

## Group WS-4

### Proposal for Furnishing Sewer Lift Station Control Panels & Pumps

City Manager, Honorable Mayor and City Council  
City of D'Iberville  
P. O. Box 6519  
D'Iberville, MS 39540

City Manager, Mayor and Council Members:

Pursuant to your advertisement, we do hereby submit this proposal for furnishing, as ordered by the city, Sewer Lift Station Control Panels & Pumps, in accordance with the specifications listed below, for a period of eleven months, beginning November 1, 2007, and reserving the right to request an extension of contract for a second term of twelve months, which is as follows

#### 1. Pump Control System with Transducer (above 10HP) (Duplex Stations):

- (a) An automatic pump control system shall be furnished to automatically operate the sewage pumps in accordance with variation in the level of the wet well. The control system shall employ a system with an electronic transducer and one high-level float switch specified as follows:
1. The control system shall employ an electronic transducer to monitor the Liquid level and one high-level float switch, which shall activate the high-level alarm and turn on one pump.
  2. Submersible pressure/level transducer shall be contained within a rugged stainless steel housing and shall incorporate features, to protect the solid state sensor from viscous liquids and slurries, including raw sewage. Range shall be zero to 35 feet (0-15 psi). The excitation voltage and analog signal output shall be compatible with the digital meter/controller to be specified hereinafter. The operating temperature shall be from 40 ° F. to 176 °F. Sensor shall be furnished with polyethylene-shielded cable, 50 feet in length. Transducer shall be suspended in wet well with a separate 3/16" stainless steel cable suspended from a suitable stainless steel wall anchor. Transducer and cable shall be secured with stainless steel hook.
  3. Float switches shall be of type 316 stainless steel, 5 ½-inch diameter mercury type. Cable shall be 40 feet in length, type SO with nitrile pvc jacket, containing three - #14 AWG fine-stranded conductors for heavy flexing and under-water service. Floats shall contain a sealed mercury switch rated for 20 amps at 115VAC. Float switches shall be furnished with Stainless steel or aluminum clamp tube, bracket and bolts to clamp to vertical 1" Stainless steel or aluminum pipe. Consolidated model 9G float switch, Anchor Scientific Roto-Float-SS, type P, or approved equal.

4. Level meter/controller shall be an electronic solid state proportional device which accepts in put from the previously specified submersible pressure/level transducer, conditions the signal, displays the level reading digitally, in feet, and performs discrete on/off contact closures at six or more field-adjustable set points. The setting of each set point shall be able to be displayed on the digital readout at any time. A means shall be provided to manually ramp the meter/controller up and down through its entire range, to test the operation of the system.
- (b) A pump controller/sequencer module shall use the signals generated from either the Float switch system or the electronic transducer system and shall incorporate the Following features:
1. Manual-off-automatic selector switch, green running pilot light, red failure pilot light, and red seal failure pilot light for each pump on control panel.
  2. A Pump No. 1 lead – Alternate – Pump No.2 lead sequence selector switch to select either pump as lead pump or select that the pumps alternate as lead pump on each call for cycle.
  3. A field adjustable failure time delay for each pump. Controls to start the lag pump at the lead pump start level if the lead pump fails or if the lead pump selector switch is placed in the off position. If a pump fails, the remaining functional pump shall remain the lead pump on future cycles. The failure ump shall only be called to operate at the lag pump operating level. Normal pump alternation shall resume when failure condition is corrected and pump has been reset.
  4. Staggered stop feature to require the pumps to stop three (3) seconds apart during the condition that both pumps are running when signaled to stop to prevent water hammer. Staggered start feature to require the pumps to start three (3) seconds apart during conditions that the lead and lag pumps are called for simultaneously.
  5. Individual field adjustable time controls to delay starting each pump in the automatic mode after power failure or during initial startup for 15hp and above pumps.
  6. Pump failure, pump seal failure and high water alarm red pilot lights shall flash when activated.
- (c) A vandal resistant common exterior alarm light with red lexan lens shall be furnished and mounted on a suitable support. It shall burn dimly during normal conditions to indicate power on and the lamp good, and shall flash brightly during high water level, pump failure, or seal failure. An additional normally open common alarm output contact shall be energized by these alarm conditions.
- (d) Individual pump-run-time meters with a reading accuracy of 1/10 hour shall be provided for each pump.

