

# **ON-SITE SEWAGE DISPOSAL SYSTEMS**

## **Pressurized Distribution Self-Installer's Manual**



Linn County Environmental Health Program  
(541) 967-3821

# ON-SITE SEWAGE DISPOSAL SYSTEMS

## Pre-permit Site Work

To ensure that the environmental quality of Linn County is protected and to prevent the spread of disease caused by improper sewage disposal, the Linn County Environmental Health Program must approve all proposed sewage disposal systems. To obtain this approval, the following steps are required.

1. An Environmental Health Specialist from the Linn County Environmental Health Program must evaluate the site of the proposed installation. An applicant must submit a detailed plot plan showing the locations of all existing structures, drainageways, water supplies, and proposed building and sewage disposal areas. The site evaluation or permit fee must be submitted with the application.
2. One or more test pits must be provided in the area of the proposed drainfield. (At the time of application, you should receive a Fact Sheet containing specifics on test pits and setback information.)

The Environmental Health Specialist will evaluate the site including soil conditions, depth to seasonal saturation, slope, and water supply location. If the inspection indicates that your site is adequate for a sewage disposal system, you will be sent an approval notification or a pre-permit plan packet showing the approved disposal area, type of system approved, and system specifications.

## Permit

Once Environmental Health staff issue the pre-permit plan packet, the system must be staked-out according to the required specifications, and, based on the stakeout, you or your installer must complete all the necessary paper work. Then submit the completed plans to our office for review and approval (see the Pressurized Plan Checklist to make sure that you have all the required paperwork). We may make a field visit to inspect the stakeout. Once we approve the plans, we will issue the permit to install the system.

**The installation of the system must conform exactly to the submitted plans unless you obtain specific approval from our office to make changes.**

## Installation

A sewage disposal system may be installed either by the owner of the property or a licensed, bonded sewage disposal service (installer). A list of local licensed and bonded installers is available from the Environmental Health Program Office.

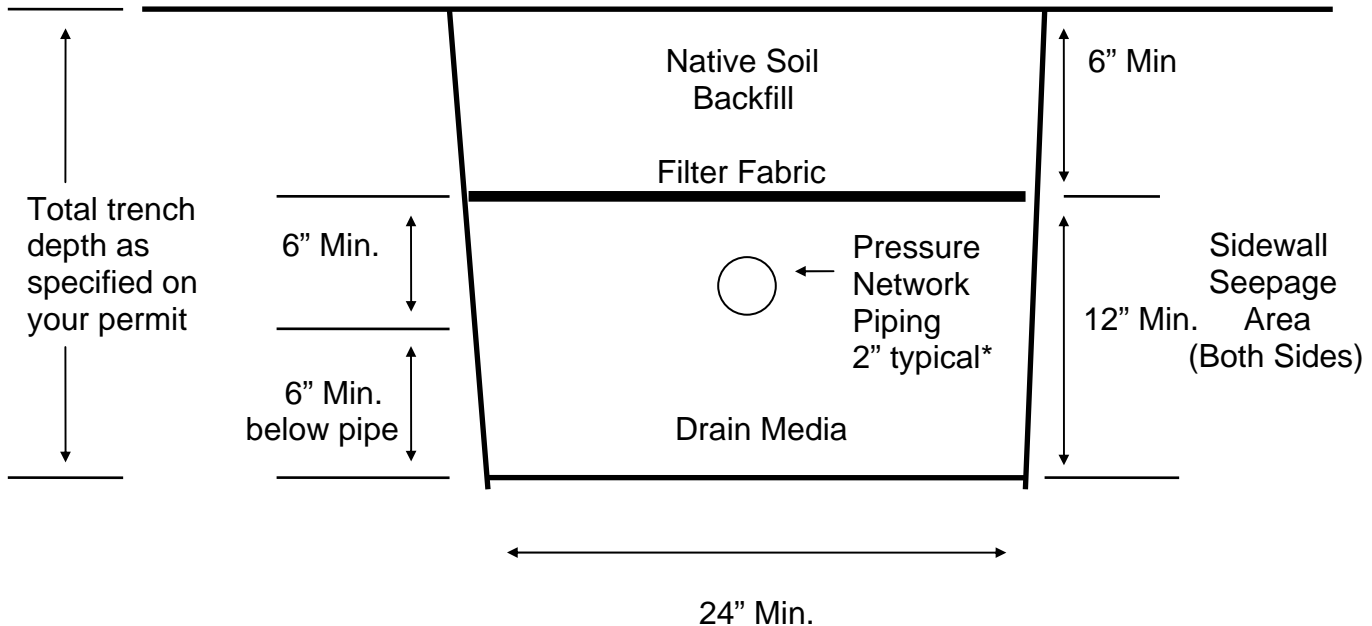
If you are an owner installing your own system, before we can issue the permit to install the system, we will try to arrange a meeting with you to review the stakeout. This will provide an opportunity to discuss construction materials and techniques, and will help to ensure a trouble-free installation. During the actual construction, you are encouraged to call us if you have problems or questions.

