

DESIGN GUIDELINES FOR CONVENTIONAL SEPTIC TANK AND DRAINFIELD SYSTEMS.



CHELAN-DOUGLAS HEALTH DISTRICT
200 VALLEY MALL PARKWAY
EAST WENATCHEE, WA 98802
(509) 886-6450

OVERVIEW OF THE PERMITTING PROCESS:

STEP ONE.

SITE EVALUATION: Before you apply for the construction permit, you will need to apply for a site evaluation by completing and submitting the form titled "APPLICATION FOR SITE EVALUATION."

You or your designer will use the information gathered during the Site Evaluation to design the system to meet the features and limitations specific to your property.

Soils information is gathered by means of test holes in the drainfield area dug to a depth of at least six feet, or deeper if the site will be cut or filled. The test holes must be ramped on one end so that an inspector can walk into the hole. The material

removed from the hole must be placed at least two feet away from the hole. Please have your backhoe operator contact the Health District to set up an appointment to inspect these holes.

A minimum of three feet of suitable soil is required between the bottom of the drainfield trench and any ground water table, or impermeable layer such as clay or hard pan. If test holes show that this separation is not possible, there may be alternative designs that a qualified designer can prepare that may be suitable for your site. On the other hand, if the soil is too permeable, or contains too much gravel, an alternative system may also be necessary to prevent sewage from contaminating ground water.

Once the Site Evaluation is completed, you will receive a copy of the back page of the form containing the soil and design information you will need to prepare the system design. If the site is not suitable, or if a lengthier explanation of the design requirements is needed, you will receive a letter.

STEP TWO.

WATER AVAILABILITY: Before construction permits can be issued, you must show evidence of an adequate water supply. If the system serves more than two homes, it must be in compliance with the regulations for public water systems. Have the manager of the water system complete the form titled "Public Water Supply Availability Checklist", then submit the form along with the permit application.

If your water supply serves only one or two homes, you will need to apply to the Health District for a PRIVATE WATER SYSTEM REVIEW. There is a separate fee for this review.

An existing well or spring, or a future well or spring site can be inspected during the Site Evaluation if you indicate so on the application. A private water source must be properly located, developed, and tested before a building permit can be issued.

STEP THREE.

INSTALLATION PERMIT: A PERMIT to construct the system is needed to get a building permit. You can apply for this permit by completing and submitting the form titled "PERMIT APPLICATION FOR ON-SITE SEWAGE DISPOSAL SYSTEM".

Information on how to design the system and fill out the application is given on the following pages.

Private home owners are limited to designing and installing one conventional gravity onsite septic system for their own personal single family residence within a 12 month period. All other work related to the design, installation, maintenance, operation, and repair of all conforming and non-conforming onsite septic systems shall only be completed by an appropriately licensed and/or certified professional.

Any changes to the approved plan must be approved by the Health District, in writing, prior to installation of the system.

FINAL INSPECTION: State regulations require that the Health District inspect the installation before your installer can cover it. This inspection must be scheduled in advance.

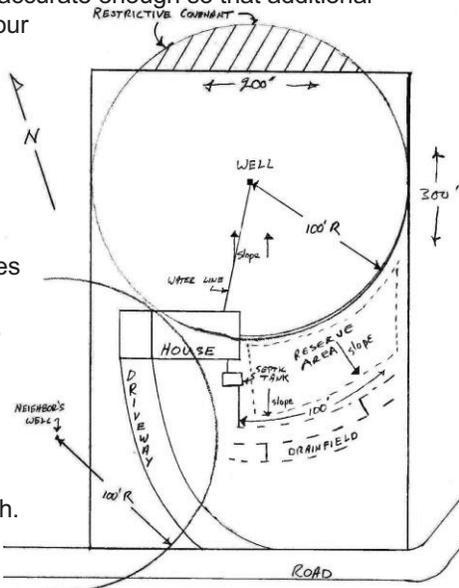
Please make sure your installer notifies us far enough ahead of time to prevent delays in inspection and covering of the system.

