



**INVITATION TO BID (ITB)
BID # FY 2017-2018-015**

**CITY OF HALLANDALE BEACH
PURCHASE OF SEWER LIFT STATIONS PUMPS**

EXHIBIT A – TECHNICAL PUMP SPECIFICATIONS

BID # FY 2017-2018-015 CITY OF HALLANDALE BEACH PURCHASE OF SEWER LIFT STATIONS PUMPS

TECHNICAL PUMP SPECIFICATIONS

MANUFACTURER (1) - Myers

Pump - The pump shall be Solids Handling Submersible Pump with 2-vane enclosed impeller. All openings in pump impeller and volute case to be large enough to pass a 3-3/16" diameter sphere. Discharge flange shall be six (6) inch standard. The pump and motor assembly shall be FM listed for Class 1, Groups C and D hazardous location service.

Operating Conditions - The pump capacity (GPM), total dynamic head (TDH), horsepower (HP) rating shall be as shown in the table 1 below.

Motor - Pump motor shall be of the sealed submersible type with rated horsepower (HP), voltage (V), phase Ø, and RPM as shown in the table 1 below. Motor shall be NEMA B type.

Stator winding shall be of the open type with Class H insulation good for 150°C maximum temperature. Winding housing shall be filled with a clean high dielectric oil that lubricates bearings and seals and transfers heat from winding and rotor to outer shell. Air-filled motors that do not have the superior heat dissipating capabilities of oil- filled motors shall not be considered equal.

Motor shall have two heavy duty ball bearings to support pump shaft and take radial and thrust loads and a sleeve guide bushing directly above the lower seal to take radial load and act as flame path for seal chamber. Ball bearings shall be designed for 50,000 hours B-10 life. Stator shall be heat shrunk into motor housing.

A heat sensor thermostat shall be attached to and embedded in the winding and be connected in series with the motor starter contactor coil to stop motor if temperature of winding is more than 130°C. Thermostat to reset automatically when motor cools to safe operating temperature. The common pump, motor shaft shall be of 416 stainless steel.

Seals - Motor shall be protected by two mechanical seals mounted in tandem with a seal chamber between the seals. Seal chamber shall be oil filled to lubricate seal face and to transmit heat from shaft to outer shell.

Seal face shall be carbon and ceramic and lapped to a flatness of one light band. Lower seal faces shall be carbide.

A double electrode shall be mounted in the seal chamber to detect any water entering the chamber through the lower seal. Water in the chamber shall cause a red light to turn on at the control box. This signal shall not stop motor but shall act as a warning only, indicating service is required.

Impeller - The impeller shall be ductile iron and of the 2-vane solids handling enclosed type. Vane inlet tips shall be carefully rounded to prevent stringy material from catching in vanes. Pump-out vane shall be used in front and back chamber. Impeller shall be dynamically balanced. Impeller shall be driven by stainless steel shaft key and impeller held in place with

lock screw and washer. Impeller and motor shall lift off case as a unit without disturbing discharge piping. Impeller neck shall run in bronze wear ring that is pressed into volute case.

MANUFACTURER (2) – KSB

Submersible Wet Pit Sewage Pumps - Submersible Wet Pit Pump, Cast Iron Construction, Motor Version UN, XN, WN, ZN. Type KRT without/cooling jacket – installation type S or P

Operating Conditions - The pump capacity (GPM), total dynamic head (TDH), horsepower (HP) rating shall be as shown in the table 1 below.

Warranty - The pump manufacturer shall warrant the pump, motor and guide system to the Owner against defects in workmanship and materials for a period of seven (7) years under normal use and service. If a guide cable system is used the pump manufacturer shall warrant the guide cable system (including guide cables and brackets) to the Owner against defects in workmanship and materials for a period of ten (10) years under normal use and service. Both pump manufacturer warranties shall be in published form, and shall apply to all similar units. A copy of each warranty shall be provided to the Owner at startup.

