



Utility Engineering Consultants, LLC

Phone : 205.951.3838
FAX : 205.951.3839
WEB : www.uecllc.com

130 Southcrest Drive, Suite 100
Homewood, AL 35209
P.O. Box 19218
Birmingham, Alabama 35219

June 2, 2021

**City of Marion
123 E. Jefferson Street
Marion, AL 36756**

**RE: ADDENDUM NO. 2
MARION WASTEWATER TREATMENT IMPROVEMENT PLANT PROJECT
PHASE I – CONTRACT “A”
CDBG PROJECT NO. LR-CM-PF-19-006
CONTRACT NO. MA20 043A**

ADDENDUM NO. 2

The changes, modifications and/or additions covered by and set forth in this Addendum No. 2 shall become part of and be incorporated in the Specifications, Contract Documents and Bid Documents for the above referenced project.

CONTRACT DOCUMENTS AND SPECIFICATIONS

CLARIFICATIONS

- Section 11213 Raw Sewage Pumps shall be replaced with the attached Section 11213 Addendum No.2

SPECIFICATIONS AND CONTRACT DOCUMENTS

This Addendum No. 2 shall be made a part of your set of Construction Contract Documents and Specifications. Acknowledgment of receipt of Addendum No. 2 shall be noted on Page 10 of the Bid for Unit Price Contract Form.

UTILITY ENGINEERING CONSULTANTS, LLC

Roderick A. Hawkins, P.E.

RAH/dsj

Attached: Section 11213 Raw Sewage Pumps

ADDENDUM NO. 2

SECTION 11213

RAW SEWAGE PUMPS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submersible Pump
- B. Pump Controls

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Section 15050 - Piping: Ductile Iron Pipe
- B. Section 03300 - Concrete: Pump Bases

1.3 RELATED SECTIONS

- A. Section 15050 - Piping
- B. Section 15100 - Valves
- C. Section 16150 - Motors
- D. Section 09900 - Coatings

1.4 REFERENCES

ANSI/ASTM

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate dimensions, weights, and placement of anchor bolts and piping.
- C. Product Data: Provide component sizes, rough-in requirements and installation requirements.
- D. Manufacturer's Installation Instructions: Indicate assembly and support requirements.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01700.
- B. Record actual locations of equipment and controls.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 01700.
- B. Operation Data: Indicate frequency of lubrication and maintenance required.
- C. Maintenance Data: Include installation instructions, spare parts lists, lubrication to be used, and exploded assembly views.

PART 2 - PRODUCTS

2.1 SUBMERSIBLE PUMPS

- A. Each pump shall be furnished with a submersible electric motor of the size indicated below, and suitable for 240/3/60 service. Cast iron discharge elbow shall be mounted in the wet well. Stainless steel anchor bolts and guide bar brackets will be provided with the pumps. Adequate length of stainless steel lifting cable and hypalon jacketed type SPC electric cable, P-MSHA approved and sized according to NEC and ICEA standards, will be provided for each pump.

- B. Pump performance and motor characteristics will be as follows:

Submersible Pump: 380 GPM @ 32 TDH 12.5 input KW (maximum)
Motor Horsepower - 10 HP (maximum)
Approved Pump Manufacturers: - BARNES, GRUNDFOS
EBARA AND HYDROMATIC

2.2 PUMP DESIGN

- A. Pumps:
 - 1. Installation: In submersible, wet-well environment, of the shape, size and elevation as shown on the Contract Drawings.
 - 2. Solids of the size shall be 3" passed by the pump.
 - 3. Liquid to be pumped shall be raw, or unscreened sanitary sewage.
 - 4. Impeller: Non-clog design as specified.
 - 5. Optional equipment and accessories: As specified herein and as required.
- B. The discharge connection elbow shall be permanently installed in the wet well with the discharge piping. The pumps will automatically connect to the discharge connection elbow when lowered into place and must be easily removed for inspection or service. There will be no need for personnel to enter the well.