DESIGN GUIDELINE FOR CONVENTIONAL SYSTEM

On page five you can see an example of a design portion of a **permit application form**. This example shows a typical conventional design for a four bedroom house in sandy loam soil. The actual design you will be using will depend upon the number of bedrooms you will have, and the type of soil and terrain encountered during the site evaluation. Use of the provided design format is not required. You may prepare plans on your own paper or have them professionally prepared. The amount of detail must be at least that shown on the example. The various features of a design are described below.

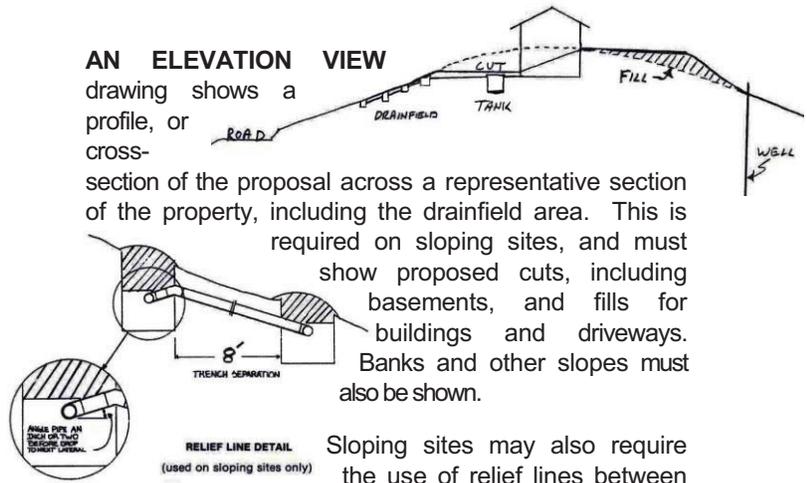
A PLOT PLAN of your proposal is required, drawn to a suitable scale, such as 1 inch = 30 feet. The plan must be detailed and accurate enough so that additional instructions to your installer will not be needed. The following items must be shown on the plan.

- Property lines with dimensions.
- Septic tank and drainfield layout, including trench length.
- Adjacent streets and roads
- Surface water, irrigation ditches, drainage ditches
- Buildings - existing and proposed
- Direction of slope
- Driveways and parking areas
- Easements
- Water lines and/or wells, including neighbor's wells and abandoned wells within 100' of the property line.
- An area for future drainfield replacement. (Reserve area)
- Interceptor or curtain drains
- Cuts, banks, fills, irrigation ditches, rock outcrops
- Arrow indicating North
- Underground utilities



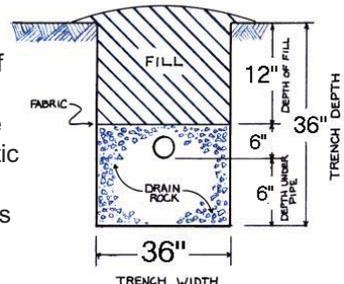
AN ELEVATION VIEW

drawing shows a profile, or cross-section of the proposal across a representative section of the property, including the drainfield area. This is required on sloping sites, and must show proposed cuts, including basements, and fills for buildings and driveways. Banks and other slopes must also be shown.



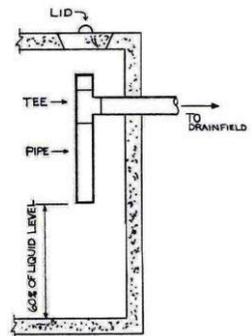
Sloping sites may also require the use of relief lines between laterals. A typical detail is shown in the application. Be sure to specify the distance between the trenches.

Also, be sure you specify the trench width, the depth of rock below and around the pipe, the depth of fill over the rock, and the size of the septic tank by filling in the blank spaces on the detail drawings on the application.



WELLS: Evidence of an adequate water supply is required before an on-site sewage disposal system permit can be issued. This means that your private well or spring must be properly located, developed, and tested before your permit can be issued. Please note that there is an additional fee required for review of a private water system. Application for review can be made either at the time of the Site Evaluation, or upon application for the septic system construction permit.

