructions to the Contractor, and the priority of the documents shall be in accordance with the order as listed in the Appendix.

1.4 **Law** The law of the Contract is stated in the Appendix.

1.5 **Communications** Wherever provision is made for the giving or issue of any notice, instruction, or other communication by any person, unless otherwise specified such communication shall be written in the language stated in the Appendix and shall not be unreasonably withheld or delayed.

1.6 **Statutory Obligations** The Contractor shall comply with the laws of the countries where activities are performed. The Contractor shall give all notices and pay all fees and other charges in respect of the Works.

2 The Employer

2.1 **Provision of Site** The Employer shall provide the Site and right of access thereto at the times stated in the Appendix.

2.2 **Permits and Licences** The Employer shall, if requested by the Contractor, assist him in applying for permits, licences or approvals which are required for the Works.

2.3 The Contractor shall comply with all instructions given by the Employer in respect of
Employer's Instructions the Works including the suspension of all or part of the Works.

2.4
Approvals No approval or consent or absence of comment by the Employer or the Employer's representative shall affect the Contractor's obligations.

3 Employer's Representatives

3.1
Authorised Person One of the Employer's personnel shall have authority to act for him. This authorised person shall be as stated in the Appendix, or as otherwise notified by the Employer to the Contractor.

3.2
Employer's Representative The Employer may also appoint a firm or individual to carry out certain duties. The appointee may be named in the Appendix, or notified by the Employer to the Contractor from time to time. The Employer shall notify the Contractor of the delegated duties and authority of this Employer's representative.

4 The Contractor

4.1
General Obligations The Contractor shall carry out the Works properly and in accordance with the Contract. The Contractor shall provide all supervision, labour, Materials, Plant and Contractor's Equipment which may be required. All Materials and Plant on Site shall be deemed to be the property of the Employer.

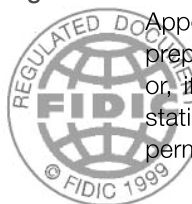
4.2
Contractor's Representative The Contractor shall submit to the Employer for consent the name and particulars of the person authorised to receive instructions on behalf of the Contractor.

4.3
Subcontracting The Contractor shall not subcontract the whole of the Works. The Contractor shall not subcontract any part of the Works without the consent of the Employer.

4.4
Performance Security If stated in the Appendix, the Contractor shall deliver to the Employer within 14 days of the Commencement Date a performance security in a form and from a third party approved by the Employer.

5 Design by Contractor

5.1
Contractor's Design The Contractor shall carry out design to the extent specified, as referred to in the Appendix. The Contractor shall promptly submit to the Employer all designs prepared by him. Within 14 days of receipt the Employer shall notify any comments or, if the design submitted is not in accordance with the Contract, shall reject it stating the reasons. The Contractor shall not construct any element of the permanent work designed by him within 14 days after the design has been



submitted to the Employer or where the design for that element has been rejected. Design that has been rejected shall be promptly amended and resubmitted. The Contractor shall resubmit all designs commented on taking these comments into account as necessary.

5.2

Responsibility for Design

The Contractor shall remain responsible for his tendered design and the design under this Clause, both of which shall be fit for the intended purposes defined in the Contract and he shall also remain responsible for any infringement of any patent or copyright in respect of the same. The Employer shall be responsible for the Specification and Drawings.

6 Employer's Liabilities

6.1

Employer's Liabilities

In this Contract, Employer's Liabilities mean :

- a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country,
- b) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country,
- c) riot, commotion or disorder by persons other than the Contractor's personnel and other employees, affecting the Site and/or the Works,
- d) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component of such an assembly, except to the extent to which the Contractor may be responsible for the use of any radio-active material,
- e) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
- f) use or occupation by the Employer of any part of the Works, except as may be specified in the Contract,
- g) design of any part of the Works by the Employer's personnel or by others for whom the Employer is responsible, and
- h) any operation of the forces of nature affecting the Site and/or the Works, which was unforeseeable or against which an experienced contractor could not reasonably have been expected to take precautions.
- i) Force Majeure,
- j) a suspension under Sub-Clause 2.3 unless it is attributable to the Contractor's failure,
- k) any failure of the Employer,
- l) physical obstructions or physical conditions other than climatic conditions, encountered on the Site during the performance of the Works, which obstructions or conditions were not reasonably foreseeable by an experienced contractor and which the Contractor immediately notified to the Employer,
- m) any delay or disruption caused by any Variation,
- n) any change to the law of the Contract after the date of the Contractor's offer as stated in the Agreement,
- o) losses arising out of the Employer's right to have the permanent work executed on, over, under, in or through any land, and to occupy this land for the permanent work, and
- p) damage which is an unavoidable result of the Contractor's obligations to execute the Works and to remedy any defects.



7 Time for Completion

- 7.1 Execution of the Works** The Contractor shall commence the Works on the Commencement Date and shall proceed expeditiously and without delay and shall complete the Works within the Time for Completion.
-
- 7.2 Programme** Within the time stated in the Appendix, the Contractor shall submit to the Employer a programme for the Works in the form stated in the Appendix.
-
- 7.3 Extension of Time** Subject to Sub-Clause 10.3, the Contractor shall be entitled to an extension to the Time for Completion if he is or will be delayed by any of the Employer's Liabilities.
- On receipt of an application from the Contractor, the Employer shall consider all supporting details provided by the Contractor and shall extend the Time for Completion as appropriate.
-
- 7.4 Late Completion** If the Contractor fails to complete the Works within the Time for Completion, the Contractor's only liability to the Employer for such failure shall be to pay the amount stated in the Appendix for each day for which he fails to complete the Works.
-

8 Taking-Over

- 8.1 Completion** The Contractor may notify the Employer when he considers that the Works are complete.
-
- 8.2 Taking-Over Notice** The Employer shall notify the Contractor when he considers that the Contractor has completed the Works stating the date accordingly. Alternatively, the Employer may notify the Contractor that the Works, although not fully complete, are ready for taking over, stating the date accordingly.
- The Employer shall take over the Works upon the issue of this notice. The Contractor shall promptly complete any outstanding work and, subject to Clause 9, clear the Site.
-

9 Remedying Defects

- 9.1 Remedying Defects** The Employer may at any time prior to the expiry of the period stated in the Appendix, notify the Contractor of any defects or outstanding work. The Contractor shall remedy at no cost to the Employer any defects due to the Contractor's design, Materials, Plant or workmanship not being in accordance with the Contract.



The cost of remedying defects attributable to any other cause shall be valued as a Variation. Failure to remedy any defects or complete outstanding work within a reasonable time of the Employer's notice shall entitle the Employer to carry out all necessary work at the Contractor's cost.

9.2

Uncovering and Testing

The Employer may give instruction as to the uncovering and/or testing of any work. Unless as a result of any uncovering and/or testing it is established that the Contractor's design, Materials, Plant or workmanship are not in accordance with the Contract, the Contractor shall be paid for such uncovering and/or testing as a Variation in accordance with Sub-Clause 10.2.

10

Variations and Claims

10.1

Right to Vary

The Employer may instruct Variations.

10.2

Valuation of Variations

Variations shall be valued as follows:

- a) at a lump sum price agreed between the Parties, or
- b) where appropriate, at rates in the Contract, or
- c) in the absence of appropriate rates, the rates in the Contract shall be used as the basis for valuation, or failing which
- d) at appropriate new rates, as may be agreed or which the Employer considers appropriate, or
- e) if the Employer so instructs, at daywork rates set out in the Appendix for which the Contractor shall keep records of hours of labour and Contractor's Equipment, and of Materials used.

10.3

Early Warning

A Party shall notify the other as soon as he is aware of any circumstance which may delay or disrupt the Works, or which may give rise to a claim for additional payment. The Contractor shall take all reasonable steps to minimise these effects.

The Contractor's entitlement to extension to the Time for Completion or additional payment shall be limited to the time and payment which would have been due if he had given prompt notice and had taken all reasonable steps.

10.4

Right to Claim

If the Contractor incurs Cost as a result of any of the Employer's Liabilities, the Contractor shall be entitled to the amount of such Cost. If as a result of any of the Employer's Liabilities, it is necessary to change the Works, this shall be dealt with as a Variation.

10.5

Variation and Claim Procedure

The Contractor shall submit to the Employer an itemised make-up of the value of Variations and claims within 28 days of the instruction or of the event giving rise to the claim. The Employer shall check and if possible agree the value. In the absence of agreement, the Employer shall determine the value.



11

Contract Price and Payment

11.1
Valuation of the Works The Works shall be valued as provided for in the Appendix, subject to Clause 10.

11.2
Monthly Statements The Contractor shall be entitled to be paid at monthly intervals:

- a) the value of the Works executed,
- b) the percentage stated in the Appendix of the value of Materials and Plant delivered to the Site at a reasonable time,

subject to any additions or deductions which may be due.

The Contractor shall submit each month to the Employer a statement showing the amounts to which he considers himself entitled.

11.3
Interim Payments Within 28 days of delivery of each statement, the Employer shall pay to the Contractor the amount shown in the Contractor's statement less retention at the rate stated in the Appendix, and less any amount for which the Employer has specified his reasons for disagreement. The Employer shall not be bound by any sum previously considered by him to be due to the Contractor.

The Employer may withhold interim payments until he receives the performance security under Sub-Clause 4.4 (if any).

11.4
Payment of First Half of Retention One half of the retention shall be paid by the Employer to the Contractor within 14 days after issuing the notice under Sub-Clause 8.2.

11.5
Payment of Second Half of Retention The remainder of the retention shall be paid by the Employer to the Contractor within 14 days after either the expiry of the period stated in the Appendix, or the remedying of notified defects or the completion of outstanding work, all as referred to in Sub-Clause 9.1, whichever is the later.

11.6
Final Payment Within 42 days of the latest of the events listed in Sub-Clause 11.5 above, the Contractor shall submit a final account to the Employer together with any documentation reasonably required to enable the Employer to ascertain the final contract value.

Within 28 days after the submission of this final account, the Employer shall pay to the Contractor any amount due. If the Employer disagrees with any part of the Contractor's final account, he shall specify his reasons for disagreement when making payment.

11.7
Currency Payment shall be in the currency stated in the Appendix.

11.8
Delayed Payment The Contractor shall be entitled to interest at the rate stated in the Appendix for each day the Employer fails to pay beyond the prescribed payment period.

12

Default

12.1

Default by Contractor

If the Contractor abandons the Works, refuses or fails to comply with a valid instruction of the Employer or fails to proceed expeditiously and without delay, or is, despite a written complaint, in breach of the Contract, the Employer may give notice referring to this Sub-Clause and stating the default.

If the Contractor has not taken all practicable steps to remedy the default within 14 days after the Contractor's receipt of the Employer's notice, the Employer may by a second notice given within a further 21 days, terminate the Contract. The Contractor shall then demobilise from the Site leaving behind Materials and Plant and any Contractor's Equipment which the Employer instructs in the second notice is to be used until the completion of the Works.

12.2

Default by Employer

If the Employer fails to pay in accordance with the Contract, or is, despite a written complaint, in breach of the Contract, the Contractor may give notice referring to this Sub-Clause and stating the default. If the default is not remedied within 7 days after the Employer's receipt of this notice, the Contractor may suspend the execution of all or parts of the Works.

If the default is not remedied within 28 days after the Employer's receipt of the Contractor's notice, the Contractor may by a second notice given within a further 21 days, terminate the Contract. The Contractor shall then demobilise from the Site.

12.3

Insolvency

If a Party is declared insolvent under any applicable law, the other Party may by notice terminate the Contract immediately. The Contractor shall then demobilise from the Site leaving behind, in the case of the Contractor's insolvency, any Contractor's Equipment which the Employer instructs in the notice is to be used until the completion of the Works.

12.4

Payment upon Termination

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

- a) any sums to which the Contractor is entitled under Sub-Clause 10.4,
- b) any sums to which the Employer is entitled,
- c) if the Employer has terminated under Sub-Clause 12.1 or 12.3, the Employer shall be entitled to a sum equivalent to 20% of the value of those parts of the Works not executed at the date of the termination,
- d) if the Contractor has terminated under Sub-Clause 12.2 or 12.3, the Contractor shall be entitled to the Cost of his suspension and demobilisation together with a sum equivalent to 10% of the value of those parts of the Works not executed at the date of termination.

