

SECTION 11217 - SIMPLEX GRINDER PUMP STATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Grinder Pump Units
- B. Pump Basin Assembly
- C. Junction Box / Level Detection
- D. Electric Control Panel
- E. Testing

1.2 RELATED SECTIONS

- A. Submittals — Section 01300
- B. Trenching, Backfilling, and Compacting — Section 02221
- C. Cast-in-Place Concrete — Section 03300

1.3 WORK INCLUDED

- A. The Contractor shall furnish and install simplex grinder pump stations and remote control panels as specified. These units are to be of the type and nature that the pump station can be installed to serve new dwellings that cannot be served by the gravity collection system.
- B. The Contractor shall furnish each factory built and tested pump station to include grinder pump and motor suitably mounted in a leak-proof fiberglass reinforced basin with cover, non-corrosive guide rail assembly, check valve, anti-siphon valve, start level control, stop level control, and high water level alarm controls, motor high temperature shut off, motor seal failure alarm (oil-filled motors), all internal wiring to the junction box, quick disconnect, shut off valve. All assembled with the basin and wired to a junction box and an external alarm and control panel.
- C. Grinder pump installation location will be as directed by the property owner. Low pressure service lateral depth to be as directed by Engineer.
- D. If standard depth units (Hydromatic: 8 ft.; Myers: 7 ft.) are not adequate to accommodate service depths, the Contractor shall provide units with additional height or extensions as necessary to accommodate service requirement.
- E. All grinder pump stations and extensions shall be installed in accordance with manufacturer's requirements.

1.4 QUALITY ASSURANCE

A. Source Quality Control:

1. Shop Tests and Inspection

- a. All material furnished by the Contractor shall be certified by the Contractor for compliance with the pertinent Specifications. Shop inspections and testing may be required. The cost of shop testing shall be borne by the Contractor.

B. The equipment furnished shall be produced by a company experienced in the design and manufacture of grinder pump stations. Manufacturer shall have a minimum of fifteen years' experience in the design and manufacture of grinder pump stations for use in low pressure sewer systems having an installation of 50 or more pumps discharging into a common force main.

C. The Contractor shall be a licensed plumber authorized to work in West Cocalico Township and must have at least five (5) years of experience installing grinder pump systems.

D. Disposition of Defective Material: All material found during the progress of the work, either before or after installation, to have cracks, flaws or other defects will be rejected by the Engineer. All defective materials furnished by the Contractor shall be promptly removed by him from the site at his own expense.

1.5 SUBMITTALS

A. In accordance with these specifications, the Contractor shall submit complete shop drawings and manufacturer's data covering installation instructions, dimensions, weight, detailed specifications, pump curves, materials, parts, devices, and ~~any and~~ all other information required to verify compliance with these specifications.

B. Make submittals in accordance with Section 01300 — Submittals.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, and store pump, basin, and other products specified herein in a manner recommended by the respective manufacturers to prevent damage and defects.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Hydromatic
- B. Myers
- C. Suitable centrifugal pump manufacturer

2.2 PERFORMANCE REQUIREMENTS

- A. Grinder pumps shall be capable of providing minimum velocity of 2.0 feet per second in 1-1/2-inch diameter or 1-1/4-inch laterals for various configurations and elevations as required by the field conditions. The pump(s) shall be capable of intermittent operation at any head up to 150% of normal rated dynamic head. The pumps must be capable of operating at negative total dynamic heads of 150% below normal rated dynamic head without installation of in-line restrictive piping or valving as to create a false apparent head.
- B. The grinder unit shall be capable of cutting solid material found in normal domestic sewage, including reasonable amounts of foreign objects, such as wood, plastic, glass, rubber, into a fine slurry that will pass freely through the pump, service line and force main.
- C. All materials exposed to wastewater shall have inherent corrosion protection: i.e., fiberglass, stainless steel, PVC.
- D. The grinder pump station shall be free from electrical and fire hazards as required in a residential environment. As evidence of this requirement, the complete assembly, including all station components, shall be listed by Underwriters Laboratories, Inc.

2.3 HYDROMATIC

A. Grinder Pump:

1. Operating Conditions

- a. Each pump shall be rated at 2.0 H.P., 230 volts, single phase, 60 hertz, 3450 RPM. Each pump shall produce a minimum of 14 U.S. GPM at 125 feet TDH and 29 US GPM at 105 feet TDH.