SEPTIC TANKS: Septic systems are sized according to the number of bedrooms in the home. A 1000 gallon septic tank will handle up to four bedrooms. Each additional bedroom will require an additional 250 gallon capacity. Most tanks will need to be sealed to be made water-tight. Some pre-cast septic tanks do not come equipped with an outlet or inlet baffles. These must be built by your installer at the time the tank is placed. A detail drawing provides instructions on how to do this. The leg of the inlet baffle need not be as long as the outlet baffle, but it must extend below the liquid level.



Effluent Filters are a substitute for the "TEE" baffle that are more effective in keeping solids from passing out of the tank to the drainfield.



DOSING OR PUMP TANKS: If your design requires a pump to lift the sewage to a higher level, or to dose it to the drainfield under pressure, you will need to use a separate tank to contain your pump and controls. All pump tanks must contain an emergency storage volume in addition to the ordinary dose volume. This will help to prevent spills when a pump or control is not working. A "high water" alarm is required, as well as the pump-on and pump-off floats.

DRAINFIELDS: A conventional drainfield begins with a trench dug no deeper than three feet, or less if specified on your site evaluation. Six inches of drain rock is placed in the trench, then a perforated drain pipe, with additional drain rock placed around and two inches over the pipe. Filter fabric is laid over the rock to prevent the backfill from infiltrating the drain rock. At least six inches of soil must be placed over the filter fabric. The total depth of the trench, including the rock, pipe and backfill may be no deeper than 36 inches from finished grade. A detail is provided in the application where you will specify the depth of the trench, the rock below the pipe, the fill, and the trench width.

When parallel trenches are used, spacing between the sidewalls should be at least six feet. Greater separation is advised on steeply sloping sites. If a piece of re-bar is buried at the end of each

drainfield lateral, it will make later detection of the drainfield ends much easier. Metal locator tape may also be placed all along the trenches.

An area must be identified on the plot plan for future replacement of the system. The same soil and set-back requirements will apply to the replacement area unless specified on the Site Evaluation report. The replacement area is normally physically separate from the initial drainfield area.

The drainfield trenches must be dug on a level grade (0 inches of fall in the entire line) across the slope of the ground. This will allow the entire trench to be utilized for absorption of the effluent.

FLOODWAYS AND FLOODPLAINS: All portions of on-site systems are prohibited in floodways. Conventional drainfields are also prohibited within the 10 YEAR FLOODPLAIN. Alternative systems may be approved within the 10 year floodplain if justification is provided to show that the system will function adequately during flood conditions, and that there will be no significant obstruction to the flows of floodwaters. Conventional drainfields may be approved in 100 YEAR FLOODPLAINS if soil tests and design show that the minimum vertical and horizontal separation requirements can be met, and if all components which are vulnerable to flooding are shown to be watertight.

LINEAR FEET OF DRAINFIELD PER BEDROOM

SOIL TEXTURE	THREE FEET WIDE TRENCH	APPLICATION RATE GAL/FT ² /DAY
Gravelly and very gravelly coarse sands. All extremely gravelly coarse sands, medium sands, loamy coarse sands, loamy medium sands, fine sands, loamy fine sands, sandy loams and loams. All soil types with 90% or more rock fragments.	Alternative system required due to excessive permeability.	1.0
Coarse sand	40	1.0
Medium sands, loamy coarse sands, loamy medium sands.	50	0.8
Fine sands, loamy fine sands, sandy loams, loams.	67	0.6
Very fine sands, loamy very fine sands; or silt loams, sandy clay loams, clay loams and silty clay loams with a moderate structure or strong structure (excluding a platy structure).	100	0.4
Other silt loams, sandy clay loams, clay loams, silty clay loams.	200	0.2
Sandy clay, clay, silty clay and strongly cemented firm soils, soil with a moderate or strong platy structure, any soil with a massive structure, any soil with appreciable amounts of expanding clays.	NOT SUITABLE	NOT SUITABLE

MINIMUM HORIZONTAL SEPARATIONS (in feet)

