



July 11, 2013

**STATE OF ALABAMA  
COUNTY OF SHELBY**

**Sealed Bids for Electric 4" Sludge Handling Dredge System**

Sealed bids for an Electric 4" Sludge Handling Dredge System will be received in the office of the County Manager, Shelby County Administration Building, 200 West College Street in Columbiana, Alabama 35051 (mailing address: P. O. Box 467), until 2:30 p.m. **July 23, 2013** at which time bids will be publicly opened and read. The Shelby County Commission reserves the right to reject any or all bids and to waive informalities in awarding this bid to the lowest bidder. Bidders are to state that bids submitted are firm and that no claims for errors will be made after bids are opened and subsequent thereof. If you have any questions concerning this bid, please contact Michael Cain at [mcain@shelbyal.com](mailto:mcain@shelbyal.com).

**GENERAL INFORMATION**

All bidders must use our form for submitting their bids. All bids must be sealed and marked in the lower left corner "**BID – SLUDGE HANDLING DREDGE SYSTEM**" with opening date and time. Late bids will not be opened.

Records showing successful bidder(s) and prices quoted will be placed on file and may be examined upon request. If contract is awarded to someone other than lowest bidder, a note of explanation will appear in the file and Commission Minutes.

Use of trade names and numbers shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition.

**Prices must be valid for a period of one (180) DAYS.**

**Shelby County requires a purchase order for all purchases. Copies of purchase orders shall be required by vendor for orders to be processed and invoices paid.**

**DISQUALIFICATION OF BIDS**

Bids may be disqualified before awarding of the contract for any of the following:

- A. Failure to mark envelope as required;
- B. Failure to sign or notarize the bid document;
- C. Failure to include requested information or other details of the bid

**METHOD OF AWARD**

The award will be made to the lowest responsive bidder meeting specifications. It is not the policy of The Shelby County Commission to purchase on the basis of low bid only. Quality, conformity with specifications, purpose for which required, terms of delivery, and past service and experience are among the factors that may be considered in determining the responsive bidder.

The Shelby County Commission reserves the right to award separate contracts for each item, each product, or any combination of products if in the best interest of the Shelby County Commission.

**All awarded vendors must provide Immigration Law Compliance Documents found on the Shelby County website at [www.shelbyal.com](http://www.shelbyal.com).**

**Please include one original bid response and two copies in your submittal.**



Alex Dudchock  
County Manager

Name of Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: (Include area code) \_\_\_\_\_ Email Address: \_\_\_\_\_

Sworn to and subscribed before me this

The \_\_\_\_\_ day of \_\_\_\_\_, 2013

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_.

# ELECTRIC 4" FLOATING SLUDGE HANDLING DREDGE SYSTEM

## PART 1 GENERAL

### 1.1 SUMMARY

- A. This specification is for the construction, delivery, and placement in operating condition in a sludge lagoon one 4" portable, radio remote controlled, floating sludge handling system. System shall be delivered to the Shelby County South Water Treatment Plant located in Wilsonville, Alabama.
- B. The floating sludge handling system shall be suitable for removing sludge from the sludge lagoon without greatly dewatering the basin or requiring the addition of dilution water. The floating sludge handling system shall be mounted on floating pontoons and shall consist of UHMW polyethylene pontoons, a 4" submerged pump, 8-1/2' wide cutterhead, hoist winch, traversing winch and appurtenances necessary to provide a complete and operable unit.
- C. The floating sludge handling system shall be capable of continuously removing sludge deposits and pumping it with a minimum of 4 percent concentration of solids by weight. The submerged pumping unit shall be capable of removing sludge deposits up to 12 inches deep and 7-1/2 feet wide in a single pass, and shall have a cutting depth ranging from 1 foot above to 12 feet below the basin water surface.
- D. The equipment specified in this section shall be located outdoors, floating on the surface of a sludge lagoon. The equipment shall be suitable for environmental conditions ranging from +32 degrees F to +110 degrees F, rain, snow, hail and intense sunlight.

### 1.2 RELATED DOCUMENTS:

- A. Bid Proposal Package, including Bid Proposal Page.