The net balance due shall be paid or repaid within 28 days of the notice of termination.



13

Risk and Responsibility

13.1

Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works from the Commencement Date until the date of the Employer's notice under Sub-Clause 8.2. Responsibility shall then pass to the Employer. If any loss or damage happens to the Works during the above period, the Contractor shall rectify such loss or damage so that the Works conform with the Contract.

Unless the loss or damage happens as a result of an Employer's Liability, the Contractor shall indemnify the Employer, the Employer's contractors, agents and employees against all loss or damage happening to the Works and against all claims or expense arising out of the Works caused by a breach of the Contract, by negligence or by other default of the Contractor, his agents or employees.

13.2

Force Majeure

If a Party is or will be prevented from performing any of its obligations by Force Majeure, the Party affected shall notify the other Party immediately. If necessary, the Contractor shall suspend the execution of the Works and, to the extent agreed with the Employer, demobilise the Contractor's Equipment.

If the event continues for a period of 84 days, either Party may then give notice of termination which shall take effect 28 days after the giving of the notice.

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following:

- a) any sums to which the Contractor is entitled under Sub-Clause 10.4,
- b) the Cost of his suspension and demobilisation,
- c) any sums to which the Employer is entitled.

The net balance due shall be paid or repaid within 28 days of the notice of termination.

14

Insurance

14.1

Extent of Cover

The Contractor shall, prior to commencing the Works, effect and thereafter maintain insurances in the joint names of the Parties:

- a) for loss and damage to the Works, Materials, Plant and the Contractor's Equipment,
- b) for liability of both Parties for loss, damage, death or injury to third parties or their property arising out of the Contractor's performance of the Contract, including the Contractor's liability for damage to the Employer's property other than the Works, and
- c) for liability of both Parties and of any Employer's representative for death or injury to the Contractor's personnel except to the extent that liability arises from the negligence of the Employer, any Employer's representative or their employees.



14.2
Arrangements

All insurances shall conform with any requirements detailed in the Appendix. The policies shall be issued by insurers and in terms approved by the Employer. The Contractor shall provide the Employer with evidence that any required policy is in force and that the premiums have been paid.

All payments received from insurers relating to loss or damage to the Works shall be held jointly by the Parties and used for the repair of the loss or damage or as compensation for loss or damage that is not to be repaired.

14.3
Failure to Insure

If the Contractor fails to effect or keep in force any of the insurances referred to in the previous Sub-Clauses, or fails to provide satisfactory evidence, policies or receipts, the Employer may, without prejudice to any other right or remedy, effect insurance for the cover relevant to such default and pay the premiums due and recover the same as a deduction from any other monies due to the Contractor.

15 Resolution of Disputes

15.1
Adjudication

Unless settled amicably, any dispute or difference which arises between the Contractor and the Employer out of or in connection with the Contract, including any valuation or other decision of the Employer, shall be referred by either Party to adjudication in accordance with the attached Rules for Adjudication ("the Rules"). The adjudicator shall be any person agreed by the Parties. In the event of disagreement, the adjudicator shall be appointed in accordance with the Rules.

15.2
Notice of Dissatisfaction

If a Party is dissatisfied with the decision of the adjudicator or if no decision is given within the time set out in the Rules, the Party may give notice of dissatisfaction referring to this Sub-Clause within 28 days of receipt of the decision or the expiry of the time for the decision. If no notice of dissatisfaction is given within the specified time, the decision shall be final and binding on the Parties. If notice of dissatisfaction is given within the specified time, the decision shall be binding on the Parties who shall give effect to it without delay unless and until the decision of the adjudicator is revised by an arbitrator.

15.3
Arbitration

A dispute which has been the subject of a notice of dissatisfaction shall be finally settled by a single arbitrator under the rules specified in the Appendix. In the absence of agreement, the arbitrator shall be designated by the appointing authority specified in the Appendix. Any hearing shall be held at the place specified in the Appendix and in the language referred to in Sub-Clause 1.5.



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Initials: -----

Annex B Price Form Breakdown

Field
Work

ITEM	DESCRIPTION	UNIT	RATE	QUANTITY	SUM
1	Mobilization	Lump Sum		1	
2	Traffic Control	Lump Sum		1	
3	Installation of BLDC Furnished 4-inch Sch 40 PVC Communication Conduit (Buried) Various Locations	LF		75	
4	Installation of BLDC Furnished 2-inch Sch 40 PVC Power Supply or Signal Conduit (Buried) Various Locations	LF		400	
5	Installation of BLDC Furnished 2-inch HDPE Sanitary Force Main – Green Stripe (Buried) St. George's Club Lift Station Discharge Force Main	LF		10	
6	Installation and Hydrostatic Testing of of BLDC Furnished 4-inch HDPE Sanitary Force Main – Green Stripe (Buried) St. Regis Lift Station Discharge Force Main	LF		45	
7	Installation of BLDC Furnished 6-inch Sch 80 PVC Sanitary Force Main (Buried) St. George's Club Sanitary Force Main	LF		10	
8	Installation of BLDC Furnished 2.5-inch Sch 40 PVC Controls Conduit (Buried) St. George's Club Lift Station Controls Conduit	LF		20	
9	Installation of 2-inch Gate Valve (BLDC Furnished) and Valve Box (not BLDC Furnished) St. George's Club Lift Station Discharge Force Main	Unit Rate per Valve		1	
10	Installation of 4-inch Gate Valve (BLDC Furnished) and Valve Box (not BLDC Furnished) St. Regis Lift Station Discharge Force Main	Unit Rate per Valve		1	

BLDC WATER WASTEWATER PROGRAM TENDERING PACKAGE #2F
PUMPING STATION UPGRADES –
ST. GEORGE'S CLUB, TIGER BAY MARKET SQUARE

ITEM	DESCRIPTION	UNIT	RATE	QUANTITY	SUM
11	Installation of BLDC Furnished 6-inch Sch 80 PVC Sanitary Force Main (Buried) Tiger Bay Lift Station Discharge Force Main	LF		50	
12	Installation of BLDC Furnished 6-inch HDPE Sanitary Force Main – Green Stripe (Buried) Tiger Bay Lift Station Discharge Force Main	LF		25	
13	Installation of BLDC Furnished 6-inch HDPE Sanitary Force Main – Green Stripe (Buried) Tiger Bay Lift Station Influent Force Main	LF		10	
14	Installation of BLDC Furnished 4-inch Sch 80 PVC Sanitary Force Main (Exposed) Tiger Bay Lift Station Discharge Force Main Inside Tiger Bay Lift Station	LF		10	
15	Installation of BLDC Furnished 6-inch Sch 80 PVC Sanitary Force Main (Exposed) Tiger Bay Lift Station Discharge Force Main Inside Tiger Bay Lift Station	LF		10	
16	Installation of 8-inch Gate Valve (BLDC Furnished) and Valve Box (not BLDC Furnished) On Existing Sanitary Gravity Sewer Outside Tiger Bay Lift Station	Unit Rate per Valve		1	
17	Installation of 6-inch Gate Valve (BLDC Furnished) and Valve Box (not BLDC Furnished) On New Discharge Force Main Outside of Tiger Bay Lift Station	Unit Rate per Valve		1	
18	Installation of 6-inch Gate Valve (Exposed) (BLDC Furnished) On New Discharge Force Main Within Tiger Bay Lift Station Valve Vault	Unit Rate per Valve		3	
19	Installation of 6-inch Swing Check Valve (Exposed) (BLDC Furnished) On New Discharge Force Main Within Tiger Bay Lift Station Valve Vault	Unit Rate per Valve		3	

ITEM	DESCRIPTION	UNIT	RATE	QUANTITY	SUM
20	Installation of BLDC Furnished 4-inch Sch 80 PVC Sanitary Force Main (Exposed) Market Wharf Lift Station Discharge Force Main Inside Market Wharf Lift Station	LF		15	
21	Installation and Hydrostatic Testing of of BLDC Furnished 6-inch HDPE Sanitary Force Main – Green Stripe (Buried) Market Wharf Lift Station Discharge Force Main (Phases 1 and 2)	LF		60	
22	Installation of BLDC Furnished 4-inch Swing Check Valve (Exposed) Inside Market Wharf Lift Station	Unit Rate per Valve		4	
23	Installation of 6-inch Gate Valve (Exposed) (BLDC Furnished) In Market Wharf Basin 2 on Basin Interconnection	Unit Rate per Valve		1	
24	Installation of 6-inch Gate Valve (BLDC Furnished) and Valve Box (not BLDC Furnished) On New Discharge Force Main Outside of Market Wharf Lift Station	Unit Rate per Valve		2	
25	Supply of Buried Fittings (Itemized Bill of Materials Sheet)	Lump Sum		1	
26	Supply of Exposed Flanged Fittings (Itemized Bill of Materials Sheet)	Lump Sum		1	
27	Excavation for Trench Type C	LF		180	
28	Installation of Trench Type C – Includes all pipe fittings, utility identification tape, subbase, backfill, embedment and compaction	LF		180	
29	Excavation for Trench Type D	LF		55	
30	Installation of Trench Type D – Includes all pipe fittings, utility identification tape, subbase, backfill, embedment and compaction	LF		55	
31	Excavation for Trench Type E	LF		60	
32	Installation of Trench Type E – Includes all pipe fittings, utility identification tape, subbase, backfill, embedment and compaction	LF		60	

BLDC WATER WASTEWATER PROGRAM TENDERING PACKAGE #2F
PUMPING STATION UPGRADES –
ST. GEORGE'S CLUB, TIGER BAY MARKET SQUARE

ITEM	DESCRIPTION	UNIT	RATE	QUANTITY	SUM
33	Surface Restoration – includes preparatory surface excavation and grading over previously backfilled trench, restoration of surface to match existing	SF		335	
34	Installation of Communications Handhole	Unit Rate per Handhole		1	
35	Installation of Flow Meter or Equipment Handhole	Unit Rate per Handhole		6	
36	Installation of Flow Meter (BLDC Furnished) This item shall also include installation of power/signal wiring and activation of each flow meter - all work required for a fully operation flow meter	Unit Rate per Flow Meter		7	
37	4" Connection To Existing Pipe or Pipe Installed by Others (Active Pipe) Connection to St. Regis Discharge Force at Temporary Connection Near St. George's Club Lift Station	Unit Rate per Connection		1	
38	4" Connection To Existing Pipe or Pipe Installed by Others (Inactive Pipe) Connection to St. Regis Discharge Force Main Near St. George's Club Lift Station	Unit Rate per Connection		1	
39	6" Connection To Existing Pipe or Pipe Installed by Others (Inactive Pipe) Connection to Tiger Bay Discharge Force Main Installed by Others Connection to Tiger Bay Influent Force Main Installed by Others Connection to Market Wharf Discharge Force Main Installed by Others Connection to Existing Market Wharf Discharge Force Main (Two)	Unit Rate per Connection		5	
40	6" Connection To Existing Pipe or Pipe Installed by Others (Active Pipe) Connection to Ex. St. George's Club Sanitary Force Main	Unit Rate per Connection		1	
41	6" Pipe Connection To Wet Well Influent Force Main Connection at Tiger Bay Lift Station	Unit Rate per Connection		1	

ITEM	DESCRIPTION	UNIT	RATE	QUANTITY	SUM
42	St. George's Club Lift Station Installation of BLDC Furnished Lift Station Basin, Duplex Submersible Grinder Pumps and Valve Vault including but not limited to; pump station wet well basin and valve vault; submersible grinder pumps and pump retrieval system; exposed and buried piping; hatches; valves; accessories and other mechanical equipment; controls and control panel, and all electrical and instrumentation work. This item shall include all work required for fully operational facility. This item shall include the connection of the existing 8" potable water supply main (installed by others) to the 4" potable water main within the St. George's RO Plant.	Lump Sum		1	
43	Tiger Bay Lift Station Improvements – Demolition, Structural Modifications, Pump Replacements, Electrical and Instrumentation Demolition (removal of existing equipment and appurtenances), structural modifications, construction of external valve vault, installation of BLDC Furnished submersible pumps and appurtenances, and replacement of existing systems. This item shall include all work required for fully operational facility	Lump Sum		1	
44	Market Wharf Lift Station Improvements – Demolition, Pump Replacements, Electrical and Instrumentation Demolition (removal of existing equipment and appurtenances), construction of new exterior piping configurations and valving, installation of BLDC Furnished submersible pumps and appurtenances, maintenance of sewer flows, and replacement of existing systems. This item shall include all work required for fully operational facility	Lump Sum		1	

