



Chelan-Douglas Health District

200 Valley Mall Parkway, East Wenatchee, WA 98802

Onsite Sewer System Installation Guide

Understanding Rules and Regulations

- Knowledge of WAC 246-272A, Onsite Sewage Systems
- Knowledge of Onsite Wastewater Treatment Systems Manual, USEPA

Understanding Design Plans

- Elements of site plan: design location and dimensions; topography and site features
- Standards and specifications; pump performance and hydraulics; treatment and disposal technologies
- Basic knowledge of soil profile descriptions
- Ability to make mathematical calculations of area, volume, rates and measures

Site Preparation

- Apply designer's plan to site; and identify conflicts that may relate to elevations or topography
- Equipment needs and limitations; materials and supplies; soil characteristics

Installation Procedures

- Ability to recognize soil characteristics in the field
- Knowledge of specifications and installation techniques for tanks, baffles, filters and screens, piping and fittings, sand media, proprietary treatment components, pumps and siphons, liner materials, and valves
- Knowledge of electrical requirements
- Knowledge of gravity dispersal: step downs; D-Box; level manifold, level trench bottoms
- Knowledge of sand filter and pump/siphon dosed system requirements
- Knowledge of timers
- Knowledge of bedding, testing, and pipe connection methodologies
- Knowledge of pump performance specifications: total dynamic head in pressurized systems
- Ability to make mathematical calculations and conversions

Study Guide

This study guide is intended to help homeowners prepare for the Installer Exam by pointing to the sections of the regulations and State and Federal guidance documents most relevant to installers. It is not a substitute for those documents.

Some of the following materials are referenced in cases where an issue is not addressed in the Washington Administrative Code (WAC 246-272A), and are the standards of practice for items not specified in regulation.

Study Materials Available on the Internet:

- The Washington Administrative Code [WAC 246-272A](#) . Please pay special attention to sections 0250, 0260 and 0265
- Recommended Standards and Guidance (RS&G) documents addressing specific systems such as Pressure Distribution [Recommended Standards and Guidance \(RS&G\) Documents](#)
- The EPA Design Manual (EPA) publication #625/R-00/008 (published 2002) [Onsite Wastewater Treatment Systems Manual](#)
- [CDHD Onsite Construction Manual](#)

Study Materials Included in this Handout:

- Department of Ecology (DOE) “Criteria for Sewage Works Design” (**Section C1-9**)
- EPA excerpt on septic tanks (**Page 4-43 & 4-44**)
- Uniform Plumbing Code (UPC) “Building Sewers” (**Section 1106**)
- Installation Report
- Final Inspection for OSS (Checklist)

The Washington On-Site Sewage Association has classes available. The Association can be contacted @253-770-6594 or <https://wossa.org/>

General Notes

1. Installers are required to be licensed by this Health District before they can install in Chelan or Douglas County (CDHD Code 4.20.060.A).
2. Installers are required to be licensed by this Health District before they can install in Chelan or Douglas County (CDHD Code 4.20.060.A).
3. The installer must follow the approved design to the scale specified in the design.
4. An appointment for inspection must be made with the inspector at least 2 working days prior to the desired date of the inspection. Please email: inspections@cdhd.wa.gov
5. The Installation Report and Record Drawing must be completed and on site at the final inspection.

6. All or any portions of the sewage disposal system must be inspected and approved before it is covered with soil (0250).
7. The installer should shoot elevation grades and stake drain field location prior to excavating.
8. Roof and surface water runoff or discharge must be directed away from or down slope from the sewage disposal system by means of footing and/or foundation floor drains or surface diversion ditches (0230).
9. All pipe joints, including those in drain field, must be glued and water tight with no exceptions (0250).

Building Sewer

1. The recommended minimum grade on all parts of the building sewer is at least 1/8 inch fall per foot (UPC).
2. If there are elbows or bends in the building sewer, they typically should be no greater than a 45 degree angle, or a 90 degree sweep may be used. It is recommended to install a clean out at any such elbow.
3. Any solid pipe under driving/parking or vehicular encroachment areas should meet or exceed the crush strength of ASTM 3034 and/or be bedded and enclosed in 5 or 6 inch PVC, steel, or concrete pipe which meets or exceeds the crush strength of ASTM 3034. The pipe length should exceed the drive width.
4. If the pipe crosses any water line (domestic/irrigation), the Department of Ecology criteria must be followed (DOE).
5. All of the onsite septic system must be watertight except for the dispersal component (0250).