2. Construction

- a. Each pump shall be of the sealed submersible grinder type, model HVS200 as manufactured by Hydromatic.
- b. The pump volute, motor and seal housing shall be high quality gray cast iron, ASTM A-48, Class 30.
- c. All external mating parts shall be machined and Nitrile O-ring sealed on a

beveled edge. Gaskets shall not be acceptable.

- d. All fasteners exposed to the pumped liquid shall be 300 series stainless steel.

3. Power Cord

- a. Power cord shall be SOOW water resistant 600V, UL and/or CSA approved.
- b. The single cord shall incorporate both power and sensor leads and shall be a minimum of five 12-gauge conductors.
- c. The pump shall be protected with compression fitting and epoxy potted area at the power cord entry to the pump. A separation between the junction box area of the pump and the motor, by a stator lead sealing gland or terminal board, shall not be acceptable. The power cable entry into the cord cap assembly shall first be made with a compression fitting.
- d. Each individual lead shall be stripped down to bare wire, at staggered intervals, and each strand shall be individually separated. This area of the cord cap shall then be filled with an epoxy compound potting which will prevent water contamination to gain entry even in the event of wicking or capillary attraction. The power cord leads shall be connected to the motor leads with extra heavy connectors having copper inserts with a crimped wire-to-wire connection rather than a terminal board that allows for possible leaks. The cord cap assembly shall be sealed with a Nitrile O-ring on a beveled edge to assure proper sealing.

4. Motor

- a. The stator, rotor and bearings shall be mounted in a sealed submersible type housing. The stator windings shall have Class F insulation (155°C or 311°F) and a dielectric oil-filled motor, NEMA B design (three- phase), NEMA L design (single-phase). Because air-filled motors do not dissipate heat as efficiently as oil-filled motors, they shall not be acceptable.
- b. The pump and motor shall be specifically designed so that they may be operated partially dry or completely submerged in the liquid being pumped. The pump shall not require cooling water jackets. Supplemental cooling shall not be acceptable.

5. Bearings and Shaft

- a. An upper single row ball radial bearing and a lower double row angular contact bearing shall be provided. Bearings shall be permanently lubricated by the dielectric oil that fills the motor housing.
- b. The shaft shall be machined from solid 400 series stainless steel and be designed with large diameters and minimum overhang to reduce shaft deflection and prolong bearing and seal life.

6. Seals and Sensors

- a. The rotor and stator in the motor housing shall be separated and protected from the pumped liquid by an oil-filled seal housing incorporating two type 21 carbon ceramic mechanical seals mounted in tandem.
- b. The seal housing shall be equipped with a moisture sensing probe installed

between the seals, and the sensing of moisture in the seal chamber shall be automatic, continuous and not require the pump be stopped or removed from the wet well.

7. Impeller

- a. The impeller shall be constructed of 316 SST/CF8M and be designed for rough duty service. It shall be a ten-vane, semi-open design with four wash out vanes on the rear shroud. The impeller shall be a non-overloading design.

8. Grinder Mechanism

- a. The stationary cutter shall be circular in design and contain evenly spaced cutting slots that extend outwards from the inlet of the pump. The slots are tapered inward toward the inlet to help direct slurry through the cutting slots into the pump. The slots are to be angled, or undercut, to help maintain a sharp axial cutting edge, even as the axial face wears during use.
- b. The stationary cutter shall be pressed into the suction opening of the volute and held in place by four 300 series stainless steel screws. The stationary cutter shall be provided with tapped back-off holes so that screws can be used to remove the cutter from the volute.
- c. The rotating cutter shall contain three axial cutting arms extending from the hub, perpendicular to the pump shaft, that are shaped to aid in the rejection of suspended debris that has not been sufficiently reduced in size by the axial cutting action.
- d. The curved, leading edge of the cutting arms shall create a scissor action with the cutting slots of the stationary cutter plate to minimize the required torque. This will allow the cutter to macerate tough objects and prolong cutter life.
- e. Serrations on the hub of the cutter add additional cuts that prevent debris from becoming entangled within the rotating cutter.
- f. The rotating cutter shall thread onto the end of the pump shaft and be secured by a 300 series stainless steel washer in conjunction with a 300 series stainless steel flat head cap screw threaded into the end of the shaft.
- g. Both stationary and rotating cutters shall be made of 440C stainless steel, hardened to Rockwell 57-60C and ground close to tolerance.
- h. The grinder shall be capable of grinding normal domestic sewage into a fine slurry.

