



**PLEASE READ!**

***ALL INSTRUCTIONS, FORMS,  
YOUR PERMIT AND APPROVED PLANS***

**THANK YOU. DAUPHIN BOROUGH**



# Light-Heigel & Associates, Inc.

ENGINEERS AND SURVEYORS

CIVIL  
STRUCTURAL  
MUNICIPAL  
ENVIRONMENTAL  
HYDROLOGY  
HYDRAULICS  
INSPECTIONS  
SANITARY  
WATER  
LAND SURVEYS  
STORM WATER  
LAND DEVELOPMENT  
SOIL/PERCOLATION  
TESTING  
AERIAL SURVEYS

To: Hillside Resident

Date: 11/30/2007

CC: Dauphin Borough

Project: **House Service Connection To Grinder Pumps**

CODE & ZONING ENFORCEMENT  
MUNICIPAL PLANNING

By Borough – Wexcon:

- I. Complete installation of Grinder Pump for the 21 Dwellings
  - A. Electrical Panel Installed
  - B. Laterals pressure tested
  - C. Site Specific Rep Start up and tests instruction
  - D. Substantial completion by Wexcon for public sewer
  - E. Substantial completion by Wexcon for specific lateral

**MAIN OFFICE:**  
430 EAST MAIN ST.  
PALMYRA, PA 17078  
717-838-1351  
1-800-257-2190  
Fax: 717-838-3820  
comments@light-heigel.com

**BERKS**  
Suite 102, Grande Plaza,  
1103 Rocky Drive.  
Wernersville, PA 19565  
610-678-7560  
Fax: 610-678-7686

**HALIFAX**  
906 North River Rd.  
P.O. Box 602  
Halifax, PA 17032  
717-896-8881  
Fax: 717-896-9145

**LANCASTER**  
845 Silver Spring Plaza  
Suite F  
Lancaster, PA 17601  
717-285-7002  
Fax: 717-285-2794

**LEWISBURG**  
Rt. 45 & Chestnut Alley  
P.O. Box 120  
Montandon, PA 17850  
570-524-7742  
Fax: 570-524-7746

**MONTGOMERY**  
1700 Dekalb Pike  
Blue Bell, PA 19422  
610-279-1830  
Fax: 610-279-1824

**SCHUYLKILL HAVEN**  
39 Dock St.  
Schuylkill Haven, PA 17972  
570-385-3439  
Fax: 570-385-5788

**NEW JERSEY**  
327 Greens Ridge Rd.  
Stewartsville, NJ 08886  
1-800-257-2190

**CARLISLE**  
717-249-4294

**HARRISBURG**  
717-236-5459

**MOUNT JOY**  
717-653-9289

**ROBESONIA**  
610-589-2099

By Home Owner:

- I. Acquire UCC permit, pay tapping/connection fee after substantial completion is established
- II. Electrical:
  - a. Extend 20 amp, 240 V, 60 Hz, 1-Phase circuit to the E-One Control Panel (SEE ATTACHED E-ONE INSTRUCTIONS)
  - b. Connect electrical and check all systems as required by the manufacturer.
  - c. Electrical inspection and approval
- III. Test:
  - a. Open curb stop.
  - b. Pump 50 - 100 gallon of clear water through the pump and the lateral into the public sewer.
- IV. Plumbing Connection
  - a. Verify status of existing dwelling plumbing and required improvements for venting, foundation drains and non-sanitary sumps.
  - b. Verify requirement of running trap, exterior vent, etc.
  - c. Connect.
  - d. Provide certificate of completion.

***Providing Answers. Designing Solutions.***

*A member of A PROFESSIONAL MANAGEMENT GROUP*



**CONSTRUCTION OF**  
**SEWER CONNECTIONS TO GRINDER PUMPS**  
**HILLSIDE DEVELOPMENT, DAUPHIN BOROUGH**  
**DAUPHIN COUNTY, PENNSYLVANIA**  
**NOVEMBER 30, 2007**

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**EROSION CONTROL DEVICES**

The owner must have their excavator - contractor provide Erosion and Sedimentation for all disturbed areas on the lots including but not limited to the areas disturbed during the installation of the laterals and the grinder pumps. The lot owner and the Contractor are responsible for the Erosion & Sedimentation Control facilities for their private property,

Some Eighteen-inch (18") to thirty-inch (30") silt fencing have been installed downgradient of disturbed areas most likely to erode and deposit sediment onto roadway surfaces. Maintain these silt fences by removing the silt from behind the fence at regular intervals and after major storm events. The areas with silt fence are satisfactory with proper maintenance and completion of the permanent and temporary stabilization as described below.

If the silt fence becomes damage it must be replaced. Additional silt fence should be used up slope of the existing installations as new areas are disturbed. The placement locations are as determined by homeowner and their contractor, and inspection and maintenance of silt fence devices should be continually performed.

See attached DEP Fact Sheet on Individual Home Disturbance Projects.

## **DISTURBED AREA STABILIZATION SUGGESTIONS**

The current dates December 1 to April 30 and historic weather forecast probably places the individual connection projects beyond the threshold at which grass seed, and particularly permanent grass seed, will germinate. For this reason, it is recommended that permanent seeding be post-poned until spring, when weather conditions become favorable for growth.

In order to provide an interim measure of stabilization to lawn areas, two options are suggested. The first suggestion is to cover the disturbed lawn areas with burlap, and anchor with 6-inch U-shaped landscaping staples. The burlap seams should overlap a minimum of 3-inches. Staples should be placed on a square grid, and spaced no more than 4-feet apart.

*(A local supplier of burlap (100 yds rolls available in 36" to 72" widths) is based in Mechanicsburg, PA. Bag Processors, Inc. can be reached via telephone at 717-766-0703. This supplier is simply being presented as a source option, and is neither recommended nor required as a provider.)*

An alternate suggestion to temporarily stabilize disturbed earthen areas is with a chemical soil stabilizer. Dirt Glue is one manufacturer option. Dirt Glue is an acrylic polymer that binds to form a stabilizing "crust" over soil. Any chemical soil stabilizer selected must be biodegradable and environmentally safe, and temporary so as not to prevent or inhibit grass growth in the spring, and must be approved by the engineer prior to application.

*(Dirt Glue can be reached via telephone at 888-606-6108, attention Larry, and via internet at [www.dirtglue.com](http://www.dirtglue.com). This supplier is simply being presented as a source option, and is neither recommended nor required as a provider.)*



# Fact Sheet

Commonwealth of Pennsylvania • Department of Environmental Protection

## SOIL EROSION AND SEDIMENT REQUIREMENTS FOR SINGLE-FAMILY RESIDENCES, INDIVIDUAL LOT CONSTRUCTION AND MINOR CONSTRUCTION PROJECT ACTIVITIES

All earth disturbance activities in the Commonwealth of Pennsylvania are regulated by the requirements of Title 25, Chapter 102 of the Pennsylvania Code. Depending on the size and scope of a project, the requirements range from implementing and maintaining Best Management Practices (BMPs) to having an Erosion and Sediment (E&S) Control Plan to requiring a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges associated with construction activities.

### How are the Size and Scope of the Project Determined?

One of the key factors in determining what is required is the size of the area of disturbance.

Area of disturbance: *The area affected by construction or other human activity that disturbs the surface of the land including, but not limited to: clearing and grubbing; grading; excavations; embankments; land development; and the moving, depositing, stockpiling, or storing, of soil, rock or other earth materials.*

The size of the building lot may not be equal to the area of disturbance. Only the area that is being disturbed for construction or use as listed above should be considered. If the remainder of the lot will remain in a natural undisturbed state, it is not considered part of the area of disturbance.

### When is an E&S Control Plan Required?

All earth disturbance activities, including those that disturb less than 5,000 square feet, must implement and maintain E&S control practices.

A written E&S Control Plan is required if one or more of the following apply: the total area of disturbance is 5,000 square feet or greater, or if the activity has the potential to discharge to a water classified as a High Quality (HQ) or Exceptional Value (EV) water published in Chapter 93 regulations (relating to water quality

standards). Since many municipalities have local ordinances that require a written and approved E&S Control Plan even if the disturbance is less than 5,000 square feet, it is recommended you contact your local county conservation district office to determine whether a written plan is required under a local ordinance.

### When is an NPDES Permit required?

An NPDES Permit is required if five or more acres of earth is disturbed. An NPDES Permit is also required if both of the following apply: the total area of disturbance is greater than one acre, and there is a point source\* discharge from the affected area to surface waters\* (\*see *definitions below*). Additionally, an NPDES permit would be required for an earth disturbance of one acre or smaller if it is part of a larger, common plan of development. A common plan of development is an area where several distinct construction activities are occurring under one overall plan (e.g., the construction of a house on a half-acre lot in a residential development where other homes are being constructed). It is recommended you contact your local county conservation district office to determine whether a permit is required.

\*Point Source: *Any discernable, confined and discrete conveyance including, but not limited to: any pipe, ditch, channel, conduit, well, discrete fissure, container from which pollutants are or may be discharged to surface waters.*

\*Surface Waters: *Any and all rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, ponds, springs, wetlands and all other bodies or channels of conveyance of surface water, or parts thereof, whether natural or artificial.*

Most single-family residence individual lot construction sites can avoid a point source discharge so long as they are not part of a

larger common plan of development. If water runoff is collected on site and permitted to soak into the ground, or if runoff is permitted to flow across the land without being concentrated into a point source, an NPDES Permit would not be necessary.

**What other Approvals May be Necessary?**

This fact sheet focuses on state and federal E&S requirements. Local governments often have their own requirements for construction sites. It is the responsibility of the landowner and contractor to ensure compliance with all local requirements as well. Additional state or federal permits may be needed when operating across, along or near Surface Waters of the Commonwealth.

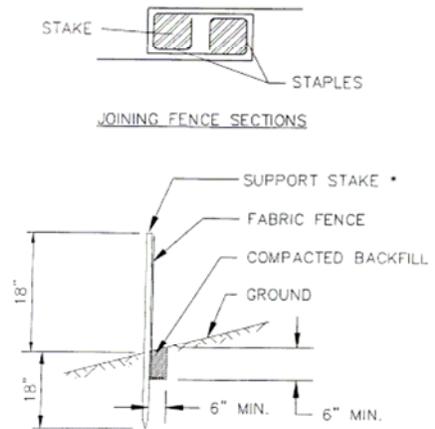
**What are E&S Control Practices or BMPs?**

E&S BMPs are activities or structures that effectively control stormwater during construction to prevent and minimize soil loss and surface water pollution. The implementation and maintenance of BMPs are required on all earth disturbance activities including those that do not require a written E&S Control Plan or NPDES Permit. The most common BMPs for a single-family residence individual lot construction site would include Filter Fabric Fence or Straw Bale Barriers, Rock Construction Entrance, and Site Stabilization.

Filter Fabric Fence, commonly referred to as Silt Fence, can be purchased at most builder's supply stores or landscape centers (ensure that the silt fence is a minimum of 18 inches in height). Filter Fabric Fence and Straw Bale Barriers perform the same function and are referred to as perimeter controls. Either of these practices would be installed down-slope of the construction where the disturbed area meets vegetation in the undisturbed area. Proper installation and maintenance of the Filter Fabric Fence and/or the Straw Bale Barrier is crucial to the BMP functioning correctly. (Figures 1 & 2)

**Figure 1**

**STANDARD CONSTRUCTION DETAIL #19**  
Standard Filter Fabric Fence (18" High)



\*Stakes spaced @ 8' maximum. Use 2" x 2" wood or equivalent steel stakes.

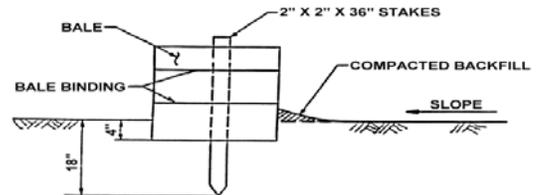
Filter Fabric Fence must be placed at level existing grade. Both ends of the barrier must be extended at least 8 feet up slope at 45 degrees to the main barrier alignment.

Sediment must be removed when accumulations reach 1/2 the above ground height of the fence.

Any section of Filter Fabric Fence which has been undermined or topped must be immediately replaced with a Rock Filter Outlet.

**Figure 2**

**STANDARD CONSTRUCTION DETAIL #17**  
Straw Bale Barriers



Straw Bale Barriers should not be used for more than 3 months.

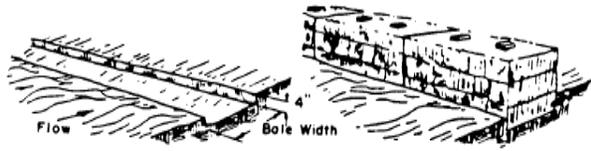
Straw Bale Barriers shall be placed at existing level grade. Both ends of the barrier shall be extended at least 8 feet up slope at 45 degrees to the main barrier alignment.

Sediment shall be removed when accumulations reach 1/3 the above ground height of the barrier.

Any section of Straw Bale Barrier which has been undermined or topped shall be immediately replaced with a Rock Filter Outlet.

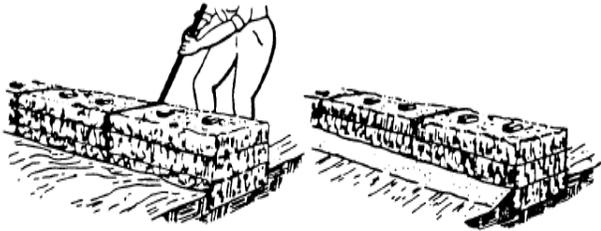
1. EXCAVATE THE TRENCH.

2. PLACE AND STAKE STRAW BALES.



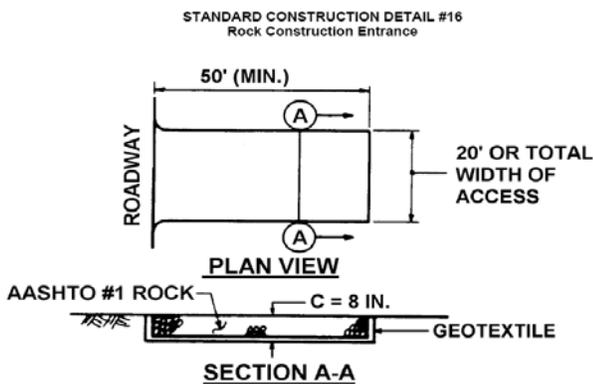
2. WEDGE LOOSE STRAW BETWEEN BALES.

4. BACKFILL AND COMPACT THE EXCAVATED SOIL. (ANCHOR TOE)



A Rock Construction Entrance is installed along the roadway for the purpose of cleaning mud from the tires of construction vehicles before they leave the worksite. (Figure 3)

Figure 3



MAINTENANCE: Rock Construction Entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile shall be maintained on site for this purpose. At the end of each construction day, all sediment deposited on paved roadways shall be removed and returned to the construction site.

Site Stabilization is one of the most effective tools available to control erosion. Site Stabilization is used as both a temporary and permanent measure to control erosion of bare ground on construction sites. When areas of a construction site are completed, they should be stabilized as soon as possible. Getting vegetation to grow on completed portions of a jobsite while remaining areas are still under construction makes final stabilization of the entire site easier and provides some buffering for the remainder of the site. Stabilization

practices can use straw mulch, seed, manufactured erosion control products, or a combination of all of the above.

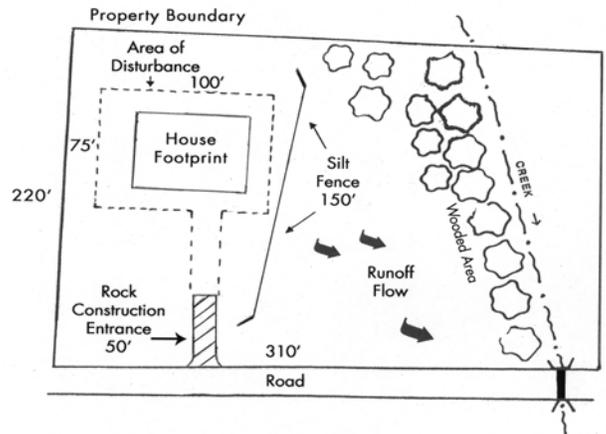
## Erosion & Sediment Control Plan

### What is Included in a Written E&S Control Plan?

A site sketch should include the dimensions of the lot, identification and dimensions of the area to be disturbed, location of any prominent drainage, wetland, or surface waters, location of any major trees, an understanding of your lot's general slope characteristics, and the BMPs that need to be implemented. (Figure 4)

For the purposes of a single-family residence, a site sketch made by the landowner and/or operator should be adequate.

Figure 4



## NPDES Permit Assistance

If you believe your single-family residence construction site may need an NPDES Permit, the first step would be to discuss your concerns with your contractor, consultant, municipality or county conservation district. They will be able to assist you in making the determination if an NPDES Permit is required.

The process of developing an NPDES Permit application is best completed by a Qualified Licensed Professional or earthmoving construction professional (engineer, geologist, surveyor, or landscape architect).

**For More Information:**

Visit DEP's Web site at [www.depweb.state.pa.us](http://www.depweb.state.pa.us), Keyword: "Erosion Control."

Or contact your local county conservation district, or the DEP Permitting and Technical Services Section at one of the following regional offices:

<p><b>Southeast Region</b> 2 East Main Street Norristown, PA 19401 484-250-5900</p> <p><b>Counties:</b> <i>Bucks, Chester, Delaware, Montgomery and Philadelphia</i></p>	<p><b>Southwest Region</b> 400 Waterfront Drive Pittsburgh, PA 15222-4745 412-442-4000</p> <p><b>Counties:</b> <i>Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland</i></p>	<p><b>Southcentral Region</b> 909 Elmerton Ave., 2nd Floor Harrisburg, PA 17110 717-705-4707</p> <p><b>Counties:</b> <i>Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York</i></p>
<p><b>Northeast Region</b> 2 Public Square Wilkes-Barre, PA 18711-0790 570-826-2511</p> <p><b>Counties:</b> <i>Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming</i></p>	<p><b>Northcentral Region</b> 208 W. Third St., Suite 101 Williamsport, PA 17701 570-327-3574</p> <p><b>Counties:</b> <i>Bradford, Cameron, Clearfield, Centre, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union</i></p>	<p><b>Northwest Region</b> 230 Chestnut St. Meadville, PA 16335-3481 814-332-6984</p> <p><b>Counties:</b> <i>Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren</i></p>



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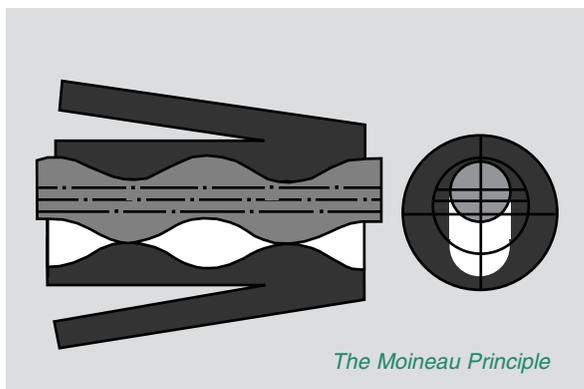
one<sup>®</sup>

Environment One Low Pressure Sewer Systems

engineered

to do one job

perfectly.<sup>®</sup>



*The Moineau Principle*

engineered  
to do one job  
perfectly.

The GP 2000 grinder pump station has evolved from everything we've learned in more than 35 years of engineering low pressure sewer systems.

The pump stations incorporate the grinder pump, motor controls and level-sensing device integrated into a compact unit, easily removable for service when necessary.

The progressing cavity pump itself is based on the Moineau principle. A rotor turns within a stator, creating a sequence of sealed chambers. The precision-cast and polished stainless steel rotor moves wastewater through these chambers at a nearly constant flow, over a wide range of conditions – from negative to abnormally high heads. Turning at just 1,725 rpm, the one-horsepower motor can pump fluid through miles of small-diameter piping and elevation changes of over 138 feet.

