

PUMP AT SOUTH PITTSBURG WATER TREATMENT PLANT

1. Remove and replace existing high service pump at South Pittsburg Water Treatment Plant
2. Contractor shall furnish all labor and materials and must comply with pump specs.
3. Contractor is responsible for all miscellaneous piping to connect to existing pipe manifold.
4. Contractor must remove existing motor; remove wire; pull pump motor, etc.
5. Contractor must install pump and re-install motor and install all electrical, etc.

Bids will open on Monday, October 2 at 1:30 PM CST.

Please call ahead to schedule a site visit at 423-837-7164 or 423-837-6841.

VERTICAL TURBINE SPECIFICATION

GENERAL REQUIREMENTS:

These specifications are intended to cover the furnishing of a complete vertical motor-driven deep well turbine pump for the high service pump at South Pittsburg Water Treatment Plant.

OPERATING CONDITIONS: The following are the operating conditions:

(1) Size of well (inside diameter)	N/A inches
(2) Depth of well	22 feet
(3) Standing water level below top of well	16 feet
(4) Pumping level below top of well at rated pump capacity	N/A feet
(5) Pumping head or pressure above top of well	N/A feet
(6) Total pumping head (4 and 5)	305 feet
(7) Capacity of pump	1400 GPM

The total pumping head does not include losses in the pump, which must be allowed by the bidder. The efficiency of the pumping unit shall be as high as correct design and good engineering will permit. All things being equal, consideration will be given to overall pumping costs.

The motor shall be NEMA standard design B, Vertical Hollow Shaft high thrust, WP-1 enclosure, 1775 RPM, squirrel cage induction full voltage type starting, powered by an electrical service rated at 460 volts, 60 hertz, 3 phase. Each motor shall be capable of driving the pump under all head conditions without exceeding the rated capacity of the motor. Motor shall have class B insulation, 1.15 service factor rated 90 6; rise at service factor load. Motor shall be supplied with a non-reverse ratchet. Motor shall conform to AIEE and NEMA standards. Motor design shall be premium efficiency style.

The motor thrust bearing shall be designed to carry the hydraulic thrust plus the weight of the shaft and the impellers. The thrust bearing life expectancy shall have a five year average rating based on 24 hours per day usage. The motor shall be capable of carrying up thrust equal to approximately 30% of the total down thrust. Bearings shall be oil or grease lubricated as per manufactures standard design.

Each motor shall be provided with a corrosion-resistant nameplate giving the name of the manufacturer, horsepower, voltage, frequency, speed, efficiency and current for unit at full load.

DISCHARGE HEAD ASSEMBLY

Discharge head shall be a cast iron surface discharge or with 250lb. ANSI dimension discharge flange and shall support the motor, column, shafting, and pump assembly. The discharge head shall be mounted on a fabricated steel, - sole plate which shall be anchored to a concrete pad over the well or sump. The bottom surface of the head shall be machined smooth. A tapped drain line connection shall be provided for the removal of the excess water to a drain.

A cast iron stuffing box shall be provided with a bronze removable stuffing box bushing, galvanized split gland, T-bolts with stainless steel clips and brass nuts. Stuffing box shall utilize a minimum of five synthetic Garlock 8913 packing rings, compressed around the pump shaft and lubricated by the pumped water.

Two piece top shaft shall be threaded and coupled just above the stuffing box (On column setting 50 feet or less).

COLUMN ASSEMBLY

Column pipe shall be furnished in interchangeable sections not over 5 feet in length and shall be connected with flanged couplings. The friction loss in the column shall not exceed 5 feet per 100 feet of column, based on the rated capacity of the pump. The weight and size of the column shall be no less than required in AWWA sped E101-1. The line shafting shall be AISI 416 stainless steel of ample size, minimum of 1" diameter, to operate the pump without distortion or vibration. The shaft shall be furnished in interchangeable sections not more than 10 feet in length and shall be coupled with AISI 410 stainless steel coupling. The column assembly shall have bronze bearing retainers retained by the butted pipe ends. Each bearing retainer shall contain a water-lubricated, cutless rubber bearing designed for vertical turbine pump service.

PUMP BOWL ASSEMBLY

The pump bowls shall be of close grained cast iron, having a minimum tensile strength of 30,000 pounds per square inch, free from blow holes, sand holes, and all other faults; accurately machined and fitted to close dimensions. Bowls are to be coated inside with a smooth vitreous enamel to reduce friction losses, corrosion and sand wear in the water passages and this gives better efficiency. Each intermediate bowl is to be constructed by using a bronze bearing and a neoprene bearing to support the impeller shaft which gives the longest possible life, based on the widest range of pump conditions.

The bowl is to provide a side seal at the impeller skirt and in addition, a resilient neoprene ring, reinforced with an imbedded steel core, is to be installed in the bowl directly below the impeller skirt. This "lateral bowl ring" is to reduce the wear of the impeller skirt. Original capacities and efficiencies are to be maintained by adjustment of the top shaft nut at the top of the motor. The impellers shall be of bronze enclosed type only, accurately machined and finished, and balanced. They shall be securely fastened to the impeller shaft with a steel taper bushing. The impeller shaft shall be of stainless steel of not less than 12% chrome. The impeller shaft shall be supported by a combination of water lubricated, fluted rubber and bronze bearings. Discharge and suction cases shall both be fitted with steel sand collars. All bowl bolting shall be of stainless steel.

STRAINER

The bell suction shall be fitted with a clip-on galvanized steel basket strainer. The openings in the strainer shall be of proper size to exclude anything large enough to clog the impeller. The open area of the strainer shall not be less than four times the impeller eye area.

WATER LEVEL INDICATOR

A suitable air line of galvanized iron pipe, copper or plastic tubing of sufficient length to extend from the surface at the top of the bowl assembly, with an altitude gage reading in feet, and connections for an air pump shall be furnished.

COATINGS

The assemblies indicated shall be coated with pump manufacturer standard paint to a minimum thickness of 10 mils.

- Bowl unit outside surfaces
- Column outside surfaces

FACTORY ASSEMBLY

Close couples vertical pump(s) shall be factory assembled if the overall length does not exceed 20 feet from top of discharge head to bottom of suction casing. The motor(s) and motor shaft of the two-piece top shaft shall be shipped un-mounted for field installation by contractor.

START-UP PROCEDURE

The pump and motor shall be installed in strict compliance with the pump manufacturer's instructions. The correct motor rotation shall be confirmed prior to installing the top shaft and the impeller lateral adjustment shall be in accordance with the pump manufacturer's instructions.