Septic Tank

1. The septic tank must be set level on undisturbed soil, or by manufacturer's standards if other than concrete tank. If the native soil is rocky, the bed should be over excavated and sand added to bed the tank (EPA).
2. If the excavation is dug too deep, it should be backfilled to the proper elevation with sand to provide an adequate bedding for the tank (EPA).
3. All pipe connections to the tank should be watertight with proper grade.
4. The tank should be accessible at grade unless a marker is placed at the finished grade. The top of the tank can be no more than 6 inches below finished grade. If this is not possible then risers must be installed so the riser lids are not deeper than 6 inches below finished grade (0238).
5. If an effluent filter is installed, a riser to grade for access must be provided (0238).
6. The tank must be a minimum of 5 feet from property lines, easements, building foundations, foundation drains, down gradient features and in-ground pools. It must be 10 feet from any pressurized water supply line (Table IV).
7. The septic tank should be at least 5 feet from the drainfield (EPA).

Line from Septic Tank to Drainfield or Distribution Box

1. The pipes should be bedded with ASTM readings face up and have glued and watertight joints.
2. The grade on gravity pipes must be a minimum of 1/8 inch downward fall per foot from the tank outlet (UPC).
3. All pipe connections to the tank must be watertight with proper grade (0250).
4. If the pipe crosses any water line (domestic/irrigation), the Department of Ecology criteria must be followed (DOE).
5. Any solid pipe under driving/parking or vehicular encroachment areas should meet or exceed the crush strength of ASTM 3034. The pipe length should exceed the drive width.
6. When using a distribution box, the pipe must have a watertight connection (sealed, grouted, or manufactured fittings) (EPA).

Distribution Box (D-Box)

1. The D-box should be set level on a concrete pad on undisturbed soil, 5 feet minimum from the beginning of trench, gravel, and perforated pipe.
2. All outlets in use should be equipped with flow equalizers (such as dial-a-flow inserts). The flow equalizers must be set to allow liquid to enter all lines with equal flow simultaneously.
3. All unused outlets must be water tight.
4. The D-box must be 5 feet minimum from the beginning of the drain field infiltration area, property lines, easement lines, and driveway. It shall be a minimum of 50 feet from private wells and open surface water (ditches, weir boxes, ponds, canals, lakes, streams, etc.) It must be 100 feet from public wells (Table IV).
5. The inlet of the D-box should be equipped with a vented baffle (90 degree sweep with hole drilled or a PVC "t") to prevent short-circuiting.

Drainfields, Absorption Beds, SSAS (Sub-Surface Absorption Systems)

1. The installer must follow the approved design. Any changes to the approved design must be authorized in writing by both the Health District and the Designer (0250).
2. Drainfields must run perpendicularly to the slope (across/right angles or 90 degrees) and may need to be contoured or curved to accomplish this (EPA).
3. The trench bottom must be level and should be hand raked (EPA).
4. If the soils are smeared, the sidewalls should also be hand raked.
5. The entire drainfield including pipe connections bedded in soil should be left open for inspection.
6. The ends of all perforated pipes should be capped and exposed for inspection.
7. If sidewalls and trench bottom are both smeared and compacted during excavation, both sidewalls and trench bottom should be roughed up.
8. Drain rock must be washed gravel or crushed rock ranging from .75 to 2.5 inches (0010).

9. Drainfield lines must be covered with a minimum of 2 inches of gravel (0234).
10. All drainfield connections must be watertight.
11. The drainfield must be installed in original, undisturbed soil. No cutting/filling can have taken place following the site evaluation in a proposed drainfield area (0234).
12. The drainfield must be at least 6 inches into native soil (0234).
13. A relief line or stepdown must have a 1 to 2 inch upsweep before entering the lower drainfield pipe (CDHD Permit).



