

CONSTRUCTION STANDARDS**340-073-0025 TANK CONSTRUCTION**

The following construction requirements shall apply to all holding, dosing, septic and dosing septic tanks manufactured for use in Oregon unless specifically exempted by other portions of these rules:

- (1) **Compartments:** Tanks may have single or multiple compartments. Multiple compartment tanks shall comply with the following:
 - (a) The first compartment shall have a minimum liquid capacity of not less than 2/3 of the total required liquid capacity, as measured from the invert of the outlet fitting;
 - (b) Each compartment shall have access provided by a manhole having not less than 18 inches across its shortest dimension unless otherwise approved by the Department. The manhole cover shall not weigh more than 75 pounds. All tanks shall be constructed to accommodate watertight risers per OAR 340-071-0220 (3)(b)(C). Tank lids shall be constructed with or provided with a durable, non-degradable, resilient gasket, the purpose of which is to restrict access to vectors and vermin and to control odors and retard infiltration;
 - (c) No compartment shall have an inside horizontal dimension of less than 24 inches.
- (2) **Liquid Depth:** The liquid depth of any compartment shall be at least 30 inches. Liquid depths greater than 72 inches shall not be considered in determining the working liquid capacity, except for tanks greater than 3,000 gallons capacity.
- (3) **Watertightness:** After installation, all tanks shall be watertight. Each tank shall be water tested by filling to a point at least 2 inches above the point of riser connection to the top of the tank. During the test there shall be no more than a one gallon leakage over a 24 hour period.
- (4) In the case where the tank manufacturer does not install and/or seal the tank at the job site, the manufacturer shall provide bonding and sealing agents and instruction manual with the tank.
- (5) **Structural:** All tanks shall be capable of supporting an earth load of at least 300 pounds per square foot when the maximum coverage does not exceed 3 feet. Tanks installed with more than 3 feet of cover shall be reinforced to support the additional load. Lateral load shall be 62.4 pcf of equivalent fluid pressure (EFP). Tanks shall be capable of withstanding long-term external hydrostatic loads in addition to soil loads. Internal hydrostatic pressures shall be omitted to allow for septage pumping during critical groundwater conditions. A 2,500 pound wheel load concentrated over the critical elements of the tank shall also be considered.

- (6) The inlet and outlet fittings shall be of Schedule 40 P.V.C. plastic, Schedule 40 ABS plastic, or other materials approved by the Department, with a minimum diameter of four inches:
- (a) The distance between the inlet and outlet fittings shall be equal to, or greater than, the liquid depth of the tank;
 - (b) The inlet and outlet fittings, where applicable, shall be located at opposite ends of the tank. The inlet must be readily accessible by way of the service access or other means approved by the Department in the design of the tank. They shall be attached in a watertight manner approved by the Department;
 - (c) The inlet fitting shall be a “sanitary tee” extending at least 6 inches above and at least 12 inches below the normal high and low liquid levels;
 - (d) The outlet fitting, holes or ports provided in a vault or outlet filtering device shall be positioned to withdraw effluent horizontally from the clear zone, at an elevation measured from the inside bottom of the tank 65 to 75 percent of the lowest operating liquid depth. The net area of the ports shall be not less than 6 square inches. The outlet fitting shall extend at least 6 inches above the highest normal liquid depth in order to provide scum storage. When the tank is used as a holding or dosing tank, the outlet fitting shall be provided with a watertight plug, or omitted;
 - (e) Ventilation shall be provided through the fittings by means of a 2 inch minimum space between the underside of the top of the tank and the top of the inlet “tee” fitting;
 - (f) The invert of the inlet fitting shall be not less than one inch and preferably 3 inches above the invert of the outlet fitting, or the highest normal liquid level;
 - (g) A convenient means of monitoring sludge and scum accumulation shall be provided, with access extending to ground level;
 - (h) The tank manufacturer shall provide with each fitting a rubber or neoprene rubber gasket meeting **ASTM Specification C-564**, or an appropriate coupler which the Department determines will provide a watertight connection between the fittings and the building and effluent sewer pipes;
 - (i) Manufacturer shall provide a method to attach a specified type of riser to the tank in a watertight manner.
- (7) At least 10 percent of the inside volume of the tank shall be above liquid level to provide scum storage and reserve.
- (8) In tanks with more than one compartment, a 4 inch diameter (minimum) “tee” fitting shall be placed in each common compartment wall, using the same specifications as required for the outlet fitting. The invert of this “tee” fitting shall be at the same elevation as the outlet “tee”. Access ports and risers shall be provided for inspection and maintenance.