Materials - Submersible Sewage Pumps

Pump Case: Cast Iron, ASTM A48, Class 35B

Motor Housing: Cast Iron, ASTM A48, Class 35B

Impeller: Cast Iron, ASTM A48, Class 35B

Intermediate Housing (Back plate): Cast Iron, ASTM A48, Class 35B

Discharge Base Elbow: Cast Iron, ASTM A48, Class 35B

Pump/Motor Shaft: Carbon Steel, C 45 N with replaceable ASTM A276 Type 420 shaft protection sleeve or entire shaft to be ASTM A276 Type 420 stainless steel with an ASTM A276 Type 420 shaft protection sleeve.

Shaft Sleeve: Stainless Steel, ASTM A276 Type 420

Wear Ring, case: Cast Iron, ASTM A48, and minimum 200 Brinell

Wear Ring, impeller (enclosed impellers only): Stainless Steel, AISI329, and 350 Brinell

O-Rings: Nitrile Rubber (NBR)

Fasteners (including impeller fastener): Stainless Steel, ASTM A276 Type 316Ti.

Lower Seal Faces: Silicon Carbide/Silicon Carbide

Upper Seal Faces: Silicon Carbide stationary/Carbon rotating

Guide rails/cables and mounting brackets: Stainless Steel, ASTM A276 Type 316 (cables shall be nylon coated)

Lifting Chain or cable: Stainless Steel, ASTM A276 Type 316

Oil-all uses (seal lubrication, etc.): Ecologically safe, paraffin or mineral base

Power/Control Cable Jacket: Chloroprene with non-wicking fillers

Power Cable – Provide 50 feet of power/control cable with each pump, suitable for submersible wastewater application, sized in accordance with NEC requirements. Provide cable terminal box on side of motor housing, with cable entry sealed to insure that no entry of moisture is possible into the high-voltage motor/ terminal area even if the cable is damaged or severed below water level. Cable seal shall include a compressed rubber grommet to seal the cable exterior and epoxy fill to seal the interior passages. A strain relief device, in direct contact with both the cable

and the cast iron entry housing, shall be provided. The cable entry shall be rated by Factory Mutual (or UL) for submerged operating depths to 85 feet.

Temperature Protection - Furnish temperature monitoring devices in motor windings for use in conjunction with and supplemental to external motor overload protection. Arrange controls to shut down pump should any of the monitors detect high temperature and automatically reset once motor temperature returns to normal. Set temperature monitors at levels recommended by pump manufacturer

Seal Leak Detection - Provide a detector in the motor's stator cavity which allows a control panel mounted relay to indicate leakage into the motor. In addition, on motors 80HP and larger provide a stainless steel float switch in a separate leakage collection chamber to indicate leakage past the inner mechanical seal prior to its entrance into either the motor stator cavity or the lower bearing. Electronic probes which depend on sensing resistance value changes in seal oil will not be acceptable as seal leak indicators.

Motor Sensor Monitoring Relay - The pump supplier shall furnish all relays required for monitoring all motor sensors. The relays shall be installed by others in the motor control panel and properly wired in accordance with pump manufacturer's instructions. Relays shall mount in standard 12-pin socket bases (provided) and shall operate on available control voltage of 24-240 VAC. If relays require an input voltage that is not available in the motor control panel an adequate transformer (with fused input) shall be provided by the pump supplier. Relays shall have a power consumption of no more than 2.8 watt, and shall be UL approved. Relays shall be modular in design, with each relay monitoring no more than two motor sensor functions.

Each relay module shall include a dual color (red/green) LED to indicate the status of each monitored sensor. Green will indicate "status OK"; red will indicate a failure or alarm condition. A self-corrected fault will allow the relay output contacts to reset, and cause the LED to change from a steady alarm indication to a flashing signal. The LED shall continue to flash until locally cleared, providing the operator an indication of a potential intermittent fault. Each relay shall also include a power-on LED and both "test" and "reset" pushbuttons.

An independent fail-safe (switch on power loss) form-C output contact shall be included for each monitored sensor to provide a normally-open / normally-closed dry contact to initiate a remote alarm device or shut down the motor. Contacts shall be rated for 5 amps at 120 volt.

Fabrication, General - Provide pumps capable of handling raw unscreened wastewater. Design pumps to allow for removal and reinstallation without the need to enter the wet well and without removal of bolts, nuts or other fasteners.