14. There must be a minimum of 6 inches of soil cover on the drainfield (0234).

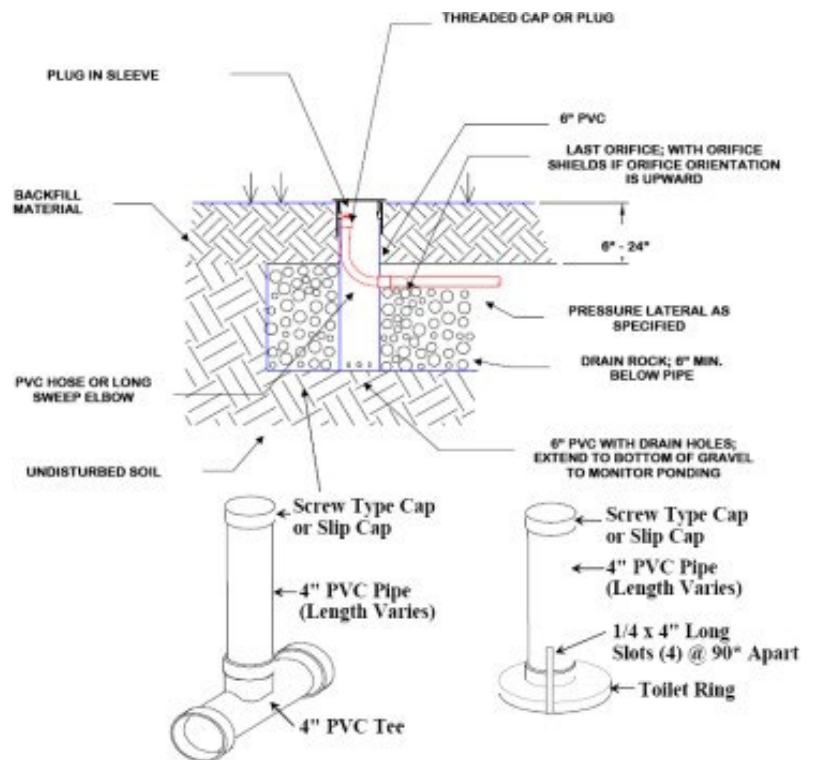
15. All pressure distribution laterals must be equipped with cleanouts and monitoring ports at the distal (far) ends. (Pressure Distribution RS&G, 3.8.5)

16. Monitoring ports have slots or holes drilled in them at the bottom to allow liquid to enter them. (Pressure Distribution RS&G, 3.8.5)

17. If an orifice is in the 12 o'clock position, an orifice shield is required. (Pressure Distribution RS&G, 3.8.4)

18. Rebar should be placed at ends of laterals if monitoring ports or upsweeps are below grade.

19. If the monitoring ports or pressure lateral upsweeps are at grade, it is recommended that irrigation boxes are used as covers.



20. The soil barrier over the drainfield must be filter fabric (for example, typar 3301 & 3341 or approved equivalent, 3.0 to 4.0 oz/square yard and spun-bonded (not woven) material without petroleum/oil properties) (0010).
21. Installation of dripline systems require certification (Subsurface Drip RS&G, 2.8).
22. Some manufacturers require certification for installation of their product
23. Drainfield and replacement areas must be protected from encroachment or damage such as vehicular and equipment traffic, a quantity of penned livestock, heavy weights or objects, impervious coverings (such as asphalt or concrete), or anything which can obstruct aeration of the system (0270).

Post-Construction

1. A request for inspection is required to be made 2 working days prior to the desired date.
2. A pressure system inspection requires a squirt test for the residual head.
3. ASTM C-33 sand must be used in sand-lined systems. The sand spec sheet must be provided to the Health District.
4. A drawdown measuring the amount of liquid level drop in a tank must be measured and the gallons calculated before the timer can be set.
5. The Record Drawing and Installation Drawing (as-built) must be completed and on site at the time of the final inspection.
6. Record Drawings must be accurate within 6 inches and the Installation Report must include all items listed in WAC 246-272A-0265.

C1-9 Special Requirements

C1-9.1 Required Separation between Water Lines and Sanitary Sewers

The basic separation requirements apply to all gravity and pressure sewers of 24-inch diameter or less; larger sewers may create special hazards because of flow volumes and joint types, and accordingly require additional separation requirements. The special construction requirements given are for the normal conditions found with sewage and water systems. More stringent requirements may also be necessary in areas of high ground water, unstable soil conditions described in this section will require assessment and approval of the appropriate state and local agencies.

C1-9.1.1 Horizontal and Vertical Separation (Parallel)

A minimum horizontal separation of 10 feet between sanitary sewers and any existing potable water lines, and a minimum vertical separation of 18 inches between the bottom of the water line and the crown of the sewer, shall be maintained. The distance shall be measured edge to edge. See Figure C1-2.

C1-9.1.2 Unusual Conditions (Parallel)

When local conditions prevent the separations described above, a sewer may be laid closer than 10 feet horizontally or 18 inches vertically to a water line, provided:

- It is laid in a separate trench from the water line.
- The elevation of the crown of the sewer line must be at least 18 inches below the bottom of the water line. When this vertical separation cannot be obtained, the sewer shall be constructed of materials and joints that are equivalent to water main standards of construction and shall be pressure tested to ensure water tightness (see C2-3.6) prior to backfilling. Adequate restraint should be provided to allow testing to occur.
- If sewers must be located in the same trench as a potable water line, special construction and mitigation is required. Both water lines and sewer lines shall be constructed with a casing pipe of pressure-rated pipe material designed to withstand a minimum static pressure of 250 PSI. The water line shall be placed on a bench of undisturbed earth with the bottom of the water pipe at least 18 inches above the crown of the sewer, and shall have at least 5 feet of horizontal separation at all times. Additional mitigation efforts, such as impermeable barriers, may be required by the appropriate state and local agencies. See Figure C1-3.

