CITY OF FRIENDSVILLE UTILITY DISTRICT

GRINDER PUMP

Installation Specifications & Homeowner Guide

Low-Pressure Sewer System – Wastewater Collection

Approved Grinder Pump System:
E/One Extreme Series Grinder Pump – Environment One Corporation

City of Friendsville Utility District • 213 West College Ave, Friendsville, TN • (865) 995-0243

IMPORTANT: All grinder pump equipment must be inspected and approved by Friendsville Utility District staff BEFORE connection to the public sewer system. Do NOT connect to the sewer main without a passed inspection.

SECTION A – INTRODUCTION AND GENERAL DESCRIPTION

A1. General

These specifications describe the requirements for grinder pump sewer systems connecting to the City of Friendsville Utility District ("CFUD" or "Friendsville Sewer") low-pressure wastewater collection system. For requirements not contained in this specification, the Standard Sewer Specifications of Friendsville Sewer shall apply.

Grinder pump systems consist of a pump vault, pump(s), discharge piping, control panel, and level sensors. All materials and their installation shall meet all the requirements of the current Plumbing and Electrical Codes. Inspections of private grinder pump equipment are required before connection to the public sewer system.

The Water Manager or staff shall inspect and approve all privately installed equipment before a connection to the public sewer can be made. Upon approval, the property owner's plumber may make the connection to the public sewer at the valve box.

Currently approved lists of service providers and contractors are available at the Friendsville Utility office in City Hall, 213 West College Ave, Friendsville, Tennessee. These lists are updated periodically.

A2. Right of Entry

Authorized agents of Friendsville Sewer shall have the right to enter any lot for the purpose of sewer system facilities inspection, maintenance, and repair in accordance with the Friendsville Sewer Use Resolution.

A3. Sewer Service Application and Requirements

Each property owner will be required to complete and submit an application to Friendsville Water & Sewer as a condition of connection to the public sewer system. All customers are required to adhere to the Resolutions and Policies of Friendsville Sewer relating to the public sewer system.

All requests for the major subdivision of property within the Friendsville Water & Sewer public sewer service area shall require approval from the Engineer of Record of the Friendsville Sewer System.

A4. Ownership, Operations, and Maintenance Responsibilities

It is the policy of Friendsville Water & Sewer that all sewer system components located on private property are owned by — and are the maintenance and replacement responsibility of — the property owner. This includes:

- The grinder pump, alarm/pump control panel, vault, piping, and all appurtenances from the building to the service connection;
- All on-site sewer facilities from the building to the isolation and check valve box located at the property right-of-way (ROW) boundary.

The isolation and check valve box located at the property right-of-way boundary is the point of connection to and is part of the public sewer system.

Each grinder pump location will be required to be accessible year-round by maintenance vehicles for the purpose of inspection and maintenance. The grinder pump, alarm/pump panel, and sewer clean-out locations shall be approved as part of the inspection process.

All sewer facilities that are to become the property of Friendsville Sewer shall be designed and constructed in accordance with the Standard Sewer Specifications of Friendsville Sewer. All sewer components constructed on private property that are to remain the responsibility of the property owner shall be designed, constructed, inspected, and tested in accordance with Friendsville Wastewater Regulations Ordinance No. 2021-04.

SECTION B – MATERIALS AND INSTALLATION

B1. General Installation Conditions

The installation of all on-site facilities shall be inspected and approved by Friendsville Sewer prior to connection with the wastewater system. The property owner shall be responsible for the installation of all on-site facilities, including but not limited to the following:

- Building sewer from the structure to the grinder pump;
- Pump vault;
- Effluent pump and power cable;
- Discharge piping;
- Float controls and electrical connections;
- Pump control panel;
- Pressure sewer service lateral line to sewer main line connection at the isolation and check valve box.

B1.1 Electrical Requirements and Installation

It shall be the responsibility of the property owner to provide all wiring to the pump control panel. The property owner will supply electrical service utilizing a separate circuit with dual-element fuses or circuit breakers at the distribution panel, as required by the approved grinder pump system specifications below.

The pump control panel and all associated electrical components shall be installed as per the National Electrical Code (NEC). All electrical components must be inspected and approved by the appropriate agency. The property owner will be responsible for the monthly electric bill for all on-site components.

B1.2 Inspections

The property owner shall be responsible for scheduling inspections with Friendsville Sewer for the installation of all on-site sewer facilities. The following inspection is required:

- After all components are installed, but before grading and clean-up of the job site — see Installation Checklist in Appendix B.

To schedule inspections call (865) 995-0243. All inspections by Friendsville Sewer shall be scheduled in advance. Inspections shall be provided in accordance with Friendsville Sewer standard policies.

B1.3 Submittals

The property owner is responsible for submitting the following information for review and approval by Friendsville Sewer prior to installation:

- A completed application for installation of on-site sewer facilities;
- A site sketch showing the location of the building(s), grinder pump, piping, conduit, and alarm/pump panel.