- C. Sliding guide bracket shall be an integral part of the pump unit. Sealing of the pump to the discharge connection elbow shall be accomplished by the simple linear downward motion of the pump. The entire weight of the pumping unit shall be guided by not less than two (2) guide bars and shall press tightly against the discharge connection elbow with metal-to-metal contact. Sealing of the discharge interface by means of diaphragms, O-rings, or other devices will not be acceptable. Lower guide bar holders shall be cast on the pump discharge connection. Guide bars for pumps will be 2" diameter (minimum) schedule 40 pipe and shall not be required to support any portion of the weight of the pump. No part of the pump or the guide support system, other than the discharge elbow shall bear directly on the floor of the sump. The pump with its appurtenances and cable, will be capable of continuous submergence underwater without loss of watertight integrity to a depth of 21 ft.

2.3 PUMP CONSTRUCTION

A. General

1. Maximum process temperature: +104 degrees F.
2. PH: 4 to 10
3. Ambient operating temperature range: -4 degrees F to +104 degrees F.
4. Major pump components: ASTM A-48, Class 35B grey cast iron.
5. Exposed nuts and bolts: A151 type 304 stainless steel.
6. Other than stainless steel or brass, metal surfaces in contact with sanitary sewage shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on pump exterior.

B. Volute:

1. Single piece ASTM A-48 Class 35-40B grey cast iron.
2. Non-concentric design with smooth passages.
3. Capable of passing all solids that may enter the impeller.
4. Rubber, brass or stainless-steel wear ring.

C. Impeller:

1. ASTM A-48 Class 35-40B grey iron.
2. Dynamically balanced.
3. Design; as shown in Table 1:
 - a. Double shrouded, single channel non-clog.
 - b. Vortex
4. Keyed to shaft, retained with an expansion ring.
5. Passing solids:
 - a. 2.5-inch discharge pass 2-inch solid
 - b. 3-inch discharge pass 3-inch solid
 - c. 4-inch discharge pass 4-inch solid
6. Pump to impeller: adjustable without pump disconnection from discharge pipe.

D. Cooling system (if applicable):

1. Stator encircled water jacket.
2. Pumped media coolant.
3. Impeller back vanes circulate pumped media.
4. Coolant media channels and ports: Filtered and non-clogging with integrated screening systems.

5. Provision for external cooling and seal flushing shall be provided.
- E. Cable entry system:
1. Single cylindrical elastomer grommet flanked by washers.
 2. Compressed by the body containing a strain relief function, separate from the function of sealing the cable.
 3. Terminal board shall separate cable entry junction chamber from motor.
- F. Pump shaft
1. Pump shaft and motor shaft: single piece of stainless steel.
- G. Bearings
1. L-10 bearing life: 100,000 hours.
 2. Upper bearing: Single roller bearing.
 3. 3. Lower bearings: One single-row angular bearing and one roller bearing.
- H. Mechanical seal:
1. General:
 - a. Tandem mechanical shaft seal system of independent seal assemblies.
 - b. Seals operate in a lubricant reservoir, providing lubricant at a constant rate to the lapped seal faces.
 - c. Lubricant reservoir shall prevent overfilling.
 - d. Drain and inspection plug: accessible from outside.
 - e. Lubricant: FDA Title 2.1 approved nontoxic.
 - f. Each seal interface: held in contact by its own shielded and protected spring system.
 - g. Seals shall require neither maintenance nor adjustment.
 - h. Direction of rotation shall not affect sealing.
 2. Lower, primary seal:
 - a. Located between pump and lubrication reservoir.
 - b. One stationary and one positively driven.
 - c. Silicon-carbide.
 3. Upper, secondary seal:
 - a. Located between lubrication reservoir and motor housing.
 - b. One stationary and one positively driven.
 - c. Silicon-carbide.
- I. Motor:
1. Motor as specified in Table 1:
 - a. Explosion proof FM Class 1, Division 1, Groups C and D hazardous location.
 - b. Non-explosion proof.
 2. NEMA B design, induction type with squirrel cage rotor, shell type design, air-filled, watertight chamber.
 3. Inverter duty rating in accordance with NEMA MG1, Part 31.
 4. No less than 15 evenly spaced starts per hour.
 5. Motor and pump: Same manufacturer.
 6. Service factor: No less than 1:15.
 7. Voltage tolerance: Plus or minus 10%.
 8. Motor temperature rise: No more than 80 degrees C.