You must use a septic tank that has been approved by the Department of Environmental Quality. Commercially manufactured septic tanks constructed of concrete, coated steel, and fiberglass are available (polyethylene tanks are not approved for use in a pressurized distribution system). Each septic tank (and dosing tank, if used) must be fitted with a watertight riser and lid. The riser must extend to the ground surface or above. You must test the tanks and the riser seam for watertightness in a manner specified by the tank manufacturer. This is commonly done by blocking the inlet and outlet of the tank, filling the tank with water into the riser to a height not to exceed 2 inches above the top surface of the tank, and marking the water level. **Note: A single compartment dosing septic tank may not be used in a pressurized distribution system unless the tank is partitioned with a flow through below the tank's lowest liquid level.**

The following guidelines apply to all pressurized distribution sewage disposal systems:

1. The septic tank and pressure transport pipe must be at least 5 feet from the foundation line of the house or any other building, 5 feet from any property line, 50 feet from any well, river, stream, or lake, and 10 feet from any water line. The disposal trenches must be at least 10 feet from the foundation line of the house or any other building, 100 feet from any well, and 10 feet from property lines. Disposal trenches must be sited at least 100 feet from rivers, streams, and lakes for most systems.
2. The bottom of the disposal trenches and the pipe in the trenches must be level throughout each trench. The orifice holes must be 1/8" in diameter, facing up and evenly spaced not more than 24" apart. The ends of the laterals must have long sweep elbows to bring the end of the pipe to ground surface. The ends of the pipe must be provided with threaded plugs or other devices to allow for the access and flushing of the laterals. **Tip:** Open the ends of the lines and flush all debris from the laterals before performing the squirt test, as any debris left in the pipe will block the orifices. Once an Environmental Health Specialist from our office has performed the squirt test, place the orifice shields and just enough drainrock to cover the shields.
3. There must be at least 5 feet of pressure transport pipe between the septic tank and the disposal trenches. A minimum 18-gauge green-jacketed tracer wire must be placed above the pressure transport piping.
4. For approval, you must demonstrate at least 5 feet of head at the most remote orifice and no more than a 10 percent variation in squirt height between the nearest and most remote orifice in the laterals. **Tip:** To achieve even distribution of pressure throughout the drainfield, feed the lines from the center of the laterals rather than from the ends, and avoid over-drilling the orifices.
5. Contact the Linn County Planning and Building Department for plumbing requirements between the building and the septic tank. (967-3816 or 1-800-319-3816)
6. Disposal trenches must be spaced 10 feet apart on center (minimum) unless otherwise specified on your permit.

## DISPOSAL TRENCH CROSS SECTION



### Approved Drain Media for Oregon

- Rock: 3/4" - 2 1/2" **Washed** River or Crushed Rock
- Plastic Chambers: Infiltrator Systems Inc. Equalizer<sup>®</sup> 24 Chambers\*\* or Quick 4 Chambers
- ADS Biodiffuser<sup>™</sup> Bio 2 Chamber\*\*
- Other: E-Z Drain Co. EZ Flow (expanded polystyrene aggregate)\*\*

### Drain Media Protection

- Filter Fabric

### Pressure Piping

- 2" pressure piping\*

\*See list of acceptable pipe materials at end of pamphlet.