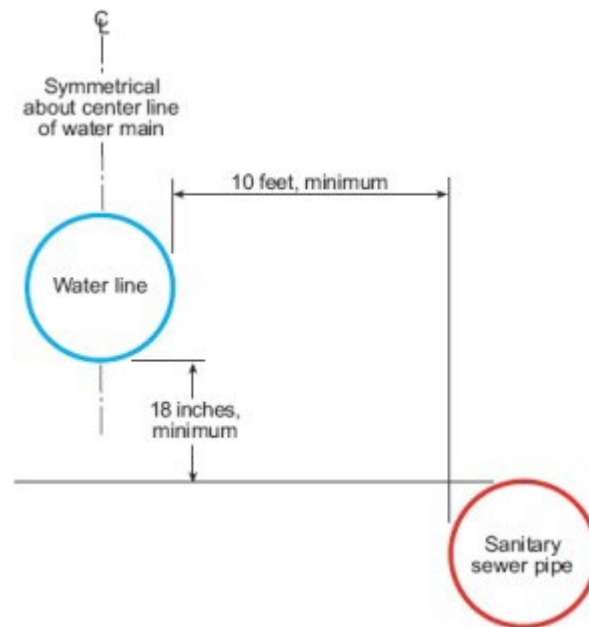


Figure C1-2. Required Separation between Water Lines and Sanitary Sewers, Parallel Construction

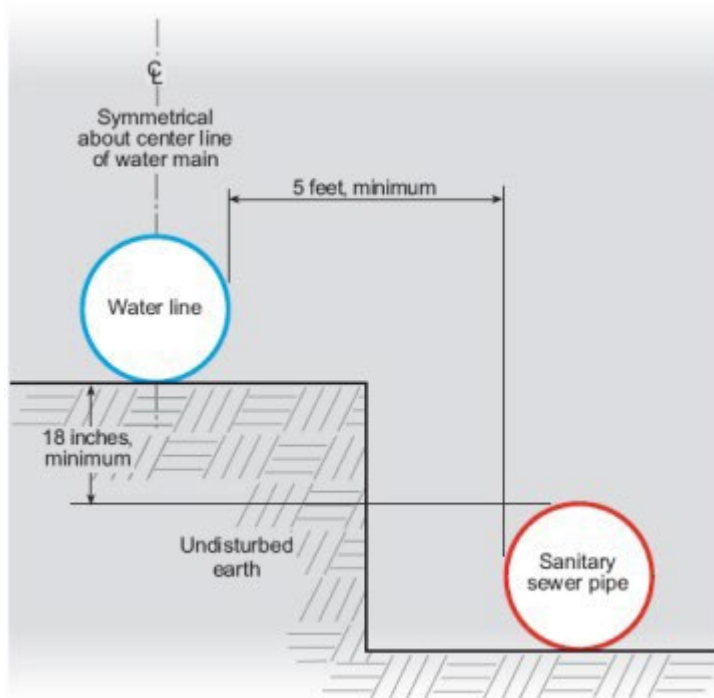


Figure C1-3. Required Separation between Water Lines and Sanitary Sewers, Unusual Conditions Parallel Construction

C1-9.1.3 Vertical Separation (Perpendicular)

Sewer lines crossing water lines shall be laid below the water lines to provide a separation of at least 18 inches between the invert of the water line and the crown of the sewer.

C1-9.1.4 Unusual Conditions

When local conditions prevent a vertical separation as described above, construction shall be used as follows:

A.

Gravity Sewers Passing Over or Under Water Lines

The gravity sewers shall be:

- Constructed of material described in Table C1-4. The one segment of the maximum standard length of pipe (but not less than 18 feet long) shall be used with the pipes centered to maximize joint separation.
- Standard gravity-sewer material encased in concrete or in a one-quarter-inch thick continuous steel, ductile iron, or pressure rated PVC pipe with a dimension ratio (DR) (the ratio of the outside

Diameter to the pipe wall thickness) of 18 or less, with all voids pressure grouted with sand-cement grout or bentonite. Commercially available pipe skirts and end seals are acceptable. When using steel or ductile iron casing, design consideration for corrosion protection should be considered.

- The length of sewer pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the water line. The sewer pipe shall be the longest standard length available from the manufacturer.