### 1.3 QUALITY ASSURANCE

- A. General
  - 1. The manufacturer shall provide and be responsible for all components of a complete system that dredges and pumps solids from the sludge lagoon. The sludges may contain stringy materials and may consist of both organic and inorganic matter such as sand, small pieces of metal, animal bone, and similar objects.
  - 2. The manufacturer shall have supplied a similar sludge handling system to at least five different locations. Specifically, the sludge handling system shall have been used to pump high viscosity organic and inorganic solids.
- B. Operating Requirements
  - 1. The sludge handling system shall be specifically selected to meet or exceed, but shall at no point be less than performance conditions and

requirements as tested in clean water in accordance with current Hydraulic Institute Standards:

2. Required pump characteristics are based on pumping clean water. Pump shall not overload any component of its power supply and shall be free from cavitation, excessive vibration or any other operational problem when operating at any speed at any operating point within the following boundaries on a conventional head/capacity plot:
  - a. UPPER BOUNDARY: Pump characteristic curve at 1750 rpm, 11" diameter impeller.
  - b. LOWER BOUNDARY: The straight line representing 60' total dynamic head.
  - c. LEFT-HAND BOUNDARY: The straight line representing 0 GPM.
- C. Unit Responsibility
  1. It shall be the responsibility of the manufacturer for incorporation of all the related equipment specified herein into a complete working unit ready for service to the performance requirements specified herein.

#### 1.4 SUBMITTALS

- A. Submittals shall include the following information:
  1. Exceptions to these specifications along with justification for each exception.
  2. Manufacturer and manufacturer's type designation.
  3. Manufacturer's catalog data confirming conformance to specified requirements.
  4. Overall dimensional data including drawings, sketches and photographs.
  5. Predicted performance curves developed for the specific application. Pump performance curves shall show speed, capacity, pressure and power for the specified conditions.
  6. Parts list noting materials of construction.
  7. List of five locations where the manufacturer has supplied a sludge handling system used to pump high viscosity organic and inorganic solids. The list shall include the name and address of the respective owner and contact person who has knowledge of the sludge handling system performance.

### **PART 2 PRODUCTS**

#### 2.1 SLUDGE HANDLING SYSTEMS AND APPURTENANCES

- A. Flotation System
  1. The flotation unit shall be 20' long by 8' wide and shall be engineered for proper flotation and balancing and shall consist of a structural steel integrated pontoon system, an operating platform and pump mounting system.
  2. The unit shall support all on-board station components plus a maximum live load of 300 pounds. Sufficient flotation shall be provided to allow a minimum safety factor of two based on doubling live loads.
  3. A minimum of 6 inches of free-board shall be provided with the pump in operating position. The flotation system shall not list drastically due to shifting live loads and the weight of full discharge piping. Maximum width for overland transport shall be 8-1/2 feet and maximum overall

length shall be 23 feet. The entire unit shall be capable of being transported by a crane. Lifting eyes shall be provided for this purpose.

4. The floating platform shall consist of UHMW high density, polyethylene pontoons, foam filled with 2.0 pound per cubic foot polystyrene foam. Twelve (12) 26" body sections shall be bolted to an A36 mild carbon steel frame with zinc-plated bolts, nuts and washers.

B. Depth Control Winch

1. The pump shall be mounted on a pivoting boom, which shall be capable of moving the operating pump and cutterhead assembly to 12 feet below the water surface during pumping/dredging operations. The assembly shall also be able to extend one foot above the water surface for periodic inspection and maintenance. The boom shall be lowered by way of an electrically operated, depth control winch. The winch shall have a 1-1/2 horsepower motor and 17-1/2' of 1/4" galvanized steel cable.

C. Auger/Tiller Cutterhead

1. An 8-1/2' wide Auger/Tiller Cutterhead complete with water lubricated outboard bearings, thirty-six (36) detachable hardened steel cutting blades, hydraulic motor capable of 5500 in.-lbs. of torque @ 51 RPM. The Auger/Tiller shaft shall be mounted in a suction head enclosure. The Auger/Tiller enclosure shall consist of two 480x8 wheels with adjustable mounts that attach to each side of the cutterhead. The cutterhead enclosure will have a bolt on cage constructed from 5/8" steel rod that runs both vertically and horizontally. The cutterhead shall be powered by an electric/hydraulic power unit, complete with a 7.5 hp, 1750 rpm, TEFC, 460 volt electric motor, a submerged pump, flexible coupling, suction screen, pressure relief valve, return line filter, screened fill cap and a 20 gallon hydraulic reservoir.

