

## WS\_B, WS\_BF, WS\_BHF Series Submersible Sewage Pumps

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### GENERAL

- Furnish and install \_\_\_\_\_ Goulds Pumps, Model 3887, submersible sewage pump(s), \_\_\_\_\_ HP, \_\_\_\_\_ phase, \_\_\_\_\_ volts, \_\_\_\_\_ Hz, pump(s) rated for \_\_\_\_\_ GPM, at \_\_\_\_\_ Ft. Total Dynamic Head.
- Pump(s) shall be Goulds Pumps, Order No: \_\_\_\_\_.

### QUALIFICATIONS

All pump manufacturers must be pre-qualified by the engineer in order to qualify as acceptable manufacturers. Pre-qualification shall be no later than two (2) weeks prior to published bid date for this project. Failure to pre-qualify will be grounds for disqualification after the bid opening date. All decisions of qualification shall reside with the engineer of record at time of bidding.

### PUMP DESIGN

Pumps with a "B" suffix feature a 2" NPT threaded casing with a vertical discharge. Pumps with a "BF" or "BHF" suffix have a 2" NPT threaded companion flange which bolts to the flanged vertical discharge casing. An optional A1-3, 3" NPT companion flange is available as a separate component. Pumps are designed for effluent, sewage or wastewater applications and are capable of passing maximum 2 inch spherical solids.

### MECHANICAL SHAFT SEALS

The motor shall be protected by a mechanical shaft seal mounted on the pump shaft. The mechanical seal shall be constructed of a silicon carbide vs. silicon carbide sealing faces. The upper mechanical seal shall be, tensioned by an independent spring system constructed of series 300 stainless steel metal components and BUNA-N elastomers.

### IMPELLER

The impeller shall be semi-open with ejector (pump out) vanes on the top of the impeller for protection of the lower mechanical seal and hydraulic balance. Due to design, only single plane spin balancing shall be required for smooth operation.

The impeller shall be threaded to the solid series 400 stainless steel shaft and is secured by a thread-locking nut which will prevent the impeller from loosening during short periods of reverse rotation as might occur when rotation direction is being verified outside the installation.

### CASING

The casing shall be cast from ASTM A48 class 30 gray cast iron of sufficient thickness to withstand 1.5 times the shut off pressure generated by the largest impeller available for this model in accordance with current revision of the Hydraulic Institute Standards. The discharge connection shall be a standard 2 inch NPT or 3 inch NPT suitable for direct connection to the station piping, without the use of any external fittings or adapters for vertical orientation of the discharge direction. Integral feet of cast iron shall be made a part of the casing for accurately positioning the pump suction opening at the correct elevation off the sump floor for good pump down capability.

### MAJOR CASTING MATERIALS

The impeller, casing, bearing/seal housing and motor cover shall be of ASTM A48 Class 30 high quality cast iron for strength and long life. Bronze impeller shall be cast iron from ASTM B584 C87600 when ordered as an option.

### CORROSION PROTECTION

The pump/motor shaft wetted-end shall be series 400 stainless steel. Both inner and outer surfaces of cast iron shall be electrocoat-painted with thermo-setting Acrylic Enamel baked at 400 degrees F., after castings are completely machined and cleaned.

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### MOTOR

The integral motor shall be completely sealed from the environment by use of circular cross section o-rings accurately fitted into machined grooves which shall provide designed compression of metal to metal fits. Designs which require a specific torque on the casing bolts or which require rectangular gaskets or sealing rings shall not be allowed. The motor shall be rated for continuous duty under full nameplate load while at full submergence in the station. The motor shall be provided at the specific site conditions of 115, 208 or 230 V, single phase or 200, 230, 460 or 575 V, three phase as required, all shall be at 60 Hz. Single phase motors: shall be capacitor-start. All single phase motors shall be provided with thermal protection. Single phase motors shall have an on winding sensor with automatic reset. Three phase motors shall be protected by ambient compensated quick-trip heaters, or, adjustable motor circuit protectors provided in control. The stator winding shall be open type with class B insulation suitable for operation in clean dielectric oil for efficient heat transfer and lubrication of the ball bearings. The stator shall be a register fit into the bearing housing to ensure positive alignment, and bolted for ease of serviceability. The motor shall be provided with ball type anti-friction bearings which shall support the heavy duty rotor shaft and to handle all radial and axial loads imposed by the impeller while limiting shaft deflection at the mechanical seal faces. Sleeve type bearings shall not be considered equal and, therefore, shall not be allowed. The ball bearings shall be designed for a B-10 life of 30,000 hours minimum. The motor shall be designed and tested to withstand an 18 day locked-rotor operation without damage.

### POWER CABLE

The power cable shall be sealed at the motor end as it enters the motor casing by a two part barrier to moisture intrusion. The first line of defense shall be the compression of the oil and chemical resistant grommet which shall seal the outer jacket of the power cord. In the event that the outer jacket of the power cord should become damaged, then the second line of defense shall be the epoxy poured isolated conductors within the jacketed cable itself. The insulation shall be removed from the individual conductors and the epoxy shall be allowed to form a leak-proof seal against wicking of the power cable between the outer jacket and the insulation of the individual conductors. The outer jacket of the power cord shall be oil resistant and water resistant. The power cable shall be rated for NEC severe service "S", type "SJTOW" or "STOW".

### PUMP OPTIONS

1. Bronze impeller
2. Mechanical seal faces of silicon carbide/tungsten carbide material
3. Power cable of 30, 50 or 100 foot lengths
4. Refer to the factory for items not listed.

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