9. Paint:

- a. The pump shall be painted with waterborne hybrid acrylic/alkyd paint. This custom engineered, quick dry paint shall provide superior levels of corrosion and chemical protection.

B. Pump Basin Assembly:

1. The basin and cover shall be custom molded of fiberglass reinforced polyester resin. The basin shall be 24-inch diameter.
2. The basin shall be molded from HDPE high performance medium density UV

stabilized molding and shall have an anti-flotation base and rib design shall also be used for anti-flotation. Basin shall be resistant to impact and designed to withstand wall collapse.

3. The cover shall be reinforced fiber filled to withstand 350 psf live load rating. The cover shall be bolted to the basin with stainless lag screws.

C. Removal System:

1. Each basin shall be equipped with a guide rail assembly which shall be mounted in the basin on a stainless riser support. The guide rail assembly shall be stainless steel and should be fastened in a manner as not to cause damage to equipment while in operation. The guide rail shall permit easy installation and removal of the pump.

D. Discharge Piping and Valves:

1. Discharge piping shall be 1-1/4-inch PVC pipe and PVC corrosion resistant 1-1/4 inch shut off valve with shut off valve extension handle.
2. A 1-1/4 inch, self-cleaning check valve with a neoprene rubber ball shall be installed and permit removal of the pump from the station without making any disconnects.

E. Junction Box:

1. A corrosion resistant, flame retardant, thermoplastic, NEMA 4X junction box shall be installed.
2. The junction box shall utilize an integral hinge that will prevent the cover, when opened for service, from dropping into the basin.
3. The cover of the junction box shall be accessible from the ground level surface of the basin and shall not require personnel to enter the wetwell.

F. Level Switches:

1. Level detection shall be accomplished by use of a detection mechanism specifically designed for use in a pump tank.
2. Mercury/mechanical float switches, mounted through a stainless-steel float bracket, shall be acceptable.

G. Electric Control Panel:

1. A NEMA 4X reinforced fiberglass gray control panel shall be furnished with each pumping unit. UL 508A label. 5K amp short circuit current rating. Single phase power shall be 240/110 volt, three wire system.
2. The motor control panel shall be assembled and tested by a shop meeting U.L. Standard 508 for industrial controls. The motor control panel shall be assembled and tested by the same manufacturer supplying the pump to ensure suitability and assurance of experience in matching controls to motors and to ensure single source responsibility of equipment.
3. The panel shall include-terminals for 12-7 pump power cords, a 15 amp, double pole main breaker, thermal magnetic pump branch circuit breakers, a 15 amp single-pole circuit breaker for the control and alarm circuit, single phase start components, IEC rated starter and ambient compensated class 10 overload

relays., pump H-O-A switch, green pump running lights mounted inside the enclosure, automatic reset pump motor heat sensor circuit, flashing alarm light, alarm horn, PUSH-TO-TEST switch mounted inside the enclosure, horn and PUSH-TO-SILENCE switch mounted on the enclosure side, high water alarm activation with PUSH-TO-TEST button, seal fail indication for each pump mounted on the enclosure side, aluminum swing dead front inner door, fused relay, motor manual reset overload, switch holding relay, ground bar, and all necessary wiring and brackets. Switch lights and components mounted on enclosure shall be NEMA 3R rated.

4. All internal wiring shall be neat and color coded and all incoming wires shall terminate into a box clamp type terminal box except incoming power.
5. A schematic diagram (showing wire color where practical) shall be permanently fastened to the inside of the enclosure.
6. The enclosure shall have provisions for padlocking. A nameplate shall be permanently affixed to the panel and include the model number, voltage, phase, hertz, ampere rating and horsepower rating. A warning label against electric shock shall be permanently affixed to the outer door. All fasteners shall be 300 series stainless steel or Type 6063T5 aluminum, or thermoplastic. The outer door shall be attached to the enclosure using captured, thermoplastic screws or latch and non-corrosive hinge.

2.4. MYERS

A. Grinder Pump:

1. Operating Conditions

- a. Each grinder pump shall be of the centrifugal design and be capable of delivering a minimum of 26 GPM at 80 feet head. The shutoff head shall be no less than 105 feet.

