## SCOPE

Furnish (QTY____) Stancor SKR-355 heavy duty slurry submersible pump(s) capable of delivering a maximum capacity of____ GPM at____ feet of TDH when operated by 7 ½ HP, 1800 RPM____ volt, ____ phase, 60Hz motor, 3" discharge. Each pump unit shall have __33_feet of power cable.

## PUMP DESIGN

The pump(s) shall be designed to handle, without clogging, lime slurries, mill scale, coal runoff sumps, wash down sumps, ash transfer, tailing ponds, slag pits, food wastes, silt removal, sand and gravel dewatering, and barge and tank cleanout.

## PUMP CONSTRUCTION

Major pump components shall be of Cast Iron (FC-20) with smooth surfaces devoid of porosity or other irregularities. All exposed fasteners shall be AISI type 304 stainless steel. Critical mating surfaces where a watertight seal is required shall be machined and fitted with NBR o-rings. Sealing will be the result of controlled compression of rubber o-rings without requiring a specific torque on fasteners to accomplish sealing. Rectangular cross sectioned gaskets requiring specific fastener torque to achieve compression shall not be considered adequate or equal. No secondary sealing compounds shall be used or required.

**Impeller:** The impeller shall be of the semi-open and constructed of High Chrome Alloy capable of passing a 25mm diameter spherical solid. Each impeller shall be dynamically balanced to insure vibration-free operation. The impeller shall be positively keyed to the shaft and secured with a stainless steel bolt.

**Adjustable Wear Plate:** The adjustable wear plate shall be made of high Chrome Alloy to resist abrasion. The adjustable wear plate shall be mounted to the volute with stainless steel studs and adjusting nuts to permit close tolerance adjustment with the impeller for maximum pump efficiency. Adjustment to allow for wear and restore peak pumping performance shall be accomplished using standard tools, and without requiring disassembly of the pump. The use of fixed or non-adjustable adjustable volute or rings, or systems that require disassembly of the pump or shimming of the impeller to facilitate adjustment shall not be considered equal.

**Agitator:** An auger type agitator made of High Chrome Alloy shall be mounted at the end of the pump shaft to create a suspended slurry for effective pumping.The agitator shall be positively keyed to the shaft and secured with a stainless steel bolt.

**Pump Discharge:** The pump shall be of top discharge, side flow design to insure efficient motor cooling when the pump operates unsubmerged. Discharge design shall permit attachment to standard Discharge flange design shall permit attachment to standard 3" NPT pipe fittings.

**Shaft & Rotating Assembly:** The common motor/pump shaft shall be of 410 stainless steel material that is in contact with pump's mechanical seals and shall have a polished finish and accurately machined shoulders to accommodate bearings, seals and impeller. Carbon steel shafts shall not be considered adequate or equal. The rotating assembly (impeller, shaft, rotor and agitator) shall be dynamically balanced such that undue vibration or other unsatisfactory characteristics will not result when the pump is in operation.

**Triple Seal System:** Each pump shall be equipped with a tandem mechanical shaft seal system consisting of two independent seal assemblies with a common spring between them and a radial lip seal; providing three complete levels of sealing between the pump wet end and the motor. The mechanical seals shall operate in an oil filled chamber which is completely separate from the motor chamber. The seal faces shall be Sic/Sic for the lower seal and Carbon/Ceramic for the upper seal. Metallic components of the mechanical seal shall be constructed of 300 series stainless steel. The seal system shall not rely upon the pumped media for lubrication and shall not be damaged when the pump is run dry. A readily accessible inspection screw shall be provided for inspecting the condition of the seal chamber oil during routine maintenance.



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**Bearings:** The pump shaft shall rotate on permanently lubricated, greased bearings. The upper bearing shall be a single row deep grooved ball bearing. The lower bearing shall be a heavy duty single row, deep grooved ball bearing. Upper and lower bearings shall be of sufficient size and properly spaced to transfer all radial and axial loads to the pump housing and minimize shaft deflection. B-10 bearing life shall be a minimum of 30k hr at BEP. Pump designs utilizing other than ball bearings, or those requiring supplemental guide bushings for the shaft or impeller shall not be considered acceptable.

**Motor:** The motor housing shall be Cast Iron (FC-20) and the top cover of Cast Iron (FC-20).The motor shall be of the squirrel-cage induction design with copper windings, housed in an air filled, water tight chamber. The motor shall be capable of continuous submerged operation under water to a depth of 65 feet. The stator windings and stator leads shall be insulated with moisture resistant Class F insulation rated for 155ºC (311ºF). The motor shall be capable of operating continuously, submerged in liquid of 40ºC (104 ºF) without overheating. The service factor shall be 1.15. The motor shall be capable of handling up to 10 evenly spaced starts per hour. All motors shall have a voltage tolerance of +/- 10% from nominal name plate rating.

**Power Cable:** The power cable shall be sized according to NEC and CSA standards and shall be of sufficient length to reach the junction box without requiring splices. The outer jacket of the cable shall be oil and water resistant thermoplastic elastomer. The power cable shall be fitted to the motor using an epoxy potted water tight cable entry system with a rubber grommet as the secondary seal and strain relief.