In addition, the geometry of the pump not only produces a near-vertical pump curve, but allows passage of ground solids without clogging. Because of the low rpm and highest quality components, we experience the lowest service call rate in the industry. More than eight years mean time between service calls is typical.



## Some Key Advantages:

- **High Heads/Negative Heads.** Reliable operation from negative head to 138+ feet of total head for continuous duty reduces the number of lift stations and pipe sizes. This cuts costs – both initially and in long-term operation and maintenance.
- **Constant Flow.** The system pressures to be overcome by any given grinder pump in a low pressure system vary dramatically over the course of a day. E/One's progressing cavity pump readily accommodates these pressure variations while maintaining a nearly constant flow without ever operating at "near shut off" – thus avoiding the wear and motor burn-out suffered by other pump types.
- **High Grinding Torque.** Our unique pump system, driven by a one-horsepower motor turning at 1,725 rpm, produces grinding torque equal to a two-horsepower pump turning at twice the speed.
- **Low Energy Consumption.** Pump is activated automatically. Runs for short periods. Typical annual energy consumption equals a 40-watt light bulb.
- **Low Maintenance Submersible Motor.** Low maintenance and long life are the hallmarks of our air-filled motor. Permanently lubricated ball bearings and Class F insulation eliminate the need for periodic oil changes and oil disposal costs required by oil-filled submersible motors.
- **Large Diameter Grinder Assembly.** Almost twice the diameter of most other types of pumps, contributing to a dramatic reduction of inflow velocity for less wear and no clogging, jamming, or blinding.
- **No Preventive Maintenance.** Self-cleaning static level sensors require no preventive maintenance. Because of our unique, near constant discharge rate, no main line flushing is required in a properly designed system.
- **Corrosion Resistance.** E/One's stainless steel ball-type discharge valve and piping won't corrode like copper or galvanized, and hold up years longer. No corrosion, no maintenance.
- **Dependability.** E/One pumps typically run eight to ten years between service calls with more than 35 years of in-ground experience.
- **Provides for environmentally sound wastewater management.** The GP 2000 grinds waste material into small particles. This enables the use of inexpensive, small-diameter pressure pipes, buried at shallow depths, to transport waste water to a suitable processing site. Result: Ground water contamination from failing septic tanks can be eliminated.
- **Serviceability.** Our unique core design reduces the need for in-field troubleshooting and pump servicing. This means lower maintenance costs and minimum homeowner inconvenience.

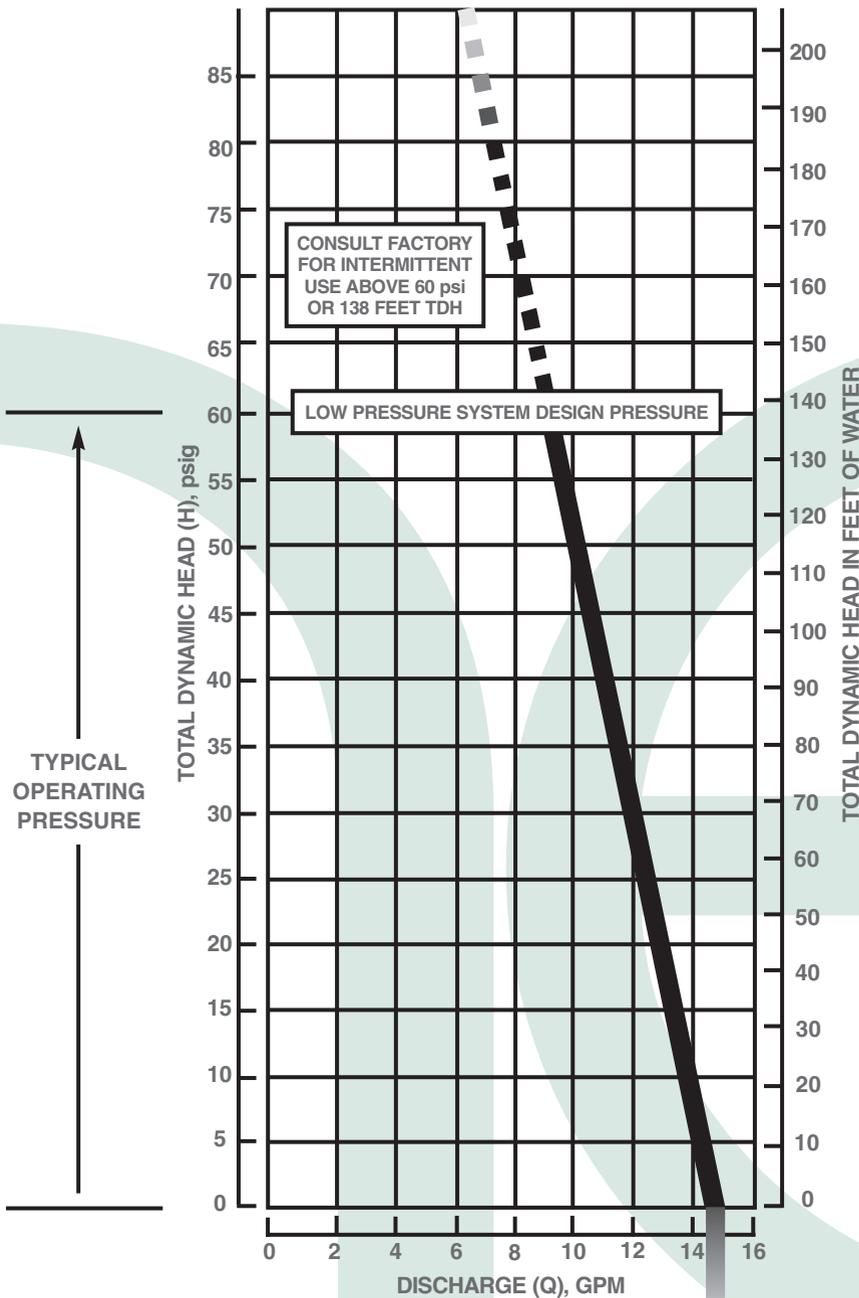
# Environment One

# engineered

# low pressure systems:

# repealing the law of gravity.

## Grinder Pump Performance Characteristics



Gravity sewers are no longer the rule for solving wastewater problems.

With huge savings in front-end costs, and a much gentler footprint on the environment, gravity-independent Environment One low pressure sewer systems are revolutionizing the field.

At the heart of the system is the E/One progressing cavity grinder pump – with high heads that eliminate costly lift stations, and a robust, powerful design that translates into the industry’s highest levels of reliability, availability and maintainability.

# nobody can touch our curve.

In a low pressure system, **constant, predictable pump output is the foundation for proper hydraulic design.** It enables the engineer to minimize retention time, pump wear, and keep scouring action at effective levels.

Environment One’s semi-positive displacement, progressing cavity pump has a nearly vertical H-Q curve. It is by far the most “forgiving” pump design – providing predictable flow over the full range of typical system pressures; strengths critical in a large-scale, low pressure sewer.

E/One’s superior high head capability allows a system with few, if any, lift stations. And, it easily accommodates additional future connections without compromising system performance.

These E/One pump characteristics translate into:

- predictable hydraulic design
- lower collection system capital costs
- less maintenance
- lower operating costs

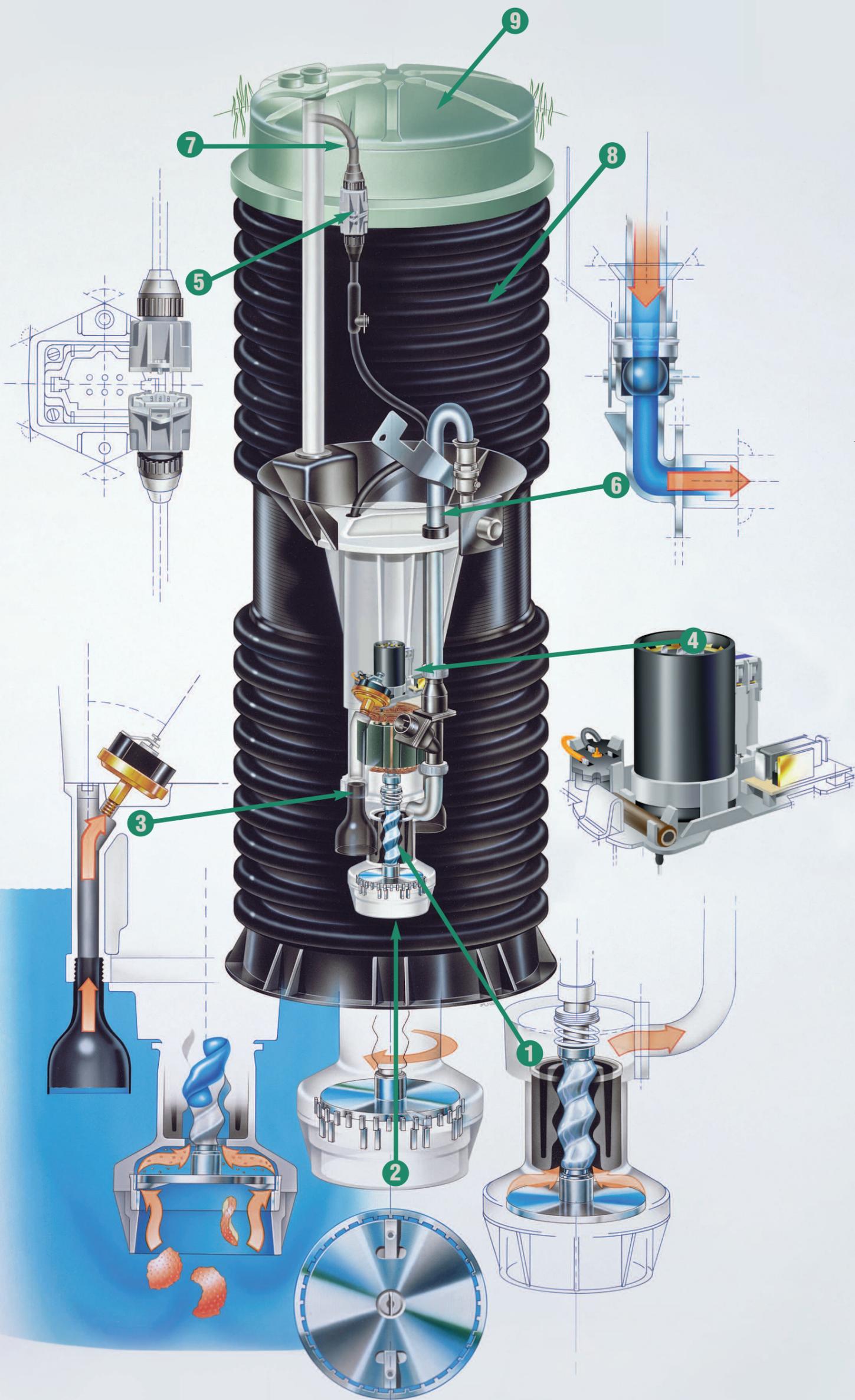
# Anatomy of a Leader:

the inside

story on the

GP 2000 System.

- 1** **Progressing Cavity Pump** – A deceptively simple design produces a nearly constant flow under a wide range of continuously varying conditions.
- 2** **Grinder Wheel and Shredder Ring** – Hardened stainless steel cutter bars and teeth process sewage, grinding wastewater solids, as well as wood, plastic and cloth. **Will not jam or clog!**
- 3** **Pressure Switch Level Control** – Self-cleaning level sensors require no preventive maintenance.
- 4** **Unique Core Design** – Reduces the need for in-field troubleshooting and service. Modular controls simplify service.
- 5** **Electrical Quick Disconnect** – For safe and easy service. UL-listed, compatible with OSHA regulations for confined space entry. NEMA 6P rated.
- 6** **Stainless Steel Piping & Hardware** – E/One's SS discharge piping and ball valve won't corrode. No corrosion, no maintenance.
- 7** **Direct-Bury Cable** – For simple and inexpensive installation.
- 8** **High-Density Polyethylene Tank** – Double-wall construction of high-density thermoplastic for rugged reliability. Factory pressure-tested for infiltration- and exfiltration-free installation.
- 9** **Low-Profile Cover** – Aesthetically pleasing. Provides easy access for service while blending with surroundings.



# leading the industry we invented.

Environment One not only pioneered the low pressure sewer system, but consistently leads the industry both in sales and innovation. The company is dedicated to Total Quality and Continuous Improvement, as evidenced by the GP 2000 series. Today, there are more than a half million users, worldwide.



Protected by U.S. Patent Nos. 5,562,254, 5,439,180 and 5,816,510. Other U.S. Patents and Foreign Patents Pending.

## sewer anywhere, save thousands, virtually service-free.

Driven by the remarkable GP 2000 grinder pump, E/One Sewers give engineers, developers, sanitarians, and land planners unprecedented new freedom in land usage.

And they're so much easier to install. **Front-end costs are reduced by as much as 70%.**

The GP 2000 System reduces all forms of sanitary waste to a non-clogging slurry and pumps it through a network of small-diameter pipes. Since gravity is replaced by the power of the pump, sewer systems need not run downhill nor require large-diameter pipes, deep trenches, multiple booster stations – or their associated costs.

A system powered by the GP 2000 pump converts formerly cost-prohibitive building sites into cost-effective reality. "Problem areas," with high ground water, elevation changes or impenetrable bedrock, are transformed into valuable, developable real estate.

Of course, E/One's low upfront cost advantages apply to conventional building sites, as well.

In addition, E/One units are easy to install and virtually maintenance-free – refined through more than 35 years of experience with the largest installed base in the industry.

Contact your local distributor.

**e one**

SEWER SYSTEMS

A PRECISION CASTPARTS COMPANY

Environment One Corporation

2773 Balltown Road

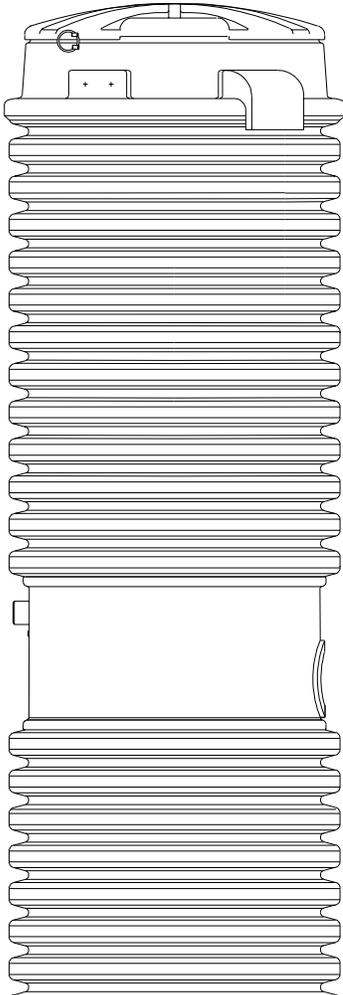
Niskayuna, NY 12309-1090

Voice 518-346-6161

FAX 518-346-6188

[www.eone.com](http://www.eone.com)

LM000127 Rev.E



# Limited Warranty

1000 Series, 2000 Series, AMGP

Environment One Corporation offers a limited warranty that guarantees its product to be free from defects in material and factory workmanship for a period of two years from the date of installation, or 27 months from the date of shipment, whichever occurs first, provided the product is properly installed, serviced and operated under normal conditions and according to manufacturer's instructions. Repair or parts replacement required as a result of such defect will be made free of charge during this period upon return of the defective parts or equipment to the manufacturer or its nearest authorized service center.

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

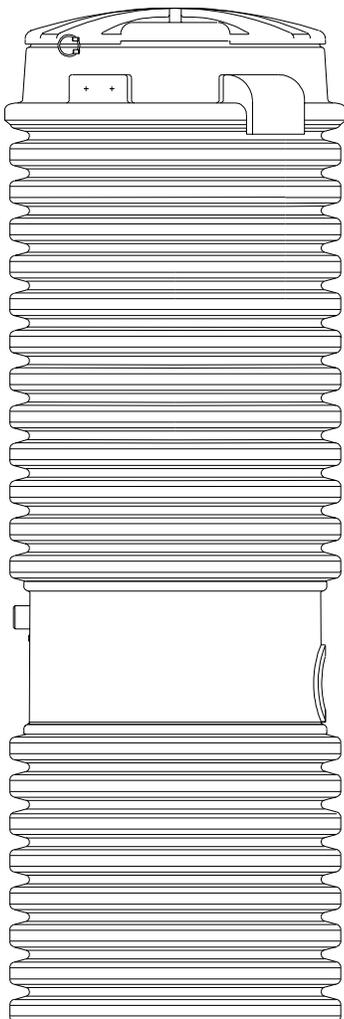
Installation Date: \_\_\_\_\_



2773 Balltown Rd • Niskayuna NY USA 12309  
(01) 518.346.6161 • www.eone.com

PA1190P01 Rev. A

# User Instructions for the Environment One Grinder Pump



Congratulations on your Environment One grinder pump investment. With proper care and by following a few guidelines, your grinder pump will give you years of dependable service.

## Care and Use of your Grinder Pump

The Environment One grinder pump is capable of accepting and pumping a wide range of materials. Regulatory agencies advise that the following items should not be introduced into any sewer, either directly or through a kitchen waste disposal unit:

Glass	Diapers, socks, rags or cloth
Metal	Plastic objects (toys, utensils, etc.)
Seafood shells	Sanitary napkins or tampons
Goldfish stone	Kitty litter

In addition, you must **never** introduce into any sewer:

Explosives	Strong chemicals
Flammable material	Gasoline
Lubricating oil and/or grease	

## Periods of Disuse

If your home or building is left unoccupied for longer than a couple of weeks, perform the following procedure:

**Purge the System.** Run clean water into the unit until the pump activates. Immediately turn off the water and allow the grinder pump to run until it shuts off automatically.

**Duplex Units.** Special attention must be taken to ensure that both pumps turn on when clean water is added to the tank.

**Caution: Do not disconnect power to the unit**

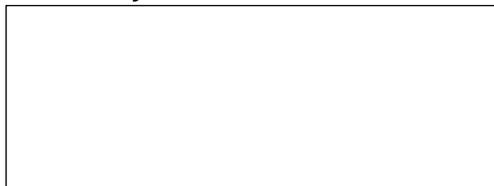
## Power Failure

Your grinder pump cannot dispose of wastewater without electrical power. If electrical power service is interrupted, keep water usage to a minimum.

## Pump Failure Alarm

Your Environment One grinder pump has been manufactured to produce an alarm signal (120 volt) in the event of a high water level in the basin. The installer must see that the alarm signal provided is connected to an audible and/or visual alarm in such a manner as to provide adequate warning to the user that service is required. During the interim prior to the arrival of an authorized service technician, water usage must be limited to the reserve capacity of the tank.

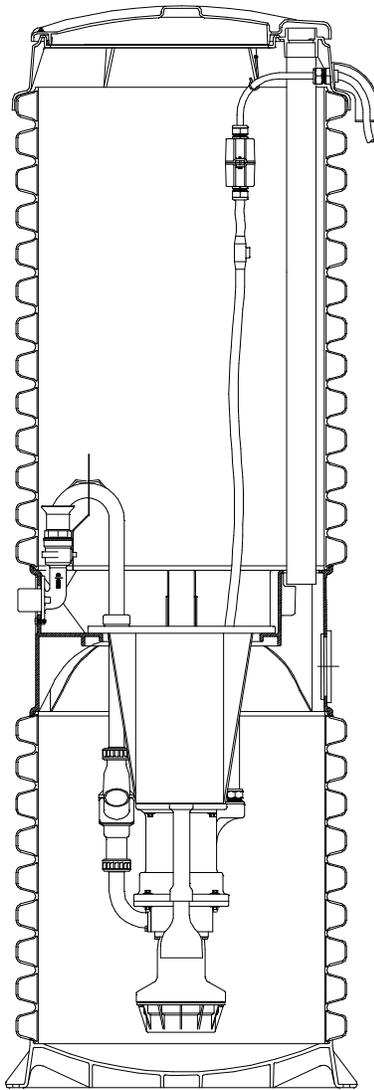
**For service, please call your local distributor:**



## General Information

In order to provide you with suitable wastewater disposal, your home is served by a low pressure sewer system. The key element in this system is an Environment One grinder pump. The tank collects all solid materials and effluent from the house. The solid materials are then ground to a small size suitable for pumping as a slurry with the effluent water. The grinder pump generates sufficient pressure to pump this slurry from your home to the wastewater treatment receiving line and/or disposal plant.