Table C1-4. Water Main Standard Pipe Material

Type of Pipe	AWWA (ASTM) Standard		
	Pipe	Joint	Fittings
Ductile Iron	C 151 and C 104	C 111	C 110
Asbestos-Cement	C400 (Type II) Class 200	(D 1869)	C 110
Polyvinyl-Chloride	C 900*	(D 3139 and F 477)	C 110
Concrete Cylinder	C 303		
HDPE 3408	C 906	Fused per C 906	C 906

*Pipe spec C 900 for pipe up to about 12 inches in diameter, C 905 for pipe more than 12 inches in diameter

B. Water Lines Passing Under Gravity Sewers

Water lines shall be protected by providing:

- A vertical separation of at least 18 inches between the invert of the sewer and the crown of the water line.
- Adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking of the water lines.
- The length of sewer pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the water line. The sewer pipe shall be the longest standard length available from the manufacturer.
- A water line casing equivalent to that specified in C1-9.1.4A.

C. Pressure Sewers Under Water Lines

These pressure sewers shall only be constructed under water lines with

Ductile iron pipe or standard sewer pipe in a casing equivalent to that specified above in C1-9.1.4A for a distance of at least 10 feet on each side of the crossing.

C1-9.2 Pumpout Facilities at Marinas

Pumpout facilities and shoreline facilities for disposal of sanitary wastes from boats shall be installed at marinas at the time of initial construction or expansion of facilities, when the marina is of sufficient size and design to serve boats 17 feet or larger in overall length.

The facilities shall be designed according to “Design Criteria for Pumpout Facilities at New or Expanded Marinas,” which is the criteria established by the Washington State Parks and Recreation Commission in its document, “Financial Assistance Application for Clean Vessel Funding Program.”

The requirement for construction of sewage pumpout facilities shall be specified in the Water Quality Certification for the Corps of Engineers Section 10 permit.

Each marina shall prominently display signs stating that it is illegal to discharge untreated sanitary wastes into US waters and directing boaters to the pumpout facilities.

C1-9.3 Stream Crossing

The pipe and joints shall be tested in place, exhibit zero infiltration, and be designed, constructed, and protected against anticipated hydraulic and physical, longitudinal, vertical, and horizontal loads, erosion, and impact. Sewers laid on piers across ravines or streams shall be allowed only when it can be demonstrated that no other practical alternative exists. Such sewers on piers shall be constructed in accordance with the requirements for sewers entering or crossing under streams. Construction methods and materials of construction shall be such that sewers will remain watertight and free from change in alignment or grade. A minimum cover of 5 feet for stabilized channels and 7 feet for shifting channels should be provided.

Permits from other agencies or departments are required for work in or adjacent to waterways, and are described in Chapter G1.

C1-9.4 Inverted Siphons

Inverted siphons shall have not less than two barrels, with a minimum pipe size of 6 inches, and shall be provided with necessary appurtenances for convenient flushing and maintenance. The manholes shall be designed to facilitate cleaning and, in general, sufficient head shall be provided and pipe sizes selected to secure velocities of at least 3 fps for average flows. A rock catcher and coarse screen should be provided to prevent plugging of the siphons. The inlet and outlet details shall be arranged so that normal flow quality construction is critical to

Proper performance. Tanks must be properly designed, reinforced, and constructed of the proper mix of materials so that can meet anticipated loads without cracking or collapsing. All joints must be watertight and flexible to accommodate soil conditions. For concrete tank manufacturing, a “best practices manual” can be purchased from the National Pre-Cast Concrete Association (NPCA, 1998). Also, a *Standard Specification for Precast Concrete Septic Tanks* (C 1227) has been published by the American Society for Testing and Materials (ASTM, 1998).

Watertightness

Watertightness of the septic tank is critical to the performance of the entire onsite wastewater system. Leaks, whether exfiltration or infiltrating, are serious. Infiltration of clear water to the tank from the building storm sewer or ground water adds to the hydraulic load of the system and can upset subsequent treatment processes. Exfiltration can threaten ground water quality with partially treated wastewater and can lower the liquid level below the outlet baffle so it and subsequent processes can become fouled with scum. Also, leaks can cause the tank to collapse.

Tank joints should be designed for watertightness. Two-piece tanks and tanks with separate covers should be designed with tongue and groove or lap joints (Figure 4-24). Manway covers should have similar joints. High-quality, preformed joint sealers should be used to achieve a watertight seal. They should be workable over a wide temperature range and should adhere to clean, dry surfaces; they must not shrink, harden, or oxidize. Seals should meet the minimum compression and other requirements prescribed by the seal manufacturer. Pipe and inspection port joints should have cast-in rubber boots or compression seals.

