

**ADDENDUM #7
BID NO. 2009-T**

Issue Date: August 26, 2009

Project: South Columbia County Regional Wastewater Treatment Plant

Notice to all bidders is hereby given that the following modification is made to the Request for Bids referenced above:

Revision to Technical Specifications – Section 11305

Section 11305 of the Technical Specifications has been revised. The attached Section 11305 shall replace in its entirety the previous Section 11305.

Each bid submitted in response to this Request for Bids shall include an acknowledgement of this addendum.

SECTION 11305

HORIZONTAL NON-CLOG SCREW CENTRIFUGAL PUMPS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: The Contractor shall furnish materials, equipment and labor to furnish, install and test the horizontal non-clog screw centrifugal pumps complete with pumps, motors, mounting bases, piping, valves and appurtenances, as indicated on the contract drawings and as herein specified.

B. Related Work Described Elsewhere:

1. Materials and Equipment: Section 01600.
2. Painting: Section 09900.
3. Process Instrumentation and Controls - Products: Division 13.
4. Electrical: Division 16.

1.02 QUALITY ASSURANCE

A. Qualifications

1. The pumping units specified herein are to be standard pumping units for the intended service. Each pump shall be capable of handling raw sewage solids and stringy materials without clogging, and shall be of first-class modern design and materials, as manufactured by reputable makers of long experience.
2. Unit responsibility. Horizontal non-clog screw centrifugal pumps, complete with motor, V-belt, baseplate, necessary guards, control panel, and all other specified accessories and appurtenances shall be furnished by the pump manufacturer to insure compatibility and integrity of the individual components, and provide the specified warranty for all components.
3. The pumps shall be designed for continuous operation and will be operated continuously under normal service. To minimize operation power costs, the hydraulic efficiencies listed for each pump are the minimum acceptable, and must be guaranteed by the manufacturer.

1.03 SUBMITTALS

- A. Shop Drawings and Manufacturer's Literature: All pumps to be furnished under this Section shall be in accordance with Section 01340: Shop Drawings, Working Drawings and Samples.
1. Manufacturer's literature and illustrations, including the total weight of the equipment and the weight of the single largest item.
 2. Manufacturer's certified curves showing pump characteristics of head, discharge, brake horsepower, and efficiency.
 3. Shop Drawings, including details of pump assembly and installation layouts and procedures, motor control wiring diagrams, types of materials used in pump construction, details of all pump accessories, drive guards and dimensions of major components.
- B. Operation and Maintenance Manuals: For all pumps furnished under this Section, the Contractor shall submit operation and maintenance manuals in accordance with Section 01730 Operating and Maintenance Data. In addition to the operating and maintenance manual submittal specified in Section 01730, the submittal shall include the following:
1. General - equipment function, description and normal and limiting operating characteristics.
 2. Installation instructions - assembly procedures and alignment and adjustment procedures.
 3. Operation instructions - start up procedures, normal operating conditions, emergency and normal shutdown procedure.
 4. Lubrication and maintenance instructions.
 5. Troubleshooting guide.
 6. Parts list and predicted life of parts subject to wear.
 7. Drawings - cross sectional view, assembly and wiring diagrams.
 8. Pump performance curves.

