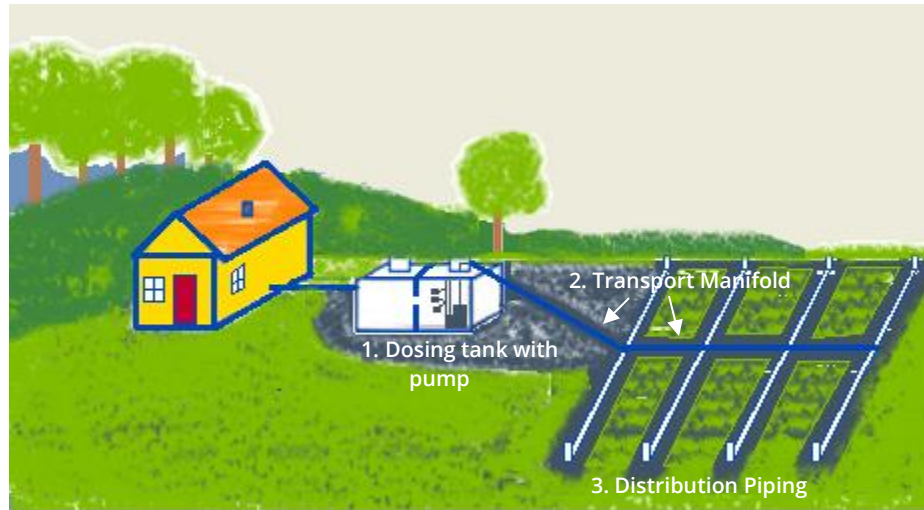


PRESSURE DISTRIBUTION SYSTEM GUIDE

Overview

Pressure distribution systems are used to conserve space on small lots or in soils that are classified as having *rapid permeability*. Pressure distribution systems consist of a **pump in the septic tank (1)**, a **transport manifold (2)**, and **perforated distribution piping in the drainfield (3)**. The distribution piping is pressurized so that a small dose of effluent is equally distributed throughout the entire drainfield.



Oregon Administrative Rules [OAR 340-71-100(148)] defines *soil with rapid or very rapid permeability* as any soil texture equal to or coarser than loamy sand or soils with more than 35% rock/gravel. Rapidly draining soils do not support the biological activity that occurs in the soil to remove pollutants from wastewater because the wastewater effluent drains so quickly.

System Design

Deschutes County recommends a licensed Department of Environmental Quality (DEQ) installer with experience installing pressure distribution systems submit the design and hydraulic calculations. The retailers that sell pump system components can also help with design and hydraulic calculations.

1. The drainfield trenches should be laid-out in the same manner as an equal distribution standard drainfield. The trenches must be located in the Approved Area identified in the site evaluation report and should follow the natural contours of the native soil. There must be (8) feet of undisturbed soil between each trench.
2. If laterals longer than (75) feet are used, the transport manifold should run down the center of the drainfield.

3. The lateral orifices must be evenly spaced, no more than (24) inches apart in coarse textured soils or (4) feet apart in finer textured soils.
4. Determine the correct pump size to allow for a minimum (5) foot squirt height from the remotest orifice *with no more than 10% height variation throughout the system*.



Community Development Department
117 NW Lafayette Street
Bend, Oregon 97703
www.deschutes.org/cd
(541) 388-6575

To request this information in an alternate format, please call 541-388-6575 or send an email to accessibility@deschutes.org.

Total Dynamic Head and Design Flow Rate

Use the equations below to determine the required hydraulic calculations for level sites where all lateral piping is the same elevation. Sloping and complicated sites may require a consultant's calculations to verify uniform distribution throughout the system.

A. HOW TO CALCULATE THE DESIGN FLOW RATE

$$(N) \times (R) = \underline{\hspace{2cm}} \text{ gpm (design flow rate)}$$

(N) **Number of orifices:** Total Number of (1/8) inch holes. =

(R) **Discharge rate:** Discharge rate per (1/8) inch hole = 0.43 gpm

B. HOW TO CALCULATE THE TOTAL DYNAMIC HEAD (TDH)

$$(A) + (B) + (C) + (D) + (E) = \underline{\hspace{2cm}} \text{ feet (TDH)}$$

(A) **Static Head:** The elevation difference from the low water level in the tank (pump off) to the laterals. = feet

(B) **Friction Head:** Length of transport pipe multiplied by friction loss (refer to manufacturer's tables). = feet