9. Maximum ambient motor operation temperature: 104 degrees F.
10. Motor horsepower: adequate such that motor is not overloading at any point on the curve.
11. Stator:
 - a. Class H insulation to 180 degrees C.
 - b. Heat-shrink fitted into cast iron stator housing.
 - c. Thermal switches, in series, within each phase winding.
 - i. Thermal switches: Designed to open at 260 degrees F, stop the motor and activate an alarm.
12. WIO – Water-in-oil sensor (optional):
 - a. Detects
 - i. Water greater than 20%, sends an alarm.
 - ii. Air in oil chamber, sends an alarm.

2.4 CONTROLS

- A. The control panel will be designed automatically operate pumps in response to excursions in the liquid level as indicated on the Plans. The control panel shall be completely factory assembled, wired, and tested prior to shipment. The pump control, sequence control and all level sensing equipment shall be furnished as a complete unit by the pump supplier to insure unit responsibility, proper coordination between pumps and controls, equipment compatibility, and easy availability of factory authorized replacement parts and service.
- B. All wiring shall have not less than 600 volt insulation and all power wiring and bus shall be in complete conformity with the National Electric Code and state and local and NEMA Electrical Standards. Control wiring shall be color coded according to its function. All job connections required to conveniently replace control components shall be made at approved type terminal blocks with engraved bakelite marker strips or similar approved means.
- C. The control panel will include circuit breaker for the pumps. Overload protection shall utilize melting alloy heater elements specifically selected by motor full load current. Internationally circuit breakers or over-load relays which allow field adjustment of the trip setting will not be allowed and will constitute basis for equipment rejection by the Engineer.
- D. The control panel shall be suitable for operation on 240/3/60 service. Wiring shall be NEMA Class II, Type B. Where Type C wiring is indicated the master terminal blocks shall be located at the bottom. All pilot lights and selector switches shall be oil-tight and heavy duty for continuous operation.
- E. The control panel shall be housed in a Fiberglass NEMA 4X, enclosure and will be arranged for mounting as shown on the Drawings. The enclosure shall be constructed of not less than 14 gauge galvanized steel and shall have a rust-inhibiting base primer coating and an exterior grade baked enamel coating. The enclosure shall be listed by Underwriter's Laboratories, Inc.
- F. The enclosure shall be weatherproof, tamper proof, and raintight, and designed for mounting in an unprotected outdoor location. It shall have a gasketed, hinged, front weather door with locking capability, and an internally mounted hinged dead front panel so that all components normally actuated by Operating Personnel are accessible without opening the dead front and yet are not exposed to the elements or unauthorized personnel. All major components and

sub-assemblies in the control panel shall be identified as to function with laminated, engraved bakelite nameplates, or similar approved means. A 100 watt screw base 120VAC condensation heater and adjustable thermostatic switch shall be supplied in the enclosure to prevent the formation of moisture in the enclosure.

G. Panel shall be equipped with timers that show hours of each pump operation.

H. Listed below are the components of the Control Panel:

Control Panel Shall Include but Not Limited to The Panel Ancillary Items:
Enclosure Door Stop; 120 Watt Anti- Condensation Heater; Pump Circuit Breaker, 3 pole; Control Transformer; Fuse Holder; Fuse; NEMA Motor Starter, Size 1; Melting Alloy Overload Heater; Overload Reset Mechanism; Phase Monitor-190V-500V; Three Phase Lightning Arrestor; Control Fuse; Control Fuse Holder; Incoming Power Distribution Block; HandOff Auto 3 Position Selector Switch; Pump Run Pilot Light; High Level Pilot Light; Motor Heat Sensor Pilot Light; Seal Failure Pilot Light; Alternator w/lead Selector Switch; Lag Pump Time Delay Timer; Macromatic Adjustable Seal Fail Relay; High Level Alarm Activation; Motor Heat System Alarm Activation; Seal Failure Alarm Activation; Motor Heat Sensor Manual Reset Pushbutton; High Level Auxiliary Contact; Motor Heat Sensor Auxiliary Contact; Seal Failure Auxiliary Contact; Phase Power Fail Auxiliary Contact; LED Alarm Light (Red); Audible Alarm Horn; Silence Pushbutton; Alarm Test Pushbutton; Engraved Labels; Wire Numbers; Terminal Blocks and Ground Lugs are required.