ITEM	DESCRIPTION	UNIT	RATE	QUANTITY	SUM
45	Turkey Hill Pumping Station Improvements – Connection to New Supply, Electrical and Instrumentation, and Decommissioning of Pumping Station Demolition (removal of existing equipment and appurtenances), connection of the Turkey Hill Pumping Station distribution system to the new supply line, and installation of BLDC Furnished equipment. This item shall include all work required for fully operational facility	Lump Sum		1	
46	Fort Victoria Reuse Reservoir Improvements – Site Work, Electrical, and Instrumentation Installation of BLDC Furnished equipment/materials and any other equipment/materials required for fully operational facility	Lump Sum		1	
47	St. George's Club Flow Meter Chamber Installation of BLDC Furnished gravity flow meter and installation of required conduit, wiring, etc. as required for fully operational facility	Lump Sum		1	
48	Contractor specified items: Any elements of work or expenditure not covered elsewhere in the Tender Price Analysis and are necessary in the execution of this work. Proponent to itemize.	Lump Sum		1	
	TOTAL TENDER SUM FOR WORKS	Sub Total		Sub Total	

Number of sheets, appended by the Proponent to this Form

(if nil, enter NIL)

SIGNED ON BEHALF OF PROPONENT:

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ITEM	DESCRIPTION	UNIT	RATE	QUANTITY	SUM
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Labour & Equipment Rates for Works

Labour and Mark-Up Rates

ITEM	DESCRIPTION	QUANTITY	RATE
1	Foreman/Site Supervisor	Hourly Rate	
2	Pipe Fitter	Hourly Rate	
3	Labour	Hourly Rate	
4	Excavator/Trenching Machine (as required by contractor)	Hourly Rate	
5	Excavation of Hard Rock (contractor to state machine Size)	Hourly Rate	
6	Traffic Control	Hourly Rate	
7	Road Reinstatement and Sidewalk Repair	Hourly Rate	
8	Trucking	Hourly Rate	
9	Landscaping	Hourly Rate	
10	Contractor specified items: Additional Day Work Rates for Labour, Materials or Equipment necessary for the execution of this work.		

Mark-Up Rates for WATER MAIN Works

ITEM	DESCRIPTION	RATE (%)
1	Overhead and Mark-Up (own work)	
2	Mark-Up (Sub-Contracted labour and materials)	

Signed

(1) _____ Title _____ Date _____

for and on behalf of _____

ANNEX C: NOTES AND SPECIFICATION LIST

GENERAL

- COVERSHEET AND DRAWING INDEX	SHEET C-0000
- GENERAL NOTES	SHEET C-0001
- TRENCHING PERMIT & TRAFFIC NOTICES	SHEET C-0001
- SPECIFICATIONS OF TRENCH WORK	SHEET C-0001
- STANDARD ACCEPTABLE TRENCH CROSS-SECTIONS	SHEET C-0001
- HARD ROCK	SHEET C-0001
- UNFORSEEN CONDITIONS	SHEET C-0001
- PROTECTION OF PERSONS AND PROPERTY	SHEET C-0001

DETAILED CIVIL SPECIFICATIONS

- EXCAVATION, EARTHWORK AND GRADING	SHEET C-0001
- BACKFILLING AND COMPACTION	SHEET C-0002
- GRANULAR MATERIAL	SHEET C-0002
- FINISHED GRADE SETTLEMENT LIMITATIONS	SHEET C-0002
- RESTORATION	SHEET C-0002
- CONCRETE	SHEET C-0002
- REINFORCING STEEL	SHEET C-0003
- MASONRY WALLS	SHEET C-0003
- SIDEWALKS	SHEET C-0003
- ASPHALT PAVING	SHEET C-0003
- PVC CONDUIT FOR COMMUNICATION LINE	SHEET C-0003
- SANITARY FORCE MAIN, POTABLE WATER AND RECLAIMED WATER PIPING	SHEET C-0003
- HDPE FITTINGS AND SERVICE CONNECTIONS	SHEET C-0004
- MANUFACTURER'S EVALUATION FOR HDPE PIPES	SHEET C-0004
- HDPE PIPE CERTIFICATION	SHEET C-0004
- PIPE WARRANTY	SHEET C-0004
- PIPE TRACING AND MARKING	SHEET C-0004
- PIPE INSPECTION, DELIVERY, HANDLING AND STORAGE	SHEET C-0004
- PIPE PLACEMENT AND LAYING	SHEET C-0004
- OPEN INSTALLATION FOR HDPE PIPE	SHEET C-0004
- HDPE PIPE PRESSURE TESTING	SHEET C-0005
- HDPE PIPE LEAKAGE TESTING	SHEET C-0005
- HYDROSTATIC TESTING OF HDPE PIPE	SHEET C-0005
- COATINGS & WRAPPINGS	SHEET C-0005
- PIPE CLEANING	SHEET C-0005
- DISINFECTION	SHEET C-0005
- EROSION AND SEDIMENT CONTROL	SHEET C-0005
- FINAL CLEAN UP	SHEET C-0005
- KEY MAP, LEGEND AND ABBREVIATIONS	SHEET C-0006

DETAILED LIFT STATION SITE PLANS

- TIGER BAY LIFT STATION SITE PLAN	SHEET C-1000
- ST. GEORGE'S CLUB LIFT STATION SITE PLAN	SHEET C-1001
- MARKET WHARF LIFT STATION SITE PLAN	SHEET C-1002

DETAILED SITE PLANS

- TURKEY HILL SITE PLAN	SHEET C-1003
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- FORT VICTORIA SITE PLAN SHEET C-1004
- FORT VICTORIA VALVE CHAMBER SHEET C-1005
- ST. GEORGE'S CLUB FLOW METER CHAMBER SHEET C-1006
- DETAILS 1 SHEET C-2000

DETAILED ELECTRICAL SPECIFICATIONS

- ELECTRICAL NOTES AND SYMBOLS SHEET C-3000
- PROP. TIGER BAY LIFT STATION ELECTRICAL SHEET C-3001
- PROP. ST. GEORGE'S CLUB LIFT STATION ELECTRICAL SHEET C-3002
- PROP. MARKET WHARF LIFT STATION ELECTRICAL SHEET C-3003
- CONDUIT & CONDUCTORS SHEET C-3004

DETAILED WET WELL MODIFICATIONS

- TIGER BAY WET WELL MODIFICATIONS SHEET S-0001

Additional Specifications as specified in ANNEX I

GENERAL REQUIREMENTS

- 01 01 00 Summary of Work
- 01 31 00 Project Management and Coordination
- 01 50 00 Temporary Facilities and Controls
- 01 56 00 Environmental Protection
- 01 77 00 Project Closeout

TECHNICAL SPECIFICATIONS

- 33 32 00 Sanitary Sewerage Equipment
- 40 05 10 Mechanical Piping Systems
- 40 05 61 Valves and Accessories

Annex D - Agreement Acknowledgement

(Note: all sheets form part of the tender)

FIDIC Standard Short Form of Agreement Acknowledgement Letter

This is to certify that I, _____ (name), in the position of _____ hereby acknowledge that I am aware of the terms and conditions of the attached FIDIC Conditions of Contract for the Short Form of Contract, First Edition 1999, published by the Federation Internationale des Ingenieurs-Conseils (FIDIC).

I acknowledge that the following documents have been provided in the Request for Tender package and at the date of this submission I have no issue with the terms and conditions of this agreement.

- FIDIC Short Form Contract including General Conditions and Particular Conditions
- Specifications and Drawings

Signed: _____

Print Name: _____

Title: _____

Company: _____

Date: _____

Annex E – Subcontractor Company Information

(Note: all sheets form part of the proposal)

Will subcontractors be used for this work ☐ Yes ☐ No, if yes, please state what service this subcontractor will performed or what goods this subcontractor will provided below:

If no subcontractors will be used skip this annex, below. Otherwise, list all subcontractors that will be used for this work. **Submit multiple copies of Annex E, one for each Subcontractor included in this Proposal.**

1. **Subcontractor Name** _____

Contact Person _____

Phone numbers: Cellular _____ **Telephone** _____

Email Address: _____

2. **Principal(s), Director(s), and Shareholder(s) of the Company:**

5. **What is the corresponding % of the bid prices will this subcontractor perform** _____%

6. **Company Insurance details:**

Commercial Third Party Insurance carried: BD\$ _____

Workers Compensation Insurance carried: BD\$ _____

7. **Company's Bermuda Payroll Tax No.:** _____

8. **Company's Bermuda Social Insurance No.:** _____

9. **Company Banking Details:**

Name and address of principal bankers:

Include a letter from principal bank confirming credit status of Bidder.

10 **Do you have any involvement with other entities that may be seen as a conflict of interest? If so, please provide details:**

Annex E Subcontractor Company Information (continued)

11. Number of Employees/Bermudians

Please indicate the total number of persons employed by the subcontractor and the number and percentage of Bermudian employees.

TOTAL NUMBER OF STAFF	
NUMBER OF BERMUDIAN	
NUMBER OF NON-BERMUDIANS	
PERCENTAGE OF BERMUDIANS	

12. Attach a copy of the Company's Certificate of Incorporation (if applicable)

13. Safety, Health and Environmental Policies

Please indicate whether the company has a (i) safety and health policy, (ii) sustainable goods and/or services policy, and/or (iii) an environmental policy. If so, then please provide a copy.

Copies are attached Yes_____ No_____

14. Do you offer apprenticeships/training opportunities? _____

Apprenticeships/training opportunities

Please indicate whether the company offers apprenticeships or training opportunities. If no apprenticeship or training opportunities exist, then indicate below. (Add more lines as needed)

<u>NUMBER</u>	<u>NAME</u>	<u>NON BERMUDIAN</u>	<u>BERMUDIAN</u>	<u>APPRENTICESHIPS OR TRAINING OFFERED BY YOUR COMPANY (month/year)</u>

By signing this Annex E, I certify this information provided is true and correct.

Signed: _____

Print Name: _____

Title: _____

Company: _____

Date: _____

ANNEX F LOCAL BENEFITS

(SOCIAL, ECONOMIC AND ENVIRONMENTAL)

Do you offer apprenticeships/training opportunities? _____

Apprenticeships/training opportunities

Please indicate whether the company offers apprenticeships or training opportunities. If no apprenticeship or training opportunities exist, then indicate below. (Add more lines as needed)

NUMBER	NAME	NON BERMUDIAN	BERMUDIAN	APPRENTICESHIPS OR TRAINING OFFERED BY YOUR COMPANY (month/year)

Number of employees/Bermudians

Please indicate the total number of persons employed by the company and the number and percentage of Bermudian employees.

NUMBER OF NON-BERMUDIANS:	
NUMBER OF BERMUDIANS:	
NUMBER OF EMPLOYEES:	
PERCENTAGE OF BERMUDIANS:	

Will the proponent use local businesses in their supply chain?

Yes _____ No _____

If no, then please provide an explanation_____

Will the proponent use local sub-contractors (if applicable)?

Yes _____ No _____

If no, then please provide an explanation_____

If yes, proponents must complete Annex E Subcontractor Company Information.

Safety, Health and Environmental Policies

Please indicate whether the company has a (i) safety and health policy, (ii) sustainable goods and/or services policy, and/or (iii) an environmental policy. If so, then please provide a copy.

Copy attached Yes_____ No_____

Provide a copy of the proponent's **Certificate of Incorporation** (if applicable).

Annex G - Personnel Qualifications and Project Experience

(Note: all sheets form part of the proposal)

Note: Include brief resumes for all personnel identified in this Annex .

Proponent Name: _____

Project Manager

Employee Name	Title	Employed Since and Total Years' Experience	Certifications and Dates Received

Site Supervisor

Employee Name	Title	Employed Since and Total Years' Experience	Certifications and Dates Received

Similar Project Experience

Starting year	Ending year	Contract Identification	Role of Proponent
		Contract Name_____ Brief Description of the work performed by the Proponent_____ Amount of Contract_____ Name of Employer_____ Address_____	
		Contract Name_____ Brief Description of the work performed by the Proponent_____ Amount of Contract_____ Name of Employer_____ Address_____	
		Contract Name_____ Brief Description of the work performed by the Proponent_____ Amount of Contract_____ Name of Employer_____ Address_____	

Annex H – Submittals List Acknowledgement

(Note: all sheets form part of the tender)

Required Submittals Acknowledgement Letter

This is to certify that I, _____ (name), in the position of _____ hereby acknowledge that I am aware of PRE-REQUISITE submittals before starting the Field Construction Works along with the submittals, but not limited to, during construction as listed in table #1 below.