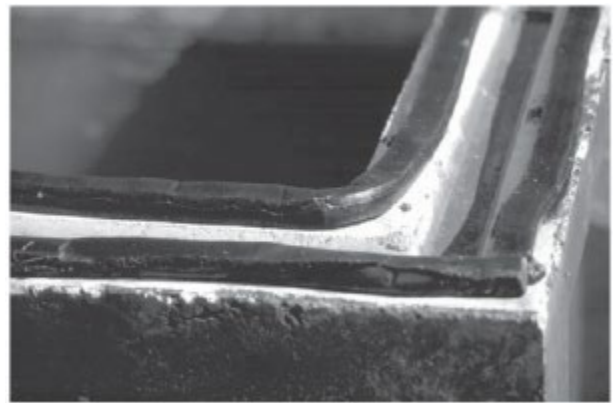


Figure 4-24. Tongue and groove joint and sealer
Source: Ayres Associates

Septic tanks should be tested for watertightness using hydrostatic or vacuum tests, and manway risers and inspection ports should be included in the test. The professional association representing the materials industry of the type of tank construction (e.g., the National Pre-Cast Concrete Association) should be contacted to establish the appropriate testing criteria and procedures. Test Criteria for precast concrete are presented in Table 4-14.

4.6.3 Construction Considerations

Important construction considerations include tank location, bedding and backfilling, watertightness, and floatation prevention, especially with nonconcrete tanks. Roof drains, surface water runoff, and other clear water sources must not be routed to the septic tank. Attention to these considerations will help to ensure that the tank performs as intended.

Table 4-14. Watertightness testing procedure/criteria for precast concrete tanks

Standard	Hydrostatic test		Vacuum test	
C 1227, ASTM (1993)	Seal tank, fill with water, and let stand for 24 hours. Refill tank.	Approved if water level is held for 1 hour.	Seal tank and apply a vacuum of 2 in. Hg.	Approved if 90% of vacuum is held for 2 minutes.
NPCA (1998)	Seal tank, fill with water, and let stand for 8-10 hours.	Approved if no further measurable water level drop occurs.	Seal tank and apply a vacuum of 4 in. HG.	Approved if vacuum can be held for 5 minutes without a loss of vacuum.

Location

The tank should be located where it can be accessed easily for septage removal and sited away from drainage swales or depressions where water can collect. Local codes must be consulted regarding minimum horizontal setback distances from buildings, property boundaries, wells, water lines, and the like.

Bedding and Backfilling

The tank should rest on a uniform bearing surface. It is good practice to provide a level, granular base for the tank. The underlying soils must be capable of bearing the weight of the tank and its contents. Soils with a high organic content or containing large boulders or massive rock edges are not suitable.

After setting the tank, leveling, and joining the building sewer and effluent line, the tank can be backfilled. The backfill material should be free flowing and free of stones larger than 3 inches in diameter, debris, ice, or snow. It should be added in lifts and each lift compacted. In fine-textured soils such as silts, silt loams, and clay, imported granular material should be used. This is a must where freeze and thaw cycles are common because the soils movement during such cycles can work tank joints open. This is a significant concern when using plastic and fiberglass tanks.

The specific bedding and backfilling requirements vary with the shape and material of the tank. The manufacturer should be consulted for acceptable materials and procedures.

Watertightness

All joints must be sealed properly, including tank joints (sections and covers if not a monolithic tank), inlets, outlets, manways, and risers (ASTM, 1993; NPCA, 1998). The joints should be clean and dry before applying the joint sealer. Only high quality joint sealers should be used (see previous section). Backfilling should not proceed until the sealant setup period is completed. After all joints have been made and cured, a watertightness test should be performed (see table

4-14 for precast concrete tanks). Risers should be tested.

Floatation Prevention

If the tank is set where the soil can be saturated, tank floatation may occur, particularly when the tank is empty (e.g., recently pumped dose tanks or septic tank after septage removal). Tank manufacturers should be consulted for appropriate anti-floatation devices.

4.6.4 Operation and Maintenance

The septic tank is a passive treatment unit that typically requires little operator intervention. Regular inspections, septage pumping, and periodic cleaning of the effluent filter or screen are the only operation and maintenance requirements. Commercially available microbiological and enzyme additives are promoted to reduce sludge and scum accumulations in septic tanks. They are not necessary for the septic tank to function properly when treating domestic wastewaters. Results from studies to evaluate their effectiveness have failed to prove their cost effectiveness for residential application. For most products, concentrations of suspended solids and BOD in the septic tank effluent increase upon their use, posing a threat to SWIS performance. No additive made up of organic solvents or strong alkali chemicals should be used because they pose a threat to soil structure and ground water.