- (9) Except as provided in OAR 340-073-0026, tanks shall be constructed of concrete, fiberglass, or other non-corrosive materials approved by the Department:
- (a) Pre-cast concrete tanks shall have a minimum wall, compartment, and bottom thickness of 2-1/2 inches, and shall be adequately reinforced. The top shall be at least 4 inches thick;
 - (b) Cast-in-place tanks shall be designed by a civil/structural engineer to the requirements of these rules and the tank construction shall be certified by the designer or qualified representative. A structural permit from the Building Codes Division or the municipality with jurisdiction (as defined in ORS 456.750(5)) is required when cast-in-place concrete tanks are used;
 - (c) Tanks made of other non-corrosive materials shall be constructed to provide structural integrity to meet the requirements of sections (3), (4) and (5) of this rule.
- (10) All prefabricated tanks shall be marked on the uppermost tank surface over the outlet with the liquid capacity of the tank, the burial depth limit, date of manufacture, and either the manufacturer's full business name or the number assigned by the Department.
- (11) Each commercial manufacturer of prefabricated tanks shall provide two complete sets of plans and specifications, prepared by a registered professional engineer licensed to practice in Oregon, to the Department for review and approval. Plans submittal shall include the structural analysis, calculation of total gallons, operating gallons, gallons per inch, and buoyancy, including predetermined countermeasures.
- (12) Each commercial manufacturer of pre-fabricated tanks shall provide the Department with written certification that tanks for use in on-site sewage disposal systems in the State of Oregon will comply with all requirements of this rule.
- (13) An installation manual, on waterproof paper, shall be provided by the manufacturer with each tank distributed. It shall describe proper installation of the tank, riser(s) and lid, pipe connections, testing procedures, backfill and any special precautions or limitations.

[Publications: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 5-1982, f. & ef. 3-9-82; DEQ 15-1986, f. & ef. 8-6-86; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0026 SEPTIC TANKS

- (1) Septic tanks shall be constructed of concrete, fiberglass, steel, or other non-corrosive materials approved by the Department. Steel septic tanks shall be not less than 12 gauge or thicker steel. They shall be coated inside and out with asphalt or other protective coatings, meeting the most current American National Standards Institute UL 70 standard, Sections 25 through 43, or other coatings of equal or better performance approved by the Department.
- (2) The outlet of a septic tank serving a commercial facility shall be equipped with an effluent filter or treatment device meeting the requirements of OAR 340-073-0056, complete with a service riser that meets all the requirements of these rules.

Stat. Auth.: ORS 454.625 & 468.020
Stats. Implemented: ORS 454.615
Hist.: DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0030 DOSING SEPTIC TANK

- (1) A dosing septic tank may discharge effluent with a pump or dosing siphon from the clear zone at the outlet end of the tank. These may be considered by the Department for equipment approval for installations where the design flow does not exceed 600 gallons per day.
- (2) Special Configuration:
 - (a) The minimum total primary volume of the tank shall be 1,100 gallons for flows less than or equal to 450 gallons per day and 1,500 gallons for flows up to 600 gallons per day;
 - (b) The minimum submerged volume at the lowest operating liquid level shall ensure optimum surge capacity, reserve storage capacity, sludge and scum capacity, and hydraulic retention time;
 - (c) Unless otherwise authorized by the Department, liquid levels shall be controlled so that no more than 20 percent of the projected daily sewage flow is discharged each cycle; except that for sand filters the discharge shall be no more than 10 percent per cycle;
 - (d) All apparatus shall be constructed and installed to facilitate ease of service without having to alter any other component;
 - (e) Besides the requirements in OAR 340-073-0025(13), the installation manual shall describe the installation of pump or siphon, piping, valves, controls, and wiring to manufacturer's specifications and these rules.