Signed: _____

Print Name: _____

Title: _____

Company: _____

Date: _____

Table #1- Required Submittals

Pre-Construction Submittals required to be approved before starting Field Construction Works			
Section	Phase	Submittal Description	Submittal Type
01 31 00	Pre-Construction	SCHEDULE OF WORK	Document
01 31 00	Pre-Construction	METHOD STATEMENT / RISK ASSESSMENT - TRENCH EXCAVATIONS, PIPE INSTALLATION, BACK FILLING AND COMPACTION	Document
01 31 00	Pre-Construction	METHOD STATEMENT / RISK ASSESSMENT - EMERGENCY PROCEDURE (SERVICE STRIKE)	Document
01 31 00	Pre-Construction	METHOD STATEMENT / RISK ASSESSMENT - FUSION WELDING	Document
PIPE PRESSURE TESTING	Pre-Construction	METHOD STATEMENT / RISK ASSESSMENT - PRESSURE TESTING & HYDROSTATIC TESTING	Document
01 31 00	Pre-Construction	INCIDENT REPORTING LOG	Document
01 50 00	Pre-Construction	SITE SETUP, WELFARE AND SECURITY PLAN	Document
01 31 00	Pre-Construction	MANAGEMENT & SUPERVISION CONTACTS LIST AND ROLES	Document
01 31 00	Pre-Construction	TRAFFIC MANAGEMENT PLAN	Document
01 31 00/ 01 77 00	Pre-Construction	INSURANCES	Document
	Pre-Construction	PRE-CONSTRUCTION SITE SURVEY	Document
CERTIFICATIONS/ 01 77 00	Pre-Construction	TECHNICIAN FUSION WELDING CERTIFICATION	Document
EXCAVATION EARTHWORK AND GRADING NOTES	Pre-Construction	LIST OF MATERIALS AND GRADATION REPORT FOR PROPOSED BACKFILL AGGREGATE	Document
TRENCHING AND TRAFFIC NOTES - SAMPLES	Pre-Construction	UTILITY IDENTIFICATION/ WARNING TAPE	Product Sheet
01 77 00	Pre-Construction	LIST OF MAJOR SUBCONTRACTORS AND SUPPLIERS	Document
TRENCHING AND TRAFFIC NOTES - PRODUCT DATA	Pre-Construction	MANHOLE FRAME AND COVER DATA SHEETS	Document
UTILITIES	Pre-Construction	COMMUNICATION CONDUIT FITTINGS	Product Sheet
UTILITIES	Pre-Construction	HDPE PIPE FITTINGS, ACCESSORIES AND ADAPTERS	Product Sheet
UTILITIES	Pre-Construction	TRACING WIRE	Product Sheet
Submittals Required approval after start-up of Construction Field Work			
UTILITIES	Construction	ABOVE GRADE SUPPORT SYSTEM DATA SHEETS	Product Sheet
	Construction	WATERSTOP DATA SHEETS	Document
TRENCHING AND TRAFFIC NOTES - PRODUCT DATA	Construction	SHEETING, SHORING AND BRACING MATERIALS	Product Sheet
TRENCHING AND TRAFFIC NOTES - PRODUCT DATA	Construction	COATING AND WRAPPING FOR STAINLESS STEEL NUTS AND BOLTS	Product Sheet
UTILITIES	Construction	2" PVC PIPE AND FITTINGS (ARV CHAMBERS)	Product Sheet
UTILITIES	Construction	ELECTROFUSION TAPPING SLEEVE	Product Sheet
UTILITIES	Construction	PIPE SUPPORTS	Product Sheet
UTILITIES	Construction	WALL ANCHOR / FLEX SUPPORT	Product Sheet
UTILITIES	Construction	FLEXIBLE RESTRAINTS	Product

			Sheet
CONCRETE NOTES	Construction	CONCRETE MIX DESIGN	Document
CONCRETE NOTES	Construction	MORTAR MIX DESIGN	Document
	Construction	NON-SHRINK GROUT DATA SHEETS	Document
	Construction	PULL STRING DATA SHEETS (NO DIAMETER SPECIFIED IN DOCS)	Document
DETAILS	Construction	CONCRETE BLOCK/BOND BEAM - PRODUCT DATA	Product Sheet
01 77 00	Construction	REQUEST FOR FINAL INSPECTION	Document
01 77 00	Construction	CERTIFICATE OF INSURANCE FOR PRODUCTS AND COMPLETED OPERATIONS	Document
CONCRETE NOTES	Construction	REINFORCING STEEL	Product Sheet
CONCRETE NOTES	Construction	CONCRETE COMPRESSION TESTING RESULTS	Document
DETAILS	Construction	TRANSITION COUPLING	Product Sheet
FIELD QUALITY CONTROL NOTES/ 01 77 00	Construction	EARTHWORK DOCUMENTATION (DAILY FIELD REPORTS)	Document
UTILITIES	Construction	FLUSHING CONNECTION MATERIALS DATA	Document
UTILITIES/ 01 77 00	Construction	HDPE PIPE FUSION WELD LOG	Document
UTILITIES/ 01 77 00	Construction	LEAKAGE TEST RESULTS	Document
UTILITIES/ 01 77 00	Construction	HYDROSTATIC TEST RESULTS	Document

Bermuda Land Development Company Water and Wastewater Program

**1 Longfield Road
St. George's, Bermuda
(441) 293-5712**



BERMUDA LAND DEVELOPMENT COMPANY LIMITED

CONTRACT DOCUMENTS

**Tendering Package #2F
Pumping Station Upgrades
St. George's Club, Tiger Bay, and Market
Wharf
May 13, 2022**



RAMBOLL

Bright ideas. Sustainable change.

NO TEXT ON THIS PAGE

BLDC WATER & WASTEWATER PROGRAM TENDERING PACKAGE #2F
PUMPING STATION UPGRADES –
ST. GEORGE’S CLUB, TIGER BAY, AND MARKET WHARF

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DIVISION 01– GENERAL REQUIREMENTS

01 01 00	Summary of Work
01 31 00	Project Management and Coordination
01 50 00	Temporary Facilities and Controls
01 56 00	Environmental Protection
01 77 00	Project Closeout

TECHNICAL SPECIFICATIONS

DIVISION 33 – SITE UTILITIES

33 32 00	Sanitary Sewerage Equipment
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DIVISION 40 – PROCESS INTERCONNECTIONS

40 05 10	Mechanical Piping Systems
40 05 61	Valves and Accessories

ANNEXES

ANNEX B	Pricing Form
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* * * * *

SECTION 01 01 00 – SUMMARY OF WORK

PART 1 – GENERAL

1.1 SCOPE OF WORK COVERED BY CONTRACT DOCUMENTS

- A** The Works involve the supply and installation of new HDPE sanitary sewer force main, PVC sanitary sewer force main, and PVC communication/power conduit of sizes and locations as shown on the Contract Drawings. The Works also include the expansion and repurposing of the existing Tiger Bay Lift Station, the repurposing of the existing Market Wharf Lift Station, the installation of a new lift station and valve vault to receive sanitary sewer flows from St. George’s Club and convey the flows to the Tiger Bay Lift Station, the installation of flow metering devices, modifications and installation of equipment at the Turkey Hill Pumping Station, installation of equipment at the Fort Victoria reuse tank, and the installation of equipment at the St. George’s Club Clubhouse.
- B** The Works consist of:
1. Contractor identification of utility crossings and coordination for new piping installed.
 2. Open trench excavation, pipe installation, backfilling, compaction and site restoration.
 3. Installation of communication hand holes where shown on the Contract Drawings.
 4. Installation of flow meter hand holes and fully operational flow meter assemblies where shown on the Contract Drawings.
 5. Installation of a resilient seated gate valve and valve box along the sanitary sewer main between the Tiger Bay Lift Station and the discharge point for cruise ships as shown on the Contract Drawings.
 6. Installation of a connection to the Tiger Bay Lift Station wet well for the 6” sanitary sewer force main from the St. Regis site installed by others.
 7. Structural modifications required for the expansion of the existing Tiger Bay Lift Station.
 8. Installation of an external valve vault at the Tiger Bay Lift Station.
 9. Replacement of the pumps, interior piping, and appurtenances at the Tiger Bay Lift Station.
 10. Installation of a resilient seated gate valve and valve box adjacent to the existing Tiger Bay Lift Station as shown on the Contract Drawings.
 11. Connection of the new discharge and influent piping for Tiger Bay Lift

Station to piping installed by others in the vicinity.

12. Replacement of controls, electrical, and instrumentation systems at the Tiger Bay Lift Station.
13. Installation of discharge piping and valving to redirect flows at the Market Wharf Lift Station to the new 6” sanitary sewer force main installed by others and to provide a means for maintenance of sewer flows during Market Wharf Lift Station improvements.
14. Replacement of the pumps, interior piping, and appurtenances at the Market Wharf Lift Station.
15. Replacement of controls, electrical, and instrumentation systems at the Market Wharf Lift Station.
16. Installation of a duplex submersible grinder lift station and valve vault to receive sanitary sewer flows from St. George’s Club and convey the flows to the Tiger Bay Lift Station.
17. Installation of electrical/controls conduit and wiring for the new duplex submersible grinder lift station at St. George’s Club.
18. Connection of the 8” potable water main near St. George’s RO Plant (installed by others) to the 4” potable water main within St. George’s RO Plant.
19. Connection of the Turkey Hill Pump Station distribution system to the reuse supply pipe installed by others and decommissioning of the Turkey Hill Pump Station.
20. Installation of monitoring/control equipment at the Turkey Hill Pump Station, the Fort Victoria Reuse Reservoir, and the St. George’s Club Clubhouse.
21. Site work at Fort Victoria Reuse Reservoir.
22. Installation of all other piping, fittings and accessories for completion of Work to full operational capacity.
23. Hydrostatic pipe testing:
 - 4-inch HDPE Sanitary Force Main – Green Stripe (Buried), St. Regis Discharge Force Main
 - 6-inch HDPE Sanitary Force Main – Green Stripe (Buried), Market Wharf Lift Station Discharge Force Main (Phases 1 and 2 Piping)

C For the Work Under this Contract the BLDC shall furnish:

Various Locations

1. 75 LF of 4" Sch. 40 PVC Communications Conduit
2. 400 LF of 2" Sch. 40 PVC Power Supply or Signal Conduit

St. George’s Club Lift Station

3. 10 LF of 2" HDPE Green Stripe Pipe (Discharge Force Main)
4. 45 LF of 4" HDPE Green Stripe Pipe (St. Regis Discharge Force Main)
5. 10 LF of 6" Sch. 80 PVC Pipe (Influent Force Main)
6. 20 LF of 2.5" Sch. 40 PVC Conduit (Lift Station Controls Conduit)
7. One (1) 2" Resilient Seated Gate Valve
8. One (1) 4" Resilient Seated Gate Valve
9. One (1) Submersible Lift Station Basin
10. Two (2) Submersible Grinder Pumps with Base Elbows
11. One (1) Complete Valve Vault Including Interior Piping, Valves, and Appurtenances
12. One (1) Control Panel for Packaged Lift Station
13. One (1) Set of Pump Controls for Packaged Lift Station
14. One (1) Power Distribution Panel for Packaged Lift Station
15. One (1) 2" Flow Meter
16. One (1) 4" Flow Meter

Tiger Bay Lift Station

17. 35 LF of 6" HDPE Green Stripe Pipe
18. 10 LF of 4" Sch. 80 PVC Pipe
19. 60 LF of 6" Sch. 80 PVC Pipe
20. One (1) 8" Resilient Seated Gate Valve
21. Four (4) 6" Resilient Seated Gate Valves
22. Three (3) 6" Swing Check Valves
23. Three Submersible Pumps to include auto-couplings, upper guide holders, guide claws
24. One (1) Set of Pump Station Controls and Enclosures
25. One (1) Power Distribution Panel for Pump Station
26. One (1) 4" Flow Meter

Market Wharf Lift Station

27. 15 LF of 4" Sch. 80 PVC Pipe (Discharge Force Main)
28. 60 LF of 6" HDPE Green Stripe Pipe
29. Four (4) 4" Swing Check Valves
30. Three (3) 6" Resilient Seated Gate Valves
31. Four Submersible Pumps to include auto-couplings, upper guide holders, guide claws
32. One (1) Set of Pump Station Controls and Enclosures
33. One (1) Power Distribution Panel for Pump Station
34. One (1) 4" Flow Meter

Turkey Hill Pumping Station

35. One (1) 4" Resilient Seated Gate Valve
36. One (1) 4" Flow Meter

Fort Victoria Reuse Reservoir

- 37. One (1) 4" Butterfly Valve with Electric Actuator
- 38. Two (2) 4" Flow Meters
- 39. One (1) Ultrasonic Level Transducer
- 40. One (1) Level Monitor/Controller
- 41. Three (3) 4" Resilient Seated Gate Valves
- 42. 200 LF of 4" HDPE Lilac Stripe Pipe

St. George’s Club Clubhouse

- 43. One (1) gravity flow meter.