Provide a pump which connects to a permanently mounted discharge connection by simple downward motion, without rotation, guided by at least two non-load-bearing guides. All system components for guide cable systems, including cable, shall be supplied and warranted by the pump manufacturer. For guide pipe systems the pipe shall be supplied and warranted by the installing contractor. Guide cable systems shall be suitable for proper operation when installed at up to 5 degree misalignment from vertical, pipe guides must be installed perfectly plumb and vertical. Intermediate guide supports (between upper bracket and discharge elbow connections) shall not be required for cable systems but MUST be supplied where needed to maintain perfect alignment for pipe guides. Final connection shall insure zero leakage between pump and discharge connection flange. Provide a discharge connection/ guide system so that no part of

the pump bears directly on the floor of the wet well. Provide Type 316 stainless steel chain of sufficient length to properly and safely lift pumps from the wet well. All exposed cast iron and ferrous surfaces shall be cleaned of dirt and grease, sandblasted to near white finish, and coated with an anti-corrosion reaction primer. The pump shall then be coated with two-component thick coat paint, with an epoxy resin base, having at minimum 83% solids by volume. This coating shall be non-toxic and approved for both wastewater and water applications.

Major Components - Furnish major components (pump case, impeller, intermediate housing, and motor housing) of cast material as specified with smooth surfaces devoid of blow holes and other irregularities. Pump case design shall incorporate a centerline discharge for stability when mounted on the base elbow.

Provide non-clog type impeller, capable of passing at minimum a 3" spherical solid. Statically and dynamically balance the impeller. On enclosed impeller designs, provide hard metal wear rings of material and Brinell hardness specified, to insure maximum pump/impeller life and continuing high efficiencies. Impellers must incorporate back vanes which reduce axial loads and propel solids away from the seal area. Do not use soft metals (i.e. bronze, 304 or 316 stainless) or elastomers as wear ring material as these are incompatible with the grit contaminate expected in the pumpage.

Shaft - Provide common pump/motor shaft of sufficient size to transmit full driver output with a maximum deflection of 0.002 inches measured at the lower mechanical seal. Machine the shaft of carbon steel or stainless steel and isolate the shaft from the pumped media with a replaceable Type 420 stainless steel shaft sleeve under the lower mechanical seal. Pump shafts without shaft sleeves are not acceptable due to higher maintenance costs associated with repairing shafts / rotor assemblies that are left unprotected.

Shaft Seal - Provide two totally independent mechanical shaft seals, installed in tandem, each with its own independent single spring system acting in a common direction. Install the upper seal in an oil-filled chamber with drain and inspection plug (with positive anti-leak seal) for easy access from external to the pump. Provide seals requiring neither routine maintenance nor adjustment, but capable of being easily inspected and replaced. Provide seals which are non-proprietary in design, with replacements available from a source other than the pump manufacturer or its distributors. Do not provide seals with the following characteristics: conventional double mechanical seals with single or multiple springs acting in opposed direction; cartridge-type mechanical seals; seals incorporating coolant circulating impellers, seals with face materials other than those specified

Bearings- Furnish upper and lower bearings, single row (preferred) or double row as needed to provide a B10 life of, at minimum, 100,000 hours at all anticipated axial and radial loadings. Provide sealed/shielded (permanently lubricated) bearings .If open-type (non-shielded) bearings are used, provide re-lubrication ports with positive anti-leak plugs for periodic addition of lubrication from external to the pump

Motor - Provide a motor which is squirrel cage, induction in design, housed in a completely watertight and air filled chamber, with a min 1.15 service factor. The motor shall be adequately sized and rated for continuous operation at a maximum fluid temperature of 104° F (40° C) [optional: 140°F (60° C)]. Allowable maximum submergence shall not be less than 100 ft. (30 m). Insulate the motor stator with, at minimum, Class H insulation rated for 180 Degrees C. Windings shall be insulated using trickle impregnation process to ensure uniformity with a

winding fill factor of at least 95%. The use of multiple step “dip and bake” type stator insulation method shall not be acceptable. The rotors bars and short circuit rings shall be made of cast aluminum. The motor and pump set complete shall be designed and manufactured by the same company. Provide temperature protection and seal leak detection as described in above. Provide adequately rated motor with sufficient surface area for ambient only cooling suited for the intermittent mode of operation in wet well wastewater applications, submerged or partially submerged, without damage. Motors containing di-electric oils used for motor cooling and/or bearing lubrication or motors where the pumped media or externally provided fresh water is directed through the motor shell for cooling is not acceptable.

