

## SECTION 02595

### SEWAGE LIFT STATION

#### DOGWOOD LANE PUMP STATION IMPROVEMENTS

##### 1.0 GENERAL:

- 1.1 Description: The work includes furnishing and installing all materials and equipment to construct one (1) complete and operable lift station as shown on the drawing and specified.
- 1.2 Quality Assurance: It shall be the responsibility of the Contractor to furnish a complete and fully operating system. The drawings and specifications are intended to include all details of a complete equipment installation for the purposes specified. The Contractor shall be responsible for all details which may be necessary to properly install, adjust and place in operation the complete installations.
- 1.3 Submittals: Submit shop drawings for all work of this section. Material shall include manufacturer's literature, installation details, typical pump performance curves, etc.
- 1.4 Operation and Maintenance Data:
  - 1.4.1 An operating and maintenance manual for all pump station equipment, including but not limited to pumps, valves, electrical equipment, control panel, etc., shall be furnished by the Contractor. Two hard (2) copies of the manual bound in hardback binders shall be provided to the Engineer as well as all electronic files on a thumb flash drive. As a minimum, each manual shall include the following information:
    - a. Clear and concise instructions for the operation, adjustment, lubrication, and other maintenance of the equipment. These instructions shall include a complete lubrication chart.
    - b. List of all parts for the equipment with catalog numbers and other data necessary for the ordering of replacement parts.
    - c. All instruction and parts lists shall have been prepared for the specific equipment furnished and shall not refer to other sizes and types or models of similar equipment.
    - d. The names addresses and telephone numbers of the Contractor, each subcontractor installing equipment and systems, and the local representatives for each item of equipment and each system.
    - e. A complete set of preventive maintenance requirements as a function of running and/or elapsed type.
    - f. Complete listing of consumable items sufficient for one (1) year's operation, i.e., light bulbs, belts, etc.
    - g. Recommended spare parts inventory.

1.4.2 Each piece of equipment shall be provided with a substantial nameplate of non-corrodible metal, securely fastened in place, and clearly and permanently inscribed with the manufacturer's name, model or type designation, serial number, rated capacity, electrical or other power characteristics and other appropriate name plate data.

2.0 PRODUCTS:

2.1 Sewage Pumps:

2.1.1 General: Provide pumping equipment as shown on the drawings and specified herein. The equipment shall include, but not be limited to, submersible sewage pumps, controls, and appurtenances. The pumps shall be purchased through Sun State Systems, Inc.

2.1.2 Description: Submersible pumps shall be vertical, centrifugal type designed for municipal sewage application. Pumps shall be complete with mounting frames and slide rails. Pumps shall be SULZER, WILO or approved equal.

2.1.3 Components of Submersible Pumps:

- a. Motor Housing and Pump Castings: Close-grained cast-iron ASTM A48, Class 35B.
- b. Impeller: Semi-open, non-clogging, single vane design constructed of gray iron. Impeller shall be provided with replaceable stainless-steel wear rings.
- c. Shaft: Stainless Steel.
- d. Shaft Seal: Tandem double mechanical seal in oil bath.
- e. Motor: Oil filled, completely sealed against moisture. Heat and moisture sensors in motor windings which will shut down pump if either device operates. Pump shall be designed to operate totally submerged or totally non-submerged for a period of at least 24 hours. Motor shall be 5 HP, 1750 RPM, 230 volt, 3-Phase, 60Hz, NEMA B design with Class H insulation.
- f. Fasteners: All nuts, bolts, washers, and other fastening devices shall be stainless steel.

2.1.4 Pump Characteristics: Each pump shall meet the following:

Type of Pump	Submersible
Number of Units	2
Delivery of Guarantee Point	177.5 gpm
T.D.H. at Guarantee Point	39.73 feet
Minimum Shutoff Head	49 feet
Minimum Efficiency at G.P.	70.1%
Maximum Rotative Speed	1750 rpm
Minimum Sphere to Pass	3-inch
Motor Size (Minimum)	5.0 HP