- D** The piping shall be picked up by the contractor from the BLDC pipe storage facility located at Lot 100 - Orange Hole Road Storage Depot, St George’s DD03, Bermuda. The Contractor shall provide piping in all quantities and sizes above what is being provided by BLDC.
- E** All remaining items such as valves, pumps, lift stations and electrical panels (if applicable) shall be picked up by the contractor at the BLDC storage building P4 E Unit, #2 Warf Street, St. George’s DD03, Bermuda.
- F** The Contractor will be responsible for the transport of all materials to storage on site or off site.
- G** The Project shall be constructed under the FIDIC Conditions of Short Form of Contract.

1.2 SECURITY OF THE SITE

- A** The Contractor is responsible for maintaining the security of the site area.
- B** The Contractor shall ensure that there is no access to the active work site by members of the public during the contract period.
- C** The Contractor is responsible for all traffic regulation to ensure a safe working area.

1.3 CONTRACT METHOD OF MEASUREMENT

- A** The quantities set out in the Bill of Quantities are the estimated quantities of the work, but are not to be taken as the actual or correct quantities of the Works to be executed by the Contractor in fulfillment of his obligations under the Contract.
- B** The Engineer or Owner’s Representative shall, in conjunction with the Contractor, re-measure the actual quantities of the work in accordance with FDIC Short Form Contract Annex A Form of Agreement (Sub-Clause 11.1 Lump Sum Subject to Re-Measure).

- C** Payment to the Contractor will be based on installed and approved quantities of works per the unit price included in contract Annex B, Price Form Breakdown
- D** All Work to complete the trenching, installation and reinstatement as detailed on the drawings and in these Technical Specifications shall be covered within the prices in Annex B, Price Form. All prices shall be all-inclusive and include all preliminary set up costs, labour, equipment and materials to complete each task. If a specific task is not identified separately in Annex B, the Contractor shall assume that it is included as part of another related listed item or items.

1.4 PROJECT PROGRAMME OF WORKS

- A** Contractor shall programme the works coordinating all tasks and activities.
- B** Work sequence shall take into account the operating hours of the Government waste disposal sites.

1.5 USE OF PREMISES

- A** Not Applicable

1.6 WORK UNDER OTHER CONTRACTS

- A** Not Applicable

***** END OF SECTION 01 01 00 *****

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1 Submittals

- A** Schedule of Work.
- B** Method Statement for the whole of the Work.
- C** Health and Safety Plan including a Traffic Management Plan for the whole of the Work.
- D** Insurances.

1.2 General

- A** Provide to Owner’s Representative for review the submittals specified. Submit with reasonable promptness and in an orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- B** Do not proceed with Work affected by any submittal until review is complete.
- C** Review submittals prior to submission to the Owner’s Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of the Work and Contract Documents. Submittals not stamped, signed, dated and identified as to the specific project will be returned without being examined and will be considered rejected.
- D** Verify that field measurements and affected adjacent Work are coordinated.
- E** Contractor’s responsibility for errors and omission in submission is not relieved by Owner’s Representative review of submittals
- F** Contractor’s responsibility for deviations in submission from requirements of Contract Documents is not relieved by Owner’s Representative review.
- G** Keep one review copy of each submission on Site.

1.3 Programme of Work

A Prepare schedule in the form of a linked bar chart. All events, activities and constraints shall be numbered and shall be given a title. Details to be given for each event, activity or constraint should include:

- its title
- its earliest and latest start and finish dates
- its scheduled start and finish dates
- its duration
- any relevant “must” start or finish dates
- resources (equipment and labour) required.

B Provide a separate bar for each event, activity, operation or constraint. Show proposed progress of all activities for main work items. All construction activities must be identified. Where applicable, indicate labour, construction crews, plant and equipment to be employed.

C The project Programme of Works shall provide at least the level of detail listed below:

- Trenching Work, installation of new water main, sanitary sewer force main, reclaim water main and communication conduit, including and reinstatement of road surface or landscaping
- Transportation of construction debris to approved site
- Making good the site area

D The key milestones in the construction process shall also be identified. Schedule milestones will include but not be limited to the following:

- Start date on site.
- Delivery dates for equipment and materials.
- Completion of trenching on each road segment.
- Completion of water main installation and connection to existing water mains on each road segment to minimise the time the supply is shut down
- Reconnection of service connections along the route
- Completion of road reinstatement on each road segment
- Final handover (final completion).

E Revise and resubmit programme every two weeks to reflect actual progress on

the Works.

- F** With schedule updates, provide written explanations to Owner's Representative as to why previously reviewed programme is not being met (if applicable).
- G** Show changes in operations proposed (if required), to complete construction works within Contract Time.
- H** No progress payments will be approved until receipt of programme updates acceptable to the Owner's Representative.

1.4 Work Hours

- A** The Work shall be carried out during normal working hours (7.00 am until 6.00 pm Monday to Saturday) unless the Works are unavoidable or necessary for saving life or property or for the safety of the Works, or as per any instruction from an applicable governmental authority. In such cases the Contractor shall advise the Owner's Representative of the need to perform such extraordinary Works.
- B** The Owner will not accept claims for overtime unless the Works are as a result of an unforeseen condition.
- C** The Contractor is aware that the Works are to be carried out on public roads which may cause interruption to the Works during peak traffic times.

1.5 Method Statements

- A** Provide Method Statement for each key activity, as requested by Owner's Representative, to show construction methods, equipment and general methodology for carrying out the Work. Relate Method Statement to activities shown on Construction Programme.
- B** Method Statement shall identify, among other things:
- Sequencing of Work.
 - Methods of excavation.
 - Methods of water mains installation and connections to minimise the shutdown of customer supplies.
 - Methods to ensure appropriate environmental protection.
 - Risk assessment of the hazards involved in the works.
 - Other key tasks as specified in the Contract Documents, and/or as requested by the Owner's Representative.

1.6 Certificates

- A** Contractor shall not be required to obtain a Trenching License. The Contractor shall obtain all other required approvals from the Ministry of Works and Engineering, Government of Bermuda.
- B** Within 5 working days after award of Contract, submit certificates of insurances.

1.7 Utilities

- A** The Contractor shall contact representatives of all utilities to ascertain the location of all underground services. All such services positions shall be clearly marked at the surface PRIOR to any trenching works commencing.
- B** The Contractor shall be fully responsible for any damage to services that were clearly marked at the surface caused by the Contractors work and shall fully indemnifies the Owner from any liability arising from any such damages.
- C** The Contractor shall maintain such markings at the surface at all times.
- D** When approaching underground services, the Contractor shall cease mechanical digging when machinery is within three (3) feet of the service location or when digging indicates that a service is present. Hand digging shall be used when crossing and exposing utilities and mechanical digging shall only be resumed once the utility service has been fully exposed and confirmed to be undamaged.

1.8 Daily Records

- A** The Contractor shall maintain accurate daily records of all works undertaken, all resources present on site, and of the progress.
- B** Records shall be submitted to the Owner at least weekly and the Contractor may inform the Owner’s Representative at any time that it is recording pertinent information.
- C** Records of any Works that have or have not been carried out that may affect the Schedule shall be used to update the Schedule.

1.9 Inspections

- A** At all times the Owner’s Representative shall be allowed to visit the Site to inspect the Works.
- B** Prior to closing in any part of the Works, the Contractor shall notify the

Owner's Representative with at least 48 hours' notice and afford him full opportunity to examine the Works before it becomes inaccessible.

- C** Any trench works closed before the pipe work has been hydro-tested shall be at a minimum, uncovered at the joints to allow the Owner's Representative to inspect the joints during the test. Such Works shall be to the account of the Contractor.
- D** The Owner's Representative shall reasonably make himself available at the request of the Contractor.

1.9 Safety and Health

- A** All Works shall be conducted in accordance with the Health and Safety at Work Act 1982. The Contractor shall erect appropriate traffic warning signs and safety barriers. Safe access must be maintained to all public and private properties at all times.
- B** All workers under the employ of the Contractor, including any sub-contractors it may employ shall comply with the Health and Safety at Work Act 1982 and at a minimum wear at all times.
1. A hard hat
 2. Metal toe safety boots
 3. Reflective vests.
- C** Any workers not wearing appropriate safety gear may be requested by the Owner's Representative to leave the Site, at which time they shall inform the Contractor that they have been requested to leave, and not return until they comply with the Applicable Law or regulations.
- D** All staff and sub-contractors, under the employ of the Contractor, shall be supplied with written health and safety instructions which they shall read, date and sign prior to commencing work. The signed instructions shall be held by the Contractor and copies shall be provided to the Owner.
- E** When the Site includes public property such as roads or parks the Site shall be protected from public access with temporary barriers and signs which shall provide appropriate warnings, the Contractors name and a contact telephone number.
- F** In completing the Works, the Contractor shall comply with all Health and Safety requirements of Applicable Law including all licenses issued by the Bermuda Government to permit the Works including, without limitation, the trenching license obtained by the Contractor to complete the Works (the "Trenching License").

***** END OF SECTION 01 31 00 *****

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A** This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

1.2 USE CHARGES

- A** The Contractor will be responsible for all temporary work required and shall be required to test, repair/replace or enhance the utility services as necessary to facilitate the Works.
- B** The Contractor shall allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner Representative, testing and inspecting agencies and personnel of authorities having jurisdiction.

1.3 TEMPORARY UTILITY INSTALLATION

A Electrical Service:

Where necessary, engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide alternate services.

B Sanitary Facilities:

1. Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
2. Disposable Supplies: Provide toilet tissue, paper towels, paper cups,

BLDC WATER & WASTEWATER PROGRAM TENDERING PACKAGE #2F
PUMPING STATION UPGRADES –
ST. GEORGE'S CLUB, TIGER BAY, AND MARKET WHARF

and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.

3. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
4. Wash Facilities: Supply cleaning compounds appropriate for each type of material handled.
5. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
6. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 degrees F (7.2 to 12.7 degrees C).

*****END OF SECTION 01 50 00*****

SECTION 01 56 00 – ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 ENVIRONMENTAL MEASURES

- A** Meet or exceed the requirements of all Bermuda environmental legislation and regulations, including all amendments up to project date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- B** At all times during the Works the Contractor shall maintain the Site and surrounding areas in a clean and orderly manner.

PART 2 – PRODUCTS

- A** Not Applicable.

PART 3 - EXECUTION

3.1 FIRES

- A** Fires and burning of rubbish on site will not be permitted.

3.2 DISPOSAL OF WASTES

- A** Burying of rubbish and waste materials on site will not be permitted.
- B** Collect all rubbish and waste material and dispose of in accordance with the latest editions of the Ministry of Works and Engineering, Waste Management Plan.
- C** Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- D** When cleaning with needle scabblers, provide enclosures, screens and traps to confine and contain all material and paint debris and other extraneous material.
- E** Do not allow any paint debris or other foreign material to enter the water.
- F** Hazardous waste such as lead paint debris should be double-bagged (as asbestos would be) and sent to proper waste stations. Manifest will be required by the Owner’s Representative.

3.4 DRAINAGE

- A** Provide temporary drainage and pumping as necessary to keep site free from water.
- B** Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- C** Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Bermuda authority requirements.