D. Submerged Sludge Pumping Unit

1. The submerged pumping unit shall consist of a centrifugal pump with a 4-inch minimum discharge mounted on the end of the 11-1/2' boom. Pump bearings shall be ball bearings in a totally enclosed bearing protection system with tandem mechanical seals. The bearing enclosure shall be surface ventilated with a seal failure site bottle indication system. The primary seal is a Tungsten/Carbide face and the secondary is a Carbon/Ceramic face.
2. The pump performance shall be tested in accordance with the Hydraulic Institute Standards for centrifugal, rotary and reciprocating pumps. The water pump shall be capable of passing a minimum of 2-3/4 inch solids without clogging. The water pump shall be capable of continuously pumping stabilized sludge at 4 percent solids concentration.
3. All rotating parts shall be accurately machined and in as nearly perfect rotational balance as practicable. The mass of the unit and its distribution shall be such that resonance at any operating speed is avoided.

E. Drive Motor

1. The floating sludge handling system shall be equipped with a new TEFC 460V, 3 Phase, 60 cycle electric motor capable of delivering at least 50 brake horsepower at 1,750 rpm with a 1.15 service factor. This single power source shall be of sufficient capacity to operate the submerged pump.

F. Control Panel

1. Controls for the pump motor starter, depth control winch, flotation unit traversing winch, 8-1/2' cutterhead and all other such controls shall be a single, dredge mounted, UL Listed, NEMA 4X stainless steel remote control panel. The controls will use 24 VDC control voltage and the motors will use 3 phase 460 V. Pushbutton controls shall be provided to retrieve the dredge if the radio fails. The Autec radio remote has toggle switches for the sludge pump, cutterhead, hoist winch, and traverse motor and emergency stop button. The traverse motor and hoist motor are to be controlled by Altivar 61 variable frequency drives. A control sequence will be activated when the dredge contacts an adjustable target on the traverse cable. The dredge will pump for a set amount of time, then lift the cutterhead and shutdown. The pump time will be adjustable in one minute increments. The hand held remote will have a spare battery and charger.

G. Painting

1. The pump and all other steel parts and appurtenances shall be painted as specified herein. The motors need not be repainted if the manufacturer's coating is sound.
2. All iron and steel surfaces shall be cleaned in accordance with SSPC-SP-5 (white metal blast cleaning). The prime coating shall consist of one coat of epoxy primer coating. Finish coats shall consist of one or more coats of color epoxy coating to obtain a total dry film thickness of 10 to 15 mils. All work shall be done in a manner to provide a finished surface free from excessive runs, drips, ridges, waves, or laps. All coats shall be applied to form a uniform thickness completely covering all corners and crevices. The finish coat shall be allowed 2 days minimum cure time before handling.

## 2.2 APPURTENANCES

A. General

1. Floating sludge handling system appurtenances shall include a propulsion system, electrical system, spare parts, lubricants and discharge piping system.

B. Propulsion System

1. The floating sludge handling system shall be equipped to be propelled along a cable track by an idler style, triple sheave electrically-operated winch, complete with enough cable to traverse the specified length of the sludge lagoon. Travel speed shall be adjustable 3-15 feet per minute in both the forward and reverse directions. The floating pump shall be capable of maintaining a travel speed of up to 10 feet per minute during all pumping/dredging operations. The triple sheaves shall have a minimum diameter of 7 inches. The cable shall be elevated so that when stretched the length of the basin it will clear the floating pipe.
2. The entire system shall be adequate for the tension required to keep the cable above the lagoon surface. In addition, all cable or rigging shall be sized for the line pulls indicated and shall be protected against a corrosive atmosphere. The systems must meet all State and Federal safety requirements for moving mechanical equipment, particularly with regard to safety guards.

3. The drive system shall move the floating platform the full length of the basin without need for shoreline adjustment. All controls necessary to start, stop, and control platform speed and operation shall be located in the on board panel and operated from a hand held radio remote.
4. The drive system cable shall be guarded for safety the length of the station, except at the capstan. Cable shall be galvanized steel, 5/16-inch 7 lay by 19 strand minimum.
5. An idler style winch shall be located on the floating sludge handling system platform, and a line wrapped around this drum shall be fixed at opposite ends of the basin using ground anchors and anchor connecting cable. Rotation of the drum shall move the platform along the line the full length of the basin. The drum rotation must be reversible to move the floating pump back and forth along the line.
6. The platform shall be stabilized against skewing during travel with sheaves mounted at each end of the floating sludge handling system. Finally, provisions must be incorporated into the system to adjust the total length of line to accommodate any changing length as the floating sludge handling system is moved laterally in the basins.

