KP

Suggested Specifications
Furnish and install, as outlined on the equipment schedule and described in these specifications, a Paco model KP double suction horizontal split case centrifugal pump (s), or equal, designed to deliver the scheduled flow rate (in GPM), the specified total dynamic head (in feet), at the scheduled efficiency and scheduled speed (RPM).
OPTION: (The pumps shall also be NSF-50 and NSF-61 certified.)

To insure cavitation-free operation, each pump's NPSH requirement must be low enough to permit stable, continuous operation at 120% or greater of best efficiency point.

Casing:
Pumps shall have the casing divided on the horizontal centerline. The casing halves shall be accurately machined, bolted and doweled together. A non-asbestos type gasket material shall be furnished between the casing halves. The casing material shall be close-grained cast iron with a minimum tensile strength of 35,000 P.S.I. Removal of the upper casing half and bearing housings shall permit removal of the complete rotating assembly without disturbing piping connections. Pumps shall be provided with removable bearing housings which will permit inspection and/or replacement of the mechanical seals, shaft sleeves, and bearings without removing the rotating assembly or top casing half. Pumps with 4 inch or larger discharge flanges shall be of the double volute design.

Casings shall be designed for scheduled working pressure and shall be hydrostatically tested at 150% of the maximum working pressure under which the pump could operate at design speed. Suction and discharge flanges shall be drilled to ANSI Standards and be machined flat face. Pumps shall be fitted with (lead-free bronze) (cast iron) renewable case wear rings indexed with a dowel pin for fixed positioning.
OPTIONS: case material-of-construction- Ductile Iron (A536), Bronze (B145), 316SS

Impeller:
The lead-free bronze impeller shall be an enclosed Francis vane type, double suction design, hydraulically and dynamically balanced. The impeller is to be securely mounted on the pump shaft, and attached with a steel key. The impeller shall be locked in position by threaded shaft sleeves. The impeller shall be trimmed to meet the specific hydraulic requirements. Impeller trim must be equal to or less than 90% of maximum diameter which will fit into the pump casing.

OPTIONS: Impeller material-of-construction- Cast Iron (A48), 316SS

Shaft:
The pump shaft shall be made of high tensile steel, precision ground to provide a true running rotating element. The minimum shaft diameter under the impeller shall be (_____").
OPTION: Shaft material-of-construction- 300 series Stainless Steel

Bearings:
The pump shaft shall be adequately supported by the pump bearings to limit the shaft deflection to 0.002 inches.

Bearings shall be ball type, grease lubricated and locked to the shaft with positive locks of ample size to withstand any axial thrust loads. Each bearing housing shall be bolted to the upper and lower casing halves for a full 360-degree support registered fit to insure positive alignment. Bearing shall provide a minimum life of 10 years when calculated at 50% of Best-Efficiency-Point for the scheduled pump.

OPTION: Bearing Lubrication- Oil Lubrication (Oil Ring Lubrication System)

Shaft Seals:
The pump manufacturer shall recommend the proper mechanical seal based on the pressure, temperature and liquid outlined on the equipment schedule. Mechanical seals, at a minimum, shall have ceramic stationary seats, carbon rotating seats, and Buna elastomers.

OPTION: Mechanical Seals- specify manufacturer and material-of-construction

Shaft Sleeves:
Lead-free bronze shaft sleeves shall be firmly attached to the pump shaft through threading and locking means. Shaft sleeve design shall prevent corrosion and wear to the shaft.

OPTION: Shaft Sleeve material-of-construction- 300 series Stainless Steel, 400 series Stainless Steel (hardened-415 BN)

Base, Coupling, and Guard:
The pumps shall be mounted on a (cast iron base with drain) or (steel base with drip pan) and directly connected through a heavy-duty flexible coupling to a horizontal motor as outlined in these specifications. The pump manufacturer shall provide an OSHA coupling guard, which shall be mounted between the pump and motor and attached firmly to the base.

Motors:
The motor shall be sized to operate continuously without exceeding the horsepower rating (as outlined on the schedule) regardless of the flow and head throughout the operating range of the "System Curve." Motors shall meet EPAC standards for efficiency as a minimum.

OPTION: Motor Efficiency- Premium Efficient

General Installation:
Pump and motor shall be realigned by the contractor, according to the standards of the Hydraulic Institute, after grouting of base and connection of piping.

The contractor shall insure that alternative pumps submitted will meet the design flow, head and efficiencies as outlined in the equipment schedule. Pumps submitted that do not meet these specified efficiencies shall require an analysis of operating costs based upon 24 hours per day, 7 days per week operation. Contractor shall credit the owner for the difference in operating costs based on five-year operation.