3.5 PLANT PROTECTION

- A** When, in opinion of Owner’s Representative, negligence of Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond work areas as shown on contract drawings, the Contractor shall be responsible, at his expense, for complete restoration including replacement of trees, shrubs, grass, etc. to satisfaction of Owner’s Representative.

3.6 POLLUTION CONTROL

- A** Maintain temporary erosion and pollution control features installed under contract.
- B** Control emissions from equipment and plant to Bermuda authorities’ emission requirements.
- C** Prevent extraneous materials from contaminating air, land or water, by vacuum, temporary enclosures, screens, traps or other devices.
- D** Spills of deleterious substances should be immediately contained and cleaned up in accordance with provincial regulatory requirements. Spills should be reported forthwith to the Owner’s Representative.
- E** Noise levels emitted from construction activities are subject to Bermuda Government requirements.

3.7 STORAGE AND HANDLING OF FUELS AND DANGEROUS FLUIDS

- A** Locate fuel storage facility a minimum of 100 m from any waterbody in an area approved by the Owner’s Representative and construct impermeable dykes so that any spillage is contained
- B** Prevent spillage of gasoline, diesel fuel and other oil products into the water and on land. Clean up spills promptly at own cost in accordance with Bermuda regulatory requirements. Report any fuel spills immediately to Owner’s Representative
- C** Proper use of primers, grouts, bonding adhesives and other hazardous substances will be undertaken to prevent their entry into the water. Substances are to be stored and mixed on protected surfaces away from site to prevent their entry into waterways and contamination of soils.
- D** Collect and dispose of used oil filter cartridges and other products of equipment maintenance at industrial waste facility to satisfaction of Owner’s Representative.

***** END OF SECTION 01 56 00*****

SECTION 01 77 00 – PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 CLEANING

- A** Use cleaning materials as recommended by product manufacturers and appropriate specification sections. Employ experienced workmen or professional cleaners.
- B** Before inspection for substantial completion, do all necessary cleaning, including the following:
1. Remove dust, dirt and debris from all surfaces
 2. Remove, clean all surfaces of oils, stains, weld splatters, etc. as required.
 3. Refer to specification sections for additional requirements for particular surfaces.

1.2 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

- A** Submit written certification that project, or designated portion of project, is substantially complete, and request, in writing, an inspection. The Owner’s Representative will make an inspection within 10 days of receipt of request.
- B** Should the Owner’s Representative determine that the work is substantially complete, he will prepare a punch list of deficiencies that need to be corrected before final inspection and issue a notice of substantial completion with the deficiencies noted.
- C** Should the Owner’s Representative determine that the work is not substantially complete, he will immediately notify Contractor, in writing, stating reasons. After Contractor completes work, he shall re-submit certification and request for final inspection.

1.3 CLOSE-OUT SUBMITTALS

- A** The project shall be closed out when all items have been completed and accepted by the Owner’s Representative.
- B** Refer to **EXECUTION** portion of each specification section for closeout requirements, including submission of certifications, test reports, etc.; provision

of spare parts and maintenance materials, all of which shall be neatly wrapped or packaged in standard sizes and clearly labeled.

- C** Certificate of insurance for products and completed operations.
- D** Typed list of all major subcontractors and suppliers with addresses and telephone numbers.

1.4 ACCEPTANCE OF THE WORK

- A** After all deficiencies have been corrected and the work has undergone a final inspection with no deficiencies, a Taking-Over Certificate will be issued. If only designated portions of the project have been inspected and accepted, a Taking Over-Certificate will be issued for that portion of the Work.
- B** Until receipt of Taking-Over Certificate, Contractor shall be responsible for the work of this Contract.

PART 2 PRODUCTS

- A** Not Applicable

PART 3 EXECUTION

- A** Not Applicable

***** END OF SECTION 01 77 00 *****

SECTION 33 32 00 SANITARY SEWERAGE EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the installation of the packaged duplex submersible grinder lift station, complete in place, with accessories and appurtenances as required for a complete and operational system. This Section also includes the installation of submersible pumps, complete in place, with accessories and appurtenances as required for a complete and operational system.
- B. Equipment specified in this Section will be furnished by the Owner.
- C. Contractor shall install equipment in full accordance with the Manufacturer’s written instructions. Contractor shall provide on-site support during the Manufacturer’s provided field services, demonstrations, and training.

1.2 SUBMITTALS

- A. Submit the following in accordance with the General Conditions and General Requirements for any items that will not be furnished by the Owner but are required for a complete and operational system:
 - 1. Shop Drawings
 - 2. Product Data: “Catalog Cuts” and spec sheets marked to specifically indicate the equipment and materials proposed for this project. Indicate selections with arrows and cross out irrelevant data.
- B. Record Drawings:
 - 1. Submit record drawings prior to time of Substantial Completion.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of materials, including unloading, storage, and handling of pumping equipment and controls, shall be in accordance with the Manufacturer’s recommendations.
- B. Materials and equipment shall be elevated above the ground using pallets, platforms, or other supports.
- C. Protect steel, packaged materials and electronics from corrosion and deterioration.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Equipment in this specification shall be furnished by the Owner.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the system in accordance with the configuration shown on the Contract Drawings and in accordance with the Manufacturer’s requirements.
- B. Properly align equipment with associated piping and utility connections, without exerting undue stress on connecting piping and utilities. Contractor shall provide flange gaskets, nuts and bolts for pump discharge piping connections.
- C. Contractor shall make all necessary adjustments to equipment to provide complete operational pump installations meeting the requirements of the Contract Documents.
- D. Install equipment plumb and level and demonstrate plumbness and levelness to the Engineer.

3.2 MANUFACTURER’S FIELD SERVICES

- A. Engage a factory-authorized service representative to perform the following inspections, checks, and supervision of testing prior to start up:
 - 1. Inspect and approve field-assembled components, equipment installation, and electrical connections for compliance with the Manufacturer’s installation recommendations and requirements.
 - 2. Set field-adjustable settings to the values recommended by the equipment manufacturer.
 - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and components.
 - 4. Supervise tests performed by independent testing firms. Witness initial energization and perform or supervise startup services.
 - 5. Prepare written report to record the following:
 - a. Inspections and checks carried out on site.
 - b. Test procedures used.
 - c. Test results that comply with Manufacturer’s requirements.
 - d. Test results that do not comply with Manufacturer’s requirements and corrective action taken to achieve compliance with Manufacturer’s requirements.

3.3 DEMONSTRATION AND TRAINING

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the equipment.

1. Train Owner's maintenance personnel for a minimum of 4 hours on procedures and schedules for energizing and de-energizing, troubleshooting, servicing, and maintaining equipment and schedules.
2. Review data in Operation and Maintenance manuals.
3. Schedule training with Owner, with at least 14 days advance notice.

3.4 CLEANING

- A. Prior to acceptance, inspect interior and exterior of pump system for dirt, splashed material or damaged paint. Clean or repair accordingly. Remove from the job site all tools, surplus materials, scrap and debris.
- B. The pumping system should be placed into service immediately. If operation is delayed, drain water from pumps and piping. Open motor circuit breakers and protect station controls and interior equipment from cold and moisture.

3.5 PROTECTION

- A. Protect installed equipment from damage through Substantial Completion.
- B. The pump system should be placed into service immediately. If operation is delayed, drain water from pumps and piping. Open motor circuit breakers and protect station controls and interior equipment from cold and moisture.

****END OF SECTION 33 32 00****

SECTION 40 05 10 MECHANICAL PIPING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes but is not limited to, the following:
1. All types and sizes of piping, except those specified under other Sections or other Contracts.
 2. Supports, restraints, thrust blocks and other anchors.
 3. Work on or affecting existing piping.
 4. Pressure and leakage testing.
 5. Installation of jointing and gasketing materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to complete exposed piping installation.
 6. Incorporation of valves, meters and special items shown or specified into piping systems as required and as specified.

1.2 QUALITY ASSURANCE

- A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. American Water Works Association (AWWA)
 - a. C219 – Bolted, Sleeve-Type Couplings for Plain-End Pipe
 2. American National Standards Institute (ANSI)
 - a. B16.5 – Pipe Flanges and Flanged Fittings
 - b. B31.3 – Process Piping
 - c. B36.19 – Stainless Steel Pipe
 3. American Society for Testing and Materials (ASTM)
 - a. A182 – Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
 - b. A193 – Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service and Other Special Purpose Applications
 - c. A194 – Carbon Steel, Alloy-Steel and Stainless Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both
 - d. A312 – Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

- e. A354 – Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners
 - f. A403 – Wrought Austenitic Stainless Steel Piping Fittings
 - g. A774 – As-Welded Wrought Austenitic Stainless Steel Fittings for general corrosive service at low and moderate temperatures
 - h. A778 -Welded, Unannealed Austenitic Stainless Steel Tubular Products
 - i. D1784 – Rigid PVC Compounds and CPVC Compounds
 - j. D1785 – PVC Plastic Pipe, Schedules 40, 80 and 120
 - k. D2241 – Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
 - l. D2464 – Threaded PVC Plastic Pipe Fittings, Schedule 80
 - m. D2466 – PVC Plastic Pipe Fittings, Schedule 40
 - n. D2467 – PVC Plastic Pipe Fittings, Schedule 80
 - o. D2564 – Solvent Cements for PVC Plastic Piping Systems
 - p. D2749 – Dimensions of Plastic Pipe Fittings
 - q. D2837 – Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
 - r. D2855 – Practice for Making Solvent-Cemented Joints with PVC Pipe and Fittings
 - s. F656 – Primers for Use in Solvent Cement Joints of PVC Plastic Pipe and Fittings
 - t. F1970 – Special Engineered Fittings or Appurtenances for use in PVC or CPVC Systems
- 4. American Welding Society (AWS)
 - 5. National Sanitation Foundation (NSF)
 - a. 61 – Drinking Water System Components - Health Effects

1.3 SUBMITTALS

- A. Submit the following in accordance with the General Conditions and General Requirements:
 - 1. Shop Drawings:
 - a. Detailed drawings in plan and profile, and laying schedules.
 - b. Details of any piping, valves, and equipment for items that are not furnished by BLDC.
 - c. Details of any supports, accessories, specials, joints, and harnessing required for completion of the Work to full operational capacity.

- d. Details of connections to existing pipes and structures.
- 2. Tests: Submit description of proposed testing methods, procedures and apparatus. Submit copies of test report for each test.
- 3. Record Drawings:
 - a. Submit record drawings prior to time of Substantial Completion.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site to insure uninterrupted progress of the Work.
- B. Handle all pipe, fittings and accessories carefully with approved handling devices. Do not drop or roll pipe off trucks. Do not otherwise drop, roll or skid piping.
- C. Store pipes and fittings on heavy wood blocking or platforms so they are not in contact with ground.
- D. Unload pipe, fittings and specials opposite to or as close to place where they are to be installed as is practical to avoid unnecessary handling. Keep pipe interiors completely free from dirt and foreign matter.
- E. Inspect delivered pipe for cracked, gouged, chipped, dented or other damaged material and immediately remove from site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Refer to applicable paragraphs for material specifications below for items not furnished by BLDC.
- B. Polyvinyl Chloride (PVC) Pipe
 - 1. Material: Unless otherwise shown or specified, PVC pipe shall be:
 - a. Type and Grade: Type 1, Grade 1
 - b. Wall Thickness:
 - 1) Schedule 80 conforming to ASTM D1785 and US Product Service PS 21-70 (supersedes US Commercial Standard CS 207-60) as having the same OD dimension as iron pipe
 - c. Temperature Rating: Maximum temperature rating shall be 140 degrees F.
 - d. Color: Gray
 - 2. Fittings:
 - a. Type, grade, schedule, and color of fitting shall match pipe.
 - b. Solvent Weld: Solvent welded fittings shall conform to ASTM D2467 for socket type.
 - c. Threaded: Threaded fittings shall conform to ASTM D2464.