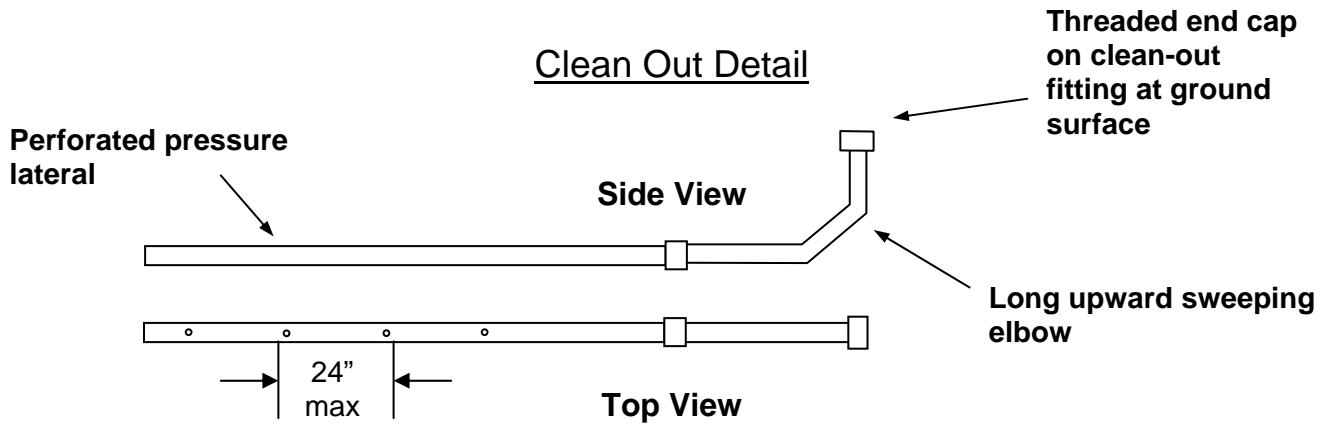
\*\*See manufacturers installation manual for detailed instructions on the installation of a pressurized distribution system using their specific product.

# TYPICAL PRESSURIZED DISTRIBUTION SYSTEM

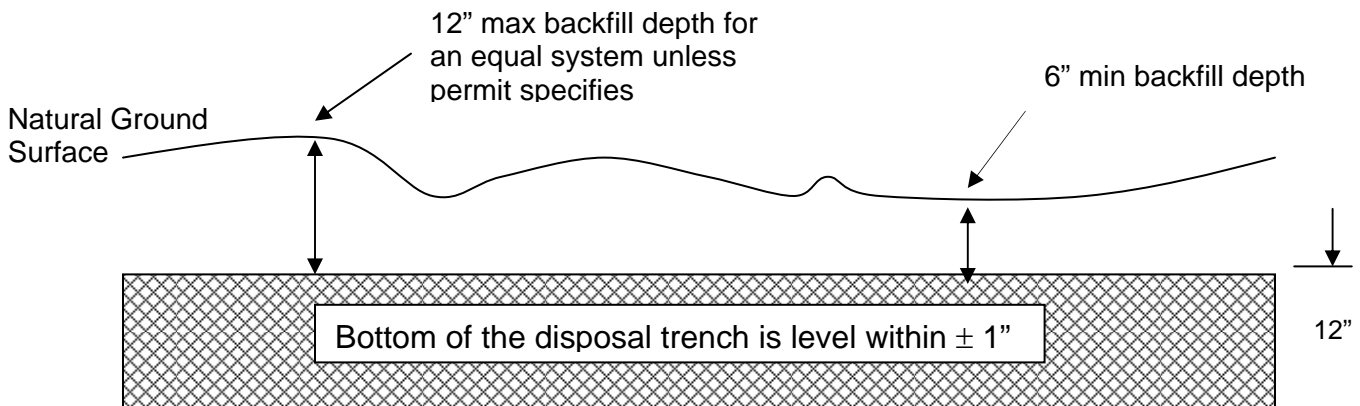
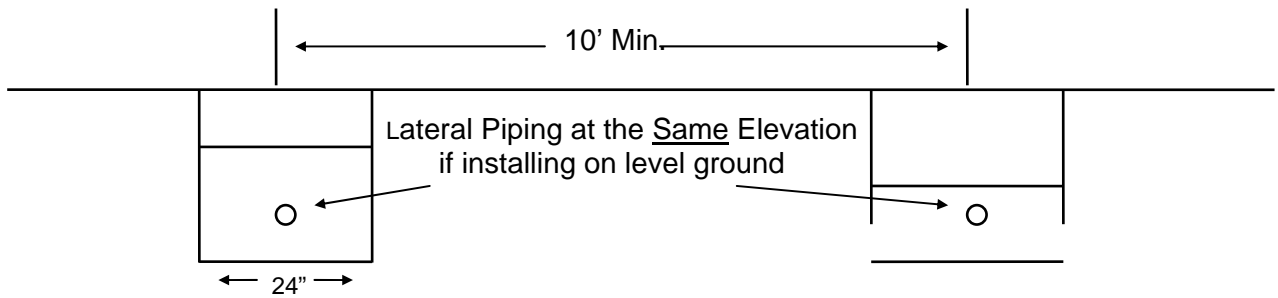
(Generally used on level ground)