Provide motors which are FM listed for use in Class I Division 1 Groups C&D hazardous locations as defined by the National Electric Code

Equipment Tests - Tests shall be performed in accordance with the Test Code for Centrifugal Pumps per the Standards of the Hydraulic Institute, Level A. Tests shall be performed on the actual assembled pumps to be supplied. Tests shall cover a range from shut-off to a minimum 20% beyond specified design capacity. Conduct test per above specification on all supplied pumps, generating a curve showing actual flow, head, BHP and hydraulic efficiency.

MANUFACTURER (3) - EBARA International Corporation

A. General:

Provide submersible sewage pumps suitable for continuous duty operation underwater without loss of watertight integrity to a depth of 65 feet. Pump system design shall include a guide rail system be such that the pump will be automatically connected to the discharge piping when lowered into place on the discharge connection. The pump shall be easily removable for inspection or service, requiring no bolts, nuts, or other fasteners to be disconnected, or the need for personnel to enter the wet well. The motor and pump shall be designed, manufactured, and assembled by the same manufacturer.

B. Pump Characteristics:

Pumps shall conform to the requirements shown in table 1 below.

C. Pump Construction:

All major parts of the pumping unit(s) including casing, impeller, suction cover, wear rings, motor frame and discharge elbow shall be manufactured from gray cast iron, ASTM A-48 Class 30. Castings shall have smooth surfaces devoid of blow holes or other casting irregularities. Casing design shall be centerline discharge with a large radius on the cut water to prevent clogging. Units shall be furnished with a discharge elbow and 125 lb. flat face ANSI flange. All exposed bolts and nuts shall be 304 stainless steel. All mating surfaces of major components shall be machined and fitted with NBR O-rings where watertight sealing is required. Machining and fitting shall be such that sealing is accomplished by automatic compression of O-rings in two planes and O-ring contact is made on four surfaces without the requirement of specific torque limits. Internal and external surfaces are prepared to SPPC-VISI-SP-3-63 then coated with a zinc-chromate primer. The external surfaces are then coated with a H.B. Teneme-Tar 46H-413 Polyamide Epoxy - Coal Tar paint.

1. Impellers:

- a. For units 2 to 5 HP, the impeller shall be radial single or multi-vane, semi-open design. It shall be dynamically balanced and shall be designed for solids handling with a long thrulet without acute turns. The inlet edge of the impeller vanes shall be angled toward the impeller periphery so as to facilitate the release of objects that might otherwise clog the pump. The 2 to 5 HP impeller design shall also include back pump out vanes to reduce the pressure and entry of foreign materials into the mechanical seal area. In addition, a lip seal shall be located behind the impeller hub to further reduce the entry of foreign materials into the seal area. Impellers shall be direct connected to the motor shaft with a slip fit, key driven, and secured with an impeller bolt. The design shall include a replaceable cast iron suction cover. The suction cover shall contain a groove(s) perpendicular to the suction opening to disrupt fibrous solids that may otherwise become lodged between the impeller and suction cover. The suction cover shall be designed such that it may be adjusted to maintain working clearances and hydraulic efficiencies.
- b. For units 7 1/2 to 30 HP, the impeller shall be a mixed flow multi-vane semi-open design. It shall be dynamically balanced and shall be designed for solids handling with a long thrulet without acute turns. The inlet edge of the impeller vanes shall be angled toward the impeller periphery so as to facilitate the release of objects that might otherwise clog the pump. The 7 1/2 to 30 HP impeller design shall also include back pump out vanes to reduce the pressure and entry of foreign materials into the mechanical seal area. In addition, a lip seal shall be located behind the impeller hub to further reduce the entry of foreign materials into the seal area. Impellers shall be direct connected to the motor shaft with a slip fit, key driven, and secured with an impeller bolt. The design shall include a replaceable cast iron suction cover. The suction cover shall contain a groove(s) perpendicular to the suction opening to disrupt fibrous solids that may otherwise become lodged between the impeller and suction cover. The suction cover shall be designed such that it may be adjusted to maintain working clearances and hydraulic efficiencies.

