SPECIFICATIONS
Vertical Turbine Pump, Water Lubricated

Scope
Furnish and install ____ vertical turbine pump(s) with driver and accessories of the size and type shown on the plans. The pump shall be manufactured for lubrication of the lineshaft bearings by the water being pumped. The pumping unit shall be designed and manufactured in accordance with the latest Hydraulic Institute standards and AWWA specifications for lineshaft turbine pumps.

Service Conditions
The pump shall be designed and built to operate satisfactorily with a reasonable service life, when installed in a proper turbine pump application. The pump shall be a Taco VT Series or approved equal. Manufacturers that meet the required material standards and performance specifications must get prior approval.

Pump Construction
Bowl assembly: The intermediate bowls, discharge cases and suction bowls shall be flanged type constructed from ductile iron, and shall conform to ASTM A536, class 65. They shall be free of defects and accurately machined and fitted to close tolerances. The intermediate bowls shall have epoxy enamel coated waterways for maximum efficiency. All threaded discharge cases shall be threaded with an 8 TPI BUTT Standard for water lubricated column assembly. All assembly bolting shall be stainless steel.

Impellers: The impellers shall be produced by investment cast method and shall be 201 stainless steel, ASTM A296 and shall be of the enclosed type. They shall be free from defects, machined, and balanced for optimum efficiency and performance. They shall be securely fastened to the bowl shaft with stainless steel taper lock collets; C1045 steel will not be accepted. The impellers shall be adjustable by means of a top shaft adjusting nut or adjustable solid shaft coupling.

Bowl shaft: The bowl shaft shall be constructed from Pump Shaft Quality (PSQ) 416 stainless steel, ASTM A582 pump shaft material. It shall be precision machined and straightened within .002 - .004 tolerance.

Discharge Head Assembly – Water Lubricated
Discharge head: The discharge head, sized for pump capacity, shall be constructed of high grade ductile iron, ASTM A536, class 65 or fabricated steel and shall be of the high profile type with an integral motor base which allows the head shaft to be coupled to the top shaft above the stuffing box. A separate motor stand is not acceptable. The discharge head shall have an ANSI 150 psi discharge flange supplied with dual ¼" NPT ports at the top. The head shall be threaded with an 8 TPI BUTT Standard to accept the column pipe.

Stuffing box: The stuffing box shall be ductile iron, ASTM A536 class 65, rated at 250 psi and contain a minimum of five rings of John Crane 1345 packing or an optional balanced mechanical seal. It shall have an available fitting for pressure relief. The packing follower gland shall be 201 stainless steel and secured in place by stainless steel studs and nuts. Cast iron or bronze glands are not acceptable. The packing box bearing shall be bronze B-505-836. A rubber water slinger shall be provided to operate on the top shaft, above the packing gland.

Column Assembly – Water Lubricated
Column pipe: Column pipe shall be ASTM A53 grade B steel pipe. The column ends shall be machined with 8 TPI BUTT Standard threads and faced parallel to the threads to ensure proper alignment. The pipe shall be connected with threaded sleeve type ductile iron couplings that will accept ¾" stainless steel bearing retainers. Intermediate column lengths and lineshaft bearing spacing shall not exceed 10' feet with pump speeds up to 1800rpm. Pumps operating at speeds over 1800rpm shall have column and bearing spacing no greater than 5'.

Bearing retainers: Investment cast 201 stainless steel bearing retainers, also known as spiders, shall be furnished for shaft stabilization at each column pipe coupling. A rubber fluted lineshaft bearing, retained with a shoulder at each end, shall be installed in each bearing retainer. Bronze or cast iron bearing retainers are not acceptable.

Lineshaft: Lineshaft shall be 416 stainless steel, ASTM A582 and sized according to the horsepower requirements of the specified pump. To ensure proper alignment, the shafts shall be straightened to within .004 tolerance and the butting faces shall be machined perpendicular to the axis of the shaft. These shafts shall be coupled with 416 stainless steel lineshaft couplings.

Suction Strainer
A stainless steel basket strainer of a suitable size shall be provided and attached to the pump suction with stainless steel fasteners. Galvanized strainers are not acceptable.

Electric Motor
The motor shall be manufactured by GE or US Motors, designed to NEMA MG-1 standards, _____ RPM vertical hollow shaft motor with a non-reverse ratchet to prevent reverse rotation. The motor shall have angular contact thrust bearings to meet the designed pump's hydraulic thrust load plus the weight of the rotating parts under operating conditions. The motor shall be premium efficient with a WP-1 enclosure (TEFC optional), 230/460 volt, 3 phase, 60HZ, and a 1.15 service factor. The motor shall be IGBT drive compatible with a 4:1 variable torque speed range (minimum 20HZ).

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