B2. Building Sewer

The building sewer is the line between the building(s) served and the grinder pump. Pipe materials and installation of the building sewer shall meet all the requirements of the Uniform Plumbing Code and Friendsville Sewer Standard Sewer Specifications. Work under this section shall include furnishing all labor, materials, tools, and equipment necessary for the installation and testing of the building sewer line.

B3. Approved Grinder Pump System – E/One Extreme Series

Friendsville Utility District has approved and requires the E/One Extreme Series Grinder Pump manufactured by Environment One Corporation for all new sewer connections. No other grinder pump brand or model shall be installed without prior written approval from the City Administrator.

B3.1 E/One Extreme Series – General Description

The E/One Extreme Series grinder pump turns on and off automatically and runs for very short periods several times per day. Electrical consumption is low. A household using 250 gallons of water per day should use between 6 kWh and 23 kWh per month to run the pump. Actual water and power usage will vary depending on system pressure.

B3.2 Motor Specifications

Specification	E/One Extreme Series Value
Motor Output	1 HP
Speed	1,725 RPM
Motor Type	High torque, capacitor start, thermally protected
Voltage	240V or 120V, 60 Hz, single phase
Discharge @ 0 psig	15 gpm
Discharge @ 40 psig	11 gpm
Discharge @ 80 psig	7.8 gpm

B3.3 Electrical Installation Requirements

For a standard 240V single-phase installation, the following dedicated circuit is required:

- Dedicated 30A breaker at the distribution panel;
- #10 wire from the breaker to the E/One panel;
- Four conductors required: L1, L2, Neutral (N), and Ground (Gnd).

If only 208V power is available, a buck-boost transformer is required to boost 208V to 240V. The E/One pump requires a minimum of 216V to start and run reliably. The approved buck-boost transformer is the E/One model PA0219P02 (0.5 kVA, NEMA 3R enclosure).

B3.4 Check Valves

Pump discharge check valves shall be true-union PVC ball check valves designed for wastewater effluent pump applications, rated for 150 psi, minimum 1¼-inch diameter, or an approved equal.

B3.5 Ball Valves

Ball valves shall be true-union PVC ball, quarter-turn shut-off valves, minimum 1¼-inch diameter or an approved equal. Ball valves shall be located downstream of the disconnect for pump removal and shall be located where they can be easily operated from the ground surface.

B3.6 Pump Vault and Screen Assembly

The grinder pump system shall be on the Friendsville Sewer approved list of suppliers. Installation shall be in accordance with these standard specifications, the applicable drawings, and the manufacturer's instructions.

B3.7 Pump Discharge Pipe Assembly

The grinder pump discharge pipe shall be 1¼-inch HDPE and shall be connected to the public sewer connection that includes the check valve and ball valve.

B3.8 Pump Float Control Assembly

The float switch assembly shall utilize mechanical-type float switches hermetically sealed in a solid, corrosion-resistant, and shock-resistant material. All float switches shall be UL-listed. A float switch support bracket shall be attached to the side of the pump vault. Float switches shall NOT be attached to the pump discharge piping.

The float switch cables shall be terminated to a single quick-connect pin and sleeve connector for ease of installation and service. The float assembly shall operate in a range of plus or minus 6 inches for ON/OFF and plus or minus 3 inches above the “pump on” level for “alarm on.” The high-level alarms and on/off function shall be adjusted and tested in the presence of the inspector.

B3.9 Pump Control Panel

The pump control panel shall be installed in line of sight to the grinder pump. The pump control panel shall be a simplex pump control/alarm panel. All wiring in the panel shall be stranded by MTW. Wiring shall be routed, bundled, and secured in a neat manner. The control panel and its components shall be assembled in accordance with the National Electric Code and all state and local codes. The assembled control panel shall be Underwriter’s Laboratories, Inc. (UL) labeled.

The pump control panel shall be installed in accordance with the manufacturer’s recommendations and the standard details.

B3.10 Pump Power Cable

Power cable motor-end terminations shall enter the submersible pump assembly by quick-connect fittings that are watertight. Cable shall be SO type and rated for 600-volt service.

B3.11 Junction Boxes

External splice boxes shall be provided where necessary for installation on existing buildings and structures or as required. Splice boxes shall be external to and attached to the riser, watertight, and suitably sized. Splice boxes internal to risers are not allowed.

Each box shall be equipped with four (4) electrical cord grips and at least one ¾-inch outlet fitting. Cord grips shall be corrosion-resistant. Waterproof silicone grease shall be applied to the cords, plugs, and cord grip plate to ensure a leak-proof seal. All wire connections shall use UL-listed heat shrink and butt connections. All conduits shall be sealed with conduit seals.

SECTION C – HOMEOWNER CARE AND USE OF YOUR GRINDER PUMP

C1. How the System Works

Your home is served by a low-pressure sewer system. The key element in the system is the grinder pump. The pump tank collects all wastewater from the house. Solid materials are ground to a small size suitable for pumping as slurry with wastewater. The grinder pump generates sufficient pressure to pump this slurry from your home to the Friendsville Utility District wastewater collection line.