Inspections

Inspections are performed to observe sludge and scum accumulations, structural soundness, watertightness, and condition of the inlet and outlet baffles and screens. *(Warning: In performing inspections or other maintenance, the tank should not be entered. The septic tank is a confined space and entering can be extremely hazardous because of toxic gases and/or insufficient oxygen.)*

Uniform Plumbing Code:

Section 1106 – Grade, Support and Protection of Building Sewers

- a. Building sewers shall be run in practical alignment and at a uniform slope of not less than one-fourth (1/4) of an inch per foot (20.9 mm per m), and such pipe or piping four (4) inches (101.6 mm) through six (6) inches (152.4 mm) may have a slope of not less than one-eighth (1/8) of an inch per foot (10.5 mm per m) and any such piping eight (8) inches (203.2 mm) and larger may have a slope of not less than one-sixteenth (1/16) of an inch per foot (5.3 mm per m).

Exception: When approved by the Administrative Authority and where it is impractical, due to the depth of the street sewer or to the structural features or to the arrangement of any building or structure, to obtain a slope of one-fourth (1/4) of an inch per foot (20.9 mm per m), any such pipe or piping four (4) inches (101.6 mm) through six (6) inches (152.4 mm) may have a slope of not less than one-eighth (1/8) of an inch per foot (10.5 mm per m) and any such piping eight (8) inches (203.2 mm) and larger may have a slope of not less than one-sixteenth (1/16) of an inch per foot (5.3 mm per m).

- b. Building sewer piping shall be laid on a firm bed throughout its entire

length, and any such piping laid in maid or filled in ground shall be laid on a bed of approved materials and shall be adequately supported to the satisfaction of the Administrative Authority.

- c. No building sewer or other drainage piping or part thereof, which is constructed of materials other than those approved for use under or within a building, shall be installed under or within two (2) feet (0.6 mm) of any building or structure, or part thereof, nor less than one (1) foot (0.3 mm) below the surface of the ground. The provisions of this subsection include structures such as porches and steps, whether covered or uncovered, breezeways, roofed porte-cocheres, roofed patios, carports, covered walks, covered driveways and similar structures or appurtenances.

Parcel Identification

Permit Number: _____ Assessor's Parcel Number: _____
 Applicant's Name: _____ Designer/Engineer: _____
 Project Address: _____ Installer: _____

Installer Checklist

I. Septic Tank	N/A or No Yes	
>5 ft. from foundation?	<input type="checkbox"/>	<input type="checkbox"/>
>50 ft. from all wells?	<input type="checkbox"/>	<input type="checkbox"/>
>50 ft. from surface water?	<input type="checkbox"/>	<input type="checkbox"/>
Clean out at building?	<input type="checkbox"/>	<input type="checkbox"/>
Risers installed for tank access?	<input type="checkbox"/>	<input type="checkbox"/>
Effluent filter installed?	<input type="checkbox"/>	<input type="checkbox"/>
Tank water tested or sealed for water tightness? <i>(Tank guaranteed watertight to invert of outlet)</i>	<input type="checkbox"/>	<input type="checkbox"/>

Tank size: _____ gallons Manufacture: _____

II. Drain Field		
>10 ft. from foundation?	<input type="checkbox"/>	<input type="checkbox"/>
>5 ft. from property lines and easement lines?	<input type="checkbox"/>	<input type="checkbox"/>
>100 ft. from all wells?	<input type="checkbox"/>	<input type="checkbox"/>
> 10 ft. from potable water lines?	<input type="checkbox"/>	<input type="checkbox"/>
Laterals level to +/- 1 inch?	<input type="checkbox"/>	<input type="checkbox"/>
Gravel clean, properly sized, and proper depth?	<input type="checkbox"/>	<input type="checkbox"/>
Gravel/gravel less chamber/ EZ flow/subsurface drip line/other utilized? <i>(circle one)</i>		

Pressure Systems

ASTM C-33 sand quality within DOH specifications? <i>(attach sieve analysis from supplier)</i>	<input type="checkbox"/>	<input type="checkbox"/>
Head height uniform +/- 15%?	<input type="checkbox"/>	<input type="checkbox"/>
Clean outs and observation ports installed?	<input type="checkbox"/>	<input type="checkbox"/>
Orifices sized and spaced per design?	<input type="checkbox"/>	<input type="checkbox"/>
Actual head height: _____ feet/inches		

III. Pump/Pump Chamber		
Riser installed for access?	<input type="checkbox"/>	<input type="checkbox"/>
Alarm floats tested and float heights set per design?	<input type="checkbox"/>	<input type="checkbox"/>
Tank water tested or sealed for water-tightness?	<input type="checkbox"/>	<input type="checkbox"/>
Pump make: _____ Pump Model: _____		
Chamber Size: _____ gallons Manufacture: _____		
Pump chamber draw-down: _____ inches in 2 minutes (120 seconds) within +/- 1 / 4 inch		
Chamber gallons per inch (from manufacture): _____		
Pump controls installed and settings programmed? (If not installed, see certification next page). <i>If yes, Pump On: _____ minutes/seconds Pump Off: _____ hours</i>		

