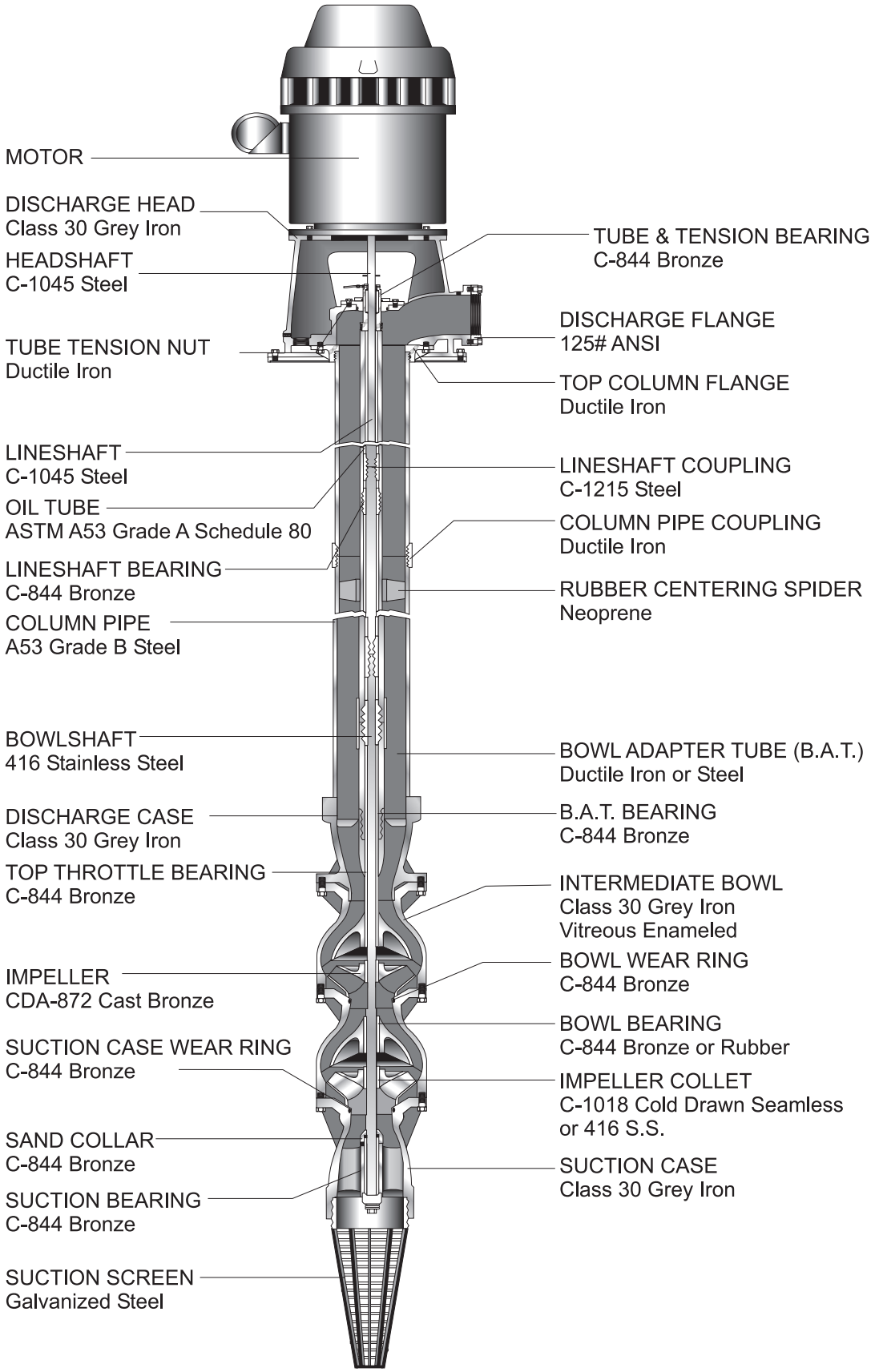
OIL LUBRICATED
DEEP WELL VERTICAL TURBINE PUMP



STANDARD PUMP SPECIFICATION
OIL LUBRICATED
DEEP WELL TURBINE PUMP

GENERAL

The contractor shall furnish a deep well oil lubricated lineshaft vertical turbine pump, manufactured by NATIONAL PUMP or approved equal, with above ground discharge and furnished with suitable driver and accessories to meet the requirements herein or as shown on the drawings. The pump shall be designed and furnished to conform to the Hydraulic Institute and AWWA specifications for Lineshaft Turbine Pumps and shall comply with all local and state sanitary and safety regulations.

INFORMATION REQUIRED IN PROPOSAL

1. Data sheet completely filled in.

2. Performance curve showing expected performance at design point. Curve will show head, capacity, efficiency, and horsepower based on bowl performances and shall cover the complete operation range of the pump from zero capacity to the maximum capacity.

3. Drawings of the proposed equipment giving general dimensions sufficient to determine how the equipment is to be supported and if it will fit within the space available.

4. Any additional information such as descriptive literature, manufacturer's specifications, and other data to demonstrate compliance with these specifications.

CONDITIONS OF SERVICE

Design conditions_____USGPM, @_____feet total dynamic head (TDH), Minimum bowl efficiency _____%, Overall length, bottom of discharge head to bottom of strainer _____feet, Well inside diameter_____inches, Maximum allowable speed_____RPM.