(C) **Discharge Assembly:** Refer to hose and valve assembly tables. = feet

(D) **System Allowance:** Includes distribution piping losses and a residual head discharge at the distribution laterals of (5) feet. Generally, (10) feet is acceptable for this factor. = 10 feet

(E) **Other:** = feet

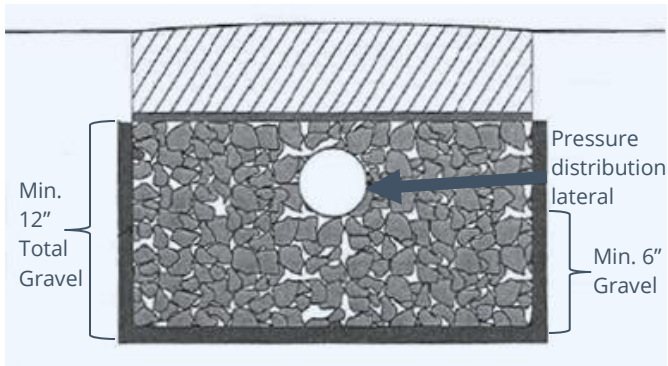
Installation

1. Install the drainfield trenches using a transit or laser level to ensure the trenches are level. There should be no fall from one end of the trench to the other. The trench bottom should be at least (24) inches wide. The trench depth is determined during the site evaluation process, is specific to each site, and is indicated in the installation permit. The maximum trench depth is measured from the native ground elevation to the bottom of the trench. It has been determined to be the most effective soil for the treatment of the wastewater, so it must not be exceeded.

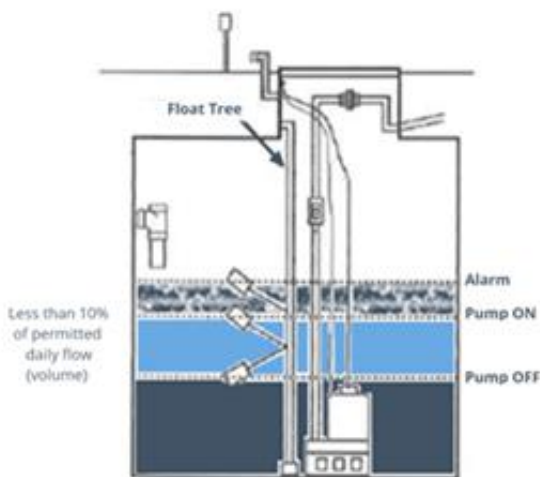
This handout is designed to explain the basic workings of a pressure distribution system and the basic layout. For construction and material standards for all septic system types refer to Oregon Administrative Rules (OAR) 340, Division 71 and 73, available on-line at: <http://www.oregon.gov/deq/Residential/Pages/Onsite-Rules.aspx>

2. Install at least (6) inches of gravel at the base of the drainfield trenches. The gravel should be (¾- 2 ½) inch river rock or crushed rock that has been sorted and *washed*.

Installation Continued. . .



3. Install the pressure distribution laterals level with distribution orifices oriented downward and equipped with removable slotted-faced shields. One orifice at the end of each lateral should be oriented upward. Orifices may be drilled with a (1/8) inch burless bit. The distal end of each lateral should have a clean-out riser consisting of an approved long radius elbow riser or (2) 45 degree elbows.
4. The transport line to the drainfield may be (3/4-2) inches in diameter. Install it deep enough to be freeze protected. **Inspection required after this step.**



Dosing Tank with Pump (Side View)

5. Install pump in approved dosing tank. Adjust the alarm float (top float) so that the bracket center is (2) inches below the invert of the tank's outlet. The center bracket of the on float (middle float) should be set (2) inches below the center bracket of the alarm float and the off float (bottom float) should be set so that no more than 20% of the permitted daily flow is pumped to the drainfield.

Inspection required after this step.



Do not forget to set the bottom float to account for volume of effluent in transport piping (system design dependent)!

6. Each drainline lateral must be covered with enough gravel to cover the orifice shields and equal a total depth of (12) inches of gravel below and above the distribution laterals.
7. Each trench must be covered with filter fabric or untreated building paper before backfilling.
8. Carefully place backfill to prevent damage to the system. Backfill must be free of large stones, frozen clumps of earth, masonry, stumps, and waste construction materials.