- d. Flanged: Provide flanged fittings with Viton gaskets.
- e. Push-on: Provide gasketed push-on fittings in accordance with ASTM D2466.
- 3. Joints:
 - a. Solvent: Use primer and solvent cement as recommended by PVC pipe manufacturer. Primer shall be in accordance with ASTM F656. Solvent cement shall be in accordance with ASTM D2564.
 - b. Threaded: Polytetrafluoroethylene (Teflon) (PTFE) tape required for threaded fittings. Pipe shall not be threaded.
 - c. Flanged: Provide with back-up flange of minimum 1/8-inch thickness. Back-up flanges and connecting bolts shall be of Type 304 stainless steel.
 - d. Push-on: Provide gasketed push-on joints in accordance with ASTM D3139 and ASTM F477.
- 4. Manufacturer:
 - a. Ipex Pipe Valves & Fittings, Inc.
 - b. Spears Manufacturing Company
 - c. The Harrington Corporation
 - d. Or equal

2.2 SPECIALTIES

A. Wall Castings and Sleeves

- 1. Wall castings shall be cast or ductile iron and shall be of the configuration as shown on the Contract Drawings.
- 2. Sleeves shall be solid cast or ductile iron castings or fabricated from Schedule 40 steel pipe.
- 3. Fabricated wall pipes and sleeves of ductile or cast iron pipe may be used in lieu of wall castings and cast sleeves with prior acceptance of the Engineer.
 - a. Fabrication shall be by a manufacturer regularly engaged in the field.
- 4. Wall castings and sleeves shall be provided with waterstops when installed in poured concrete foundations, walls, slabs, and elsewhere as shown.
 - a. Waterstops for fabricated sleeves shall be at least the same thickness as the sleeve and a minimum of 2 inches in width.
 - 1) Attached by continuous fillet weld both sides around the sleeve.
 - a) MIG weld shall be used on cast or ductile iron.
 - b) One waterstop for lengths up to and including 12 inches.
 - c) Two waterstops for lengths over 12 inches.
- 5. Waterstops for castings shall be the manufacturer's standard.

B. Link Seals

1. Provide link type mechanical seals suitable for working pressure, as scheduled, corrosive service and accessible from one side, with glass reinforced nylon pressure plates and stainless steel bolts and nuts.
2. Product and Manufacturer: Link-Seal, as manufactured by Thunderline Corporation, or equal.

C. Bolted Sleeve Type Couplings

1. Pressure and Service: Same as connecting piping.
2. Sleeve and Follower: Carbon steel with fusion bonded epoxy coating, for exposed service.
3. Gaskets: Nitrile (Buna N) rubber.
4. Bolts and Nuts: Stainless steel, Type 304.
5. Product and Manufacturer: Style 38 by Dresser Industries, Type 411 by Smith-Blair, or equal.

D. Flanged Coupling Adapters

1. One end of adapter shall be flanged and other end shall have a bolted sleeve type coupling.
2. Pressure and Service: Same as connecting piping.
3. Body and Follower: Cast or ductile iron, with fusion bonded epoxy coating.
4. Gaskets: Nitrile (Buna N) rubber.
5. Bolts and Nuts: Stainless steel, Type 304.
6. Product and Manufacturer: Style 127 by Dresser Industries, Type 912 by Smith-Blair, or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install piping as shown, specified and as recommended by manufacturer.
2. If there is a conflict between manufacturer's recommendations and Contract Drawings or Specifications request instructions from Engineer before proceeding.

B. Exposed Piping Installation:

1. Install straight runs true to line and elevation.
2. Install vertical pipe truly plumb in all directions.
3. Install piping parallel or perpendicular to building walls. Piping at angles and 45 degree runs across corners will not be accepted unless specifically shown or approved.

4. Install small diameter piping generally as shown when specific locations and elevations are not indicated. Locate such piping as required to avoid ducts, equipment, beams, and other obstructions.
5. Install piping so as to leave all corridors, walkways, work areas, and like spaces unobstructed. Unless otherwise approved, provide minimum headroom clearance under all piping of 7 feet 6 inches.
6. Protect and keep clean pipe interiors, fittings and valves.
7. Provide temporary caps or plugs over all pipe openings at the end of each day's work, and when otherwise required or directed by Engineer.
8. Cutting: Cut pipe from measurements taken at site, not from Contract Drawings.
 - a. Cut piping accurately and squarely and install without forcing or springing.
 - b. Ream out all piping and tubing to full inside diameter after cutting. Remove all sharp edges on end cuts.
 - c. Remove all cuttings and foreign matter from the inside of pipe and tubing before installation. Thoroughly clean all pipe, fittings, valves, specials, and accessories before installing.
9. Install dielectric unions wherever dissimilar metals are connected except for bronze or brass valves in ferrous piping.
10. Provide a union downstream of each valve with screwed connections.
11. Provide screwed or flanged unions at each piece of equipment, where shown, and where necessary to install or dismantle piping.
12. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.
13. Additional Requirements for Thermoplastic Piping:
 - a. Support valves independently of the piping system.
 - b. Utilize wide band supports as recommended by manufacturer and approved by Engineer to minimize localized stresses.
 - c. Provide piping passing through walls with a sleeve of wearing material to prevent abrasion damage to piping.
 - d. Use "U" clamps with wide band circumferential contact.
 - e. Use guides on long runs of piping to maintain alignment and reduce chance of elastic failure of pipe. Space guides as recommended by manufacturer.
 - f. Use expansion loops to take up pipe expansion as recommended by the manufacturer.
 - g. Use bellows with low axial force to take up pipe expansion. Provide anchors to restrain the expansion joint. Use of bellows joints shall be kept to a

minimum. Flexible connectors may be used to absorb thermal movement when approved by Engineer.

- h. Do not install pipe when temperature is less than 50°F.

C. Buried Piping Installation:

1. General

- a. Install pipelines, fittings, specials, and accessories in accordance with the configuration shown on the Contract Drawings.
- b. Excavation and backfilling shall be as shown on the Contract Drawings or as specified herein.
- c. Blocking will not be permitted under pipe, except where the pipe is to be laid with concrete cradle or encasement.
- d. No pipe shall be laid upon a foundation in which frost exists; nor at any time when there is danger of the formation of ice or the penetration of frost at the bottom of the excavation.
- e. Temporary bulkheads shall be placed in all open ends of pipe whenever pipe laying is not actively in process. The bulkheads shall be designed to prevent the entrance of dirt, debris or water.
- f. Precautions shall be taken to prevent the flotation of the pipe in the event of water entering the trench.

2. Location and Grade

- a. Pipelines and appurtenances shall be located as shown on the Contract Drawings or as directed and as established from the control survey in accordance with Division 1 specifications.
- b. The alignment and grades shall be determined and maintained by a method acceptable to the Engineer.

3. Subgrade

- a. The subgrade for pipelines shall be earth or special embedment as shown on the Contract Drawings, specified or directed by the Engineer.

4. Joints

- a. Joints shall be assembled using gaskets, lubricants and solvents as furnished by the pipe manufacturer and in accordance with the manufacturer's recommendations.

5. Embedment

- a. Embedment shall be deposited and compacted in accordance with the Contract Drawings or specified herein.
- b. Embedment shall be native material excavated from the trench, which is acceptable to the Engineer, containing no stones larger than 1-1/2 inches in size or debris.

- c. Embedment material shall be deposited and tamped in 6-inch layers to the centerline of the pipe.
 - d. Native material placed above the centerline of the pipe to a depth of 12 inches above the pipe shall be deposited in such manner as to not damage the pipe.
 - e. When specified or directed, Select Fill material shall be used in lieu of the native material for b or d above.
6. Thrust Restraints
- a. Pressure pipelines shall have thrust restraints in the form of thrust blocks, tie rods, or anchors of the size and type specified or as required by the pressure and stability of the supporting surface.
 - 1) Thrust restraints shall be installed at all changes in direction, changes in size, dead ends or other locations where shown.
 - 2) Thrust restraints shall be in place, and when of concrete (3,000 psi) shall have developed the required strength, prior to testing of the pipeline.
 - 3) Tie rods and nuts for thrust restraints shall be of high tensile steel and shall have a minimum yield strength of 70,000 psi.
 - a) Tie rods and nuts installed underground shall be coated with two coats of coal tar pitch preservative coating after installation.

D. Joints:

1. General:
- a. Make joints in accordance with pipe manufacturer's recommendations and requirements below.
 - b. Cut piping accurately and squarely and install without forcing or springing.
 - c. Ream out all pipes and tubing to full inside diameter after cutting. Remove all sharp edges on end cuts.
 - d. Remove all cuttings and foreign matter from inside of pipe and tubing before installation. Thoroughly clean all pipe, fittings, valves, specials, and accessories before installing.
2. Flanged Joints:
- a. Assemble flanged joints using 1/8-inch ring-type gaskets for raised face flanges. Use full face gaskets for flat face flanges unless otherwise approved by Engineer. Gaskets shall be suitable for service intended in accordance with manufacturer's ratings and instructions. Gaskets shall be properly centered.
 - b. Bolts shall be tightened in a sequence which will insure equal distribution of bolt loads.
 - c. Length of bolts shall be uniform and shall not project beyond nut more than 1/4-inch or fall short of nut when fully taken up. Ends of bolts shall be machine cut so as to be neatly rounded. No washers shall be used.

- d. Bolt threads and gasket faces for flanged joints shall be lubricated prior to assembly.
- e. Alternately tighten bolts 180 degrees apart to compress gasket evenly.

3. Thermoplastic Pipe Joints:

a. Solvent Cement Joints:

- 1) Bevel pipe ends and remove all burrs before making joints. Clean both pipe and fittings thoroughly. Do not attempt to make solvent cement joints if temperature is below 40°F nor in wet conditions.
- 2) Use solvent cement supplied or recommended by the pipe manufacturer.
- 3) Apply joint primer and solvent cement and assemble joints in strict accordance with the recommendations and instructions of the manufacturer of the joint materials and the pipe manufacturer.
- 4) Observe safety precautions with the use of joint primers and solvent cements. Allow air to circulate freely through pipelines to permit solvent vapors to escape. Slowly admit water when flushing or filling pipelines to prevent compression of gases within pipes.

b. Threaded Joints:

- 1) Cut pipe square and smooth and remove burrs or raised edges with knife or file. Hold pipe firmly in place in pipe vise. Protect pipe at point of grip by inserting rubber sheet or other material between pipe and vise. Thread pipe in accordance with pipe manufacturer's recommendations. Brush threads clean of chips and ribbons. Apply chemical compatible thread sealant over thread length. Screw fitting or coupling onto pipe and tighten by hand. Using strap wrench only, further tighten connection an additional one to two threads past tightness.

E. Installing Valves and Accessories:

- 1. Provide supports for large valves, flow meters and other heavy items as shown or required.
- 2. Install floor stands as shown and as recommended by manufacturer.
- 3. Provide lateral restraints for extension bonnets and extension stems as shown and as recommended by manufacturer.
- 4. Provide steel sleeves where operating stems pass through floor. Extend sleeves 2 inches above floor.
- 5. Position valve operators as shown. When position is not shown, install valve so that it can be conveniently operated and as approved by Engineer. Avoid placing operators at angles to floors or walls, unless shown on Contract Drawings.
- 6. Position flow measuring devices in pipes so that they have amount of straight upstream and downstream runs recommended by manufacturer, unless specific location dimensions are shown. Position swing check valves so that they do not conflict with discs of butterfly valves.

F. Unions:

1. Install dielectric unions wherever dissimilar metals are connected except for bronze or brass valves in ferrous piping.
 2. Provide a union downstream of each valve with screwed connections.
 3. Provide screwed or flanged unions at each piece of equipment, where shown, and where necessary to install or dismantle piping.
- G. Eccentric Reducers: Use eccentric reducers where shown and where air or water pockets would otherwise occur in mains because of a reduction in pipe size.
- H. Transitions from One Type of Pipe to Another:
1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.
- I. Wall Castings and Sleeves
1. Install wall castings and sleeves at the locations and elevations as shown on layout drawings or Contract Drawings.
 - a. Verify location with the installer of the carrier pipe before concrete is poured.
 2. Castings and sleeves installed in walls and ceilings shall be flush with the finish surface.
 3. Sleeves in floors shall be fabricated from Schedule 40 steel pipe.
 - a. In areas not requiring escutcheons or plates the sleeve shall extend 4 inches above finished floor.
 4. Sleeves installed in exterior walls, finished areas and where water or gas tightness is required shall be sealed water and gas tight.
 5. Size
 - a. Wall castings shall be the size of the carrier pipe.
 - b. Sleeves for modular link type wall seals shall be sized in accordance with the manufacturer's recommendations.
 - c. Sleeves for caulking shall be a minimum of one size larger than the carrier pipe.
 6. Sealants shall be installed in accordance with the manufacturer's recommendations.