PUMP CONSTRUCTION

DISCHARGE HEAD: Shall be of close grained, cast iron ASTM A48 Class 30, or fabricated steel, accurately machined with a rabbet fit for mounting the driver and supporting the pump column assembly and with above ground discharge flange machined and drilled to ANSI standards for _____# rating and _____ inches inside diameter. The design shall allow for the headshaft to couple above the tube tension assembly.

The tube tension assembly shall consist of a bronze CDA836 tension bearing installed in top oil tube, threaded tension nut to apply proper tension on oil tube, sealing between tension nut and discharge head shall be accomplished with "o" rings. Locknut with "o" ring and set screw to lock tension assembly after proper tension is accomplished.

Discharge head shall be furnished with one gallon oil reservoir with copper tubing, _____ manual or _____ solenoid valve and sight feed drip oiler.

The headshaft shall be C-1045 carbon steel. Impeller adjustment shall be provided at the top of the headshaft by means of an adjusting nut which shall be locked in place.

COLUMN PIPE shall be ASTM A 53 grade B steel pipe. Size shall be such that the friction loss will not exceed 5 ft. per 100 ft., based on the rated capacity of the pump and shall weigh not less than _____ lbs/ft. The column pipe shall be furnished in interchangeable sections not more than (10) or (20) feet in length and shall be connected with threaded sleeve type couplings. The ends of each section of column pipe shall be machined with 8 threads per inch with 3/16" taper and faced parallel permitting the ends to butt insuring alignment.

NOTE: TOP AND BOTTOM SECTIONS SHALL NOT EXCEED 10 FT. IN LENGTH.

COLUMN ASSEMBLY - OIL LUBRICATED

SHAFT ENCLOSING TUBES shall be ASTM A53 Grade A schedule 80 steel pipe with the ends machined square and parallel and shall butt to ensure proper alignment and sealing, they shall be straight within 0.005 in. total indicator reading for a 5 ft. section. Threaded internally to receive the lineshaft bearings. The enclosing tube shall be stabilized and centered in the column pipe by rubber centering spiders spaced at 40 ft. intervals throughout the column pipe assemblies.

LINESHAFT BEARINGS shall be C-844 bronze, internally grooved to allow proper lubrication to enclosed lineshaft and threaded externally for connecting oil tube sections.

LINESHAFTS shall be C-1045 carbon steel, turned, ground and polished. They shall be furnished in interchangeable section not over (10) or (20) feet in length to properly match the shaft enclosing tube and discharge column. The shaft shall be sized in accordance with the maximum recommended horsepower for a given size of shaft, taking into account the effect of the hydraulic thrust on the pumping equipment and the weight of the shaft and suspended rotating parts. To ensure accurate alignment of the shafts, they shall be straight within 0.005 in. total indicator reading for a 10 ft. section and 0.010 in. total indicator reading for a 20 ft. section. The butting faces shall be machined with center relief and square to the axis of the shaft. The lineshaft shall be coupled with 1215 steel couplings.

BOWL ASSEMBLY

DISCHARGE CASE shall be cast with by-pass ports to allow release of fluids through the throttle bearing. The discharge case shall be fitted with a Bowl Adapter Tube for connection to the enclosing tube and threaded for connection to the discharge column pipe. The Bowl Adapter Tube will have a bronze sleeve bearing in the bottom and threaded for a bronze lineshaft bearing on top.

TOP BOWL shall have an extra long throttle bearing with two seals to minimize the amounts of leakage through the drain ports.

PUMP BOWLS shall be of close grained, cast iron ASTM A48 Class 30 and shall be free of blow holes, sand holes, or other detrimental faults and shall be accurately machined and fitted to close tolerances. The bowls shall have vitreous enamel lined waterways to reduce friction losses and provide a maximum efficiency and wear protection. The intermediate bowls shall be provided with C-844 bronze bearings. The intermediate bowls shall be fitted with replaceable wear rings of bronze C-844.

IMPELLERS shall be of CDA872 cast bronze and shall be enclosed type accurately machined, balanced, and filed for optimum performance. They shall be securely fastened to the shaft with a taper split collet of _____1215 steel or _____416 stainless steel.

SUCTION CASE shall be fitted with replaceable wear ring of bronze C-844, grease packed C-844 bronze bearing and protected by a bronze C-844 sand collar.

BOWL SHAFT shall be ASTM A582 grade 416 stainless steel, turned, ground and polished.

SUCTION PIPE AND STRAINER

The suction pipe shall be _____ft. in length and of a size and weight at lease equal to that of the column pipe. A galvanized strainer shall be provided having a net inlet area equal to at least four times the suction pipe area.

MOTOR

The motor shall be squirrel cage induction design, NEMA design B, _____ RPM vertical hollow shaft motor, with a non-reverse ratchet. Thrust bearing shall be chosen to handle the entire hydraulic thrust load of the pump plus the weight of the rotating parts. With an AFBMA B-10 one year minimum or five year average life under design conditions. The motor shall be premium efficiency with a WP-1 enclosure, 1.15 service factor, for use on _____volt, three phase, 60 cycle electric service. The motor rating shall be such that at design it will not be loaded beyond nameplate rating and at no place on the pump curve shall the loading exceed the service factor.