## Clean Out Detail



## Cross-section



## Final Inspection

After the system has been completed, and prior to backfilling, an Environmental Health Specialist from our office must perform a final inspection to check the location and construction of the system. When you request the final inspection, you must submit the “as-built” form certifying that the installation of the system conformed to the approved plans. This form is provided with the permit. We will not perform an inspection until we have a copy of the as-built. The septic and dosing tanks (if used) must be demonstrated to be watertight before approval is granted. Once the system is approved and we have received the **original** as-built, we will issue a Certificate of Satisfactory Completion.

A reinspection fee will be required if the system is not ready for inspection when we arrive.

Inspection of the sewer line between the building and the septic tank will be done by the Building Department. You must request this inspection as well. (967-3816 or 1-800-319-3816)

## Care of the Sewage Disposal System

***The owner of a pressurized distribution system must maintain a contract with a maintenance provider to serve and maintain the system. The service contract must be maintained until the system is decommissioned.***

Neglect of the septic tank is a frequent cause of on-site sewage disposal system failure. The purpose of a septic tank is to clarify wastes (settle out the solids) so that wastewater may be more readily absorbed into the soil. When the tank is not pumped as needed, solids build up until they are carried into the disposal field, where they can clog the trench/soil interface and prevent the flow of the liquid into the soil. When the disposal field fails, it must be replaced--a costly undertaking.

Using septic tank additives such as yeast, enzymes, bacteria, and so forth is not necessary for digestion within the tank. In fact, these additives can actually be harmful to the disposal field. The normal use of bleach, detergent, soap, and drain cleaner does not harm or interfere with operation of the system. However, excessive use can cause problems.

**DO** use the disposal area for a lawn, shrubbery, or other landscaping. The vegetation takes moisture and nutrients from the disposal trenches and contributes to a longer life for your system.

**DO NOT** use the disposal field as a parking area or turnaround. Traffic on the disposal area will compact the soil, which will deprive the system of essential oxygen. Without oxygen, waste in the disposal trenches will break down so slowly that the system will become clogged, causing failure.

**NEVER** plant deep-rooted shrubs or trees such as willows, cottonwoods, poplars, silver maples, or dogwoods on or near a drainfield area.

## DEFINITIONS

**Building Sewer** is the pipe that conveys waste from a building to the septic tank.

**Distribution Pipes** are perforated pipes that distribute wastewater into the disposal trenches for absorption by the soil.