2. WGL20 Pump

- a. The pump shall be a Myers WGL20 model pump. The pump shall have an integrally built-in grinder unit and submersible type motor. The pump shall be suspended in the basin by two (2) 1" stainless steel guide rails and quick disconnect lift-out mounting assembly. Solids shall be fed in an up-flow direction to the grinder mechanism with no obstructions below the grinder inlet.

3. Grinder Assembly and Construction

- a. The grinder assembly shall consist of a rotating radial cutter and a stationary shredding ring and shall be mounted directly below the volute passage.
- b. The rotating cutter shall be threaded onto the stainless-steel shaft and shall be locked with a screw and washer.
- c. The stationary shredding ring shall be pressed onto an iron holding flange for easy removal.
- d. The flange shall be provided with tapped back-off holes so that screws can be used to push the shredding ring from the housing.
- e. Both the radial cutter and shredding ring shall be removable from the outside.

- without dismantling pump.
 - f. Grinder assembly shall be of such construction that no clearance adjustments are required when assembling.
 - g. All grinding of solids shall be from the action of the radial cutter against the shredding ring.
 - h. The radial cutter and shredding ring shall be of #440 stainless steel hardened to 58-60 Rockwell C.
4. Motor
- a. The pump motor(s) shall be of the submersible type rated for 2 horsepower at 3450 RPM. Motor shall be single phase, 230-volt, 60 Hertz. Single-phase motors shall be of the capacitor start-capacitor run type for high starting torque.
 - b. The stator winding shall be the open type with Class F insulation rated for 155°C/311°F maximum operating temperature.
 - c. The winding housing will be filled with clean dielectric oil that will lubricate bearings, seals and transfer heat from the windings to the outer shell.
 - d. The motor stator is to be pressed into the motor housing for optimum concentricity and alignment, and maximum heat transfer.
 - e. Pump motors without press fit housings will not be considered.
 - f. The motor shall be capable of operating over full range of performance curve without overloading motor and causing any objectionable noise or vibration.
 - g. The motor shall have two heavy duty ball bearings to support the pump shaft and take radial and thrust loads. Ball bearings shall be designed for 50,000 hours)
 - h. The common motor, pump and grinder shaft shall be of #416 stainless steel. The pump impeller and the grinder impeller shall thread onto shaft.
5. Power Cords
- a. Motor/control power cord shall be #14-5 type SOOW and shall be fastened by means of a cord grip in the top of the pump.
 - b. Sufficient cord length shall be used so that the pump may be removed without disconnecting power and control wires from junction box. Cord lengths shall be such that no splices will be required between the pump and junction box at top of basin.
 - c. The top of the pump shall contain a waterproof junction box which will provide space to connect the power cord to the motor leads. The motor leads shall seal between the motor housing and junction box by means of a rubber compression fitting around each wire.
 - d. The power cord shall have a green carrier ground conductor that attaches to the motor frame.
 - e. The end cap shall have female thread tapping for 1-1/2" conduit.
6. Seal Chamber
- a. The motor shall be protected by two (2) mechanical seals mounted in tandem with oil filled chamber separating the seals.
 - b. The seal chamber shall be oil filled to lubricate seal face and to transmit heat from the shaft to outer shell.
 - c. The seals shall have carbon and ceramic seal faces diamond lapped to a tolerance of one light band.

- d. Metal parts and springs for seals shall be stainless steel.
- e. An electrical sensing probe shall be mounted in the seal chamber to detect any water leakage past the lower seal.
- f. Water in the chamber shall cause a signal light to turn on in the control panel. This signal shall not stop the motor but shall act as a warning only indicating that service is required.
- g. All pumping units shall have this dual seal arrangement. Units incorporating single seals or utilizing a lip seal arrangement will not be acceptable.

7. Pump Impeller

- a. The pump impeller shall be of the recessed type to provide an open unobstructed passage through the volute for the ground solids.
- b. Pumps may be required to operate at or near shut off head conditions.
- c. Recessed impellers are required to reduce the bearing loading and prolong pump life. Pumps without recessed impellers will not be considered equal.
- d. The impeller shall be constructed of cast iron or stainless steel and shall have pump out vanes on the back side of the impeller to keep solids from lower seal and reduce pressure at the seal faces.
- e. Impeller shall be threaded onto the stainless-steel shaft.
- f. **Grinder pumps having thermoplastic or non-metal impellers or pump volutes are specifically prohibited.**

8. Pump and Motor Castings

- a. All iron casting shall be of high tensile cast iron and shall be properly cleaned, pre-treated with chromic rinse, and painted with a waterborne hybrid acrylic/alkyd paint.
- b. All pump components that are not cast iron or stainless steel shall be galvanized or painted with baked on epoxy.
- c. All fasteners shall be #302 stainless steel.