- (e) Provide properly sized (per NEMA standards) circuit breaker combination starter with NEMA class ten (10) ambient compensated overload protection for each pump. Circuit breakers shall be of the line \* load type with tabs/lugs for using lockout/tag out procedures. Starters will be of a type that has replaceable components such as contactors, coils, heaters, etc.
- (f) Lightning arrestors and protection will be properly installed in all electrical control systems. A power monitor with 8-pin base will be installed in all electrical control panel enclosures. For 240V systems, a Time Mark 258B or equal will be installed. For 480V systems, a Motor Saver 102A or equal will be installed.
- (g) Provide one float switch as described previously in the wet well which will activate the high level alarm and start one pump. Pump shall operate for a user-selectable period (0-10 minutes) after the float switch opens. The high level float will work independently of all other floats and if in the up position, the alarm light will flash and a high level alarm signal will be provided for the SCADA unit.
- (h) Controller enclosure:
  1. The main controller enclosure shall be generously oversized (not less than 30"wx 36"h x 12"d) to accommodate the system phase monitor, pump circuit breaker combination starters, control components (except for pressure transducer and float switch), GFI convenience receptacle, panel heater with thermostat, fluorescent light with operator controlled switch and related components. Lightning arrestors shall be provided to protect the pump control components. Additional space shall be provided for other future accessories. The enclosure shall be constructed of stainless steel, rated NEMA 4X, with a drip hood. A single lockable handle which simultaneously operates three latches located at top, middle, and bottom of door (three point latch) shall be provided. No penetrations through the top of the enclosure will be permitted.
  2. All selector switches, pilot lights, hour meters, and other controls shall be mounted on an interior anodized aluminum or stainless steel dead front panel with a continuous aluminum or stainless steel hinge. Circuit breakers shall be operable through the dead front panel.
  3. A thermostatically controlled electric panel heater shall be installed within each enclosure.
  4. A 110-Volt GFI duplex receptacle shall be provided inside the control panel and mounted through the interior dead front panel.

5. Automatic Alarm system, Transducer Type (SCADA):

- a. The Controller shall be 100% compatible with a Mission Communications M-800 SCADA unit and have compatible outputs for alarm conditions listed below:
- b. The Model 800 will report the following:
  1. Individual pump runtime.
  2. Cumulative pump runtime.
  3. High-level alarm
  4. Pump failure alarm
  5. AC power failure alarm
  6. Communications failure alarm
  7. Real-time status of pumps, communications, alarms, wet-well level

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2. **Lift stations with Float Ball setup, (10 HP or less):**

**A. Pump control system:** The control system shall employ four (4) float switches and a pump controller to detect level control points in the wet-well and operate the pump motor starters. No pump controls using mechanical linkage, cables, tapes, etc., between the float and control or using sliding floats shall be considered.

- (1) Float switches shall be of type 316 stainless steel, 5 ½-inch diameter mercury type. Cable shall be 40 feet in length, type SO with nitrile pvc jacket, containing three - #14 AWG fine-stranded conductors for heavy flexing and under-water service. Floats shall contain a sealed mercury switch rated for 20 amps at 115VAC. Float switches shall be furnished with Stainless steel or aluminum clamp tube, bracket and bolts to clamp to vertical 1" Stainless steel or aluminum pipe. Consolidated model 9G float switch, Anchor Scientific Roto-Float-SS, type P, or approved equal.
- (2) Floats will detect off, lead pump, lag pump and high level conditions. The high level float will work independently of all other floats and if in the up position, the alarm light will flash and a high level alarm signal will be provided for the SCADA unit.

**B. The Pump Controller will have the following:**

- (1) The main controller enclosure shall be generously oversized (not less than 30" w x 36" h x 12" d) to accommodate the system phase monitor, pump circuit breaker combination starters, control components (except for pressure transducer and float switch), GFI convenience receptacle, panel heater with thermostat, fluorescent light with operator controlled switch and related components. Lightning arrestors shall be provided to protect the pump control components. Additional space shall be provided for future

units or other future accessories. The enclosure shall be constructed of stainless steel, rated NEMA 4X with a drip hood. A single lockable handle which simultaneously operates three latches located at the top, middle and bottom of the door (three point latch) shall be provided. **No penetrations through the top of the enclosure will be permitted.**

- (2) All selector switches, pilot lights, hour meters, and other controls shall be mounted on an interior anodized aluminum or stainless steel dead front panel with a continuous aluminum or stainless steel hinge. Circuit breakers shall be operable through the dead front panel.
- (3) A thermostatically controlled electric panel heater shall be installed within each enclosure
- (4) A 110V GFI duplex receptacle shall be provided inside the control panel and mounted throughout the interior dead front panel.
- (5) Automatic Alarm System, Float Ball Type (SCADA):

NOTE: New installation panels will include a SCADA unit (or approved equivalent) and replacement panels will be SCADA ready.

