SCOPE: Furnish and install _______ submersible grinder pump(s). Each pump shall be capable of delivering the following performance points,

- U.S. GPM at ______ TDH;
- U.S. GPM at ______ TDH;
- U.S. GPM at ______ TDH;

with a shut off head of _______ TDH (minimum). The pump motor speed shall be 3450 RPM, 2HP (maximum), ______ Phase, 60 Hertz, ______ Volts. The pump(s) shall be manufactured by a company regularly engaged in the manufacture and assembly of similar units for a minimum of five (5) years. The pump(s) shall be Barnes® model _______________________.

DESIGN: A centrifugal submersible grinder pump designed to reduce all material found in normal domestic and light industrial sewage, including plastics, rubber, sanitary napkins, and disposable diapers into a finely ground slurry. The resultant slurry is then pumped through small diameter piping into a gravity interceptor or treatment facility. The temperature liquid being pumped is 77°F continuous, 160°F intermittent and shall be capable of running dry for extended periods.

PUMP CONSTRUCTION: The volute, seal plates and motor housing shall be constructed of high quality ASTM A-48 class 30 cast iron. The pump(s) shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. Discharge connection shall be a standard 1.25 inch NPT in the vertical position.

The pump impeller shall be of the recessed vortex design. Pumps with standard centrifugal semi-open impeller designs shall not be acceptable. The impeller shall be of 85-5-5-5 bronze or ASTM A-48 class 30 cast iron construction and machined for threading to the motor shaft. The impeller shall be capable of being trimmed to meet specific performance characteristics.

The grinder mechanism shall consist of a radial cutter threaded and locked on the motor shaft by a washer in conjunction with a countersunk flat head cap screw, and a shredding ring containing a minimum of seven flow passages with cutting edges. The shredding ring shall be reversible to provide twice the cutting edge life. Both the shredding ring and radial cutter shall be constructed of 440C stainless steel hardened to a min. Rockwell C55 and shall be finish ground for a fine cutting edge. Two-stage cutter mechanisms requiring external adjustment for proper clearance are not acceptable.

The unit shall utilize a single mechanical shaft seal arrangement and shall operate in an oil atmosphere. The materials of construction shall be silicon-carbide for the rotating and stationary faces, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer.

Single phase motors shall be of the capacitor start, capacitor run design. The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink or press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated.

PUMP TEST: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

1. A check of the motor voltage and frequency shall be made as shown on the name plate.
2. A motor and cord insulation test for moisture content or insulation defects shall be made per UL criteria.
3. The pump shall be completely submerged and run to determine insulation defects shall be made per UL criteria.
4. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

START-UP: The pump(s) shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pump(s).

DOCUMENTATION: The manufacturer, if requested, will supply a minimum of _______ sets of standard submittal data;

Standard submittal data consist of:

- Pump catalog data;
- Pump performance curve;
- Break Away Fitting (BAF) data;
- Access frame data;
- Typical installation drawing;
- Control panel data;
- Panel wiring schematic;
- Accessory data;
- Installation & Operation Manuals with Parts List

Air-filled motors shall not be acceptable. The motor windings shall be of Class B insulation. The motor shall meet the standard NEMA design L for single phase. The motor shaft shall be of 416 stainless steel. Protection against excessive temperature shall be provided by an overload switch in series with the stator windings. The pump shall have a two bearing design consisting of an upper and lower ball bearing. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.