B. Fiberglass Basin Assembly:

1. Basin

- a. The basin shall be 24" diameter.
- b. The basin shall be molded of fiberglass reinforced polyester resin.
- c. Twenty-five percent (25%) glass fibers shall be used and resin shall be POLYCOR 939-X-100 as manufactured by Cook Paint and Varnish Company or equal.
- d. The basin wall shall be designed to withstand a wall collapse based on the assumption of hydrostatic type loading by back-fill with a minimum density of 120 pounds per cubic foot.
- e. The basin wall laminate shall be constructed to withstand or exceed two times the assumed loading for any depth of basin.
- f. The basin bottom shall be sufficient thickness to withstand applicable hydrostatic uplift pressure with a safety factor of two. In saturated conditions, the center deflection of the empty basin bottom shall be less than 3/8" (elastic deflection) and shall not interfere with bottom pump mounting requirements.

- g. Anti-flotation means shall be provided with each basin. A fiberglass anti-flotation collar shall be provided as an integral part of all 24" diameter basins; the anti-flotation collar shall extend a minimum of 3" beyond the O.D. of the basin wall.
 - h. Corrosion resistant nuts shall be embedded in the top flange of the basin for securing the basin cover. a quantity of six (6) shall be provided; the nuts shall be totally encapsulated in fiberglass to prevent turning and corrosion.
 2. Basin Cover
 - a. The cover shall be polypropylene corrosion resistant construction.
 - b. The cover shall be bolted to the basin with stainless steel cap screws. Cadmium plated nuts for the screws shall be embedded in the fiberglass to prevent turning and for corrosion resistance.
 3. Shutoff Valve
 - a. A PVC true union ball type shutoff valve with Teflon seats shall be furnished and installed in the discharge piping, as shown on the plans.
 - b. If the discharge depth is more than 2 feet from the surface, a handle extension shall be supplied.
 4. Piping
 - a. Schedule 80 PVC discharge piping shall connect to the stationary discharge base lift assembly and terminate at a 1 ½" NPT discharge flange mounted on the basin at the height shown on the drawing.
 5. Rail Assembly
 - a. Each lift-out system shall consist of a cast iron discharge base, cast iron pump carrier and sealing plate, stainless steel pump guide plate, and cast-iron elbow. All exposed hardware shall be 300 series stainless steel.
 - b. Discharge elbow shall be 1 ¼" X 2" NPT and shall be integral to the base assembly.
 - c. The elbow/check valve shall be bolted to the pump. As simple downward sliding motion of the pump and guide plate on the guide rails shall cause the unit to be automatically connected and sealed to the base. A nitrile discharge flange seal shall be bolted between the pump and elbow/check valve. The discharge flange seal shall provide a leak proof seal at all operating pressures. Check valve shall be ball type and will be part of the pump assembly.
 - d. Two guide rail pipes shall be used to guide the pump from the surface to the discharge base connection. The guide rails shall be 1" stainless steel construction. The weight of the pump shall bear solely on the discharge base and not on the guide rails. Rail systems which require the pump to be supported by legs which might interfere with the flow of solids into the pump suction will not be considered equal. Systems deeper than 20 feet shall require an intermediate guide for each 20 feet of wet well depth.
 - e. An adequate length of stainless steel lifting chain shall be supplied for removing the pump. The chain shall be of sufficient length and strength for easy removal.

6. Inlet Flange

- a. A basin inlet hub for 4" SCH 40 plastic pipe shall be included, but not mounted on the basin.
- b. The hub to be mounted in the field at inlet height required by the installation, or as shown on the drawing.

D. Control Panel:

1. General

- a. The simplex grinder pump control panel shall control a 2 HP, 230-volt, 1 Phase, 60 Hertz grinder pump. A "Neutral" wire shall be supplied to the panel for 120 VAC control panel.