# GP2010



Patent Numbers: 5,752,315  
5,562,254 5,439,180

\* Discharge data includes loss through check valve, which is minimal.

PA1346P01 Rev. D, 1/02

## General Applications

The size, efficiency and operating economy of the GP 2010 make it your best choice for single dwellings, waterfront property, subdivision developments and marinas. The GP 2010 is ideally suited for both new and existing communities.

## General Features

The GP 2010 Grinder Pump is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank and controls. The GP 2010 is packaged into a single complete unit, ready for installation.

All solids are ground into fine particles, allowing them to pass easily through the pump, check valve and small diameter pipelines. Even objects not normally found in sewage, such as plastic, rubber, fiber, wood, etc., are ground into fine particles.

The 1 1/4-inch discharge connection is adaptable to any piping materials, thereby allowing us to meet your local code requirements.

The tank is made of tough corrosion-resistant HDPE. The optimum tank capacity of 70 gallons is based on computer studies of water usage patterns. A single GP 2010 is ideal for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory. This model can accommodate flows of 700 GPD.

The internal check valve assembly, located in the grinder pump, is custom-designed for non-clog, trouble-free operation.

The grinder pump is automatically activated and runs infrequently for very short periods. The annual energy consumption is typically that of a 40-watt light bulb.

Units are available for indoor and outdoor installations. Outdoor units are designed to accommodate a wide range of burial depths.

## Operational Information

### Motor

1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

### Inlet Connections

4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

### Discharge Connections

Pump discharge terminates in 1 1/4-inch NPT female thread. Can easily be adapted to 1 1/4-inch PVC pipe or any other material required by local codes.

### Discharge\*

15 gpm at 0 psig

11 gpm at 40 psig

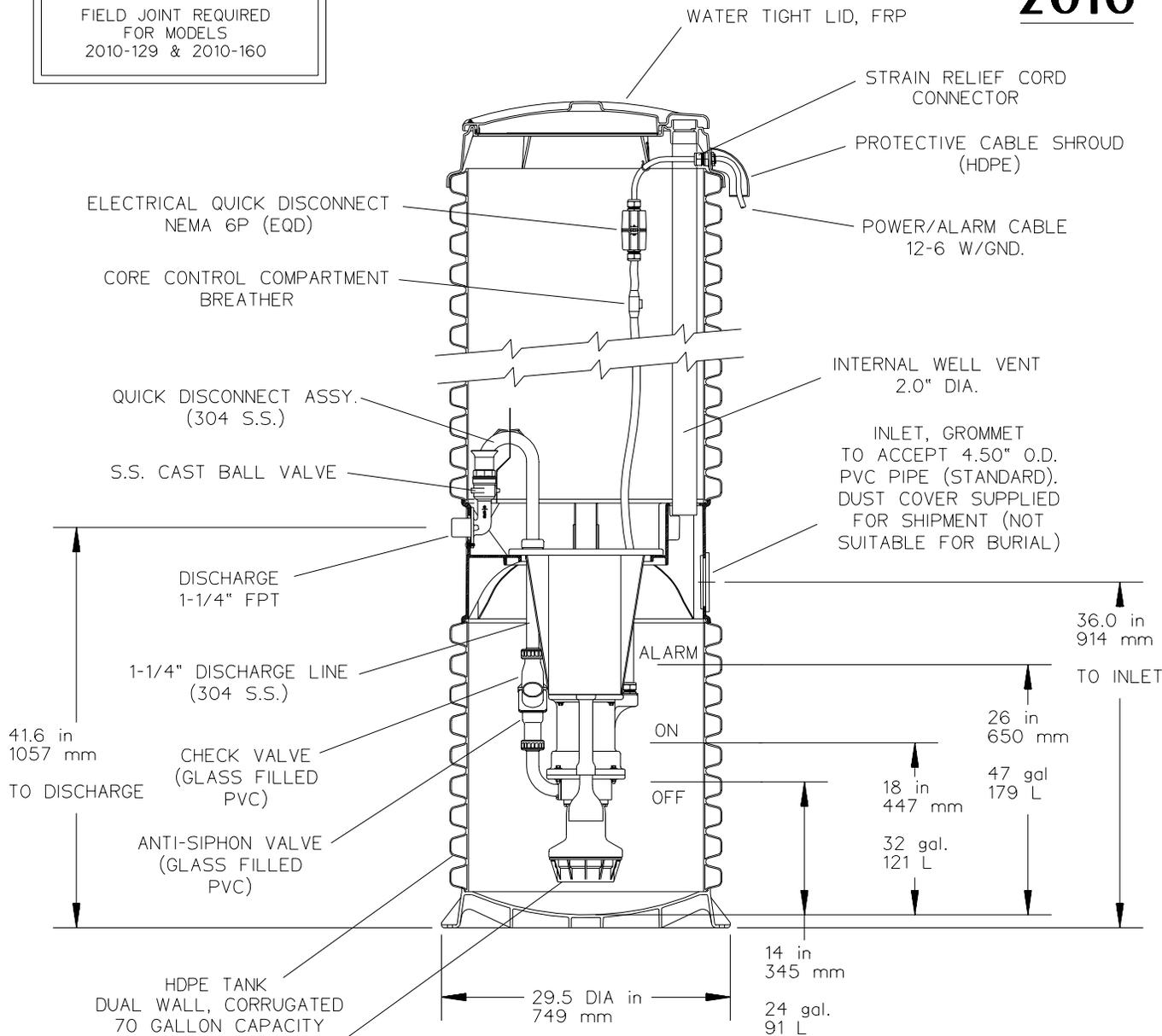
9 gpm at 60 psig

## Overload Capacity

The maximum pressure that the pump can generate is limited by the motor characteristics. The motor generates a pressure well below the rating of the piping and appurtenances. The automatic reset feature does not require manual operation following overload.

# 2010

FIELD JOINT REQUIRED  
FOR MODELS  
2010-129 & 2010-160



SEMI-POSITIVE DISPLACEMENT TYPE PUMP  
DIRECTLY DRIVEN BY A 1 HP MOTOR  
CAPABLE OF DELIVERING 9 gpm AT 138" T.D.H.  
(34 lpm AT 42m T.D.H.)



SGS	CAH	01/10/02	H	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



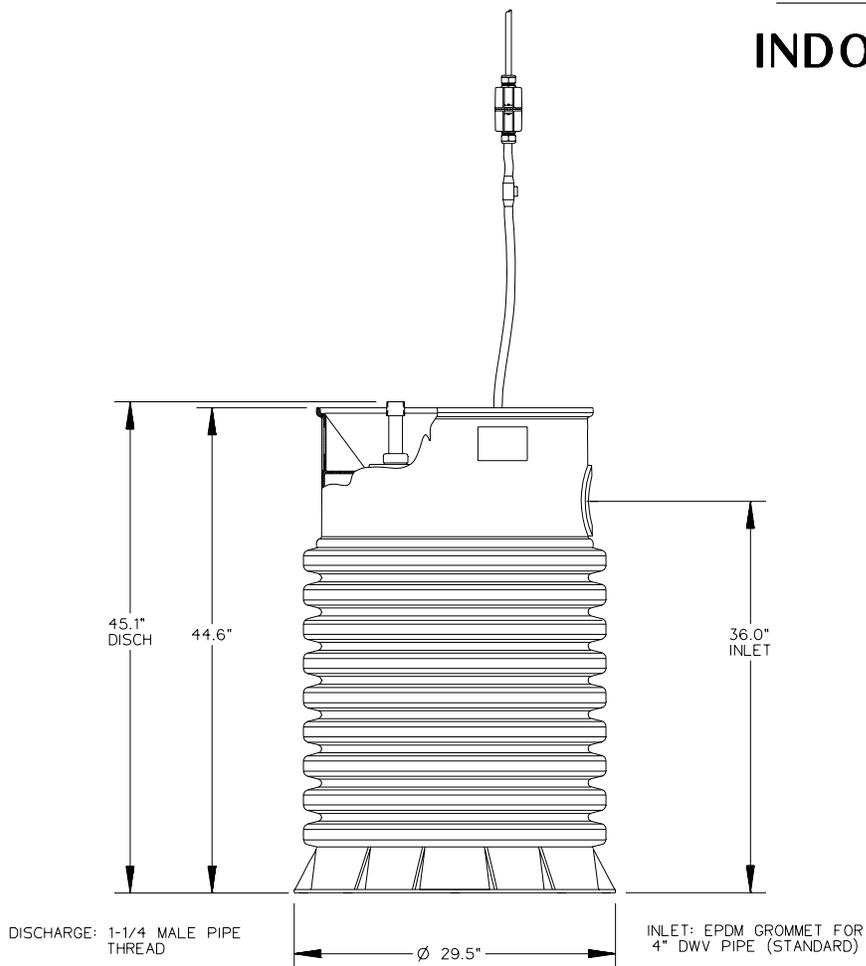
MODEL 2010, DETAIL SHEET

PA0908P01

### BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED  
ON ALL OUTDOOR MODEL 2010 STATIONS  
SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED  
TO ACHIEVE NECESSARY BALLAST EFFECT  
SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

# 2010-44 INDOOR UNIT



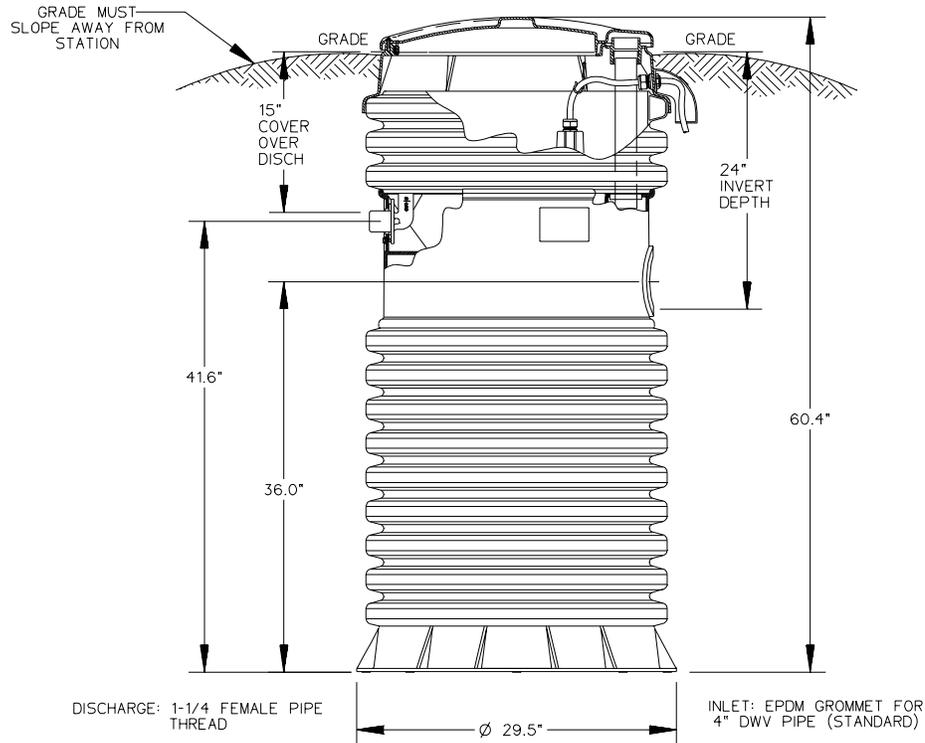
SGS	CAH	5/31/01	B	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL 2010-44

PA0856P10

# 2010-61



SGS	CAH	01/10/02	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

## BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL 2010-61 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

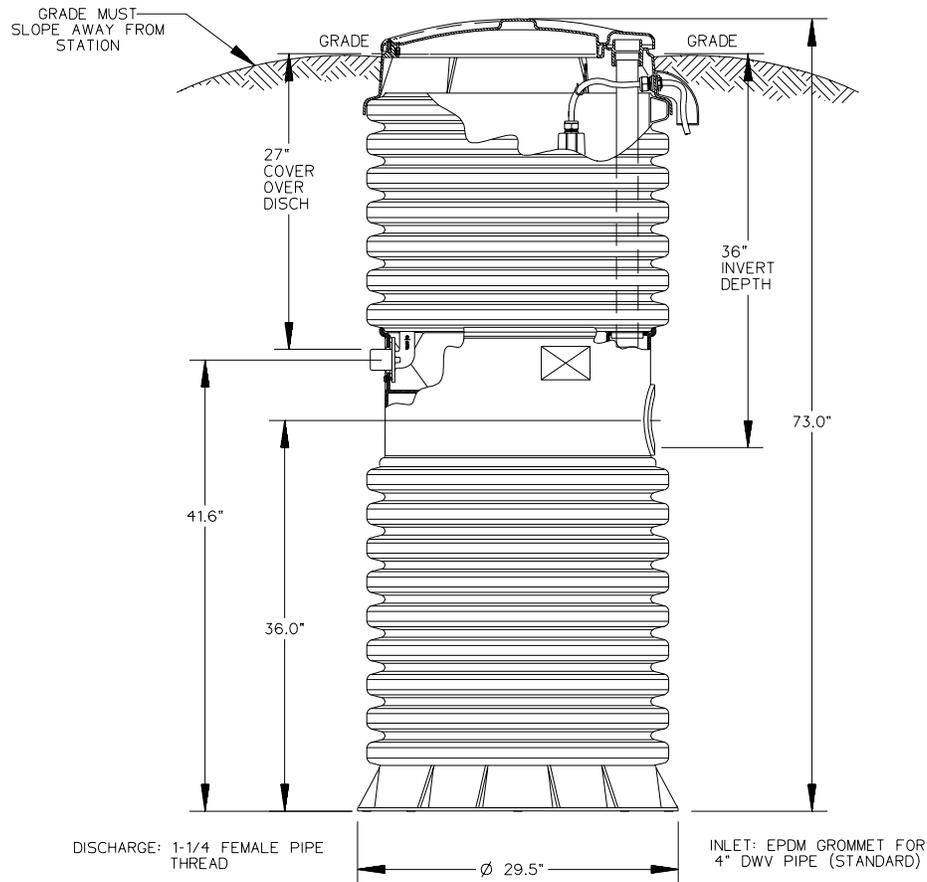
SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS



MODEL 2010-61

PA0856P02

# 2010-74



SGS	CAH	01/10/02	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL 2010-74

PA0856P03

## BALLAST REQUIREMENTS

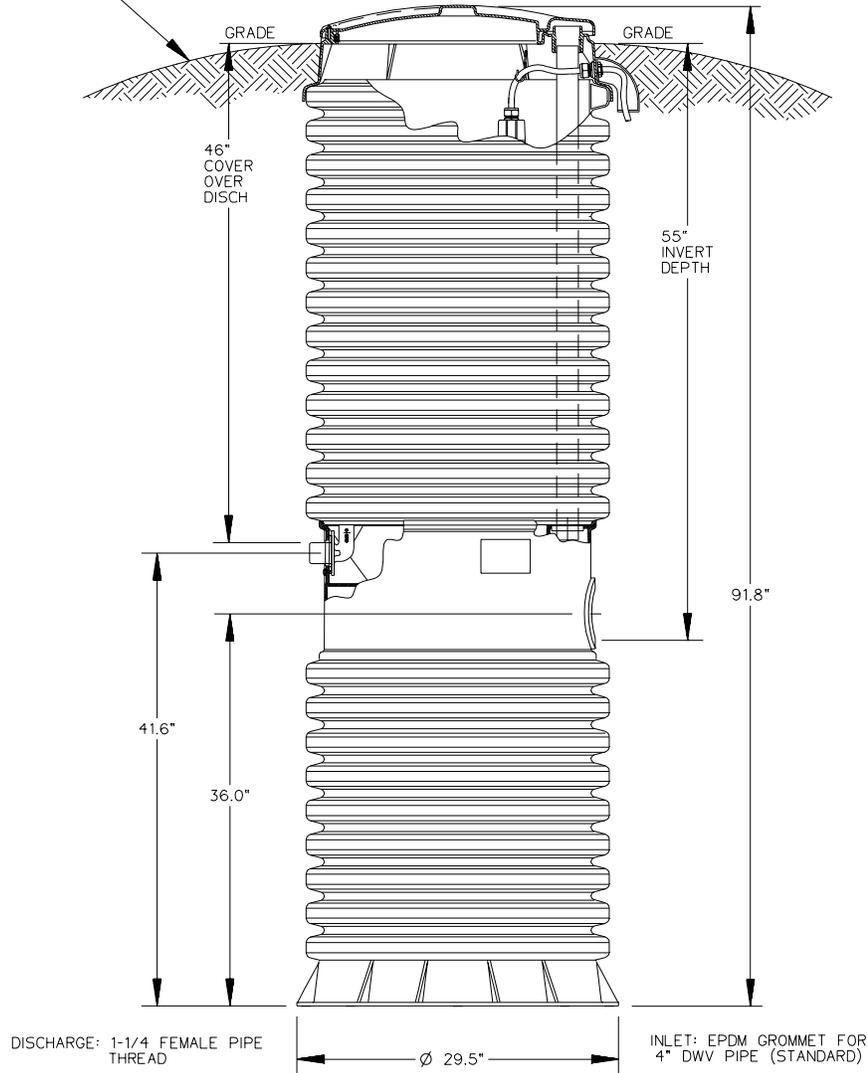
A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL 2010-74 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

# 2010-93

GRADE MUST SLOPE AWAY FROM STATION



SGS	CAH	01/10/02	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

## BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL 2010-93 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

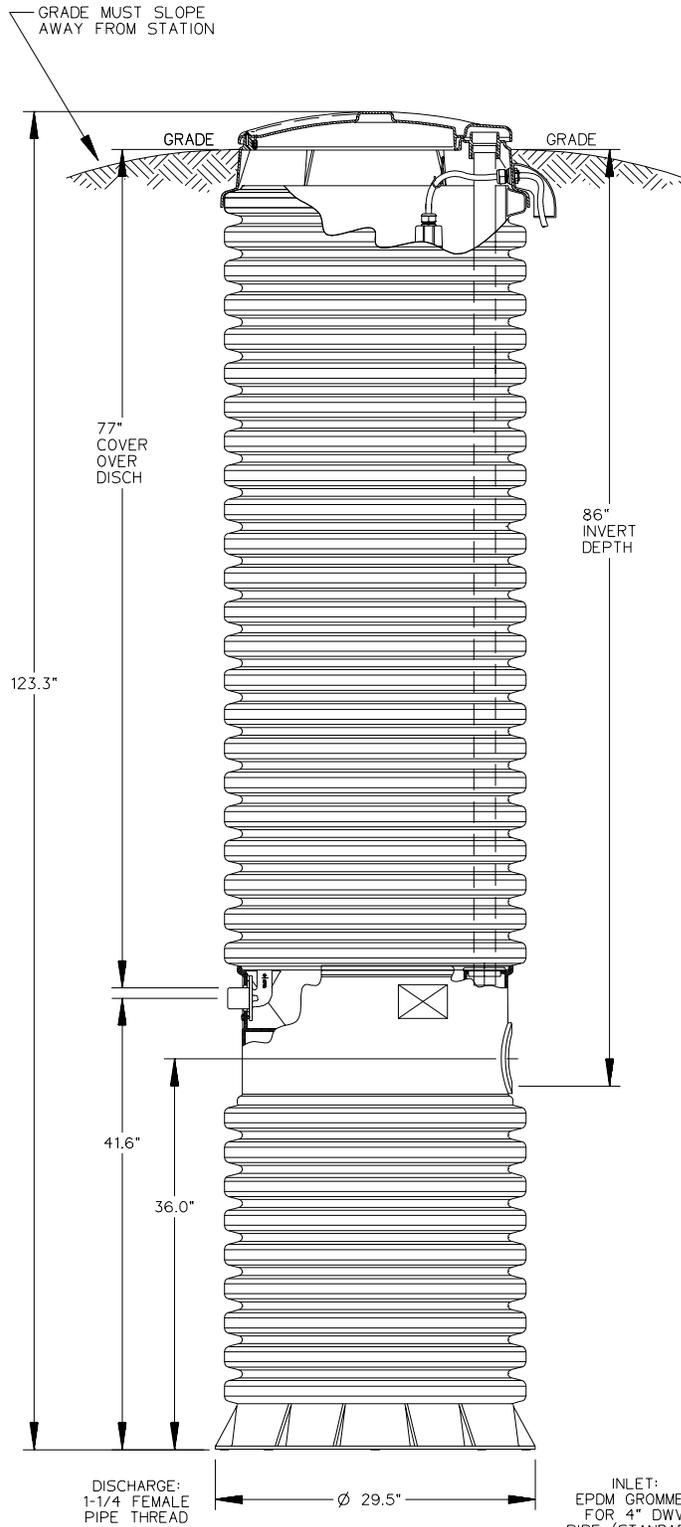
SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS



