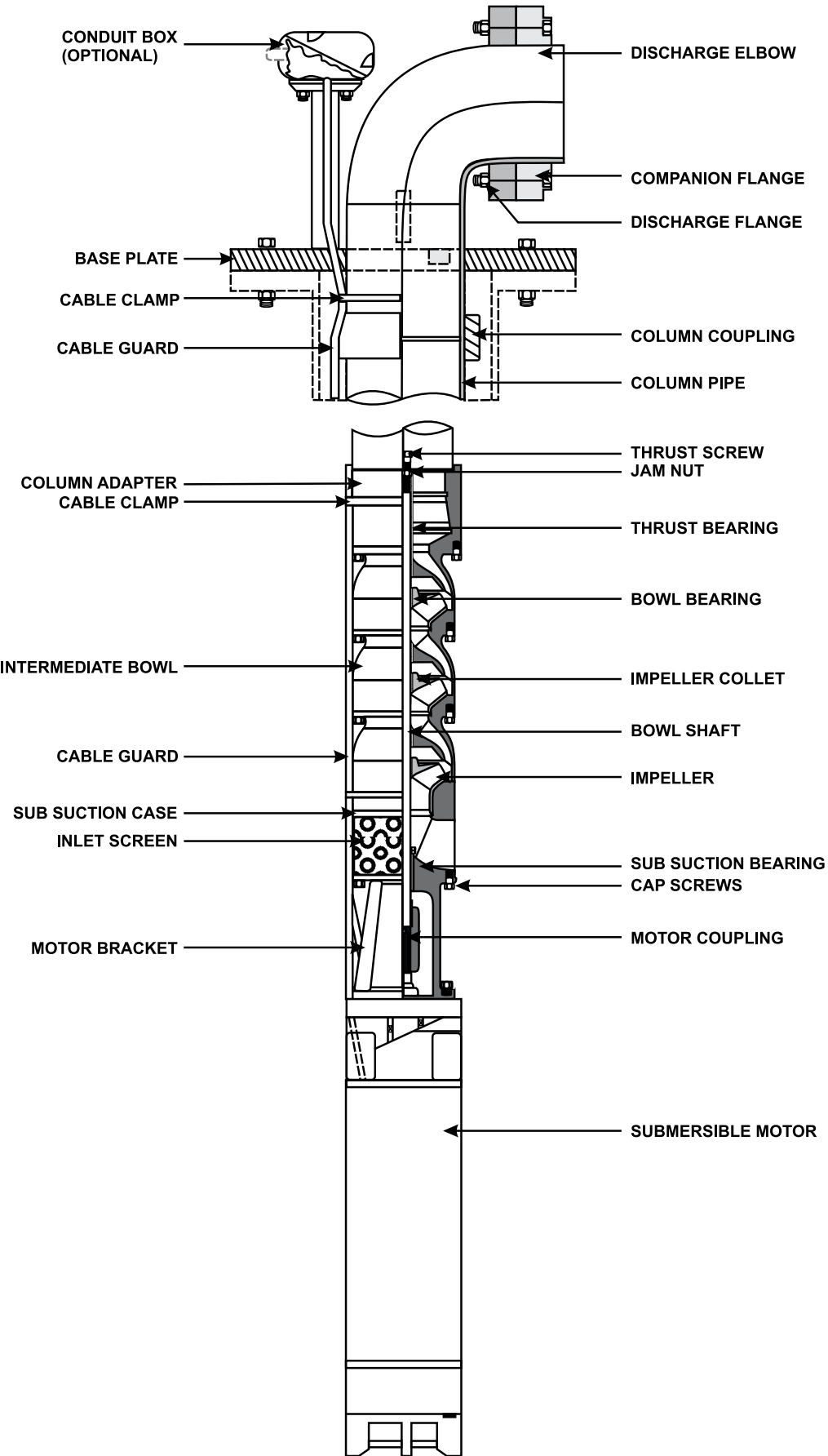


SUBMERSIBLE PUMP



SUB SAMPLE SPECIFICATIONS

GENERAL

The contractor shall furnish, completely installed, including connection to the motor starter, one (1) NATIONAL vertical turbine submersible pump, Model No. _____ and appurtenances to meet the requirements herein or as shown on the drawings or approved equal. Concrete foundations, piping beyond the pump discharge, and wiring beyond the motor starter will be provided by others. The pump is to deliver a capacity of _____ GPM against a total head (not including pump inlet, drop pipe, and discharge elbow losses) of _____ feet. The setting from the bottom of the surface plate to the top of the bowl section shall be not less than _____ feet. Pump RPM shall not exceed _____. The pump will be installed in a _____" diameter well having a total depth of _____ feet with static water level _____ feet below surface and pumping water level _____ feet below surface when pumping design capacity. Water temperature will not exceed _____ ° F.