#### C. Electrical System

1. A remote control starter panel shall be provided with all disconnects and switchgear necessary to operate the 4 motors on the floating sludge handling system. A shore disconnect panel shall be connected with 500 feet of SO type cable to the floating sludge handling system onboard control panel. The onboard panel, the shore panel and the cord shall have 100A Meltric connectors. The on shore disconnect panel shall come with a Hubbell connector Model Number HBL4100R7W to accept a male connector from the main plant power system (final sizing of connector shall be confirmed during the submittal process). The unit shall be capable of providing all electrical power for all primary and accessory functions, including all motor starters and controls. The motor starters will of the magnetic contactor type and have additional adjustable thermal overload relays.

#### D. Lubricants

1. The manufacturer shall provide the floating sludge handling system with its proper supply of correct lubricant for starting, testing, and adjustment. The manufacturer shall provide the name and address of the nearest suppliers of any special lubricants not available through the owner's current lubricant supplier.
2. All submerged bearings or fittings requiring lubrication shall be fitted with bearing protection systems complete with lubrication boxes, seals and extended tubes such that they can be lubricated from a location which is always above the water surface.

#### E. Discharge Piping System

1. A complete floating discharge piping system to convey harvested sludge from the floating pump to the fixed piping on shore shall be provided. The pipe system shall permit the floating sludge handling system to reach all portions of the lagoon while pumping to one of the fixed piping connections at the harvested sludge stations on shore. The piping system shall consist of 6-inch integral aluminum pipe floats, 6-inch flexible nylon reinforced hoses, galvanized fittings and appurtenances as shown and described below, or equal.



- a. 23 sections of 6" diameter, 15' long rigid aluminum pipe with galvanized steel quick couplers at each end. An 10" diameter, 12' long integral aluminum float shall be mounted concentrically around the 6" pipe.
- b. 24 sections of 6" flexible hose with galvanized irrigation quick couplers for use between rigid sections.

## 2.3 OPERATION AND MAINTENANCE MANUALS

- A. The manufacturer shall be responsible for supplying written instructions, which shall allow the operator to operate and maintain the equipment supplied. Instructions shall assume that the operator is familiar with pumps, motors, piping, valves, and controls, but that he has not previously operated and/or maintained the exact equipment supplied. The instruction shall be prepared as a system manual applicable solely to the equipment supplied by the manufacturer to these specifications, and shall include those devices and equipment supplied by him.
- B. The instructions shall be prepared as a system manual applicable solely to the equipment supplied by the manufacturer to these specifications, and shall include those devices and equipment supplied by the manufacturer.
- C. A minimum of two (2) hard copy and one (1) digital (PDF format) operation and maintenance manuals with spare parts lists shall be provided at no additional cost.

## 2.4 MANUFACTURERS

- A. The floating sludge handling system shall be supplied by one (1) manufacturer.
- B. Bid Qualifications
  1. All BIDDERS must submit product information with bids. Information to be submitted must show the equipment proposed meets all the specifications listed above and list **all exceptions** to the specifications in a separate document.
  2. In addition, the BIDDER must submit at least 5 references for this equipment being used at a Water Treatment Facility.
  3. Prior to award, if requested, BIDDER shall take the OWNER to see a unit in services at the nearest location available in a similar use, removing sludge produced by a Water Treatment Plant.
  4. OWNER reserves the right to reject the bid of the equipment if it does not meet the specifications in the OWNER'S opinion.

## **PART 3 EXECUTION**

### 3.1 MANUFACTURERS SERVICES

- A. The successful bidder shall furnish the services of a qualified field engineer to perform the following functions in the designated periods of time as detailed by the contract. These services are to be performed at the jobsite. A minimum of one (1) visit to the job site shall be required. The visit will include equipment installation check, start up of the equipment and initial operators training.

- B. Delivery of equipment shall be coordinated with the OWNER at least 2 weeks prior to shipment of the equipment. All shipping and unloading requirements shall be included in this coordination.

END OF SECTION