- a. The proposed equipment shall be MISSION Communications Model 100RTU or approved equal. The Controller shall be 100% compatible with a Mission Communications M-110 SCADA unit and have compatible outputs for alarm conditions listed below:

The Model 100 will report the following:

1. Individual pump runtime.
  2. Cumulative pump runtime.
  3. High-level alarm
  4. Pump failure alarm
  5. AC power failure alarm
  6. Communications failure alarm
- (6) A vandal resistant common exterior alarm light with red lexan lens shall be furnished and mounted on a suitable support to make it visible. It shall burn dimly during normal conditions to indicate power on and the lamp good, and shall flash brightly during high water level, pump failure, or seal failure. An additional normally open common alarm output contact shall be energized by these alarm conditions.
  - (7) Individual pump-run-time meters shall be provided for each pump.
  - (8) Provide properly sized (per NEMA standards) circuit breaker combination started with NEMA class ten (10) ambient compensated overload protection for each pump.
  - (9) Full operation and maintenance manual and parts shall be provided in triplicate.

### 3. Lift Station Pumps

- A. Each pump and motor unit shall be of the fully submersible type, capable of discharging raw, unscreened sewage at the rate, head conditions, maximum pump speed, and motor horsepower as shown on the schedules in the Drawings. Motors shall operate on 3 Phase, 60 Hz, 240 VAC, unless otherwise designated in the drawings.
- B. Each unit shall be equipped with a single hypalon jacketed type SPC electric cable suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards, and shall contain conductors for the power leads and all control functions. The cables shall be a minimum of (40') in length.
- C. The pump impeller shall be cast iron, dynamically balanced, and shall easily pass a 3 inch diameter solid sphere. The impeller shall be keyed to the motor shaft and secured by a bolt.
- D. All internal case clearances shall equal the discharge pipe diameter so that any object which can enter the pump and pass through the discharge can pass through the pump without clogging.
- E. Each pump shall be of the centerline flanged discharge type. The pump shall be simply and automatically connected to the discharge elbow when lowered into place without need for personnel to enter the wet well. Sealing of the pump to the discharge elbow shall be accomplished by a simple linear downward motion of the pump, resulting in a tight metal-to-metal connection without reliance of diaphragms, O-rings, or other sealing devices
- F. Major pump components shall be of gray cast iron, Class 30, without visible irregularities. All exposed hardware shall be of type 304 or 316 stainless steel or brass. All surfaces in contact with wastewater shall be coated with an approved wastewater resistant coating. Watertight seals between pump sections shall be made with nitrile rubber O-rings between machined and fitted surfaces.
- G. Each pumping unit shall include a large stainless steel pull-up lifting bail with a fixed connection to the motor housing and designed with adequate strength to lift the entire pumping unit.
- H. The entire pump assembly shall be capable of continuous satisfactory operation submerged to a depth of 65 feet.
- I. Pumping units which utilize and depend on recirculation of the pumped media for cooling purposes or provide connections for external cooling water are not acceptable.
- J. Each pump shall be provided with a tandem mechanical shaft seal system, each of which shall be independently capable of sealing the pumped liquid from the stator housing. The seals shall require no maintenance or adjustment, but shall be easily inspected and/or replaced. The upper seal shall consist of a stationary tungsten carbon ring and a driven carbon ring. The lower seal shall consist of two tungsten carbon rings. Each pump shall contain a detecting probe which shall activate its respective "moisture detect" pilot light on the control panel.

