

Annex C

Bermuda Land Development Company Water and Wastewater Program

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

BLDC

BERMUDA LAND DEVELOPMENT COMPANY LIMITED

100% SUBMITTAL CONTRACT DOCUMENTS

**Tendering Package #2D
Tiger Bay Intersection to Fort Victoria
Intersection
Piping & Pumping Infrastructure
July 2021**



RAMBOLL

Bright ideas. Sustainable change.

NO TEXT ON THIS PAGE

TABLE OF CONTENTS

GENERAL REQUIREMENTS

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 40 – PROCESS INTERCONNECTIONS

40 05 61	Valves and Accessories
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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 water transfer main, sanitary sewer force main, reclaim water transfer main and PVC communication conduit of sizes and locations as shown on the Contract Drawings.
- B** The Works consist of:
1. Contractor identification of existing utility crossing and coordination as necessary for the construction of new piping installed in existing trenches.
 2. Open trench excavation, pipe installation, backfilling, compaction and site restoration.
 3. Installation of combination air release valves in concrete brick manholes at high points along the sanitary sewer force main, potable water transfer main and reclaimed water transfer main, where shown on the Contract Drawings.
 4. Installation of PVC tapping saddles at all locations shown on the Contract Drawings.
 5. Installation of electrofusion tapping sleeve at the location shown on the Contract Drawings.
 6. Installation of resilient seated gate valves along the potable water transfer main where shown on the Contract Drawings.
 7. Installation of resilient seated gate valves along the reclaimed water main where shown on the Contract Drawings.
 8. Installation of flushing connections where shown on the Contract Drawings.
 9. Installation of communication junction boxes where shown on the Contract Drawings.
 10. Installation of all other piping, fittings and accessories for completion of Work to full operational capacity.
 11. Hydrostatic pipe testing (all pipes).
- C** For the Work Under this Contract the BLDC shall furnish:
1. 1,923 LF of 4” PVC Communication pipe
 2. 1,075 LF of 4" HDPE Green Stripe pipe
 3. 30 LF of 2" HDPE Lilac Stripe pipe

4. 982 LF of 4" HDPE Lilac Stripe pipe
5. 818 LF of 6" HDPE Lilac Stripe pipe
6. 1,048 LF of 8" HDPE Blue Stripe pipe
7. Three (3) 2-inch Combination Air Release Valve for sanitary sewer application
8. One (1) 2-inch Combination Air Release Valve for reclaimed water application
9. One (1) 2-inch Combination Air Release Valve for potable water application
10. One (1) 2-inch Resilient Seated Gate Valve for reclaimed water
11. One (1) 4-inch Resilient Seated Gate Valve for reclaimed water
12. One (1) 4-inch Resilient Seated Gate Valve for sanitary sewer
13. Three (3) 8-inch Resilient Seated Gate Valve for potable water
14. One (1) 8-inch Electrofusion Tapping Sleeve and 6-inch Resilient Seated Gate Valve

- 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 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 6.00pm 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.
- A 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, 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 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.

1.2 RELATED WORK

- A** Section 31 00 00 – Earthwork.
- B** Section 33 31 23-01 – High Density Polyethylene Pipe Fittings Installation And Testing

PART 2 – PRODUCTS

2.1 ELECTROFUSION TAPPING SLEEVE AND VALVE

- A** Valves for tapping service shall meet all the requirements for resilient seated gate valve as specified herein. In addition, the body seat rings shall have clear inside openings sufficient to pass a cutter of full diameter and equal to the nominal size of the tapping valve.
- B** Tapping valves for HDPE pipe shall produce from a pre-blended virgin resin that has a PPI listing of PE3408 which complies with ASTM D3350. This resin carries a NSF Standard 61 listing for use with potable water. The outlet pipe size shall be HDPE SDR 11 (DIPS).

2.2 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. counter clockwise). 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 COMBINATION AIR RELEASE VALVE FOR RECLAIMED WATER
TRANSFER MAIN, SANITARY SEWER FORCE MAIN AND POTABLE
WATER MAIN**

- A** Provide dual body combination Air/ Vacuum Release valves of the sizes shown on the Contract Drawings. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.
- B** The combination air valve shall combine the operating features of both an air and vacuum valve and an air release valve in one housing. The air and vacuum valve portion shall automatically exhaust large quantities of air during the filling of the pipeline and automatically allow air to reenter the pipeline when the internal pressure of the pipeline approaches a negative value due to column separation, draining of the pipeline, or other emergency. The air release valve portion shall automatically release small amounts of air from the pipeline while it is under pressure. The inlet and outlet of the valve shall have the same cross-section area. The float shall be guided by a stainless steel guide shaft and seat drip-tight against a synthetic rubber seal. The float shall be of all stainless steel construction and capable of withstanding maximum system surge pressure without failure. Valve must be manufactured per ANSI/AWWA C512-04
- B** Working pressure: minimum 150 psi. Hydrostatic Test Pressure: 250 psi.
- C** Connections
1. Dual body valves sizes 3 in. (75 mm) and smaller shall have full size NPT inlets and outlets equal to the nominal valve size with a 2 in. (50 mm) inlet on 1 in. (25 mm) valves.
 2. The body inlet connection shall be hexagonal for a wrench connection.
 3. The valve shall have three additional NPT connections for the addition of backwash accessories.
- C** Design
1. Provide an extended body with a through flow area equal to the nominal size. Floats shall be unconditionally guaranteed against failure including pressure surges. The seat shall provide drop tight shut off to the full valve pressure rating.
 2. Dual body valves for reclaimed water main and sanitary sewer force main shall consist of a Wastewater Air Release Valve. Dual body valve for potable water main shall be NSF 61 certified for use with potable water. All valves shall be piped with a full-ported brass ball valve.
 - a. The Air Release Valve shall have an extended leverage mechanism with sufficient mechanical advantage so that the valve will open under full

BLDC WATER & WASTEWATER PROGRAM TENDERING PACKAGE #2D
TIGER BAY INTERSECTION TO FORT VICTORIA INTERSECTION – PIPING & PUMPING
INFRASTRUCTURE

operating pressure. An adjustable threaded resilient orifice button shall be used to seal the precision discharge orifice in the cover.

D Materials

1. The body and cover shall be concentrically located and of ductile iron and all valve internal parts shall be stainless steel or cast iron with.
2. The float, plug, guide shafts, and bushings shall be constructed of Type 316 stainless steel.
3. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N® rubber.

E Provide the Following Options

1. Optional body materials include ASTM A536 Grade 65-45-12 ductile iron, ASTM A351 Grade CF8M stainless steel, and ASTM B584 Alloy 836 cast bronze.
2. Low Durometer seat and orifice button shall be furnished for low pressure applications.

E Manufacturer

1. The manufacturer shall demonstrate a minimum of (5) years experience in the manufacture of wastewater air valves. The valves shall be manufactured and tested in accordance with American Water Works Association Standard (AWWA) C512. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.
 - a. The exterior of the valve shall be coated with a universal alkyd primer.
 - b. Wastewater and Reclaimed Water Combination Air Release Valves shall be
 - i. ClaVal Series 36WW
 - ii. Series 800 as manufactured by Val-Matic Valve and Manufacturing Corporation, Elmhurst, IL, USA,
 - iii. Or approved equal.
 - c. Potable Water Combination Air Release Valves shall be
 - i. ClaVal Series 36
 - ii. Series 100 as manufactured by Val-Matic Valve and Manufacturing Corporation, Elmhurst, IL, USA,
 - iii. Or approved equal.

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*****