IV. Notes/Comments

Record Drawing (Accurate to +/- 1/2 foot)

Checklist (Use 100' tape measure)

- Drain field (DF) & manifold orientation & layout

- Trench/bed dimensions & critical distances within layout

- Septic/pump tank placement

- Location of buildings/property lines in relationship to the tank(s) /DF

- Observation ports & clean-out location

- Location of all wells & roads/driveways

- Undistributed native soil between trenches/beds

- North arrow

- 100% Reserve area if new construction or expansion

Caution: Minor adjustments to the septic tank location and drain field by the installer are generally acceptable to both the Health Department and the designer, but could in certain cases compromise the viability of the system. It is the installer's responsibility to obtain **prior written approval** from either the Health Department or the designer before making any deviations from the design that may affect the system viability. Any deviations from the approved design must be shown above.

Certification of Installation

Installer: Check the appropriate box from Row "A" and/or "B" then sign and date the Certification.

- A.** I certify that I installed the system without any deviations from the design stamped "APPROVED" by Chelan Douglas Health District (CDHD)
- B.** For a pressurized system, I certify that the designed control panel is installed, tested, and correctly programmed.

- I certify that all the deviations from the design stamped "APPROVED" by Chelan Douglas Health District (CDHD) are shown above.
- For a pressurized system, the control panel was not installed. I have informed the owner that I will ensure the specified panel Will be installed, tested, and correctly programed.
I will inform CDHD in writing with completed.

I further certify that all information contained on this form is accurate. I understand that if the information contained herein is not accurate, there will be just cause for immediate suspension of my Installers License and/or fines.

Signature of Installer

Date

Final Inspection for OSS

Name:	Location:
Inspector:	Date:

I. Gravity Systems

A. Septic Tanks

1. _____ Check for signs of leakage— tank should be sealed and filled with water
2. _____ Check that baffles are correctly installed
3. _____ Check for outlet filter if required
4. _____ Check for risers if required (maximum of 6 inches of cover)
5. _____ Measure distance of tank lids from house or other landmarks

B. Drain Field

1. _____ Check for length of trenches
2. _____ Check depth of trenches (every 50 ft)—maximum is 3 ft
3. _____ Check width of trenches
4. _____ Check location of observation ports (if required)
5. _____ Check depth of gravel (every 50 ft)
6. _____ Check for placement of filter fabric (if required)
7. _____ Check that laterals are level
8. _____ Measure distance between laterals
9. _____ Check for location of reserve drainfield
10. _____ Measure distance from septic tank—minimum of 5 ft from tank, 10 ft from foundation
11. _____ Check setbacks from wells, property lines, etc.
12. _____ Check step downs if present—should be different locations, minimum 6 inches soil cover

C. Installation Report and Record Drawing— to be completed on site

II. Pressure Systems

A. Pump Tanks

1. _____ Check for signs of leakage— tank should be sealed and filled with water
2. _____ Check connections to septic tank and baffle
3. _____ Check float configuration and distances— need 75% emergency storage at top
 - *Upper* float _____ inches
 - *Middle* float _____ inches
 - *Lower* float _____ inches (from _____)
4. _____ Check for proper operation of floats and alarms
5. _____ Check pump flow rate by timing for 1-2 minutes
 - a. Measure depth before and after pumping
 - b. Assume 21 gallons/inch for 1000 gallon tank
6. _____ Check timer settings
 - **ON** _____ minutes
 - **OFF** _____ hours
7. _____ Verify that the high water alarm does not turn the pump on

B. Drainfield (see *Gravity Checklist*)

1. _____ Check depth, length, and width of trenches or bed
2. _____ Orifices— check *size* (1/8 or 3/16 inch), *spacing* _____ inches apart
3. _____ Sand— check for ASTM C-33 specifications, minimum depth 24 inches
4. _____ Observation ports—to original soil surface and bottom of gravel (sand-lined)
5. _____ Gravel— should be washed and cleaned
6. _____ Pressure (squirt) test
 - a. *1/8 inch*—five feet (+/- 12 inch/lateral or 18 inch overall)
 - b. *3/16 inch*—two feet (+/- 5 inch/lateral or +/- 7.5 inch overall)

C. Miscellaneous

1. _____ If alternating drainfield, check for proper function or valve
2. _____ Check for any sewer line/water line crossing—minimum distance 10 feet apart
3. _____ Check the drainfield and tanks are located as stated in design
4. _____ For infiltrator system check splash plates, fencing beneath