The Department of Environmental Quality (DEQ) keeps an updated list of approved drainfield products that may be used instead of pipe and rock. The list of approved products and their installation guides can be found here: <http://www.oregon.gov/deq/Residential/Pages/Onsite-Products.aspx>.

Please note that wire mesh with (1/2-1) inch openings should be placed below all graveless half pipes like Infiltrator.

Inspections

A pressure distribution system installation typically requires two inspections. A complete [As-Built & Materials List](#) form must be submitted in-person at the Deschutes County Community Development Offices or emailed (onsite@deschutes.org) to the Environmental Soils Division prior to scheduling a Squirt Test inspection (#7030).

1. Schedule a Pressure Distribution inspection (#7590) prior to installing the distribution laterals. It will include:
 - Septic Tank Inspection (#7100)
 - Effluent Line Inspection (#7350)
 - Drainfield Inspection (#7450)
2. Schedule a Squirt Test inspection (#7030) prior to installing the top layer of drain media. It will include:
 - Tank Water Tightness Test (#7270)
 - Pump/Alarm System (#7310)

Schedule an Inspection:



Online via Oregon's [ePermitting](#) system

<https://aca.oregon.accela.com/oregon/>



On your phone or tablet with Oregon's [ePermitting](#) App. Search for Oregon inspections in the App store for your apple or android device



Call 888-299-2821 | You will need a site specific permit number and 4 digit inspection code for the type of inspection requested

Operation and Maintenance Requirements

Prior to the issuance of a pressure distribution installation permit, a copy of a maintenance agreement (contract) between the property owner and a DEQ certified maintenance provider is required to be submitted to the Deschutes County Environmental Soils Division. For all pressure distribution systems permitted on or after January 1, 2014, it is the responsibility of the pressure distribution system owner to maintain an ongoing contract with a maintenance provider for the life of the system [OAR 340-071-0290(7)].

The maintenance provider is responsible for providing the following to Deschutes County on the property owner's behalf:

- An annual report that demonstrates the system has been properly maintained during the reporting year and is operating in accordance with the agent-approved design specifications, or the owner has applied for a repair permit under OAR 340-071-0215;
- Payment of an annual report evaluation fee.

For more information about operation and maintenance of pressure distribution systems, checkout the DEQ Sand Filter and Pressure Distribution Maintenance Fact Sheet, available online at <https://www.oregon.gov/deq/Residential/Pages/Onsite-Resources.aspx>.

Minimum Separation Distances (OAR 340-071-0220)

Items Requiring Setback	From Subsurface Absorption Area Including Replacement Area	From Septic Tank and Other Treatment Units, Effluent Sewer and Distribution Units
1. Groundwater Supplies and Wells.	*100'	50'
2. Springs: <ul style="list-style-type: none"> • Upgradient. • Downgradient. 	50' 100'	50' 50'
**3. Surface Public Waters: <ul style="list-style-type: none"> • Year round. • Seasonal. 	100' 50'	50' 50'
4. Intermittent Streams: <ul style="list-style-type: none"> • Piped (watertight not less than 20' from any part of the onsite system). • Unpiped. 	20' 50'	20' 50'
5. Groundwater Interceptors: <ul style="list-style-type: none"> • On a slope of 3% or less. • On a slope greater than 3%: <ul style="list-style-type: none"> • Upgradient. • Downgradient 	20' 10' 50'	10' 5' 10'
6. Irrigation Canals: <ul style="list-style-type: none"> • Lined (watertight canal). • Unlined: <ul style="list-style-type: none"> • Upgradient. • Downgradient 	25' 25' 50'	25' 25' 50'
7. Manmade Cuts Down Gradient in Excess of 30 Inches (top of downslope cut): <ul style="list-style-type: none"> • Which Intersect Layers that Limit Effective Soil Depth Within 48 Inches of Surface. • Which Do Not Intersect Layers that Limit Effective Soil Depth. 	50' 25'	25' 10'
8. Downgradient Escarpments: <ul style="list-style-type: none"> • Which Intersect Layers that Limit Effective Soil Depth. • Which Do Not Intersect Layers that Limit Effective Soil Depth. 	50' 25'	10' 10'
9. Property Lines.	10'	5'
10. Water Lines.	10'	10'
11. Foundation Lines of any Building, Including GaraQes and Out Buildings.	10'	5'
12. Underground Utilities.	10'	—
* 50-foot setback for wells constructed with special standards granted by WRD.		
**This does not prevent stream crossings of pressure effluent sewers.		