2. Enclosure

- a. A NEMA 4X control panel shall be furnished with each pumping unit to be installed as shown on the plans.
- b. The control panel shall be housed in a fully gasketed NEMA 4X enclosure with a hinged door. The enclosure shall be a minimum of 16 gauge for 12 x 12 x 6 or smaller and 14 gauge for up to 20 x 20 x 6 enclosures. Enclosure shall be of fiberglass material for maximum corrosion resistance.
- c. Each enclosure shall have a closing latch/locking hasp.
- d. The back panel shall be painted. 14-gauge steel held in place by four (4) #10 screws mated to four (4) threaded standoffs which are welded to the back of the enclosure.

3. Alarm Light

- a. The control enclosure shall be fitted with a red lexan (polycarbonate) alarm light. The light shall be approximately 3" high by 3 1/2" diameter. The globe shall be mounted on top of the enclosure with a neoprene gasket.
- b. The lens cannot be removed from the exterior of the enclosure. The lens may be removed by entering the interior of the enclosure and removing four (4) #8 screws. The bulb shall be 40 watt, high-intensity, medium-base type. The bulb shall be easily replaced by removing a thumbscrew from the support bracket on the interior of the panel.
- c. The alarm shall have bright glow and flash during high water conditions. The alarm light will go out when the water level drops.
- d. The panel shall be equipped with an audible alarm horn with push to silence circuitry on the exterior of the panel. The alarm light shall remain active until the condition is cleared.

4. Components

- a. This panel shall include the following:

Two-pole, 20-amp pump disconnect breaker
One-pole, 10-amp control disconnect breaker
IEC rated starter
Seal failure light

Seal fail relay (adjustable type)
Pump hand-off auto switch
Pump run light
Start relay
Start capacitor
Run capacitor
Terminal blocks
UL 508 label
Ground bar and all necessary wiring and brackets.

5. Wiring

- a. All internal wiring shall be neat and color coded (each wire a different color or strip, except for ground). All incoming wires shall terminate into a box clamp type terminal box, except incoming power.
- b. A schematic diagram (showing wire color where practical) shall be permanently fastened to the inside of the enclosure.

E. Level Controls, Alarms, Switches, Junction Box:

1. Level Controls

- a. Pump on and off levels shall be controlled by three mercury tube float type switches.
- b. The mercury switch shall be sealed in a solid polyurethane float ball. The support wire shall be 16-2 SJOW (neoprene jacket) and weight shall be attached to the cord above the float to hold the switch in place in the sump.
- c. The level controls shall be supported in the sump by a bracket and cord snubber which will give positive support to the controls and allow flexibility in the set levels.

2. Junction Box

- a. The junction box shall be constructed of fiberglass for corrosion resistance, stability and mechanical strength. The enclosure shall be of adequate thickness and properly reinforced to provide good mechanical strength.
- b. The junction box shall have a fully gasketed cover that is held in place by four (4) captive stainless steel screws that cannot be removed from the cover, with heads totally encapsulated in PVC so that no metal parts are exposed.
- c. The screw heads shall be of adequate size so that they may easily be installed and removed without the use of special tools. The cover shall be fastened to the main body of the junction box by means of a totally corrosion resistant tether, to prevent dropping the cover into the basin during service.
- d. An adequate number of sealing type cord grips shall be supplied for incoming pump and switch cords. The cord grips shall be made of non-corrosive material, such as PVC or nylon, and shall make an effective seal around the wire jacket. The cord grip shall also seal to the junction box wall with "O" ring, gasket, or other effective means.
- e. The junction box shall have a PVC solvent weld socket type conduit hub mounted in the bottom of the enclosure. The hub shall be of a corrosion resistant material and shall be of adequate size to accommodate the number

- of wires required to operate the pump.
- f. The junction box shall be designed to NEMA 6 standards for occasional submergence.

2.5 SHOP TESTING

- A. Test each pump as follows:
 - 1. Perform a bench test. Take electrical readings and check for noise and vibration. These tests are performed for quality control purposes and are not documented.
- B. Actual appurtenances and controls, which will be installed in the field, shall be particular to the tested pump only, a common set of appurtenances and controls will not be acceptable.

2.6 MANUFACTURER'S WARRANTY

- A. The manufacturer of the grinder pump station shall warrant it to be free from defects in materials and workmanship for one year after startup of the grinder pump station.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install per manufacturer's instructions.

END OF SECTION 11217