PART 2 - PRODUCTS

2.01 GENERAL DESCRIPTION

- A. The equipment covered by these specifications is intended to be standard pumping equipment of proven ability as manufactured by reputable concerns having long experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed as shown on the Drawings.
- B. All parts shall be so designed and proportioned as to have liberal strength and stiffness, and to be especially adapted from the work to be done. Ample room and facilities shall be provided for inspection, repairs, and adjustment.
- C. Pump bases shall be rigidly and accurately anchored into position, precisely leveled and aligned, so that the completed installation is free from stress or distortion. All necessary foundation bolts, plates, nuts and washers shall be furnished and installed by the Contractor and shall conform to the recommendations and instructions of the equipment manufacturer. Anchor bolts, nuts, and washers shall be of Type 304 stainless steel. Grouting under bases after the equipment is set is included as work under this section.
- D. Stainless steel nameplates giving the name of the manufacturer, the rated capacity, head, speed, and any other pertinent data shall be attached to each pump.
- E. Stainless steel nameplates giving the name of the manufacturer, serial number, model number, horsepower, speed, voltage, amperes and all other pertinent data shall be attached to each motor.
- F. The nameplate ratings for the motors shall not be exceeded, nor shall the design service factor be reduced when its pump is operating at any point on its characteristic curve at maximum speed.
- G. All pumps shall be designed and built for 24-hour continuous service at any and all points within the specified range of operation, without overheating, without cavitations, and without excessive vibration or strain. All pumps shall be designed for outdoor service, and equipped with 7-day, 24-hour timers.

2.02 MATERIALS OF CONSTRUCTION

- Casing.....Cast Iron (ASTM A48)
- Impeller.....Bronze (ASTM B62)
- Shaft.....Carbon Steel (AISI C1045)

Shaft Sleeve.....Bronze (ASTM B62)

Case Wear Ring.....Bronze (ASTM B62)

2.03 PUMPS

A. General

1. The pumps shall be of the horizontal volute screw centrifugal, non-clog, solids handling type for outside installation.
2. The pumps shall be of standard dimensions; built to limit gauges or formed to templates, such that parts will be interchangeable between like units.

B. Performance Requirements

All pumps shall be constant speed with soft start. The following performance conditions shall be strictly adhered to:

No.	Function/Location	Flow (gpm)	TDH (feet)	Min. Eff.	Media
1	SBR #1 circulation	1650	22	80%	Mixed liquor
2	SBR #2 circulation	1650	22	80%	Mixed liquor
3	SBR circulation common spare	1650	22	80%	Mixed liquor

2.04 PUMP CASING

- A. The pump casings shall be of the top centerline self venting or tangential design, designed for the type service herein specified and be constructed of close grained cast iron meeting ASTM A48, Class 30. Casings shall be designed to permit rear impeller pull out and shall have connections for vents, drains and gauges and shall have a minimum thickness of 0.375 inch. The case on pumps 5-inches and larger shall be provided with a hand-hole cleanout contoured to the case design.
- B. Casings shall be fitted with the appropriate size ANSI Class 125 flange connection.
- C. Casings shall be given a certified hydrostatic test to 75 psi for five (5) minutes with no sign of leakage. Test results shall be sealed by a registered professional Engineer and submitted for approval prior to shipment.
- D. No stationary guides will be permitted on either the suction or discharge sides of the casing.

2.05 IMPELLER

- A. The pump impeller shall be of the non-clogging type and shall be heat-treated ductile or cast iron with a minimum Brinnell Hardness of 250 BHN and shall be statically and dynamically balanced. The pump manufacturer shall be fully responsible for the vibration-free operation of the pumping unit throughout the entire operating range. Positively aligned stationary rotating elements shall be acceptable if provided with radial type wear rings.
- B. The impeller shall be capable of passing a minimum sphere size of 3" and shall be securely fastened to the shaft by means of a stainless steel key and impeller locknut or case hardened locking cap screw. Axial adjustment of the impeller shall be external through integral jack screws or shims.

2.06 PUMP SHAFT

- A. The pump shaft shall be constructed of high-grade carbon steel accurately machined.
- B. The pump shaft shall be protected from wear by a corrosion and wear resisting hardened stainless steel shaft sleeve having a 400 minimum brinell hardness. Shaft deflection shall be no greater than .002-inch through stuffing box with pump running at shut-off condition. Pump shaft shall not be less than 2-inch diameter through the bearing frame. Units incorporating a smaller diameter shaft design will not be considered equal in construction.