MODEL 2010-93

PA0856P04

# 2010-124



## BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL 2010-124 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS



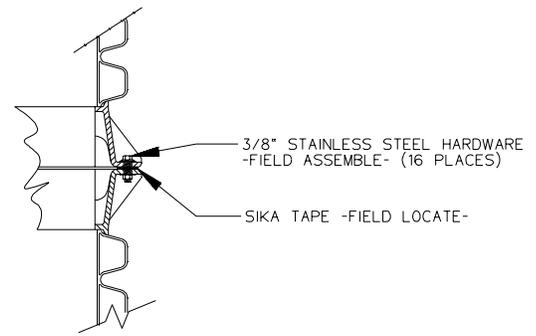
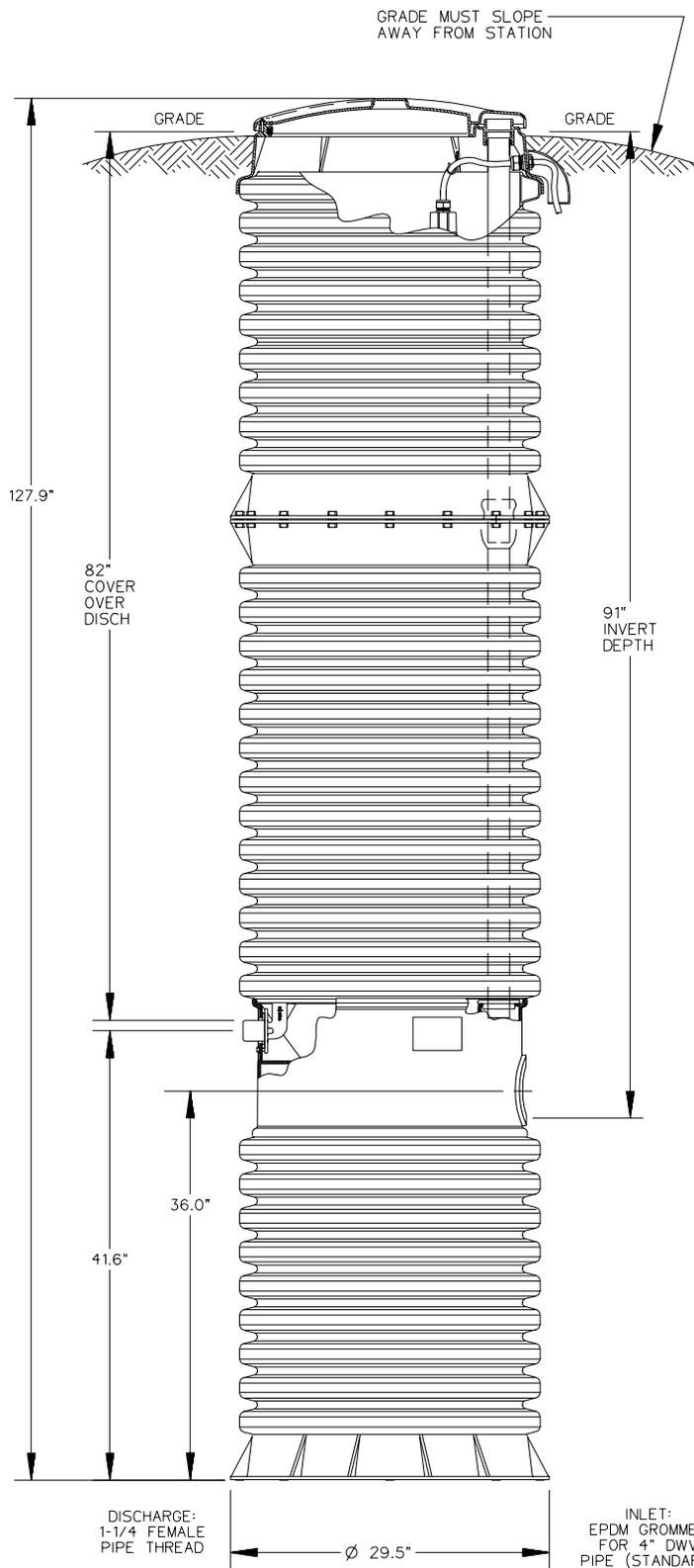
SGS	CAH	01/10/02	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL 2010-124

PA0856P06

# 2010-129



## DETAIL, FIELD JOINT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

## BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL 2010-129 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS



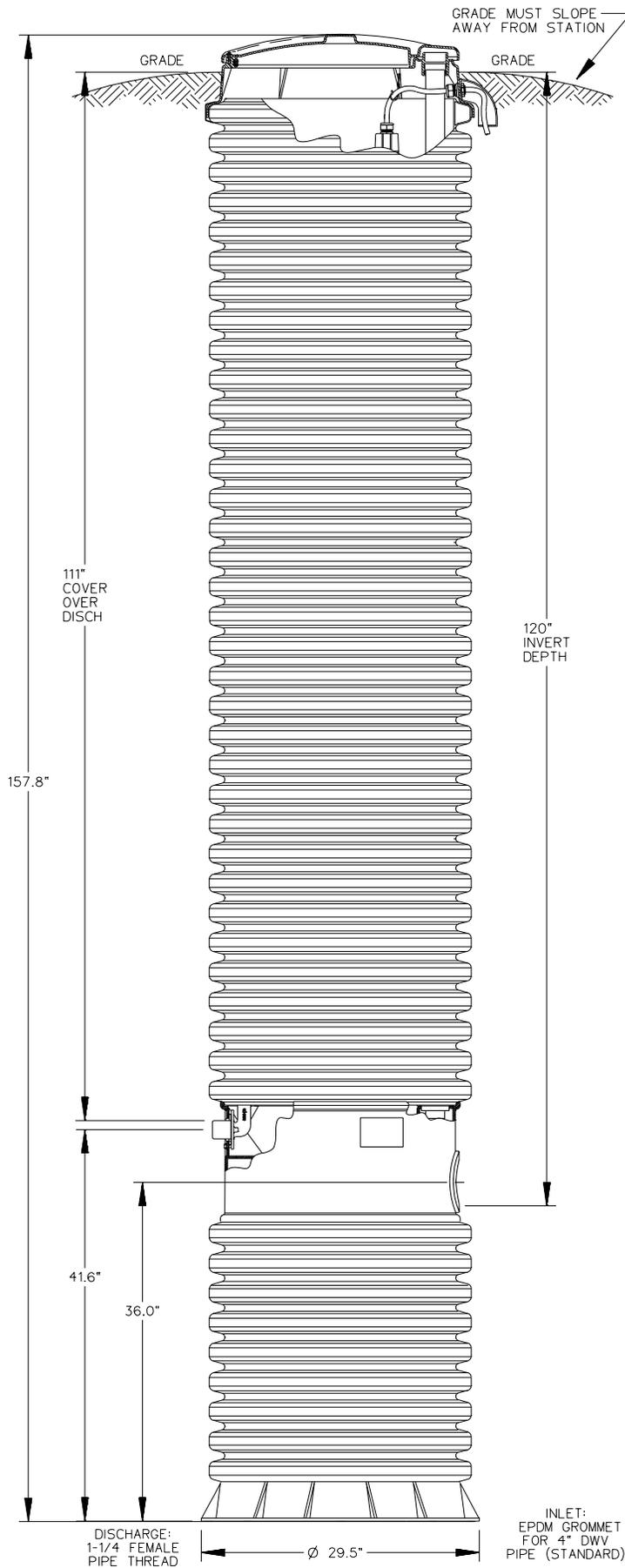
SGS	CAH	01/10/02	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL 2010-129

PA0856P07

# 2010-158



## BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL 2010-158 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS



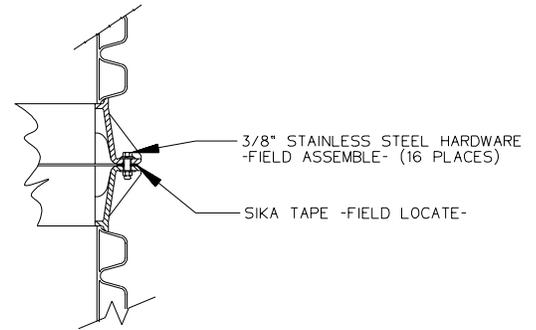
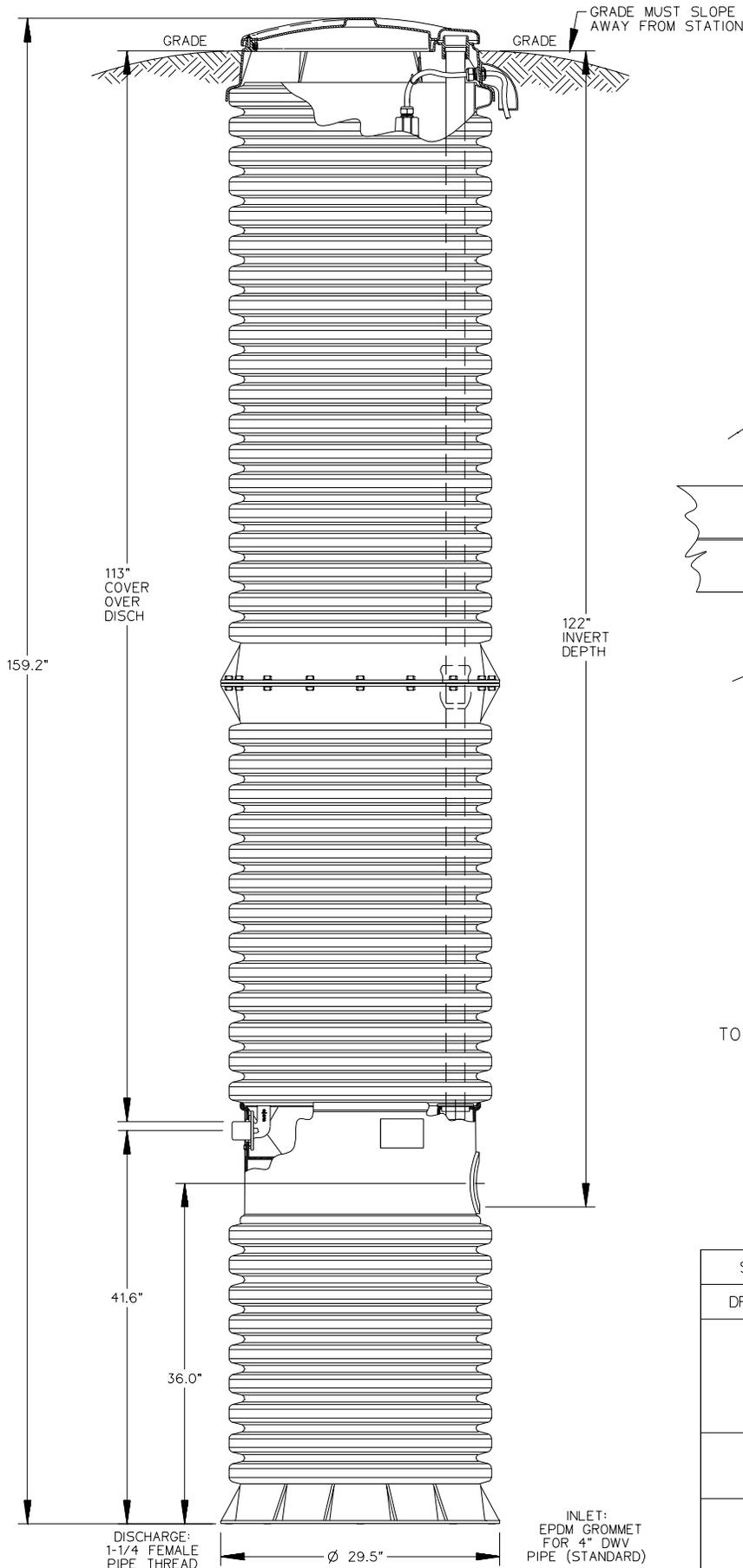
SGS	CAH	01/10/02	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL 2010-158

PA0856P08

# 2010-160



## DETAIL, FIELD JOINT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

## BALLAST REQUIREMENTS

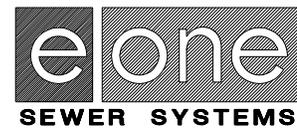
A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL 2010-160 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS



SG	CAH	01/10/02	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

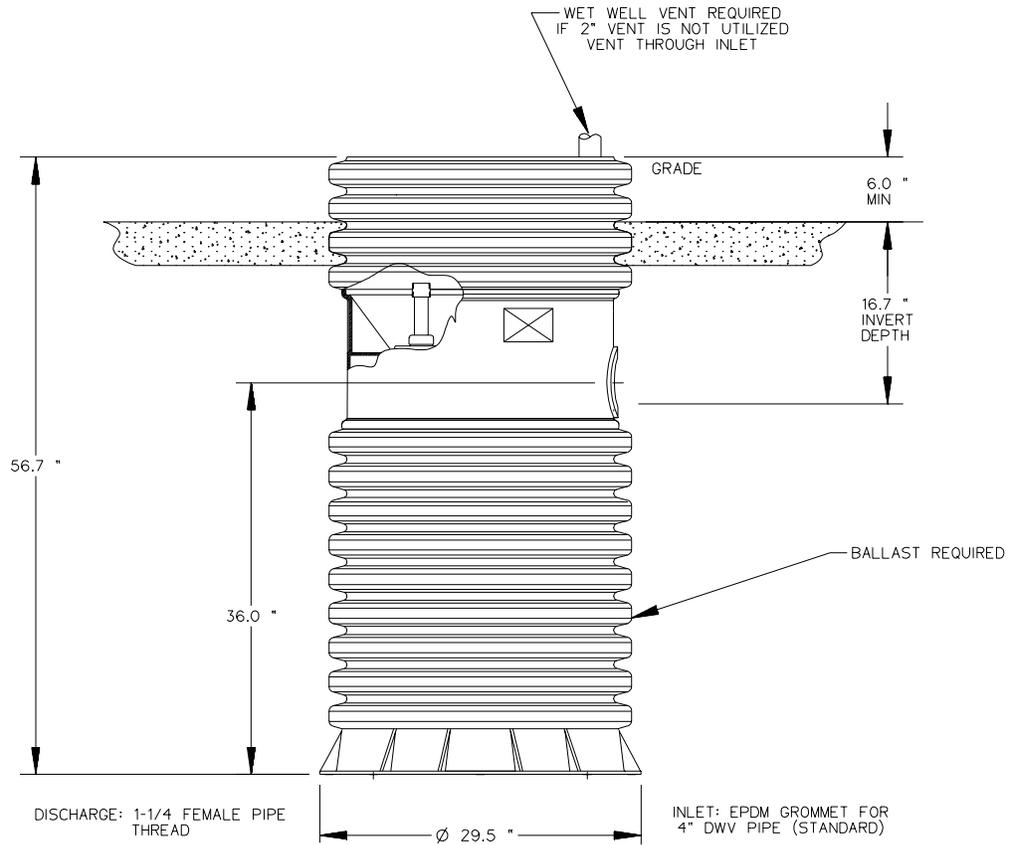


MODEL 2010-160

PA0856P09

# MODEL 2010-57 BUILDERS

STRAIGHT DISCHARGE



SG	GAE	08/23/96	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

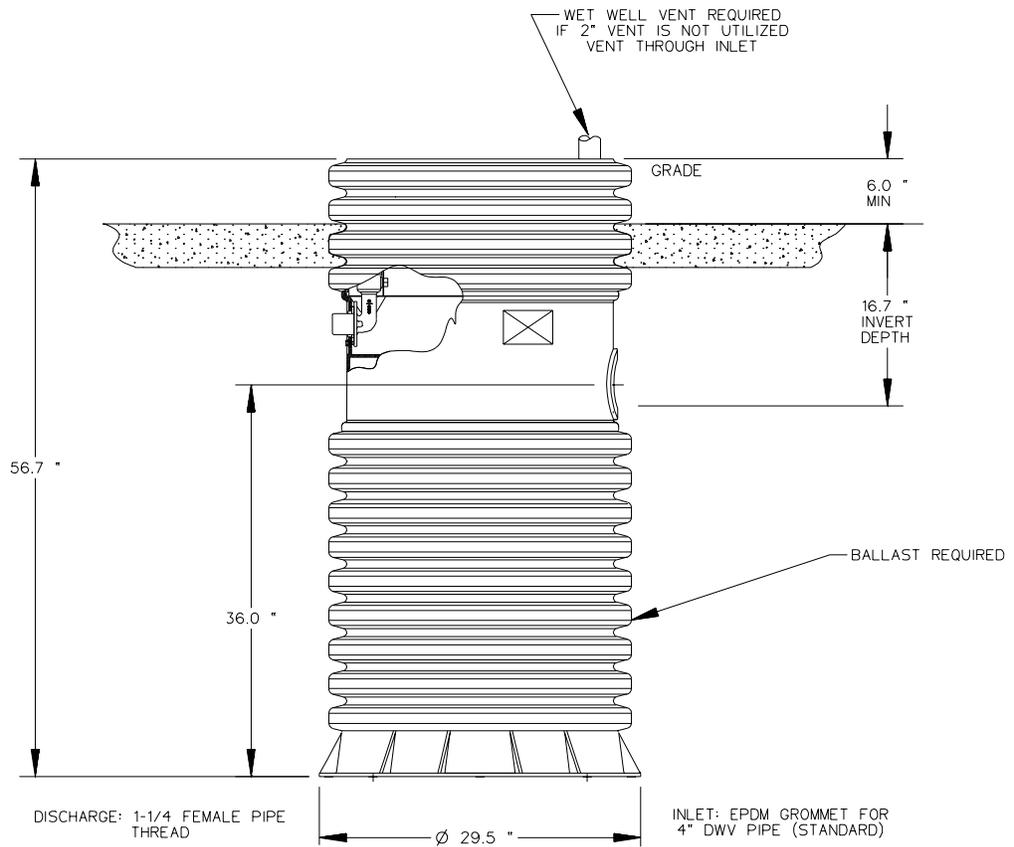


**MODEL 2010-57  
BUILDERS**

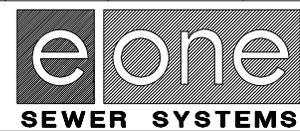
EWN 95-0061

# MODEL 2010-57 BUILDERS

DISCHARGE VALVE

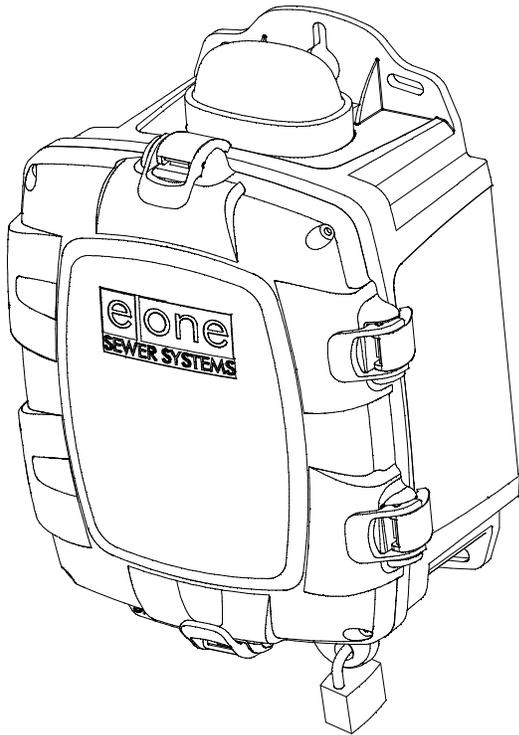


SG	GAE	08/23/96	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



**MODEL 2010-57  
BUILDERS**

EWN 95-0064



## **Typical Specifications**

### **E/One Sentry Alarm Panel**

## SECTION: ALARM PANEL

Each grinder pump station shall include a NEMA 4X, UL-listed Alarm Panel suitable for wall or pole mounting. The NEMA 4X enclosure shall be manufactured of thermoplastic polyester to ensure corrosion resistance. The enclosure shall include a hinged, lockable cover with padlock, preventing access to electrical components, and creating a secured safety front to allow access only to authorized personnel. The enclosure shall not exceed 10.5" W x 14" H x 7" D, or 12.5" W x 16" H x 7.5" D if certain options are included.