2.5 MISCELLANEOUS PANEL ITEMS

A. Panel Ancillary Items:

Aluminum Inner Door (Dead Front); Enclosure Door Stop; 120 Watt Anti-Condensation Heater; Pump Circuit Breaker, 3 pole; Control Transformer; Fuse Holder; Fuse; NEMA Motor Starter, Size 1; Melting Alloy Overload Heater; Overload Reset Mechanism; Phase Monitor-190V-500V; Three Phase Lighting Arrestor; Control Fuse; Control Fuse Holder; Incoming Power Distribution Block; Hand-Off-Auto 3 Position Selector Switch; Pump Run Pilot Light; High Level Pilot Light; Motor Heat Sensor Pilot Light; Seal Failure Pilot Light; Alternator w/lead Selector Switch; Lad Pump Time Delay Timer; Macromatic Adjustable Seal Fail Relay; High Level Alarm Activation; Moto Heat System Alarm Activation; Seal Failure Alarm Activation; Motor Heat Sensor Manual Reset Pushbutton; High Level Auxiliary Contact; Moto Heat Sensor Auxiliary Contact; Seal Failure Auxiliary Contact; Phase Power Fail Auxiliary Contact; LED Alarm Light (Red); Audible Alarm Horn; Silence Pushbutton; Alarm Test Pushbutton; Engraved Labels; Wire Numbers; Terminal Blocks and Ground Lugs are required; MTS Type 4x, Stainless Steel, Wall Mount Enclosure; MTS Line/Gen Circuit Breaker, 3-pole; Line/Gen Circuit Breaker Interlock; Powder Coated Steel Backpanel.

PART 3 - EXECUTION

3.1 INSPECTION

Examine pump bases, piping, and inlet well. Correct any irregularities prior to installation.

3.2 INSTALLATION

- A. Install the submersible pumps in accordance with the drawings and manufacturer's written instruction.
- B. Lubricate moving parts as recommended by the manufacturer's written instructions.
- C. Drill mounting holes for the guide rail bracket on the inside of the tank and fasten the guide rail bracket provisionally with two screws.
- D. Place the auto-coupling base unit on the bottom of the tank. Use a plumb line to establish the correct positioning. Fasten the auto coupling with expansion bolts. If the bottom of the tank is uneven, the auto-coupling base unit must be supported so that it is level when being fastened.
- E. Assemble the discharge pipe in accordance with the generally accepted procedures and without exposing the pipe to distortion or tension.
- F. Place the guide rails on the auto-coupling base unit and adjust the length of the rails accurately to the guide rail bracket at the top of the tank.
- G. Unscrew the provisionally fastened guide rail bracket. Insert the upper guide rail bracket into the guide rails. Fasten the guide rail bracket on the inside of the tank.
- H. Clean out debris from the tank before lowering the pump into the tank.
- I. Fit the guide claw to the discharge port of the pump.
- J. Slide the guide claw of the pump between the guide rails and lower the pump into the tank by means of a chain secured to the lifting bracket of the pump. When the pump reaches the auto-coupling base unit, the pump will automatically connect tightly.
- K. Hang up the end of the chain on a suitable hoop at the top of the tank and in such a way that the chain cannot come into contact with the pump housing.
- L. Adjust the length of the motor cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the tank. Make sure that the cables are not sharply bent or pinched.
- M. Connect the motor cable.

3.3 SERVICE

The equipment manufacturer shall furnish the services of a qualified field representative to check the equipment installation, to supervise start-up, and to instruct operating personnel in the proper maintenance and operation of the equipment. The field representative shall be available for a minimum of one trip of not less than three (3) days at no additional cost to the Owner. One day of the field service representative's time shall be for operation and maintenance instructions.

3.4 WARRANTY

A. A Warranty: 36 months from date of installation. The warranty shall apply to being free of defects in material and workmanship.

3.5 CLEANING

Clean grease, oil, or any other debris from the exterior surfaces of the equipment.

3.6 START-UP

- A. Ensure impeller rotates freely by hand.
- B. Check oil level.
- C. Check pump is correctly installed.
- D. Ensure adequate fluid is present.
- E. Energize pump.
- F. Check status of sensors.
- G. Use floats, air bells or electrodes to ensure correct start, stop.
- H. Check direction of rotation.
- I. Observe amperage during operation and ensure correct valve.
- J. Perform drawdown of each pump.
- K. Seal fail check.
- L. Heat sensor check
- M. Check pump hours of operation meter (timers)