3.2 PAINTING

- A. Not required for plastic and stainless steel piping systems.

3.3 TESTING OF PIPING

A. General:

1. Test all piping as specified below unless otherwise authorized by Engineer.

2. Notify Engineer 48 hours in advance of testing.
 3. Provide all testing apparatus including pumps, hoses, gages, and fittings.
 4. Pipelines shall hold specified test pressure for two hours.
 5. Repair and retest pipelines which fail to hold specified test pressures or which exceed allowable leakage rate.
 6. Test pressures required are at lowest elevation of pipeline section being tested, unless otherwise specified.
 7. Follow special test procedures below for gaseous chemical and liquid chlorine lines.
 8. Conduct all tests in presence of Engineer. Repeat tests in presence of local authorities having jurisdiction, if required.
- B. Schedule of Pipeline Tests:
1. Test piping at test pressure indicated in Piping Schedule.
 2. For piping not included in Piping Schedule, Engineer will notify Contractor in writing of test pressure to be utilized.
- C. Pressure Test Procedure:
1. Ensure that all supports and restraint protection are securely in place.
 2. Fill section to be tested slowly with water and expel all air. Install cocks, if necessary, to ensure removal of air.
 3. Test only one section of pipe at a time.
 4. Apply specified test pressure required for two hours and observe pressure gauge. Check carefully for leaks while test pressure is being maintained.
- D. Leakage Testing:
1. Conduct leakage test after satisfactory completion of pressure test.
 2. Allowable Leakage Rates (gallons per hour per 1000 feet per inch diameter):
 - a. Copper, Steel, Ductile Iron, Thermo Plastic, and all Other Piping: 0.0
 3. Leakage Test Procedure:
 - a. Examine exposed pipe, joints, fittings and valves. Repair visible leakage or replace defective pipe, fitting or valve.
 - b. Refill line under test to reach required test pressure.
 - c. Provide test container filled with known quantity of water at start of test. Attach test pump suction to test container.
 - d. Pump water from test container into line with test pump to hold specified test pressure for test period. Water remaining in container shall be measured and amount used during test shall be recorded on test report.

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- e. Perform all repair, replacement, and retesting required because of failure to meet testing requirements.
- f. Leakage shall be less than rate specified above.

3.4 PIPING SCHEDULE (EXCLUDES HDPE IPS DR11 PIPE SPECIFIED ELSEWHERE)

Description	Size	Mat'l	Wall Thickness or Class	Joints	Test Pressure (psig)
Exposed Sanitary Sewer Force Main (Tiger Bay Discharge)	4"/6"	PVC	Sch. 80	Flg.	N/A
Buried Sanitary Sewer Force Main (Tiger Bay Discharge)	6"	PVC	Sch. 80	Solv. Wld.	N/A
Exposed Sanitary Sewer Force Main (Market Wharf Discharge)	4"	PVC	Sch. 80	Flg.	N/A

Legend

PVC Polyvinyl Chloride
Solv. Wld. Solvent Welded
Flg. Flanged

****END OF SECTION 04 05 10****

SECTION 40 05 61.23 – VALVES AND ACCESSORIES

PART 1 – GENERAL

1.1 REQUIREMENTS

- A** The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated on the Drawings and specified herein.
- B** This Section covers furnishing and installing all labor, materials and equipment required for the installation of two inch through four inch resilient-seated gate valves, all in accordance with the details shown on the plans and requirements of these specifications. Metal-sealed gate valves shall not be used.

PART 2 – PRODUCTS

2.1 RESILIENT SEATED GATE VALVE

- A** Pressure Class. Design pressure for resilient-seated gate valves shall be 200 psi for diameters up to 12 inches. Valves for operating pressures other than the above shall be as specified on the plans or in the special specifications.
- B** Component Parts. Unless otherwise provided herein, component parts for resilient seated gate valves shall be in accordance with AWWA C509 and C515. All components of resilient seated valves shall be tested and certified by an approved testing laboratory located in the United States. All parts shall be readily available.
 - 1. The valve manufacturer's name and valve model number, size, and year of manufacture shall be cast on the body.
 - 2. The resilient seat shall be fastened to the gate by use of either mechanical, stainless steel fasteners, or vulcanizing methods in accordance with the requirements of ASTM D429 and the manufacturer's recommended procedures.
 - 3. Resilient-seated gate valves shall be provided with a two inch square operating nut. When specified on the plans, a hand wheel shall be used. The direction to open the valve shall be to the left (e.g. counterclockwise). A direction indication for opening the valve shall be cast on the operating nut. Position indicators shall not be required unless specified on the plans or in the special specifications. Valves must have a minimum of 2 turns

per inch of diameter.

4. All interior ferrous surfaces exposed to fluid flow, including the gate, shall be factory coated with a thermo-setting or fusion epoxy coating. The coating shall be safe for potable water systems in accordance with AWWA C550 with an NSF/ANSI 61 certified fusion bonded epoxy.
5. The wedge shall be manufactured of ductile iron and fully encapsulated in a molded EPDM resilient material, 1/8-inch thick, resistant to heat, corrosion, hydrolysis, tuberculation, abrasion and bacteria and comply with ASTM D2000. The bond shall meet tests for rubber to metal bond according to ASTM D 429.
6. All exterior ferrous surfaces, including nuts and bolts, shall be field coated with a fast curing sealant from the approved materials list in Appendix A for this use. The application of the sealant shall be accordance with the manufacturer's recommendations. Nuts and bolts may be manufactured of ASTM type 304 or 316 stainless steel in lieu of being coated.
7. All internal parts shall be accessible for repair or replacement without removing the valve body from the pressure line. The stem shall be sealed by use of a minimum of two O rings. The O-ring(s) shall be located above the stem collar. O-rings shall be replaceable under pressure with the valve in the open position.
8. The diameter of the internal passageway shall have a nominal inside dimension equal to the valve size or larger. The valve shall provide an unobstructed waterway in the full open position making the valve applicable for tapping applications.
9. Valve stem shall be a high strength, low zinc bronze, 40,000 psi yield strength, 70,000 psi tensile strength, with not less than ten percent elongation. Stem bronze shall conform to the requirements of Section 2 of AWWA C509.
10. Where the joint type is not scheduled or shown, joints shall conform to the type of pipe joint at the point of installation.
11. Where specified in the Contract Document, valve ends shall be flanged in accordance with AWWA C110 for 125/150 lb. flanges and ASME/ANSI B16.1 FOR 250/300 lb. flanges. Connection bolts and washers shall be manufactured of 316 stainless steel and nuts shall be manufactured of 316 stainless steel with a Xylem coating or approved equal. No anti-seize compound shall be applied on flanged bolts.

- C** Provide valves designed for buried service. The wedge shall consist of a ductile iron casting encased in a bonded-in-place nitrile elastomer covering which shall form the resilient sealing surfaces. All buried valves shall be non-rising stem design with sealing accomplished by double O-rings. The valve wedge encapsulation material shall be Nitrile (NBR/Buna-N). Provide gate valves designed and constructed in accordance with the following criteria.
- D** Face-to-face and end-to-end dimensions of flanged or welding-end valve bodies: ANSI B16.10. Connection: butt fused joint or restrained MJ adapter with stainless steel stiffener and accessory kit.
- E** Gate valves shall be vertical open-RIGHT (Clockwise) of the non-rising stem type with butt fused joint or restrained MJ adapter with stainless steel stiffener and accessory kit ends and 2-inch square operating nut. Gate valves shall be iron body, double disc, parallel seat, fully bronze mounted.
- F** Working pressure: minimum 150 psi. Hydrostatic Test Pressure: 250 psi.
- G** Provide T-handle valve extension stem wrenches for operating valves of various depths. Length of extension stem: designed for depth of valve. Provide buried valves with a valve box as shown on Drawings and as specified. The valve boxes shall be cast iron, tar coated, sliding type. The valve box shall be adjustable together with a cast iron cover. The bell end of the valve box shall be sufficiently large to fit over the stuffing box of the gate valve.
- H** Furnish all valves of the same type, style, and duty, supplied by a single manufacturer.
- I** Acceptable manufacturers:
 - 1. Clow Valve Company
 - 2. Mueller Company
 - 3. Kennedy Valve Company
 - 4. M&H Valve Company

2.2 SWING CHECK VALVE

- A** General:
 - 1. The valves shall conform to AWWA C508 and as specified herein.
 - 2. Sizes: 4 in. through 24 in.
 - 3. Type: Resilient-seated.
 - 4. Design Working Pressure:
 - a. Smaller than 12 in. Diameter: 175 psig.
 - b. 12 in. Diameter and Larger: 150 psig.
 - 5. The valves shall be suitable for horizontal or vertical mounting.

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6. The check valves shall have a clear waterway with full open area equal to the pipe size.
7. The check valves shall be provided with outside adjustable weight and lever.
8. Valves larger than 6-inch shall be provided with adjustable air cushion chambers.
9. Valve seats shall be mechanically attached and shall be field replaceable.
10. Valve ends shall be flanged in accordance with AWWA C110 for 125/150 lb. flanges and ASME/ANSI B16.1 FOR 250/300 lb. flanges. Connection bolts and washers shall be manufactured of 316 stainless steel and nuts shall be manufactured of 316 stainless steel with a Xylem coating or approved equal. No anti-seize compound shall be applied on flanged bolts.

B Materials of Construction: All materials of construction shall conform to the requirements of AWWA C508 and shall be as follows for various valve components:

1. Body, Disc, Cover and Gland: Cast-iron.
2. Disc Arm: Ductile iron.
3. Hinge Shaft: Type 316 stainless steel.
4. Hinge Shaft Bushings: Bronze, ASTM B 62, Alloy UNS C83600.
5. Shaft End Plate: Type 316 stainless steel.
6. Body Seat and follower ring on rubber seat on disc: Type 316 stainless steel.
7. Disc Center Pin Assembly: Type 316 stainless steel.
8. Air Cushion Chamber:
 - a. Chamber and Plunger: Bronze, ASTM B 62, Alloy UNS C83600.
 - b. Linkages and Pins: Type 316 stainless steel.
 - c. Air Check Valve and Tubing: Brass.
9. All Rubber Items:
 - a. Up to 180°F Fluid Temperature: Buna-N.
 - b. Greater than 180°F Fluid Temperature: Viton.
10. All internal and external bolting and other hardware including pins, set screws, studs, bolts, nuts and washers: Type 316 stainless steel.
11. Gland Packing: Graphite and Kevlar.

C Interior Coating: All valves shall be coated inside. The steel, cast-iron and ductile iron surfaces, except machined surfaces, shall be epoxy coated in accordance with AWWA C550.

D Testing:

1. All valves shall be shop tested in conformance with the requirement of AWWA C508.
2. Permitted Leakage at Design Working and Operating Pressures: Zero.

PART 3 – EXECUTION

3.1 GENERAL

- A** Not applicable

3.2 HANDLING AND STORAGE

- A** Handling: Valves, fittings and accessories shall be carefully inspected before and after installation and those found defective shall be rejected. Valves and fittings shall be free from fins and burrs. Before being placed in position, valve, fittings, and accessories shall be cleaned, and shall be maintained in a clean condition. Proper facilities shall be provided for lowering valves into trenches. Under no circumstances shall a valve, fittings or any other material be dropped or dumped into trenches.
- B** Storage: Valves should be stored, if possible, at the job site in unit packages provided by the manufacturer. Caution should be exercised to avoid compression damage or deformation to flange faces of the valve. Gaskets should be stored in a cool, dark place out of the direct rays of the sun, preferably in original cartons.

3.3 INSTALLATION

- A** Valves shall be installed in accordance the valve manufacturer's recommendations. All fittings, valves, flexible couplings and repair clamps shall be encased with a 10 mil polyethylene in accordance with AWWA C105 Method C.
- B** All personnel of the contractor or subcontractor shall be skilled and knowledgeable with regard to the installation procedures for the valves and appurtenances being installed.
- C** Prior to installation in the trench, valves shall be fully opened and closed by the contractor to check the operation to ensure that the valve fully seats. A record shall be made of the number of turns required to fully open or close the valve. This record shall be included on the as-built plans. The inside of the valve shall be thoroughly cleaned prior to valve installation

***** END OF SECTION 40 05 61.23*****