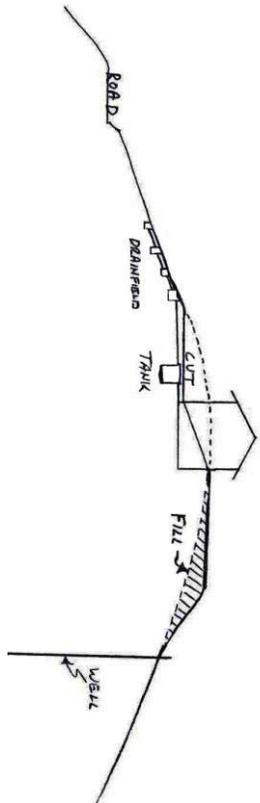
Items requiring setback	From edge of Drainfield and reserve area	From septic tank, holding tank, pump chamber, and distribution box	From building sewer, collection, and non-perforated distribution line
Non-public well or suction line	100	50	50
Public drinking water well ¹	100	100	100
Public drinking water spring ¹	200	200	100
Spring or surface water used as drinking water source ¹ measured from ordinary high water mark	100	50	50
Pressurized water supply line	10	10	10
Properly decommissioned well ²	10	N/A	N/A
Surface water/unlined irrigation ditches measured from ordinary high water mark	100	50	10
Building foundation/in-ground swimming pool	10	5	2
Property or easement line	5	5	N/A
Interceptor / curtain drains/ foundation drains/drainage ditches/other features that may allow effluent to surface	Down-gradient ³	5	N/A
	Up-gradient ³	N/A	N/A
Down-gradient cuts or banks with at least 5 ft. of original, undisturbed soil above a restrictive layer due to a structural or textural Change	25	N/A	N/A
Down-gradient cuts or banks with less than 5 ft. of original, undisturbed, soil above a restrictive layer due to a structural or textural change	50	N/A	N/A
Lined irrigation ditches:	Down-gradient ³	N/A	N/A
	Up-gradient ^{3,4}	10	N/A

1. If the water is used as a public drinking water supply, the designer shall locate all components of the septic system outside of the required sanitary control area.

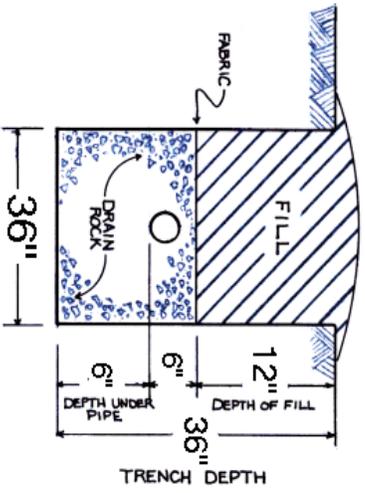
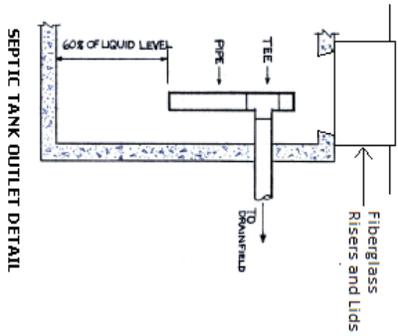
2. Before any component can be placed within 100 feet of a well, the designer shall submit a "decommissioned water well report" provided by a licensed well driller, which verifies that appropriate decommissioning procedures noted in chapter 173-160 WAC were followed. Once the well is properly decommissioned, it no longer provides a potential conduit to groundwater, but septic tanks, pump chambers, containment vessels or distribution boxes should not be placed directly over the site.

3. The item is down-gradient when liquid will flow toward it upon encountering a water table or a restrictive layer. The item is up-gradient when liquid will flow away from it upon encountering a water table or restrictive layer.