2. Mechanical Seals

- a. For units 2 to 5 HP, double mechanical seals operating in an oil bath shall be provided on all units. The oil filled seal chamber shall be designed to prevent over-filling and include an anti-vortexing vane to insure proper lubrication of both seal faces. Lower face materials shall be silicon carbide, upper faces carbon vs. ceramic, NBR elastomers, and 304SS hardware. Seal system shall not rely on pumping medium for lubrication.
- b. Units 7 1/2 to 30 HP shall be designed to include a double mechanical seal in a tandem arrangement. Each seal shall be positively driven and act independently with its own spring system. The upper seal operates in an oil bath, while the lower seal is lubricated by the oil from between the shaft and the seal faces, and in contact with the pumpage. The oil filled seal chamber shall be designed to prevent over-filling and include an anti-vortexing vane to insure proper lubrication of both seal faces. Lower face materials shall be silicon carbide upper faces carbon vs. ceramic, NBR elastomers, and 304SS hardware. Seal system shall not rely on pumping medium for lubrication.

E. Motor Construction:

The pump motor shall be an air filled induction type with a squirrel cage rotor, shell type design, built to NEMA MG-1, Design B specifications. Stator windings shall be copper, insulated with moisture resistant Class F insulation, rated for 311°F. The stator shall be dipped and baked three times in Class F varnish and heat shrunk fitted into the stator housing. Rotor bars and short circuit rings shall be manufactured of cast aluminum. Motor shaft shall be one piece AISI403 for 2 to 5 HP, AISI420 for 7 1/2 to 30 HP, rotating on two permanently lubricated ball bearings designed for a minimum B-10 life of 60,000 hours. Motor service factor shall be 1.15 and capable of up to 20 starts per hour. The motor shall be designed for continuous duty pumping at a maximum sump temperature of 104°F. Voltage and frequency tolerances shall be a maximum 10 / 5% respectively. Motor over temperature protection shall be provided by miniature thermal protectors embedded in the windings. Mechanical seal failure protection shall be provided by a mechanical float switch located in a chamber above the seal. This switch shall be comprised of a magnetic float that actuates a dry reed switch encapsulated within the stem. Should the mechanical seal fail, liquid shall be directed into the float chamber, in which the rising liquid activates the switch opening the normally closed circuit. For units 2 to 30 HP the float body and float shall be a polypropylene material with a 316SS stopper. The motor shall be non-overloading over the entire specified range of operation and be able to operate at full load intermittently while unsubmerged without damage to the unit.

Power cable jacket shall be manufactured of an oil resistant chloroprene rubber material, designed for submerged applications. Cable shall be watertight to a depth of a least 50'. The cable entry system shall comprise of primary, secondary, and tertiary sealing methods. The primary seal shall be achieved by a cylindrical elastomeric grommet compressed between the motor cover and a 304SS washer. Secondary sealing is accomplished with a compressed O-ring made of NBR material. Compression and subsequent sealing shall preclude specific torque requirements. The system shall also include tertiary sealing to prevent leakage into the motor housing due to capillary action through the insulation if the cable is damaged or cut. The cable wires shall be cut, stripped, re-connected with a copper butt end connector, and embedded in epoxy within the cable gland. This provides a dead end for leakage through the cable insulation into the motor junction area. The cable entry system shall be the same for both the power and control cables.

MANUFACTURER (4) - Goulds Water Technology

Pump Design - Pump(s) shall have 4 inch ANSI discharge flange and shall be capable of handling sewage containing non-abrasive 3 inch maximum solids.

Operating Conditions – The pump capacity (GPM), total dynamic head (TDH), horsepower (HP) rating shall be as shown in the table 1 below.