- K. The pump motor shall be a squirrel-cage, induction, shell type design, without brushes or other arc-producing mechanisms, and shall be designed for submersible service in water or raw sewage. The unit shall be listed with Underwriters Laboratories for use in Class I, Group D, Division I locations (explosion proof). All electrical parts shall be housed in an air-filled, watertight enclosure, separated from the outside with two "O" ring seals and rabbet joints with a large overlap. One seal shall be inside an oil chamber, and one outside.
  - L. Two internal moisture sensing probes shall detect any leakage of a conductive liquid past the outer seal, to provide a warning of seal failure. Cable leads shall be sealed with epoxy.
  - M. The motor shaft and all external hardware including the motor nameplate shall be of stainless steel. Motor bearings shall be pre-lubricated at the factory for a long maintenance-free service life. Bearings shall be designed to resist high thrust loads.
  - N. Motor windings shall employ a Class B insulation with Class F materials. Automatically resetting thermal overloads shall be installed in adjacent phases of the motor winding for protection against overheating.
  - O. The pump manufacturer shall warrant to the Owner the pumping units against defects in workmanship and material for a period of five years or 10,000 hours under normal municipal use.
  - P. The pump manufacturer or supplier must have qualified field service representatives readily available for hire by Contractor or the Owner for consultation and/or repair services. Replacement parts and components for the supplied pumps shall be available from manufacturer's stock, ready for immediate shipment upon order.
  - Q. Sewage pumps shall be as manufactured by WEMCO, ESSCO, or approved equal, and shall meet each of the specified performance requirements stated in the Drawings.
  - R. The actual pumping units to be furnished shall each be tested prior to shipment to the job site. Each pump shall be tested at a facility provided by the pump manufacturer in accordance with the standards of the Hydraulic Institute. Flow, head, motor current draw, and input KW shall be measured and recorded for operating conditions throughout the head/capacity range for the pump, including at "Shutoff", design flow with one pump operating, and minimum ("worst case") TDH (see system head curves tabulated in Drawings). Certified test reports shall be furnished with each pump. The Owner and/or Engineer reserve the right to witness the pump tests and/or arrange for the services of an independent testing laboratory to witness the pump tests at the pump manufacturer's facility.
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**4. General Information:**

Spare parts shall be provided within a maximum of 36 hours upon receipt of a purchase order, delivered to the Public Works Facility on Auto Mall Parkway in D'Iberville, MS 39540.

Successful bidder to deliver materials/equipment within 5 working days after receipt of purchase order.

Brochures along with warranty information are to accompany all bids.

**Lift stations with transducers**

	Brand	Unit price
1. Duplex panel/10 hp pump	_____	\$ _____
2. Duplex panel/15 hp pump	_____	\$ _____
3. Duplex panel/20 hp pump	_____	\$ _____
4. Duplex panel/25 hp pump	_____	\$ _____
5. Duplex panel/30 hp pump	_____	\$ _____

**Lift stations with float ball setup**

	Brand	Unit Price
1. Duplex panel - 5 hp pump	_____	\$ _____
2. Duplex panel - 7.5 hp pump	_____	\$ _____
3. Duplex panel - 10 hp pump	_____	\$ _____

**Myers pumps or equal – 230 volt, 3 phase – 40' lead**

1. 4vx 30m4-23 - 4" non-log pump 3 hp	_____	\$ _____
2. 4vx 50m4-23 - 4" non-log pump 5 hp	_____	\$ _____
3. 4vx 75ma-23 - 4" non-log pump 7.5 hp	_____	\$ _____
4. 4vx 100ma-23- 4" non-log pump 10 hp	_____	\$ _____
5. 4vx 150ma-23- 4" non-log pump 15 hp	_____	\$ _____
6. 4vx 200ma-23- 4" non-log pump 20 hp	_____	\$ _____



Hold harmless: Contractor agrees that it will, and hereby does, indemnify, defend and hold harmless city of D'Iberville from and against any and all claims, damages, losses, costs and expenses of every kind and nature, including court costs and attorney fees and claims for damages resulting from or arising out of any infringement claim or claim of bodily injury, death or damage to real or tangible personal property caused by contractor and/or its partners, principals, agents, employees or subcontractors in the performance of this contract. The City of D'Iberville will notify the contractor in writing of any claim to be indemnified hereunder, of which city has knowledge, and contractor in turn will promptly notify city of any such claim. Contractor shall, at its sole expense, control the defense of such suit to the extent allowed by Mississippi law. The parties agree to cooperate with one another in the defense of any such matter.

Any request for price increase during the term of contract will be rejected. Should this rejection result in the cancellation of the contract, the vendor shall be removed from the qualified bidders list for twenty-four (24) months. If adverse conditions exists industry wide, modifications to disqualifications may be made as circumstances warrant. The city reserves the right to request from the vendor an extension of this contract for a second term of twelve (12) months, commencing October 1, 2008, with all prices remaining constant.

Address bid to:

City Clerk  
City of D'Iberville  
P. O. Box 6519  
D'Iberville, MS 39540