The Alarm Panel shall contain one (1) 15-amp, double-pole circuit breaker for the pump core's power circuit and one (1) 15-amp single-pole circuit breaker for the alarm circuit. The panel shall contain a push-to-run feature, an internal run indicator, and a complete alarm circuit. All circuit boards in the Alarm Panel are to be protected with a conformal coating and the AC power circuit shall include an auto resetting fuse.

The Alarm Panel shall include the following features: external audible and visual alarm; push-to-run switch; and redundant pump start with high level alarm capability. The alarm sequence is to be as follows:

1. When liquid level in the sewage wet-well rises above the alarm level, audible and visual alarms are activated, the contacts on the alarm pressure switch close, and the redundant pump starting system is energized.
2. The audible alarm may be silenced by means of the externally mounted, push-to-silence button.
3. Visual alarm remains illuminated until the sewage level in the wet-well drops below the "off" setting of the alarm pressure switch.

The visual alarm lamp shall be inside a red, oblong lens at least 3.75" L x 2.38" W x 1.5" H. Visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 4X rating. The audible alarm shall be externally mounted on the bottom of the enclosure, capable of 93 dB @ 2 feet. The audible alarm shall be capable of being deactivated by depressing a push-type switch that is encapsulated in a weatherproof silicone boot and mounted on the bottom of the enclosure (push-to-silence button).

The entire Alarm Panel, as manufactured and including any of the following options, shall be listed by Underwriters Laboratories, Inc.

**(OPTIONAL) Alarm Contacts – Note: Included with Optional PreSTAT Feature**

**Alarm Activated Dry Contacts** – Normally open relay contact closes upon alarm activation.

**Alarm Activated Contacts for Remote Indoor Alarm Module** – Will work with or without power to the alarm panel and is designed to work with E/One's Remote Sentry.

**Alarm Activated Remote Powered Terminal** – Normally open relay contact closes upon alarm activation supplying an output voltage which will be equal to the alarm circuit input supply voltage.

**(OPTIONAL) Generator Receptacle and Auto Transfer** – The Alarm Panel shall include a 20 amp, 250 VAC generator receptacle with a spring-loaded, gasketed cover suitably mounted to provide access for connection of an external generator while maintaining a 4X rating. An automatic transfer switch shall be provided, which automatically switches from AC power to generator power during a power outage. The alarm board power shall be

provided through the generator receptacle during a power outage. When AC power is restored, the panel is automatically switched back to the AC power mode.

**(OPTIONAL) Service Equipment/Main Service Disconnect Breaker** – A separate, internal breaker rated and approved for use as “service equipment” and acts as a main service disconnect of the grinder pump station shall be provided.

**(OPTIONAL) Remote Sentry Indoor Alarm Module** – A separate, remote indoor alarm module shall be provided to indicate a high level alarm with or without AC power to the grinder pump station. The Remote Sentry indoor alarm module shall have an internal power source enabling its continued operation without AC power. The Remote Sentry shall have an audible alarm and a visual alarm, both of which shall automatically reset if the high level alarm condition is eliminated. The Remote Sentry indoor alarm module shall include a Silence switch for the audible alarm and a Test switch.

**(OPTIONAL) Run-time/Hour Meter** – A run-time or hour meter to display the total run-time or operation time for the pump core shall be provided.

**(OPTIONAL) Event/Cycle Counter** – An event or cycle counter to display the number of operations of the pump core shall be provided.

**(OPTIONAL) PreSTAT Feature** – The Alarm Panel shall include a module providing the following features:

- Viewable real time data: volts, amps, run time
- Predictive Status or Trouble indication for unacceptable voltages or amperages, and Extended Run-time of pump core, providing advanced warning of pending service requirements
- Audible and visual high level alarm indication
- Field-adjustable high level alarm delay between zero and 10 minutes
- Alarm-activated dry contacts. Normally open relay contact closes upon alarm activation.
- Alarm-activated Remote Sentry indoor alarm module contacts. Will work with or without power to the board and is designed to work with E/One’s Remote Sentry.
- Alarm-activated remote powered terminal. Normally open relay contact closes upon alarm activation supplying an output voltage equal to the alarm circuit input supply voltage.
- 16-character, single row alpha numeric LCD
- Event/cycle counter
- Run-time/hour meter
- Power-up delay with low voltage/brown-out protection (optional)
- Communication capability utilizing built-in auto dialer. Features include: field-programmable reporting to two separate numbers; ability to recognize when the phone line is in use and retry until successful; report a Trouble or Alarm condition; and provide either a field-recorded voice message or tone signal

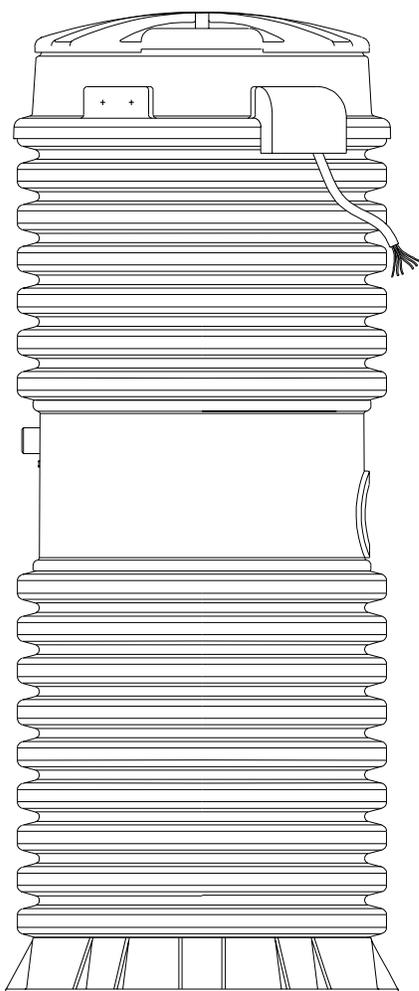
Specific indicators and switches shall include:

- Ready LED to indicate AC power to the station is satisfactory
- Pump Run LED to indicate pump is operating
- Trouble LED indicator
- High Level Alarm LED indicator
- Manual Run switch to manually activate pump
- Enter switch is used to enter selections
- Scroll switch for navigating through menus
- Normal Operation LED for Mode status
- Diagnostic LED’s to indicate the Mode switch has been activated



Environment One Corporation  
2773 Balltown Road  
Niskayuna, New York 12309

LM000335 Rev. A 3/06



# GP 2010

## TYPICAL INSTALLATION INSTRUCTIONS & WARRANTY INFORMATION

for use with Sentry Alarm Panels

# Environment One Grinder Pump Feature Identification

1. **GRINDER PUMP BASIN** – High density polyethylene (HDPE).
2. **ACCESSWAY COVER** – FRP
3. **ELECTRICAL QUICK DISCONNECT (EQD)** – Cable from pump core terminates here.
4. **POWER AND ALARM CABLE** – Circuits to be installed in accordance with local codes.
5. **ALARM PANEL** – NEMA 4X enclosure. Equipped with circuit breakers. Locate according to local codes.
6. **ALARM DEVICE** – Every installation is to have an alarm device to alert the homeowner of a potential malfunction. Visual devices should be placed in very conspicuous locations.
7. **INLET** – EPDM grommet (4.5" ID). For 4.5" OD DWV pipe.
8. **WET WELL VENT** – 2.0" tank vent, supplied by factory in units with accessways.
9. **GRAVITY SERVICE LINE** – 4" DWV, (4.5" OD). Supplied by others.
- 9a. **STUB-OUT** – 4" X 5' Long **watertight** stub-out, to be installed at time of burial unless the gravity service line is connected during installation. Supplied by others.
10. **DISCHARGE VALVE** – 1-1/4" Female pipe thread.
11. **DISCHARGE LINE** – 1-1/4" Nominal pipe size. Supplied by others.
12. **CONCRETE ANCHOR** – See Ballast Calculations for specific weight for station height. Supplied by others.
13. **BEDDING MATERIAL** – 6" minimum depth, round aggregate, (gravel). Supplied by others.
14. **FINISHED GRADE** – Grade line to be 1" to 4" below removable lid and slope away from the station.
15. **VENT** – Indoor installation. See section 6, Venting, on page 6.
16. **VALVE** – Full ported ball valve. Recommended option; for use during service operations. Supplied by others.
17. **CONDUIT** – 1" or 1-1/4", material and burial depth as required per national and local codes. Conduit must enter panel from bottom and be sealed per NEC section 300.5 & 300.7. Supplied by others.
18. **UNION** – 1-1/4" or compression type coupling. Supplied by others. (Do not use rubber sleeve and hose clamp type coupling.)
19. **VALVE** – Ball valve, must provide a full-ported 1-1/4" round passage when open. Supplied by others.
20. **REBAR** – Required to lift tank after ballast (concrete anchor) has been attached, 4 places, evenly spaced around tank.

Figure 1a

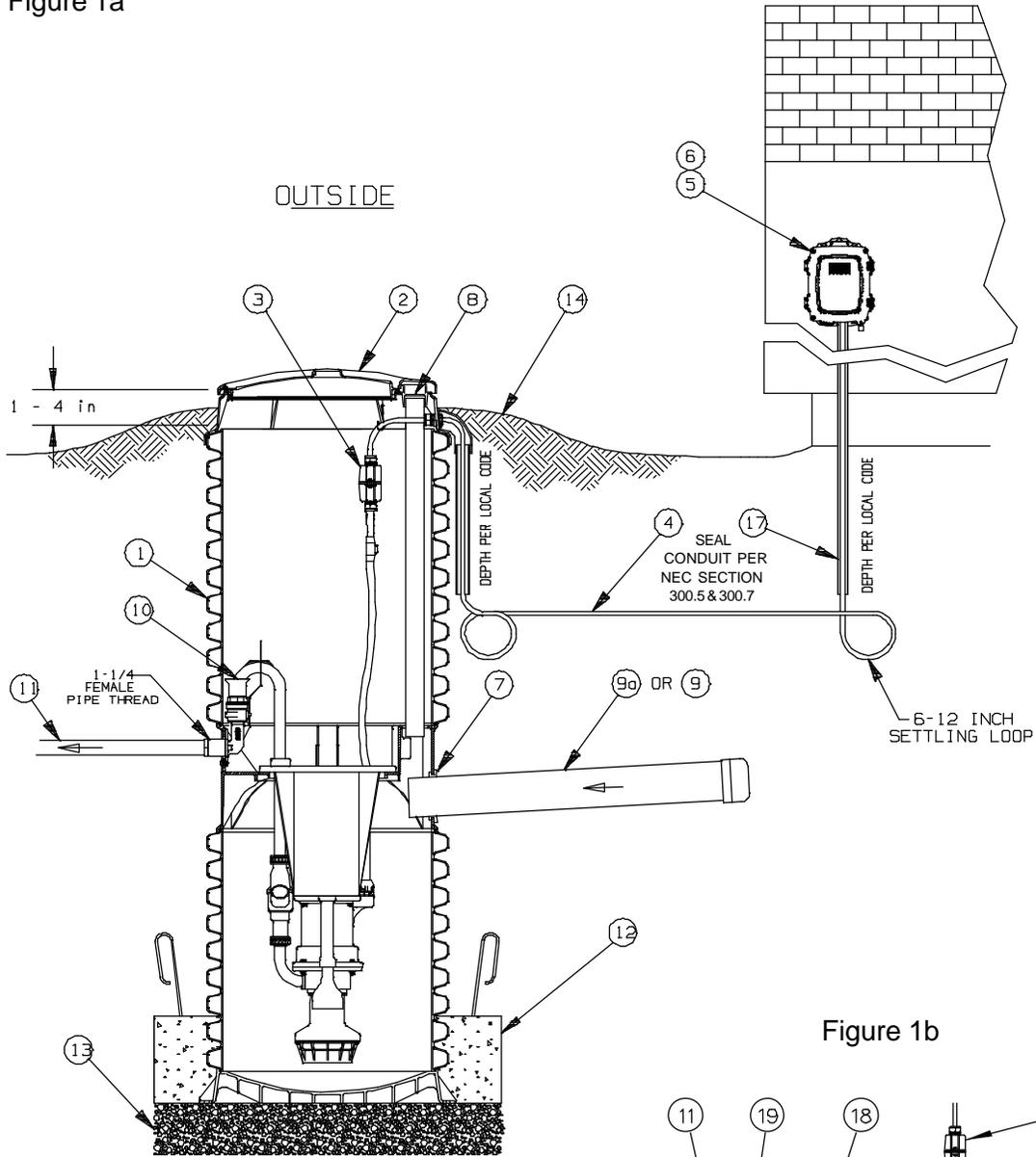
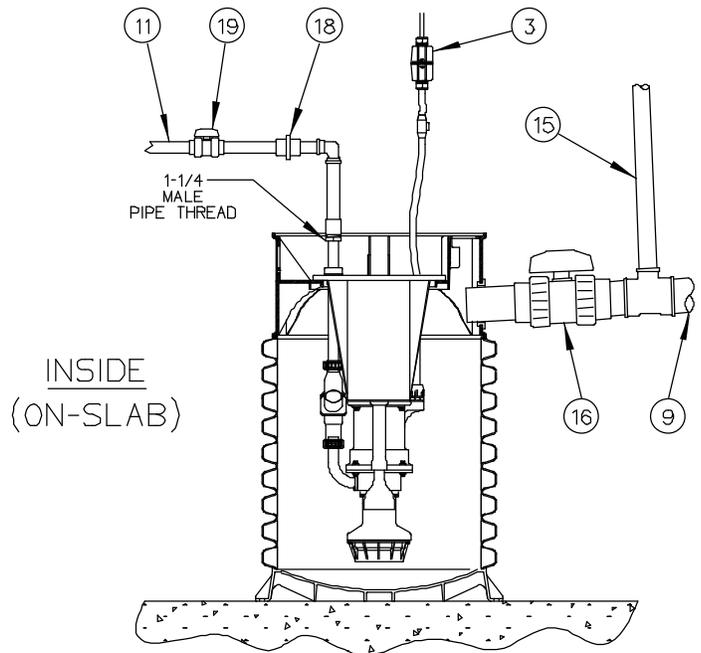


Figure 1b



**FAILURE TO COMPLY  
WITH INSTALLATION  
INSTRUCTIONS WILL  
VOID WARRANTY**

# Installation Instructions for Model 2010 Grinder Pump

The Environment One Grinder Pump is a well engineered, reliable and proven product: proper installation will assure years of trouble-free service. The following instructions define the recommended procedure for installing the Model 2010 Grinder Pump. These instructions cover the installation of units with and without accessways.

This is a sewage handling pump and must be vented in accordance with local plumbing codes. This pump is not to be installed in locations classified as hazardous in accordance with National Electric Code, ANSI / NFPA 70. All piping and electrical systems must be in compliance with applicable local and state codes.

## 1. REMOVE PACKING

**MATERIAL:** The User Instructions must be given to the home owner. Hardware supplied with the unit, if any, will be used at installation.

## 2. TANK INSTALLATION:

The tank is supplied with a standard grommet for connecting the 4" DWV (4.50" outside Dia.) incoming sewer drain. Other inlet types and sizes are optional (caution 4" DR-35 pipe is of smaller diameter and won't create a water tight joint with the standard grommet). Please confirm that you have the correct inlet before continuing. If a concrete ballast is attached to the tank lift only by the lifting eyes, (rebar) embedded in the concrete. **Do not drop, roll, or lay tank on its side. This will damage the unit and void the warranty.**

**If the tank has no accessway (Fig. 1b) (Indoor Installation):** The pump may be installed on or in the basement floor (see Fig. 1b). If the tank is to be set on the floor it must be a flat and level bearing surface. If the tank is to go into the basement floor, it must be anchored to prevent unit from floating due to high ground water (see Chart 1, page 12 for weight).

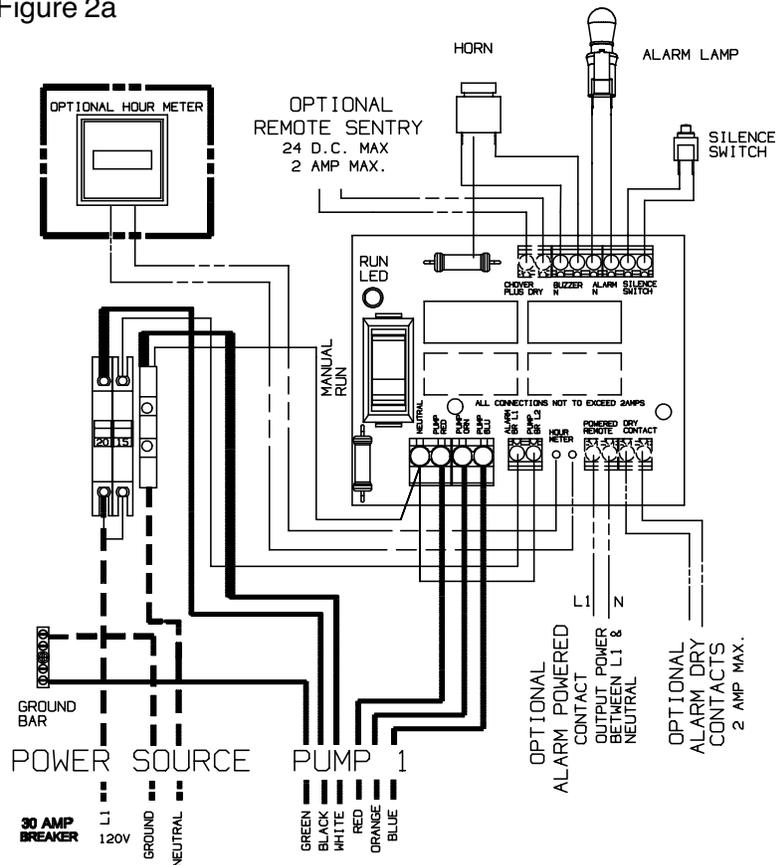
**If the tank is to go in the floor:** A hole of the correct width and depth should be excavated. The tank must be placed on a 6" bed of gravel made up of naturally rounded aggregate, clean and free flowing, with particle size not less than 1/8" or more than 3/4" in diameter.