Mechanical Shaft Seals - The motor shall be protected by two independent sets of mechanical shaft seals mounted in tandem on the pump shaft. Pump designs with one or two springs acting between rotating faces shall not be allowed as this design would allow effluent to force the seal faces apart during periods of upset or high discharge pressure. The outer mechanical seal shall be constructed of Silicon Carbide vs. Silicon Carbide (or lower seal optional Silicon Carbide vs.

Tungsten) sealing faces. The inner mechanical seal shall be constructed of Carbon vs. Ceramic sealing faces. Each set (upper and lower) shall be tensioned by an independent spring system constructed of series 300 stainless steel metal components and BUNA-N elastomers. The mechanical seals shall be located in a completely isolated seal oil chamber which will provide lubrication for the seal faces while simultaneously acting as an isolation zone for the stator chamber.

Impeller - The impeller shall be semi-open, two vane non-clog, 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 slip fitted to the shaft and key-driven. The impeller shall be held in place with a bolt and washer system that shall secure the impeller against all axial loads imposed by the hydraulic conditions of operation.

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 125 # ANSI 4 inch flange. The discharge flange shall be capable of bolting to either a 4x4 or 4x6 inch wet pit guide rail. The guide rail system shall support the full weight of the submersible pump without the need for any supports under the pump which would cause solids to build up and starve the pump.

Wet Pit Installation System - Pumps are designed for use on guide rail systems and Base Elbow Disconnect systems fitted with vertical 125# ANSI flanges for horizontal discharge. See our Accessory catalog section for available disconnect systems.

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 from ASTM B584 C87600 when ordered as an option.

Corrosion Protection -The pump/motor shaft wetted-end shall be series 300 stainless steel. Both inner and outer surfaces of cast iron shall be electro coat-painted with thermo-setting Acrylic baked at 400° F., after castings are completely machined. The gland nut/strain relief shall be series 300 stainless steel.

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 partial submergence in the station. The motor shall be provided at the specified site conditions of 208 or 230 volts, single phase or 200, 230, 460 or 575 volts, three phase as required, all shall be at 60 Hz.

Single-phase motors: 1½ - 5 HP shall be permanent split capacitor type. All single-phase motors shall be provided with thermal protection with automatic reset. Three phase motors require Class 10, quick trip, ambient compensated overload protection in the control panel. The stator winding shall be open type with class F 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 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 “STOW”.

Pump Options - Silicon Bronze Impeller, Silicon Carbide/Tungsten Carbide Lower Seal, Longer Power Cords

Table 1

Quantity	Manufacturer/ Lift Station(LS)	Part Number	GPM	TDH (feet)	(HP)	Voltage (V)	RPM	FLA	Phase (∅)
2	Myers / (LS-2)	6VC250M4-43, Equipped with 35' power cable, SS lifting bails			25	460	1750	38	3
1	Myers / (LS-3)	Myers model 6VC300M4-43, Equipped with 35' power cable, SS lifting bails			30	460	1750	47	3
2	Myers / (LS-5)	4R50M4-21, Equipped with 35' power cable, SS lifting bails	770	44	5	230	1750	34	1
1	Myers / (LS-6)	6VC600M4-43, Equipped with 35' power cable, SS lifting bails			60	460	1750	79	3
1	Myers / (LS-7)	6VC400M4-43, Equipped with 35' power cable, SS lifting bails			40	460	1750	61	3
1	Myers / (LS-10)	3RMW20DM4- 21, Equipped			2	230	1750	16	3

		with 30' power cable, and 3" flanged horizontal discharge							
1	Myers / (LS-11)	3MW20M4-21 Equipped with 30' power cable and 3" (NPT) vertical discharge			2	230	1750	12	3
3	KSB / (LS-14)	KRT F150-315/206XG-S Equipped with 50' power cable, 6' flanged H. Discharge, SS lifting bails	966	42	24	230	1160	61.2	3
1	Ebara / (LS-9)	150DLKFU6182 Equipped with 35' power cable, SS lifting bails	1310	45	25	208/230	1800		3
1	Gould / (LS-15)	WS3032D4 (With: 7" impeller, 4" discharge, 3" solids, 20' power cable)	440	20	3	230	1725	14.4	3