The grinder pump turns on and off automatically and runs for very short periods several times per day. This is normal operation. A household using 250 gallons of water per day should use between 6 kWh and 23 kWh of electricity per month to run the pump.

C2. What You Can Put in the Sewer

The grinder pump can handle normal household wastewater. However, the following items should NEVER be introduced into any sewer, directly or through a kitchen waste disposal unit:

- Glass, metal, or seafood shells;
- Diapers, socks, rags, or cloth;
- Plastic objects such as toys or utensils;
- Sanitary napkins or tampons;
- Grease, fats, oils, or wax in any quantity;
- Explosives or flammable materials;
- Lubrication oil;
- Strong chemicals or gasoline.

NEVER pour grease, oil, or chemicals down your drains. These can damage the grinder pump and clog the sewer system. You may be held financially responsible for repairs caused by prohibited discharges.

C3. Power Failure

Your grinder pump cannot dispose of wastewater without electrical power. If electrical power service is interrupted, keep water usage to a minimum until power is restored. Do NOT disconnect power to the unit.

C4. Pump Failure Alarm

Your grinder pump has been manufactured to produce an alarm signal in the event of a high-water level in the basin. The alarm must be connected to an audible and/or visual alarm, so you are adequately warned that service is required.

If the alarm is activated, limit water usage immediately to the reserve capacity of the tank and contact a licensed service provider. A list of approved service providers is included in Appendix A.

If your alarm activates, stop all non-essential water use immediately. Contact an approved service provider. Continued water use during an alarm may cause wastewater to back up into your home.

C5. Periods of Disuse

If your home or building will be unoccupied for longer than a couple of weeks, follow this procedure before leaving:

1. Run clean water into the unit until the pump activates.
2. Immediately turn off the water and allow the grinder pump to run until it shuts off automatically;
3. Do NOT disconnect power to the unit while the property is unoccupied.

For duplex units: Make certain that both pumps turn on when clean water is added to the tank before leaving.

C6. Your Maintenance Responsibilities

As the property owner, you are responsible for the maintenance, repair, and replacement of all sewer system components on your side of the valve box at the right-of-way, including:

- The grinder pump and all associated components;
- The alarm panel and all electrical connections;
- All sewer lateral lines from the house to the grinder pump and from the grinder pump to the Friendsville Sewer valve box;
- All interior plumbing is connected to the sewer system.

Friendsville Utility District is NOT responsible for any customer-side grinder pump failure, alarm, or malfunction. Contact your licensed plumber or the grinder pump manufacturer's service provider for repairs.

APPENDIX A – APPROVED SERVICE PROVIDERS

Currently approved lists of service providers and contractors are available at the Friendsville Utility office in City Hall, 213 West College Ave, Friendsville, Tennessee. These lists are updated periodically.

Plumbers

Company Name	Address	Phone
Wilson Brother Plumbing Inc.	207 Pinedale St. Maryville, TN 37801	(865) 415-1537
Fred Weston Plumbing	753 East Lincoln Rd, Alcoa, TN 37707	(865) 983-4434

Friendsville Utility District Contact

Office Address	213 West College Ave, Friendsville, TN 37737
Mailing Address	P.O. Box 85, Friendsville, TN 37737
Phone	(865) 995-0243
Website	https://www.friendsvilletn.gov
Inspection Scheduling	Call (865) 995-0243 to schedule all required inspections

APPENDIX B – GRINDER PUMP INSTALLATION CHECKLIST

Note: All of the following items MUST be verified complete before calling Friendsville Utility District to schedule your final inspection and pump activation. Do NOT connect to the sewer main without a passed inspection.

Electrical

- □ Control panel is wired correctly, and staff have access to the main breaker box if needed to turn power on or off
- □ Panel has NOT been penetrated from the top or sides, which could allow moisture to enter the box
- □ Bottom penetrations are sealed with duct sealer to prevent insects or moisture intrusion

Service Line and Connections

- □ Customer's service line, force main, and all connections are complete and per Friendsville Water/Sewer requirements
- □ Check valve is installed in the correct position (not backward)

Valve Box

- □ Valve box is visible and free of dirt; elevation is at the correct grade
- □ Valve is accessible and positioned in the correct upright position

Pump Tank and Lid

- □ Tank/lid is NOT below grade in a way that allows ground water runoff into the tank
- □ Lid is clear of dirt, sod, and mulch that would impede airflow into the lid vent from the atmosphere

Septic Tank

- □ Existing septic tank has been permanently disconnected from the home's plumbing system by a licensed contractor
- □ Existing septic tank has been pumped by a licensed septic tank pumping contractor
- □ Proof of septic tank pumping (receipt or contractor certification) has been submitted to the CFUD office

DO NOT call for inspection until ALL items above are complete. Incomplete installations will be rejected, and a re-inspection fee may apply. Call (865) 995-0243 to schedule your inspection.

Property Owner Signature: _____ Date: _____

Contractor / Plumber Signature: _____ Date: _____

Friendsville Utility District Inspector: _____ Date: _____