- 2.1.5 Design Based Upon: SULZER Model XFP100C CB1 60HZ 7.09" impeller.
- 2.1.6 Pump station pipe shall be Stainless Steel Schedule 40.
- 2.2 Access Hatch:
- 2.2.1 General: Access hatch for wet well shall be aluminum and shall be similar and equal to Series S2R, as manufactured by Halliday Products.
- 2.2.2 Description: Cover shall be constructed of one-quarter inch (1/4") aluminum floor plate reinforced for a loading of 300 pounds per square foot. Hatch shall be furnished with stainless steel hinges, hold open arm, aluminum handle, and staple for padlock. Size shall be thirty-six-inch x sixty-inch opening (36" x 60") on wet well top.
- 2.3 Check Valves: Check valves larger than two-inch (2") shall be iron body, flanged ends, outside lever, spring loaded, swing type with a straight-away passageway for full pipe area. The valve shall be renewable bronze seat ring and rubber-faced disc. Valves shall be Mueller or approved equal.
- 2.4 Plug Valves: All plug valves shall be of the nonlubricated, eccentric type with flanged joints. Valve bodies shall be semi-steel and shall be pressure rated at 175 psi. Plug facing shall be Neoprene or approved material suitable for domestic sewage. Packing shall be Buma (VEE). Each valve shall be lever operated. Valves shall be DeZURIK Series 100 or approved equal.
- 2.5 Gauges: Provide gauge for the discharge of the wastewater pumps. Gauge shall have stainless steel case, four inch (4"), glycerin filled, and brass or bronze movements. Gauge installation shall include a T-handle cock and blow-off tee and shall include a stainless-steel diaphragm seal. Gauge shall have range of 0-120 feet.
- 2.6 Mounting Guides and Lifting Cable: Stainless steel rails shall be used to guide the pump into position. The pump shall automatically connect, without leakage, to the discharge piping. Pump shall be lifted with stainless steel lifting a cable or chain.
- 2.7 General:
- 2.7.1 The sewage pump control system shall consist of float type mercury switch liquid level control system.
- 2.8 Control Panel:
- 2.8.1 The entire pump control system shall be enclosed in a single panel mounted, as indicated on the drawings. The system shall include all components necessary to perform the functions described. All internal components shall be completely factory wired to terminal strips with all control devices, starters, and circuit breakers. Panel shall be suitable for 230 volt, 3-phase, 4-wire, 60 Hz alternating current and shall contain the following:
- a. Enclosure shall be NEMA 3R, stainless steel with lock hasp.
  - b. Hand-off automatic switch.
  - c. Pump running indicator light.
  - d. Terminal strip.

- e. Floats shall be mercury float or approved equal.
- f. Alarm horn and light of weatherproof construction mounted on the side of the panel enclosure. Provide manual horn silencer.
- g. MPE2000 level controller.
- h. Circuit breaker.
- i. Elapsed time meter.
- j. Convenience receptacle.
- k. Lightning, and surge protection.
- l. Seal failure indicator lights mounted on dead front.
- m. SCADA Equipment

2.8.2 Approved Manufacturer: Sun State Systems, Inc.

2.9 Anchor, Fasteners and Bolts: Provide 316 stainless-steel unless specified otherwise.

### 3.0 EXECUTION

3.1 Field Inspection: Contractor shall inspect the site and coordinate the work of the trades involved for clearances, fittings, and installation of the work.

3.2 Preparation: Contractor shall provide anchor bolts and templates for installation of equipment making measurements, as required at the site for fabrication and installation.

3.3 Installation: Equipment shall be installed in accordance with manufacturer's approved shop drawings and written installation instruction.

3.4 Operating Tests:

3.4.1 All pumping equipment shall be tested under normal operating conditions before it is accepted. All tests shall be witnessed by the Engineer. During the tests, observations shall be made of head, capacity, and motor input to detect any defects in the equipment. Any defects or defective equipment revealed by or noted during the tests shall be corrected or replaced at the expense of the Contractor and, if necessary, the tests shall be repeated until satisfactory results are obtained. All adjustments and corrections necessary to place equipment in satisfactory working order shall be made at the time of the operating tests. Testing shall demonstrate that under all conditions of operation, each unit:

- a. Has not been damaged by transportation or installation.
- b. Has been properly installed.
- c. Has no mechanical defects.
- d. Is in proper alignment.
- e. Has been properly connected.
- f. Is free of overheating of any parts.
- g. Is free of objectionable vibration.
- h. Is free of overloading of any parts.

3.4.2 All materials and costs required for testing shall be at the expense of the Contractor.

**END OF SECTION 02595**