The wet well should be leveled and filled with water prior to pouring the concrete to prevent the tank from shifting. If it's necessary to pour the concrete to a level above the inlet, the inlet must be sleeved with an 8" tube before pouring.

There must be a minimum clearance of three feet directly above the tank to allow for removal of the pump core.

**If the tank has an accessway (Fig. 1a):** Excavate a hole to a depth, so that the removable cover extends above the finished grade line. The grade should slope away from the unit. The diameter of the hole must be large enough to allow for a concrete anchor. Place the unit on a bed of

Figure 2a



## 120 VOLT WIRING

gravel, naturally rounded aggregate, clean and free flowing, with particles not less than 1/8" or more than 3/4" in diameter. The concrete anchor is not optional. (See Chart 1 on page 12 for specific requirements for your unit)

The unit should be leveled and the wet well filled with water to the bottom of the inlet to help prevent the unit from shifting while the concrete is being poured. The concrete must be vibrated to ensure there are no voids.

If it is necessary to pour the concrete to a higher level than the inlet, the inlet must be sleeved with an 8" tube before pouring.

If your unit is a model taller than 93" it may be shipped in

two sections, requiring field assembly. See Field Joint Assembly Instructions on page 8 for additional information.

### 3. INLET PIPE

**INSTALLATION:** Mark the inlet Pipe 3 1/2" from the end to be inserted. Inlet pipe should be chamfered and lubricated with a soap solution. Lubricate the inlet grommet with soap solution as well. Insert the pipe into the grommet up to the 3 1/2" mark. Inspect to ensure the grommet has remained intact and in place.

**4. DISCHARGE:** The use of 1-1/4" PVC pressure pipe Schedule 40 and polyethylene pipe SDR 11 or SDR 7 are recommended. If polyethylene is chosen use compression type fittings to provide a smooth

inner passage. It is recommended that a Redundant Check Valve Assembly (E/One part no. PC0051GXX) be installed between the pump discharge and the street main on all installations. Never use a ball type valve as a check valve. We recommend the valve be installed as close to the public right-of-way as possible. Check local codes for applicable requirements.

**CAUTION:** *Redundant check valves on station laterals and anti-siphon/check valve assemblies on grinder pump cores should not be used as system isolation valves during line tests.*

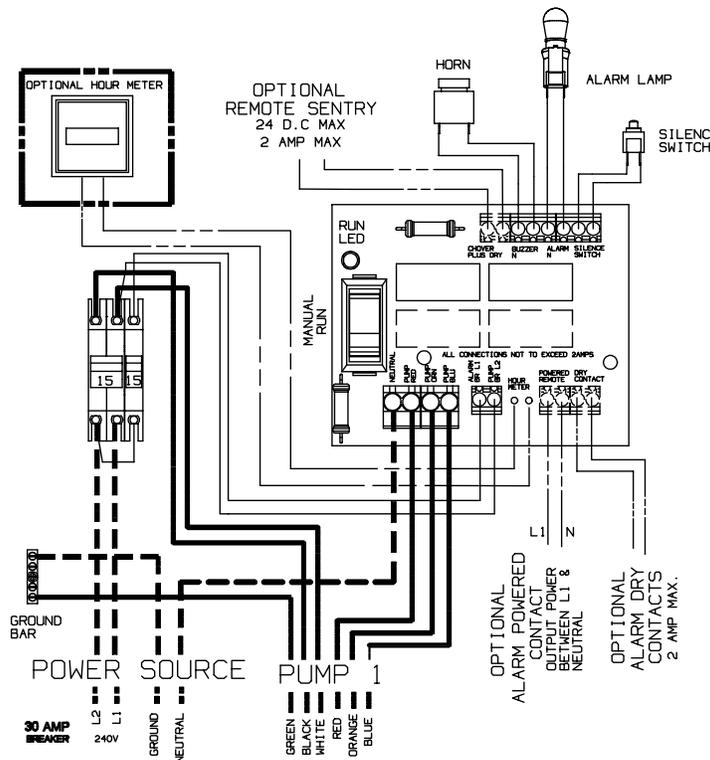
**If the tank has no accessway: (Indoor Installation)** The discharge connection is a 1-1/4" male NPT. The discharge piping must incorporate a shut-off valve and a union with a minimum pressure rating of 160 PSI, or a suitable piping disconnect to allow for removal of the pump core. The valve should be of the type that provides a full-ported passage (i.e. a ball or gate valve). A standard 1-1/4" union or a compression type coupling should be used as a disconnect joint.

**If the tank has an accessway:** There is a ball valve and a quick disconnect pre-installed in the accessway. There is a 1-1/4" female NPT discharge connection on the outside of the tank 41" above the bottom of the tank.

### 5. BACKFILL

**REQUIREMENTS:** Proper backfill is essential to the long term reliability of any underground structure. Several

Figure 2b



## 240 VOLT WIRING

methods of backfill are available to produce favorable results with different native soil conditions.

The most highly recommended method of backfilling is to surround the unit to grade using Class I or Class II backfill material as defined in ASTM 2321. Class 1A and Class 1B are recommended where frost heave is a concern, Class 1B is a better choice when the native soil is sand or if a high, fluctuating water table is expected. Class I, angular crushed stone offers an added benefit in that it needs minimal compaction. Class II, naturally rounded stone, may require more compactive effort, or tamping, to achieve the proper density.

If the native soil condition consist of clean compactible soil, with less than 12% fines, free of ice, rocks, roots, and organic material it may be an acceptable backfill. Such soil must be compacted in lifts not to exceed one foot to reach a final Proctor Density of between 85% and 90%. Non-compatible clays and silts are not suitable backfill for this or any underground structure such as inlet or discharge lines. If you are unsure of the consistency of the native soil it is recommended that a geotechnical evaluation of the material be obtained before specifying backfill.

Another option is the use of a flowable fill (i.e., low slump concrete). This is particularly attractive when installing grinder pump stations in augured holes where tight clearances make it difficult to assure proper backfilling and

compaction with dry materials. Flowable fills should not be dropped with more than four feet between the discharge nozzle and the bottom of the hole since this can cause separation of the constituent materials.

**6. VENTING:** The unit must be properly vented to assure correct operation of the pump. If you have an indoor unit it can be vented through the 2" port supplied at the top of the wet well or through the incoming sewer line with a 2" pipe (the vent must be within four feet of the grinder pump, and before the first change of direction fitting).

The outdoor units are supplied with a vent pipe from the wet well to the top of the accessway.

Failure to *properly vent* the tank will result in faulty operation and will void the warranty.

## 7. ELECTRICAL CONNECTION: (Supply panel to E/One Alarm Panel)

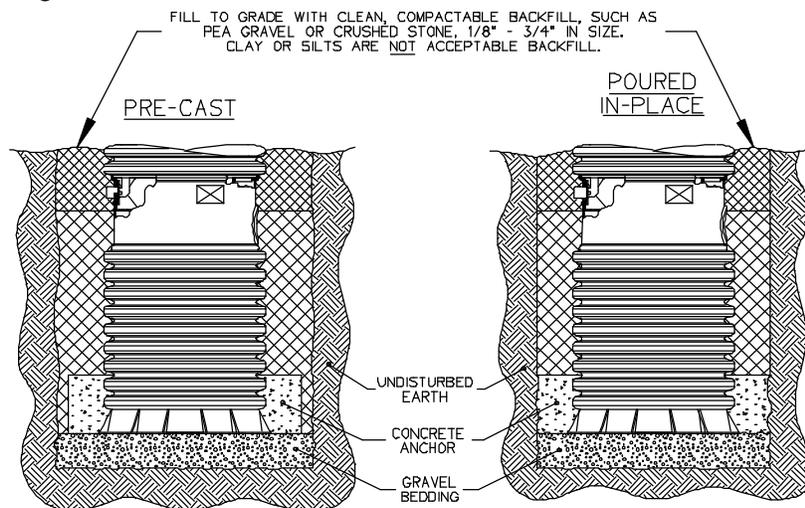
Before proceeding verify that the service voltage is the same as the motor voltage shown on the name plate. An alarm device is to be installed in a conspicuous location where it can be readily seen by the home owner. An alarm device is required on every installation. There shall be no exceptions.

Wiring of supply panel and Environment One Alarm Panel shall be per figures 2a and 2b, Alarm Panel wiring diagrams and local codes.

## 8. ELECTRICAL CONNECTION: (Pump to Panel) (Fig. 4)

The Environment One GP2000 grinder pump station is provided with a cable for connection between the station and the alarm panel, (The Supply Cable). The supply cable is shipped inside the station with a small portion fed

Figure 3



# TYPICAL IN-GROUND SECTION VIEW

through the cable connector mounted on the wall of the fiberglass shroud. The supply cable, a six conductor tray cable, meets NEC requirements for direct burial as long as a minimum of 24" burial depth is maintained. Those portions of the cable which have less than 24" of cover must be contained in suitable conduit. This includes the vertical portion dropping to a 24" depth at the station and the length rising out of the ground at the control panel.

*NOTE: Wiring must be installed per national and local codes. Conduit must enter panel from bottom and be sealed per NEC section 300.5 & 300.7.*

**8a. Procedure for installing E/One supply cable:**

1) Open the lid of the station, Locate the cable and the feed-thru connector on the wall of the shroud. If the station has a field joint and was delivered in

two pieces be sure the 2 halves of the EQD are securely assembled together. Loosen the nut on the connector and pull the supply cable out through the connector until it hits the crimped on stop feature on the cable, approximately 24" from the EQD. **\*\*IMPORTANT:** *All but 24" of the cable must be pulled out of the station, and the portion of the cable between the EQD and the molded in cable breather should be secured in the hook provided to ensure that the pump functions properly. Do not leave the excess cable in the station.*

2) Retighten the nut. This connection must be tight or ground water will enter the station.

3) Feed the wire through the length of conduit (contractor provided) which will protect it until it is below the 24" burial depth.

4) Position the conduit vertically below the cable

connector along side of the station reaching down into the burial depth. Attach the small fiberglass guard (protective shroud) provided with the station to protect the exposed cable where it enters the station. Four self tapping screws are provided.

5) Run the cable underground, in a trench or tunnel, to the location of the E/One panel. Leave a 6-12 inch loop of cable at each end to allow for shifting and settling. Connections made at the panel are shown in the panel wiring diagram (Fig. 2a and 2b).

**9. DEBRIS REMOVAL:** Prior to start-up test procedure, the core must be removed and the incoming sewer line flushed to force all miscellaneous debris into the tank. Next, all liquid and debris must be removed. Once tank is clean, re-install the pump and proceed with the test.

**10. TEST PROCEDURE:** When the system is complete and ready for use, the following steps should be taken to verify proper installation and operation:

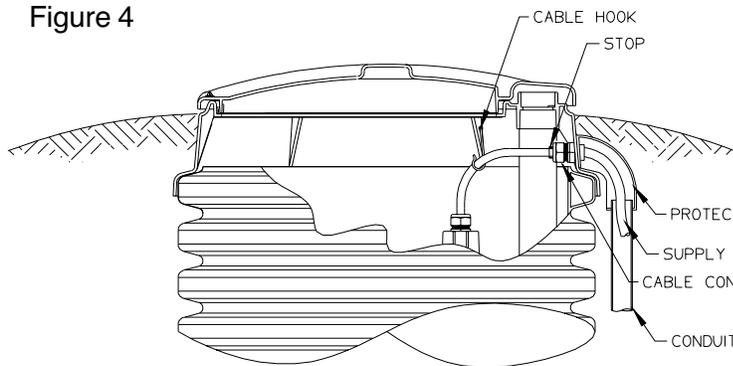
a) Make sure that the discharge shutoff valve is fully open. This valve must not be closed when the pump is operating. In some installations there may be a valve, or valves, at the street main that must also be open.

b) Turn ON the alarm power circuit breaker.

c) Fill tank with water until the alarm turns ON. Shut off water.

d) Turn ON pump power circuit breaker; the pump should turn on immediately. Within one minute the alarm will turn off. Within three minutes the pump will turn off.

Figure 4



Power at the station must not drop below 10% of nameplate voltage. Maximum Recommended Length:  
 120 Volt 60' (min. voltage at pump — 108V)  
 240 Volt 150' (min. voltage at pump — 216V)  
 Consult factory for longer lengths

**TYPICAL SUPPLY CABLE CONFIGURATION**

# Field Joint Assembly Instructions

IT IS EXTREMELY IMPORTANT THAT THE JOINT IS SEALED PROPERLY BEFORE BACKFILLING. EXCAVATING A UNIT FOR REPAIR IS VERY EXPENSIVE AND CAN BE EASILY AVOIDED BY USING PROPER CAUTION DURING THE FOLLOWING PROCEDURE.

Parts included in Field Joint Kit: Identify all parts before proceeding with installation.

- (16) 3/8-16 X 1-1/2 long screws
- (16) 3/8-16 Elastic Stop Nuts
- (32) Flat Washers
- (1) Length Sealant (Sika) Tape
- (1) Hole Punch
- (1) Vent Pipe Extension

1) Carefully clean and dry both accessway flanges with solvent. **IMPORTANT: Sealing surfaces must be dry to ensure the sealant adheres correctly.**

2) Starting at one hole of tank flange, apply two layers of Sika Tape around the inside half of the flange. Align the outside edge of the tape with the bolt circle. Move to the adjacent hole and apply one layer of Sika Tape around the outside of the flange. Align inside of tape with the bolt circle. Remove the backing paper as you lay the adhesive on the flange. **Do not stretch Sika tape during application, it may result in a leak.** The tape should overlap at the end by approximately 1/2 inch, as shown in Fig. 5a. If a section of Sika Tape is misapplied, the bad section may be cut out and replaced. Cut away the poorly laid portion cleanly with a knife and be sure to overlap the tape at each end about 1/2 inch.

3) Using the tool provided, punch a hole through the tape at each of the 16 existing bolt holes in the flange. **Be careful to keep the exposed sealant**

**clean and dry.**

4) Insert three of the sixteen 3/8-16 x 1-1/2" long bolts, with a flat washer, into the flange attached to the upper part of the accessway. These will act as guides while aligning the bolt pattern of the two flanges.

5) Support the upper accessway section a few inches over the tank with the green stripes on each lined up. Once aligned, lower the upper section onto the mating flange using the three bolts to guide it to the proper position. See Fig. 5b.

6) Insert the remaining 13 bolts with flat washers into the flanges. Place a flat washer and elastic stop nut on the end of each bolt, turning the nut on just enough to hold the washer in place.

7) Tighten up the bolts until the sealant begins to squeeze out from between the flanges. To ensure a consistent, sturdy seal tighten them in the following sequence: 1, 9; 5, 13; 3, 11; 7, 15; 2, 10; 4, 12; 6, 14; 8, 16. Always be sure to tighten

one bolt and then the bolt at the position 180° from it, see figure 1 for position numbers.

8) Using the same sequence as in step 7 tighten each bolt to 60 in-lbs. Visually inspect the joint, each bolt and each nut should have a flat washer between it and the flange, and a uniform amount of sealant should be protruding from the seam along the entire perimeter.

**In the event that there are any voids in the sealant, the joint may leak. Take corrective actions if necessary and be sure that the joint is leak free before continuing.**

9) Install the vent pipe extension piece which was shipped inside the upper piece of the accessway. Push the extension pipe into the bell mouth fitting on the pipe installed in the wet well tank. Be sure the pipe is seated correctly. Slide the top end of the extension pipe into the receptacle on the bottom of the lid.

Figure 5a

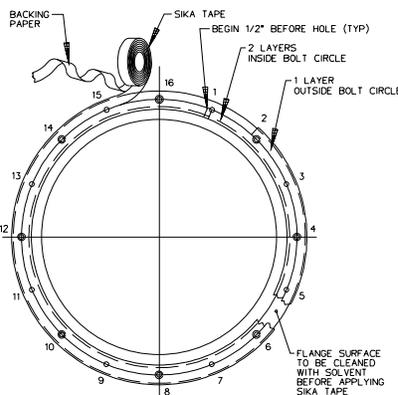
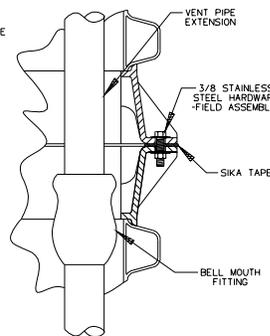


Figure 5b



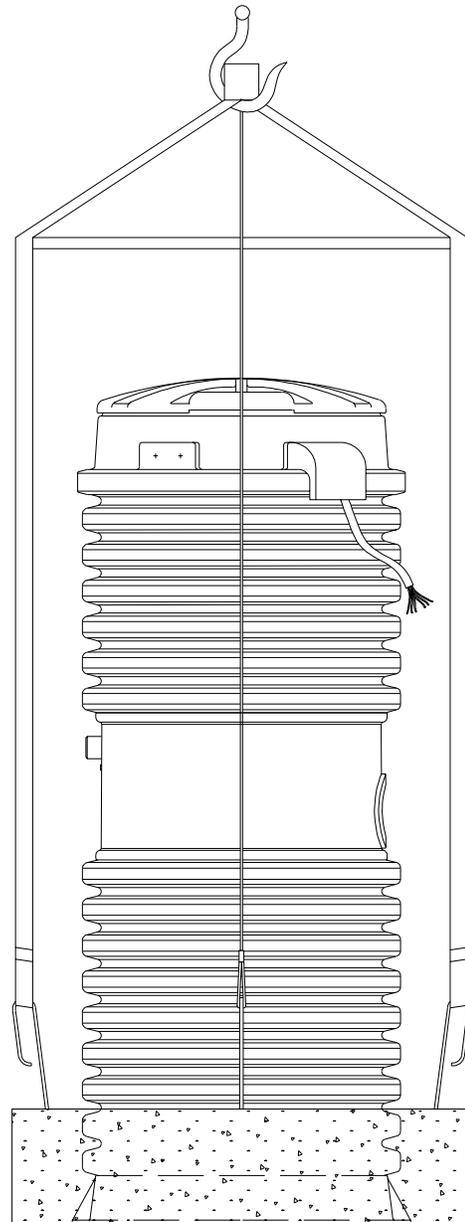
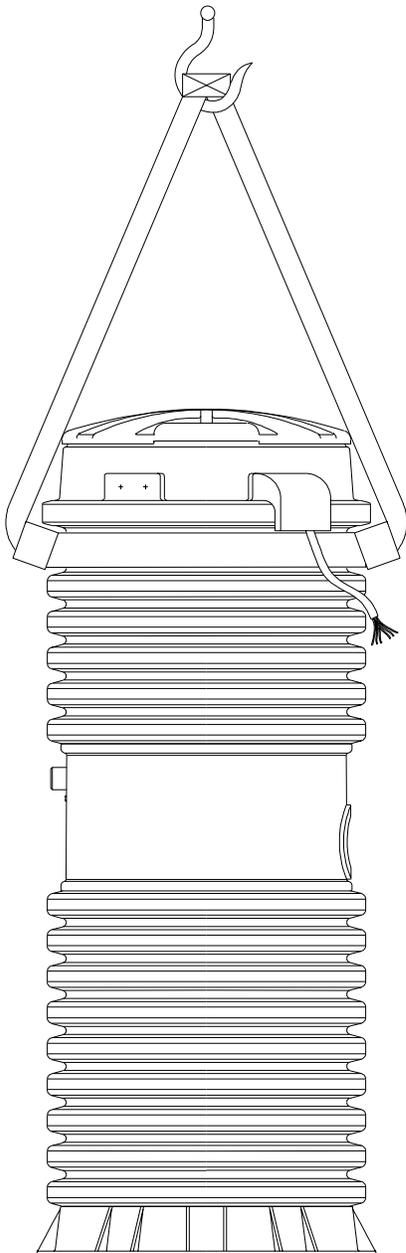
# Lifting Instructions

FAILURE TO FOLLOW THESE INSTRUCTIONS COMPLETELY WILL VOID THE WARRANTY.