**Pressure Transport Piping** conveys wastewater under pressure from a pump or siphon to a disposal field or to another part of the system.

## ACCEPTABLE MATERIALS FOR BUILDING SEWERS & GRAVITY-FLOW EFFLUENT SEWERS

<u>Type of Pipe</u>	<u>Pipe Specifications</u>	<u>Joint Type</u>	<u>Joint Specifications</u>
ABS Plastic	Schedule 40	Solvent Weld	
PVC Plastic	Schedule 40	Solvent Weld	
PVC Plastic	ASTM D 3033 or ASTM D 3034	Rubber Gasket	SDR-335
ABS Plastic	ASTM D 2751	Solvent Weld	IAPMO

## ACCEPTABLE PRESSURE PIPE MATERIALS

<u>Type of Pipe</u>	<u>Pipe Specifications</u>	<u>Joint Type</u>	<u>Joint Specifications</u>
Polyvinyl Chloride (PVC)	10'	Solid	ASTM D 2241

For piping 1" or smaller in diameter, minimum pressure rating of 200 psi is required.

For piping greater than 1" in diameter, minimum pressure rating of 160 psi is required.

## PRESSURIZED DISTRIBUTION SYSTEM WORKSHEET

- A. Calculate the number of orifices in the disposal field. Linear footage of disposal lines (as required in the system specifications) \_\_\_\_\_ feet ÷ the orifice spacing (maximum 2 feet on center) \_\_\_\_\_ feet = \_\_\_\_\_ number of orifices.
- B. Calculate the minimum pump delivery rate for your system. Number of orifices (from A above) \_\_\_\_\_ x 0.41 GPM = \_\_\_\_\_ GPM (gallons per minute).
- C. Calculate the static head (elevation the pump must lift the effluent).  
 Elevation of piping in the disposal trenches \_\_\_\_\_ feet  
 Elevation of pump "off" \_\_\_\_\_ feet  
 Static head (the difference between the two elevations) \_\_\_\_\_ feet
- D. Calculate the friction loss (the amount of resistance to flow caused by turbulence in the pipe). Use the chart below to determine friction loss.  
 Distance (pressure pipe length) between pump and drainfield \_\_\_\_\_ feet  
 Pipe size \_\_\_\_\_ inches  
 Pump delivery rate (from A above) \_\_\_\_\_ GPM  
 Friction loss in feet of head per 100 ft of pipe (from the table below) x pressure pipe length (from above) divided by 100 ft.  
 ( \_\_\_\_\_ ft x \_\_\_\_\_ ft) ÷ 100 ft = \_\_\_\_\_ feet of head friction loss (Note: some head loss will occur due to fittings and elbows. Recommended to round up).
- E. Calculate the total dynamic head for your system. Add the static head (from C above) \_\_\_\_\_ ft + the friction loss (from D above) \_\_\_\_\_ ft + operating head of 10 ft (this figure combines 5 ft of head at the orifices plus an allowance of 5 ft for friction losses in the drainfield laterals and fittings) = \_\_\_\_\_ feet total dynamic head.
- F. Using the pump curve for your desired pump (each pump will have its own pump curve), select a pump that can deliver at least the pump delivery rate (from B above) at the total dynamic head (from E above). Select your pump conservatively, as performance will drop slightly as the pump components wear.

**FRICITION CHART FOR PVC SCHEDULE 40 PIPE**  
 (Flow Coefficient C-150)

Flow	1.25"	1.5"	2"	2.5"
GPM	H <sub>f</sub>	H <sub>f</sub>	H <sub>f</sub>	H <sub>f</sub>
15	3.76	1.74	0.516	0.217
20	6.42	2.96	0.866	0.365
25	9.74	4.46	1.29	0.54
30	13.6	6.27	1.81	0.755
35	18.2	8.4	2.42	1.01
40	23.6	10.7	3.12	1.28
45	29.5	13.5	3.85	1.54
50		16.5	4.68	1.93
60		23.6	6.62	2.72
70			8.86	3.67

H<sub>f</sub> = Head loss in ft/100 ft of pipe