INFORMATION REQUIRED IN THE PROPOSAL

1. Data Sheet completely filled in.
2. Performance curve showing accepted performance at design point. Curve will show head, capacity, efficiency, and horsepower based on bowl performance 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.

DETAILED REQUIREMENTS

PUMP BOWLS

Intermediate bowls and discharge bowls shall be of cast iron enameled, free of foundry imperfection, and other detrimental defects. Bowls may be either flanged or threaded type.

IMPELLERS

The impellers shall be of bronze of the enclosed type and statically balanced. They shall be securely fastened to the impeller shaft with tapered split collets.

IMPELLER SHAFT

Impeller shaft shall be of 416 stainless steel. Shaft shall be of ample size for the horsepower required and shall be supported by bronze bearings on each side of each impeller.

SUCTION CASE

Suction case shall be of cast iron and be provided with a bearing to stabilize shaft, insure accurate alignment between pump shaft and motor shaft and to avoid radial thrust on motor bearing. Suction case shall also incorporate suction screen having minimum open area of 4 times the eye area of the impeller. Flange for connection of the motor must provide accurate rabbet fit to insure positive alignment of pump and motor.

DROP PIPE

Pipe size shall be such that friction loss shall not exceed 5' per 100' of drop pipe and velocity shall not be less than 3.5 ft./sec. based on rated capacity of the pump. The pipe may be furnished in random lengths of approximately 20' per length. Pipe shall be coupled with threaded sleeve type couplings. Pipe and couplings must be 3/4 NPT type threads.

SURFACE PLATE

The surface discharge assembly shall be of fabricated steel. It shall be of ample strength to support the motor, bowl assembly, drop pipe, cable, and column of water. The surface discharge plate shall incorporate suitable watertight openings to accommodate the cable, well vent connection, and water level measuring device. Cable entry shall terminate in watertight conduit box located approximately 12" above the top of the surface plate. Discharge shall be provided with a (flanged elbow) (female thread elbow).

SUB SAMPLE SPECIFICATIONS (CONT.)

CABLE

The cable shall consist of three or more separate conductors (or) a single jacketed three conductor cable assembly. Each conductor shall be insulated with synthetic rubber or plastic suitable for continuous immersion in the liquid being pumped. The cable must be protected by a suitable shield or guard when it passes the bowl section to prevent damage in installation or operation. Cable size shall be such that voltage drop will not exceed 5% under rated operating conditions.

CHECK VALVE

When total head exceeds 200', a drop pipe check valve is to be used and installed approximately 20' above bowl section. For settings over 600', two drop pipe check valves are to be used and the first valve installed approximately 100' above bowl section and the second valve installed approximately 60% of the distance between the first valve and the surface plate. Valves are to act as surge valves and permit the water in the drop pipe to drain slowly.

MOTOR

The motor shall be designed for operation, completely submerged. The motor shall not be loaded in excess of 115% of name plate rating under any operating condition.

Motor will operate on 3-phase, 60-cycle, _____-volt electric current and shall be suitable for operation with this power supply.

Motor thrust bearing rating must be ample to carry the thrust load imposed by the pump when operating under the maximum anticipated pumping head. With the motor in the "shaft up" position, direction of thrust shall be downward. Motor thrust bearing must be capable of operating with rotation in either direction, and thrust capacity, when operated in reverse rotation, shall not be less than 75% of rated thrust capacity.

An expansion chamber diaphragm shall be provided to relieve thermal expansion of internal motor fluid due to temperature variation and shall provide motor internal and external pressure balance under all conditions of temperature and pressure.

Shaft shall be Type 416 stainless steel or equivalent corrosion resistant material. Outer shell shall be of material to resist corrosion.

DATA REQUIRED

The following data must be filled in and included with the proposal:

PUMP DATA

Design Capacity	_____	GPM
Design Head	_____	FT. T.D.H.
Pump Efficiency - Field	_____	%
Pump Horsepower - Field	_____	HP
Total Pump Downthrust	_____	LBS.
Impeller Shaft Diameter	_____	IN.
Drop Pipe Diameter (nominal)	_____	IN.
Drop Pipe Weight	_____	LBS./FT.
Length of Drop Pipe	_____	FT.
Size of Discharge (nominal)	_____	IN.
Cable Size	_____	AWG#

MOTOR DATA

Manufacturer	_____
Motor Rating	_____ HP
Full Load Speed	_____ RPM
Full Load Amperes	_____ AMPS
Thrust Bearing Rating	_____ LBS.
Electric Characteristics	_____ PHASE
	_____ CYCLE
	_____ VOLTS
Weight of Pump and Motor	_____ LBS.