1. Transporting unit to installation site: Always lift a unit from the bottom for the purpose of transportation. The station should be received attached to a pallet for this purpose. **Never roll a station or move it on its side.**

2. No Ballast (to be poured in place): If the concrete anchor is to be poured while the station is in place lift the unit using 2 nylon straps wrapped around the accessway making a sling, as shown below. Keep station oriented vertically to avoid any damage. Only lift from the accessway to put unit in hole, not for moving any distance.

3. Precast Ballast: Never lift a station that has a ballast attached by any means except the rebar. The weight of the concrete will damage the station if you attempt to lift it from any part of the station.



# **E/One Series 2000 Grinder Pump Station Ballast Calculations**

Any buried vessel that is submerged, or partially submerged, in water will be acted on by an upward buoyant force that attempts to return the vessel to a non-submerged state. The magnitude of this buoyant force is equal to the volume of the vessel that is submerged multiplied by the density of water. On most in-ground installations a ballast, or concrete anchor, of proper volume and weight is required to resist the buoyant force. The amount of ballast required for a given set of installation site conditions may be calculated as follows.

## **Installation Site Assumptions**

1. Low water table – under worst case ground water or flood conditions only the wet well portions of the E/One grinder pump stations will be submerged.
2. Backfill materials are per E/One Installation Instructions (Models 2010, 2012, 2014, 2015 & 2016).
3. The consulting engineer should perform a soil test to determine if the assumptions that have been made are valid for the specific installation site. If the site conditions differ from these assumptions, then the consulting engineer must revise the calculations as shown in this document.

## **Physical Constants**

1. Density of Water = 62.4 lb/cu ft
2. Density of Concrete = 150 lb/cu ft (in air)
3. Density of Concrete = 87.6 lb/cu ft (in water)
4. Density of Dry Compacted Backfill = 110 lb/cu ft
5. Density of Saturated Backfill = 70 lb/cu ft

## **Procedure**

### **A. Determine The Buoyant Force Exerted On The Station**

1. Determine the buoyant force that acts on the grinder pump station when the wet well is submerged in water.
2. Subtract the weight of the station from the buoyant force due to the submerged wet well to determine the net buoyant force acting on the station.

### **B. Determine The Ballast Force Exerted On The Station**

1. Determine the ballast force applied to the station from the concrete, saturated soil and dry soil.

### **C. Subtract The Ballast Force From the Buoyant Force.**

1. Note – if the installation site conditions are different from those listed above, the consulting engineer should recalculate the concrete ballast.

## **Ballast Calculations**

The following calculations are to outline the areas used to determine the volumes of the different materials for the ballast. All sections referred to in the calculations are marked on the accompanying drawing.

# E/One Series 2000 Grinder Pump Station Ballast Calculations

## Sample Calculation GP 2010-93 Station

Volume of Station Wet Well = 13.2 cu ft  
Station Weight = 270 lb  
Station Height = 91.8 in

### A. Buoyant Force

1. The buoyant force acting on the submerged GP 2010-93 is equal to the weight of the displaced water for the section of the tank that is submerged (wet well).

$$\begin{aligned}F_{\text{buoyant}} &= (\text{density of water})(\text{volume of 2010-93 wet well}) \\ &= (62.4 \text{ lb/cu. ft})(13.2 \text{ cu. ft}) \\ &= 823.7 \text{ lb}\end{aligned}$$

2. The net buoyant force acting on the station ( $F_{\text{net-buoyant}}$ ) is equal to the buoyant force ( $F_{\text{buoyant}}$ ) minus the weight of the grinder pump station.

$$\begin{aligned}F_{\text{net-buoyant}} &= 823.7 \text{ lb} - 270 \text{ lb} \\ &= 553.7 \text{ lb}\end{aligned}$$

### B. Ballast Force

1. Determine the volume of concrete (if applicable) & soil (saturated and dry)

#### Section I: Used To Determine The Volume Of Concrete

$$\begin{aligned}\text{Area} &= (\text{Height})(\text{Width}) \\ &= (10'')[(36'' - 26.4'')/2] \\ &= 48\text{in}^2\end{aligned}$$

$$\begin{aligned}\text{Volume} &= (\text{Area})(\text{Average Perimeter of the cylinder}) \\ &= (48\text{in}^2)(\pi)((36'' + 26.4'')/2) \\ &= (4704.8 \text{ in}^3)(1/1728 \text{ ft}^3/\text{in}^3) \\ &= 2.7 \text{ ft}^3\end{aligned}$$

#### Section II: Used To Determine The Volume Of Saturated Soil

$$\begin{aligned}\text{Area} &= (\text{Height})(\text{Width}) \\ &= (28.5'')[(36'' - 26.4'')/2] \\ &= 136.8\text{in}^2\end{aligned}$$

$$\begin{aligned}\text{Volume} &= (\text{Area})(\text{Average Perimeter of the cylinder}) \\ &= (136.8\text{in}^2)(\pi)((36'' + 26.4'')/2) \\ &= (13408.8\text{in}^3)(1/1728 \text{ ft}^3/\text{in}^3) \\ &= 7.8 \text{ ft}^3\end{aligned}$$

## E/One Series 2000 Grinder Pump Station Ballast Calculations

### Sample Calculation GP 2010-93 Station Continued

Section III: Used To Determine The Volume Of Dry Soil

$$\begin{aligned} \text{Area} &= (\text{Height})(\text{Width}) \\ &= (50.3\text{in})[(36\text{in} - 26.4\text{in})/2] \\ &= 241.4\text{in}^2 \end{aligned}$$

$$\begin{aligned} \text{Volume} &= (\text{Area})(\text{Average Perimeter of the cylinder}) \\ &= (241.4\text{in}^2)(\pi)((36'' + 26.4'')/2) \\ &= (23661.5 \text{ in}^3)(1/1728 \text{ ft}^3/\text{in}^3) \\ &= 13.7 \text{ ft}^3 \end{aligned}$$

2. Determine the combined ballast

Ballast (total) = Ballast (concrete) + Ballast (saturated soil) + Ballast (dry soil)

$$\begin{aligned} &= (V_{\text{concrete}})(\text{density concrete in water}) + (V_{\text{soil}})(\text{density wet soil}) + (V_{\text{soil}})(\text{density dry soil}) \\ &= (2.7 \text{ cu ft})(87.6 \text{ lb/ft}^3) + (7.8 \text{ cu ft})(70 \text{ lb/ft}^3) + (13.7 \text{ cu ft})(110 \text{ lb/ft}^3) \\ &= 236.5 \text{ lb} + 546.0 \text{ lb} + 1507.0 \text{ lb} \\ &= 2289.5 \text{ lb} \end{aligned}$$

C. Subtract the buoyant force from the ballast force to determine the final condition

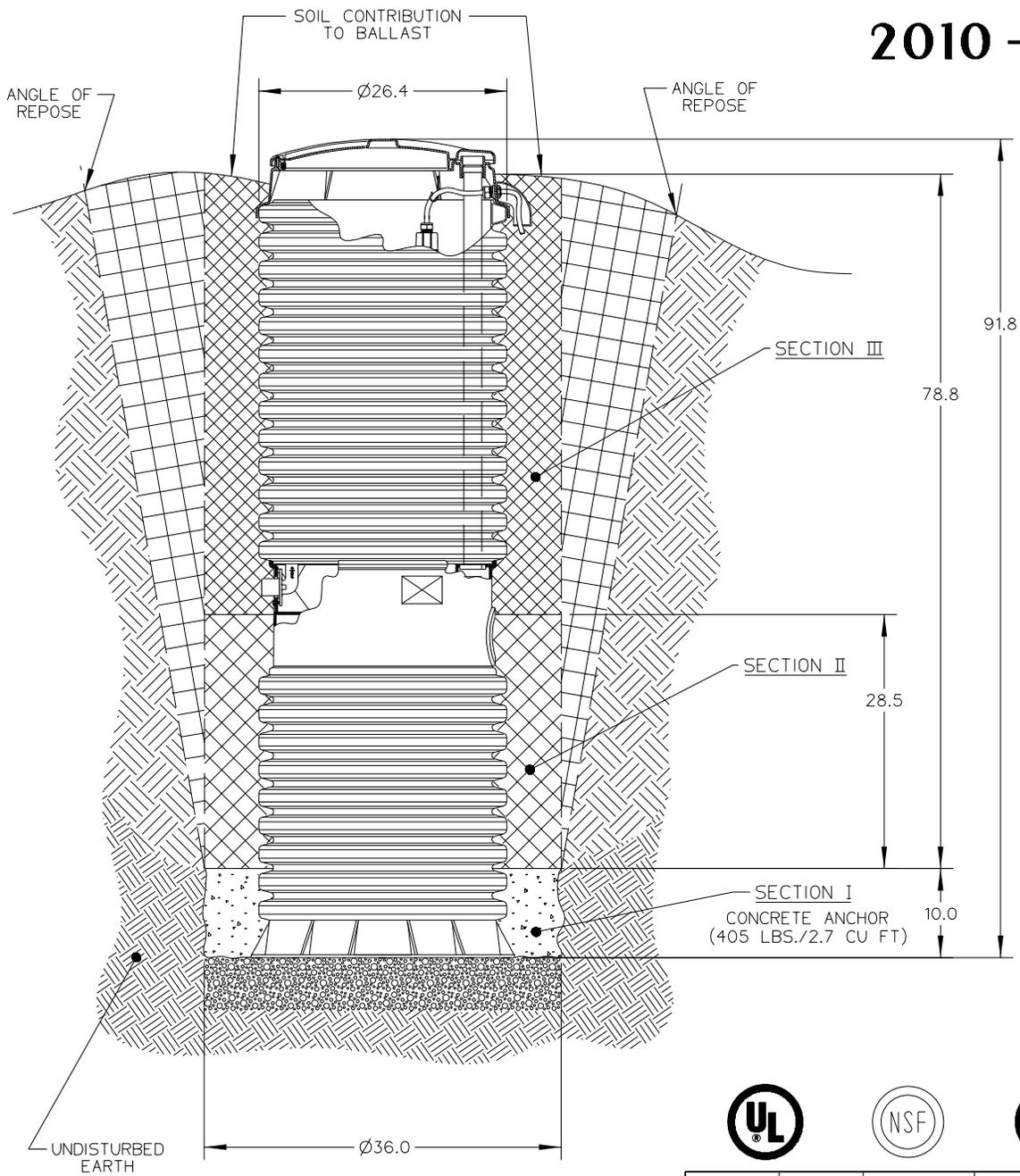
$$\begin{aligned} \text{Final Condition} &= \text{Ballast Force} - \text{Buoyant Force} \\ &= 2289.5 \text{ lb} - 553.7 \text{ lb} \\ &= 1735.8 \text{ lb} \end{aligned}$$

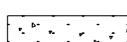
The approach outlined above may be used to calculate the ballast requirements listed below.

GP Model	Wet Well Volume (cu ft)	FNet-Buoyant (lb)	Station Weight (lb)	Fballast (lb)	Volume Concrete (cu ft)	Weight Concrete in Air (lb)
2010-61	13.2	582.7	241	1332.5	2.7	405
2010-74	13.2	569.7	254	1717.5	2.7	405
2010-93	13.2	553.7	270	2289.5	2.7	405
2010-124	13.2	543.7	280	3213.5	2.7	405
2010-129	13.2	523.7	300	3367.5	2.7	405
2010-158	13.2	498.7	325	4236.5	2.7	405
2010-160	13.2	494.7	329	4291.5	2.7	405

**Chart 1**

2010-93



-  SECTION III - DRY SOIL (ACCESS WAY)
-  SECTION II - SATURATED SOIL (WET WELL)
-  SECTION I - CONCRETE ANCHOR
-  ROUND AGGREGATE (GRAVEL)



DRL	-	10/22/01	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



BALLAST INFORMATION  
2010 SERIES

# Adjusting the Height of a 2000 Series Grinder Pump Station

## REMOVE EXISTING COVER ASSEMBLY (Fig. 6)

If your existing station has a welded-on cover shroud you will need the appropriate replacement cover kit (see Table 2, page 15).

1. Turn off all power to the grinder pump station.
2. Remove the tank lid and the electrical shroud.
3. Unplug the electrical quick disconnect (EQD) and remove the EQD from the supply cable. *Note: DO NOT CUT CABLE.* Loosen liquid tight cable connector and pull the supply cable out through the connector on the side of tank.
4. Tape the pump breather cable to the vent pipe in the tank.

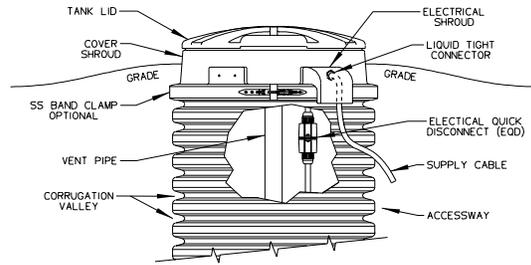


Figure 6

5. Remove the soil around the tank, exposing three of the tank corrugations below grade. Use caution not to damage buried cable.
6. Remove existing cover shroud.

6a. Welded-on shroud (standard) - Using a hand saw, cut the tank in the valley between the two corrugations at grade, discard existing welded-on shroud and attached corrugations (*shroud is not to be reused*). *Caution: Be careful not to cut either the vent pipe or the pump breather cable.*

6b. Clamped-on shroud - Remove band clamp and cover shroud.

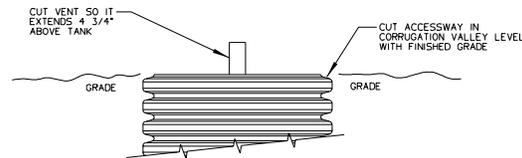


Figure 7

## REDUCING STATION HEIGHT (Fig. 7)

7. Using a hand saw, cut the tank in the valley between the two corrugations at grade.
8. Cut vent pipe 4 3/4" above the cut made on the tank. *Proceed to step 16.*

## INCREASING STATION HEIGHT (Fig. 8 and Fig. 9)

9. Remove the soil around the tank exposing it 18" deeper than the extension being installed. For example, if you have a 2' extension (not including the coupler) you must dig down 3'6" minimum from grade; if you have a 4' extension (not including the coupler) you must dig down 5'6" minimum from grade. Use caution not to damage buried cable.

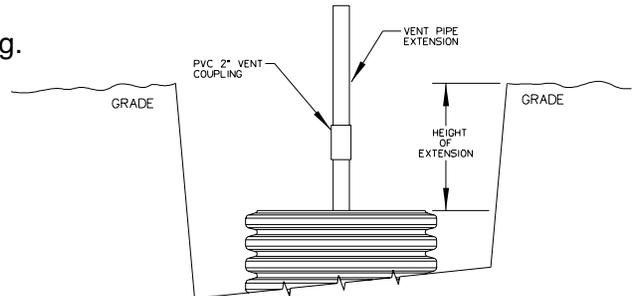


Figure 8

10. Measure from grade down 2' (for a 2' extension) or 4' (for a 4' extension) and mark accessway. Using a hand saw, cut the tank in the valley between the two corrugations that are closest to your mark. *Note: Make sure the welded-on shroud of the extension will be at grade level. Be sure you are not cutting into the wet well and you must have two corrugations below your cut, if there are less than two corrugations, this extension kit can not be used.*

*Caution: Be careful not to cut either the vent pipe or the pump breather cable.*

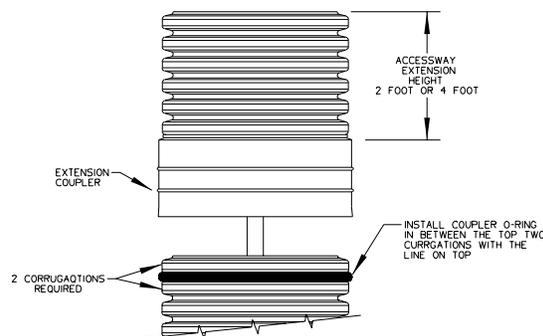


Figure 9

11. Attach the vent pipe extension with the 2" vent coupler, bringing the vent well above grade.
12. Clean all dirt and debris from top four corrugations on tank. Install the 24" coupler O-ring on the tank between the top two corrugations with the white or yellow line facing out and on top.
13. Lube extension coupler and coupler O-ring with pipe lube or dish soap.
14. Manually press coupling evenly over lubricated O-ring. If additional force is needed, place a plywood cover over the accessway and apply gentle mechanical pressure to the coupler. *Note: Care must be used when pushing down on the coupler. Excessive force or impact may result in damage and leakage.*
15. Frequent visual inspections during installation must be performed to determine when the tank has fully engaged the coupler.

**INSTALL REPLACEMENT COVER ASSEMBLY (Fig. 10)**

16. Clean top corrugation on accessway extension and mating surface of replacement shroud with acetone.
17. Liberally apply the silicone sealer provided to the under side of the replacement shroud where it will come in contact with the accessway extension.
18. Lube wet well vent grommet and vent pipe extension with pipe lube, non-grit hand cleaner or dish soap and slide vent pipe through grommet until tank shroud seats to accessway.
19. Place SS band clamp around top corrugation and the replacement shroud. Tap with a mallet around clamp to help seat the clamp. Torque stud assembly on band clamp to a maximum 125 inlb.
20. Reinstall the supply cable, EQD\*\*, tank lid and electrical shroud and tighten cable connector. (\*\*See "EQD wiring order," Table 1)
21. Follow start-up procedures to ensure proper pump operation (you will find the start-up instructions in our service manual or the station installation instruction guide).

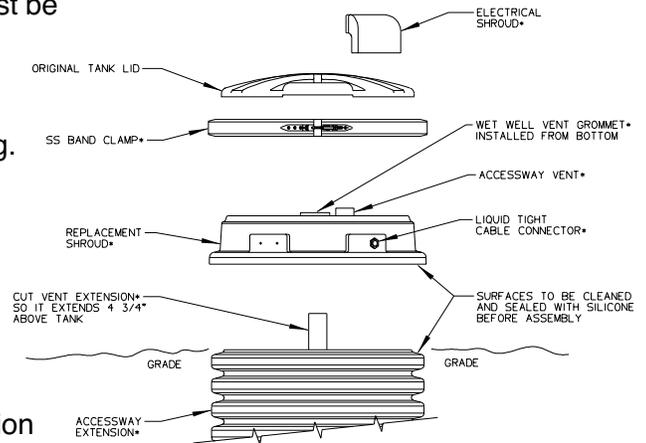


Figure 10

20. Reinstall the supply cable, EQD\*\*, tank lid and electrical shroud and tighten cable connector. (\*\*See "EQD wiring order," Table 1)

**\*\*EQD wiring order**

PIN #	COLOR
1	Red
2	Black
3	White
4	Green
5	Orange
6	Blue

Table 1

Table 2

DESCRIPTION	PART NO.
Simplex station	PC0569G15
Simplex, flood plain config	PC0569G16
Duplex station	PC0569G17
Duplex, flood plain config	PC0569G18

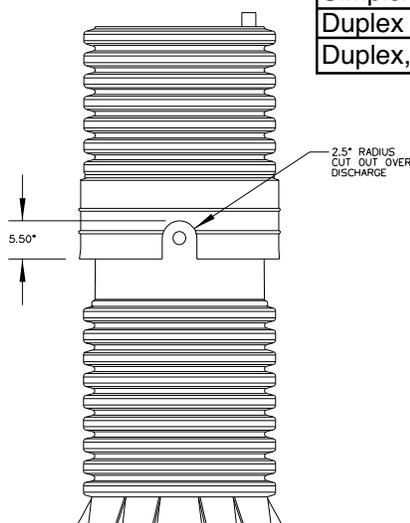


Figure 11

**NOTE: IF EXISTING ACCESSWAY HAS ONLY 2 CORRUGATIONS (Fig. 11)**

- If the coupler will not engage completely because the discharge piping is in the way, and it doesn't have a cut out, you will need to cut a slot in the coupler.