4. Test holes will be required during the irrigation season to show that no water is leaking from the ditch.

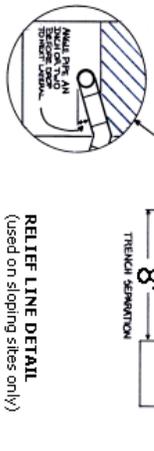


↑ VERTICAL CROSS-SECTION. SHOW EXISTING AND PROPOSED CUT, FILL AND OTHER SLOPES ↑
 PLEASE FILL OUT DETAILS BELOW: TRENCH DIMENSIONS AND SEPARATIONS, SEPTIC TANK VOLUME

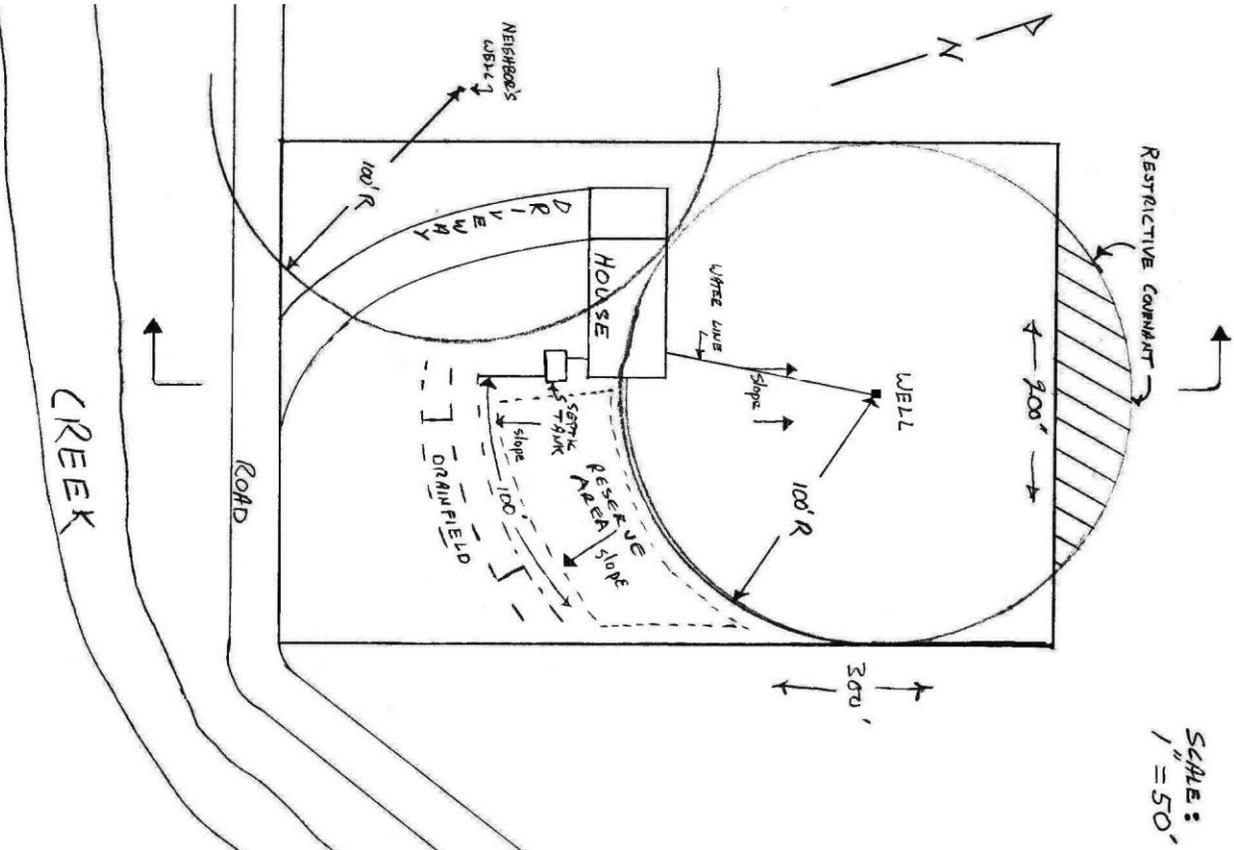


Max num trench depth (uphill side): 36"
 Minimum trench depth (downhill side): 24"

SEPTIC TANK VOLUME (gal): 1000



RELIEF LINE DETAIL
 (used on sloping sites only)



SCALE: 1" = 50'

(SITE PLAN)