2.07 BEARING FRAME

- A. The pump bearing frame shall be equipped with a bearing system designed to accept all thrust loadings and the radial loads imposed by the pump impeller. All bearings shall be designed for a 50,000 B-10 bearing life for any point within the pump operating conditions. The manufacturer shall provide bearing calculations with submittal packages including certification from a registered professional engineer from the factory.
- B. The bearing shall be of grease lubricated design and shall be provided with vents.
- C. All bearing shall be accessible while the pump is in operation. The bearings shall be grease lubricated and a relief shall be provided so that excessive grease pressure will not damage the bearings.
- D. For protection of bearings during shipment and installation, the bearings shall be properly processed with a high quality rust preventative. Each bearing frame shall be designed so that the complete rotating element can be removed from casing without disconnecting piping.
- E. The bearing support frame shall be fabricated steel or Class 30 cast iron construction and shall be designed to provide a self-centering and self-indexing fit with the wetted end of the pump.

- F. The bearing frame shall contain external provision for axial adjustment of the rotating element to provide a proper clearance between the impeller and suction cover over the life of the pump. Adjustment shall be accomplished with integral jacking screws or shims.

2.08 MECHANICAL SEAL

- A. The seal box shall be engineered specifically for double mechanical seals. The seal box shall be designed for the compressed seal length and shall not require any adjustments. The seal housing shall be extra large to provide excellent circulation of clear sealing liquid. The housing shall have two 1/2-inch in and out tapped openings 180 degrees apart for the sealing water connection.
- B. The complete seal box shall be removable as an assembly.
- C. The standard hardened stainless steel shaft sleeve design shall be provided with a snap ring. This snap ring design shall allow the sleeve and the completely assembled seal box to be removed intact. Reassembly shall be accomplished in the same manner.
- D. The seal shall be of the end face, self cleaning type with non clogging springs, positive positioning and drive, precision lapped carbon primary ring and tungsten carbide mating ring, 316 stainless steel gland, Viton "O" rings and 316 stainless steel or Hastelloy C metal parts. Seal shall be Chesterton Model 880, John Crane, or equal.

2.09 PUMP SUPPORT

- A. Each pump and motor shall be mounted on a fabricated steel pump support base of sufficient size and strength to support all loads to which it may be subjected, as shown on the drawings. Base support shall be suitable to carry the entire weight of the supplied pump and motor unit.

2.10 MOTOR

- A. The motor shall be horizontal and in accordance with Section 16150, the latest NEMA standards. All motors shall be three-phase, 230/460 Volt, 60 Heitz, 1750 RPM, and totally enclosed, fan-cooled (TEFC). The motors shall have the following characteristics:

No.	Function/Location	Horsepower (HP)
1	SBR #1 circulation pump	15
2	SBR #2 circulation pump	15
3	SBR circulation common spare pump	15

- B. Each motor shall have a sufficient horsepower rating to operate the pump at any point on the pump's head-capacity curve without overloading the nameplate horsepower rating of the motor, regardless of service factor. The motor shall have a service factor of at least 1.15. The service factor is reserved for variations in voltage and frequency.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall be in strict accordance with the respective manufacturer's instructions and recommendations in the locations shown on the Drawings. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations.
- B. The contractor shall submit a certificate from the equipment manufacturer stating that the installation of the equipment is satisfactory, that the equipment is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication and care of each unit.
- C. Pump bases shall be rigidly and accurately anchored into position, and all necessary foundation bolts, plates, nuts, and washers shall be furnished and installed by the contractor. Anchor bolts shall be set by the contractor in accordance with the manufacturer's recommendations.

3.02 FIELD PAINTING

- A. Field painting is specified under Section 09905. The primer and paint used in the shop shall be products of the same manufacturer as the field paint to assure compatibility.
- B. All nameplates shall be properly protected during painting.

3.03 INSPECTION AND FACTORY TESTS

- A. Each centrifugal pump furnished under these specifications shall be tested at the factory to verify individual performance. Certified copies of all test reports shall be submitted to the Engineer for approval prior to shipment. Each unit shall be hydrostatically tested in accordance with the Hydraulic Institute Standards.

3.04 WARRANTY

- A. See Section 01740: Warranties and Bonds.

END OF SECTION