- Using a hand, reciprocating or hole saw, cut an arch in the coupler; the cut-out is not to exceed 5.50" tall or 5.00" wide.

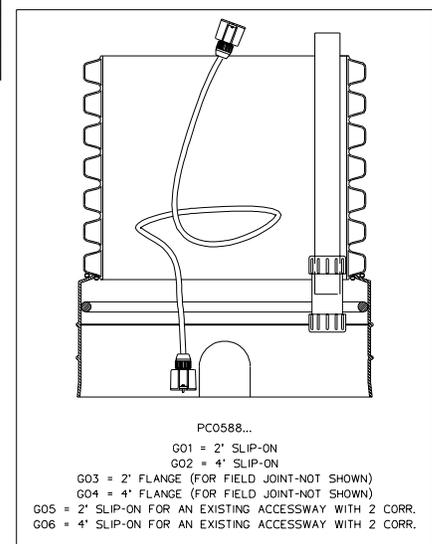


Figure 12







*A Precision Castparts Company*

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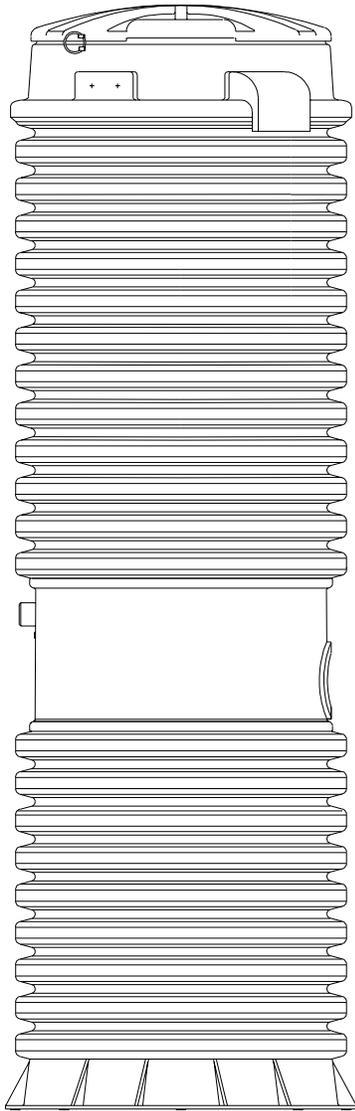
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[www.eone.com](http://www.eone.com)

PA1339P01 Rev H  
1/06

# User Instructions for the Environment One Grinder Pump



## General Information

In order to provide you with suitable wastewater disposal, your home is served by a low pressure sewer system. The key element in this system is an Environment One grinder pump. The tank collects all solid materials and effluent from the house. The solid materials are then ground to a small size suitable for pumping as a slurry with the effluent water. The grinder pump generates sufficient pressure to pump this slurry from your home to the wastewater treatment receiving line and/or disposal plant.

Congratulations on your Environment One grinder pump investment. With proper care and by following a few guidelines, your grinder pump will give you years of dependable service.

## Care and Use of your Grinder Pump

The Environment One grinder pump is capable of accepting and pumping a wide range of materials. Regulatory agencies advise that the following items should not be introduced into any sewer, either directly or through a kitchen waste disposal unit:

Glass	Diapers, socks, rags or cloth
Metal	Plastic objects (toys, utensils, etc.)
Seafood shells	Sanitary napkins or tampons
Goldfish stone	Kitty litter

In addition, you must **never** introduce into any sewer:

Explosives	Strong chemicals
Flammable material	Gasoline
Lubricating oil and/or grease	

## Periods of Disuse

If your home or building is left unoccupied for longer than a couple of weeks, perform the following procedure:

**Purge the System.** Run clean water into the unit until the pump activates. Immediately turn off the water and allow the grinder pump to run until it shuts off automatically.

**Duplex Units.** Special attention must be taken to ensure that both pumps turn on when clean water is added to the tank.

**Caution: Do not disconnect power to the unit**

## Power Failure

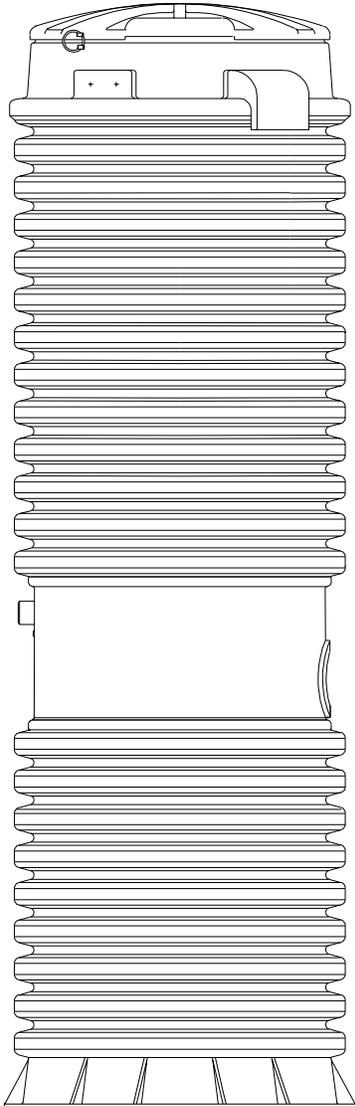
Your grinder pump cannot dispose of wastewater without electrical power. If electrical power service is interrupted, keep water usage to a minimum.

## Pump Failure Alarm

Your Environment One grinder pump has been manufactured to produce an alarm signal (120 volt) in the event of a high water level in the basin. The installer must see that the alarm signal provided is connected to an audible and/or visual alarm in such a manner as to provide adequate warning to the user that service is required. During the interim prior to the arrival of an authorized service technician, water usage must be limited to the reserve capacity of the tank.

**For service, please call your local distributor:**





# Limited Warranty

1000 Series, 2000 Series, AMGP

Environment One Corporation offers a limited warranty that guarantees its product to be free from defects in material and factory workmanship for a period of two years from the date of installation, or 27 months from the date of shipment, whichever occurs first, provided the product is properly installed, serviced and operated under normal conditions and according to manufacturer's instructions. Repair or parts replacement required as a result of such defect will be made free of charge during this period upon return of the defective parts or equipment to the manufacturer or its nearest authorized service center.

Model Number: \_\_\_\_\_

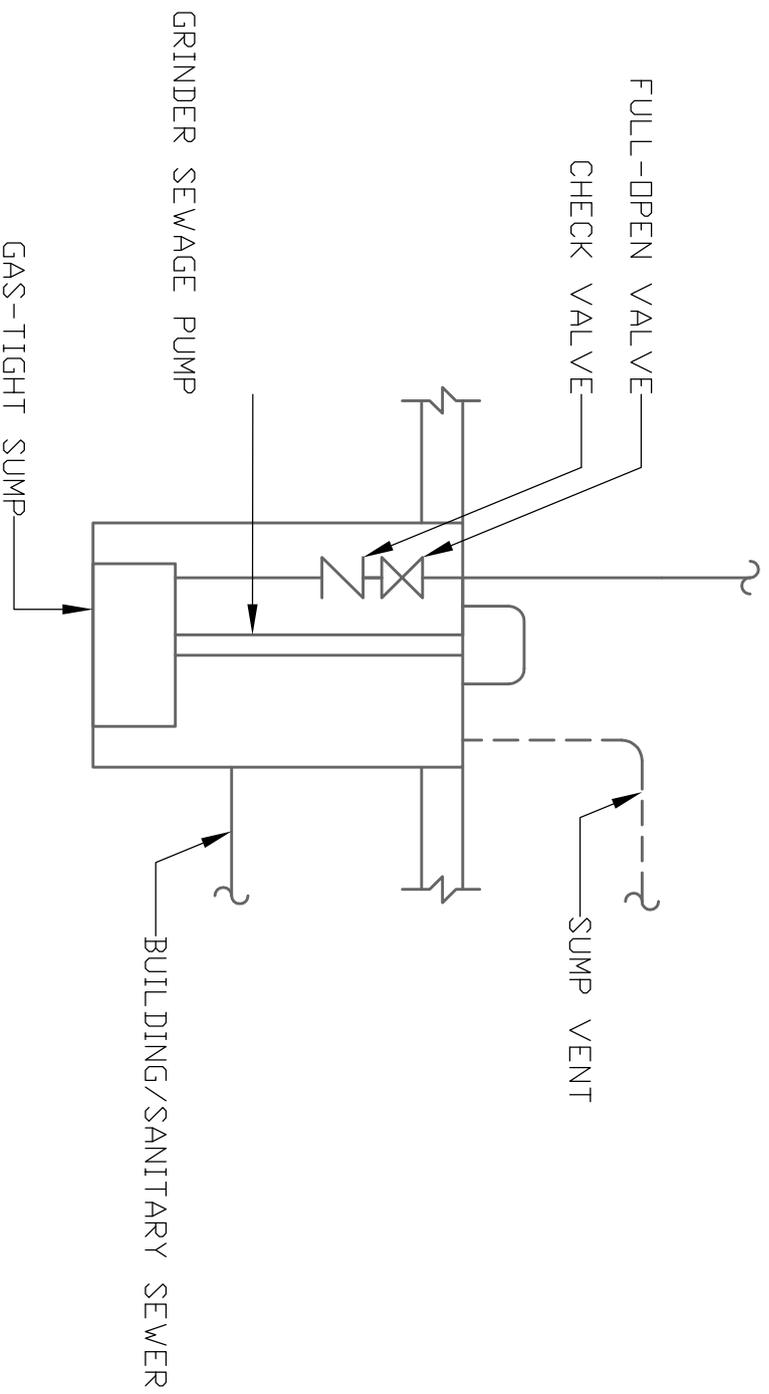
Serial Number: \_\_\_\_\_

Installation Date: \_\_\_\_\_



SEWER SYSTEMS

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**TITLE: HOUSE SERVICE  
RISER GRINDER PUMP**

**PROJECT:** 06-0052 DAUPHIN BOROUGH  
INFILTRATION & INFLOW IMPROVEMENTS

**FIGURE: 25 OF 25      DATE: 10/5/2006      DRAWN: KDC**

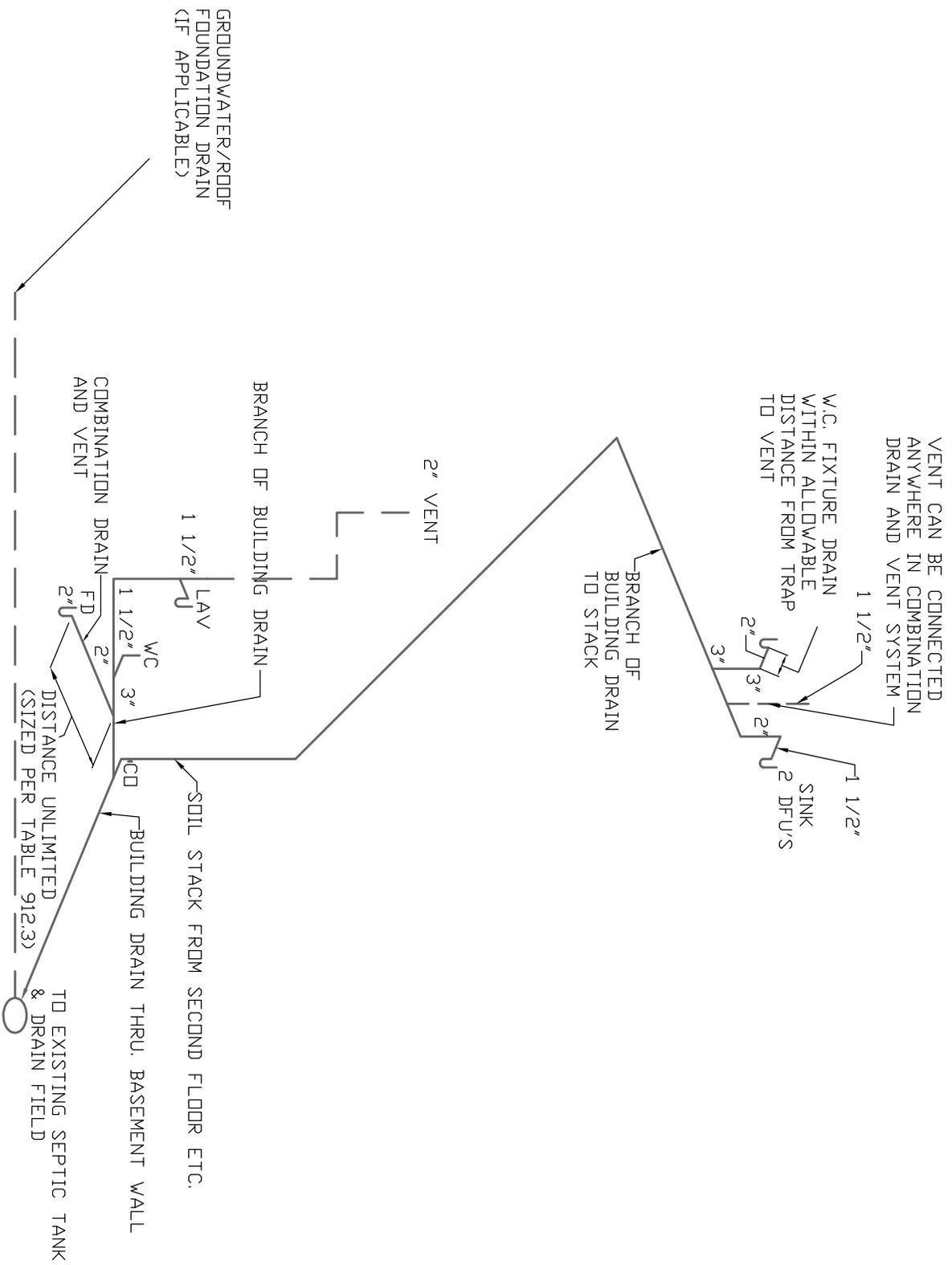


Palmyra, PA  
West Lawn, PA  
Halifax, PA  
Lancaster, PA  
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**LIGHT-HEIGEL & ASSOCIATES, INC.**

**ENGINEERS AND SURVEYORS**

MONTGOMERY COUNTY BRANCH OFFICE  
1700 DEKALB PIKE  
BLUE BELL, PENNSYLVANIA 19422  
610.279.1830



**TITLE:** HOUSE SERVICE RISER EXISTING

**PROJECT:** 06-0052 DAUPHIN BOROUGH INFILTRATION & INFLOW IMPROVEMENTS

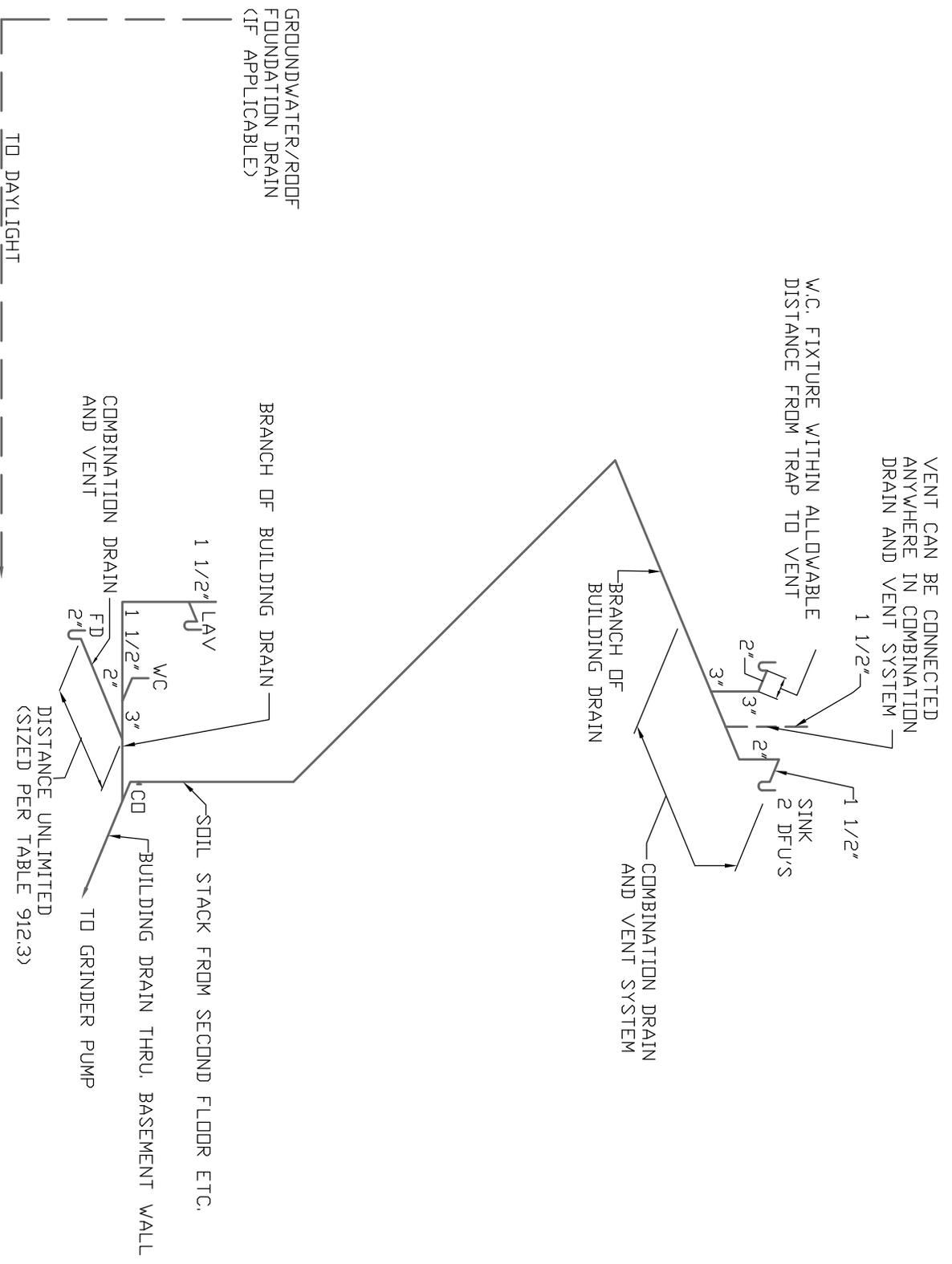
**FIGURE:** 23 OF 25 **DATE:** 10/5/2006 **DRAWN:** KDC



Palmyra, PA  
West Lawn, PA  
Haltix, PA  
Lancaster, PA  
Lewisburg, PA  
Schuylkill Haven, PA

**LIGHT-HEGEL & ASSOCIATES, INC.**

**ENGINEERS AND SURVEYORS**  
MONTGOMERY COUNTY BRANCH OFFICE  
1700 DEKALB PIKE  
BLUE BELL, PENNSYLVANIA 19422  
610.279.1830



**TITLE: HOUSE SERVICE RISER PROPOSED**

**PROJECT:** 06-0052 DAUPHIN BOROUGH INFILTRATION & INFLOW IMPROVEMENTS

**FIGURE: 24 OF 25 DATE: 10/5/2006 DRAWN: KDC**



Palmyra, PA  
West Lawn, PA  
Hellfax, PA  
Lancaster, PA  
Lewisburg, PA  
Schuylkill Haven, PA

**LIGHT-HEGEL & ASSOCIATES, INC.**

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