Stat. Auth.: ORS 454.625 & 468.020
Stats. Implemented: ORS 454.615
Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0035 DISTRIBUTION BOXES

- (1) Distribution boxes shall be constructed of concrete, fiberglass, or other materials acceptable to the Department.
- (2) Distribution boxes shall be constructed of durable, watertight materials, resistant to deterioration, and be designed to accommodate watertight connections for the effluent sewer and/or header pipes. The top, walls, and bottom of concrete distribution boxes shall be at least one and 1-1/2 inches thick.
- (3) The invert elevation of all outlets shall be the same, and shall be at least 2 inches below the inlet invert.
- (4) Each distribution box shall be provided with a sump extending at least 2 inches below the invert of the outlets.
- (5) Distribution box covers shall be marked with the manufacturer's full business name, or number assigned by the Department.
- (6) Each manufacturer shall provide the Department with complete, detailed plans and specifications of the distribution box, and shall certify, in writing, that distribution boxes manufactured for use in on-site sewage systems in Oregon will comply with all requirements of this rule.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 5-1982, f. & ef. 3-9-82; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0040 DROP BOXES

- (1) Drop boxes shall be constructed of concrete, fiberglass, or other materials acceptable to the Department.
- (2) Drop boxes shall be constructed of durable, watertight materials, resistant to deterioration, and be designed to accommodate watertight connections for the effluent sewer and/or header pipes. The top, walls, and bottom of concrete drop boxes shall be at least 1-1/2 inches thick.
- (3) The inverts of the inlet and overflow port shall be at the same elevation. The invert of the header pipe port(s) leading to the disposal trench(es) shall be 6 inches below the inlet invert.
- (4) Drop box covers shall be marked with the manufacturer's full business name, or number assigned by the Department.
- (5) Each manufacturer shall provide the Department with complete, detailed plans and specifications of the drop box, and shall certify, in writing, that drop boxes manufactured for use in on-site sewage disposal systems in Oregon will comply with all requirements of this rule.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0041 FILTER FABRIC

Except as otherwise allowed by the Department on a case-by-case basis, filter fabric used within on-site systems in Oregon shall meet the following specifications:

- (1) Material synthetic fabric, either spun-bonded or woven.
- (2) Burst Strength, psi — not less than 25 psi.
- (3) Air Permeability, cfm per sq. ft. — not less than 500.
- (4) Water Flow Rate — not less than 500 gpm per sq. ft. at 3 inches of head.
- (5) Surface Reaction to Water — Hydrophilic.
- (6) Equivalent Opening Size — 70 to 100 sieve.
- (7) Chemical Properties:
 - (a) Non-biodegradable.
 - (b) Resistant to acids and alkalis within a pH range of 4 to 10.
 - (c) Resistant to common solvents.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 15-1986, f. & ef. 8-6-86

340-073-0045 DIVERSION VALVES

- (1) Diversion valves shall be constructed of durable material, corrosion-resistant, watertight, and designed to accommodate the inlet and outlet pipes, in a secure and watertight manner.
- (2) Diversion valves shall be constructed with access to finished grade, adequate in size to provide for ease of operation and service of valve.
- (3) Each manufacturer shall provide the Department with complete, detailed plans and specifications of the diversion valve, including an instruction manual, and shall certify, in writing, that diversion valves manufactured for use in on-site sewage disposal systems in Oregon will comply with all requirements of this rule.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0050 DOSING TANKS

- (1) Each dosing tank employing one or more pumps shall have a minimum liquid capacity equal to the projected daily sewage flow for flows up to 1,200 gallons per day. The Department may use its discretion in sizing dosing tanks when the projected daily sewage flow is greater than 1,200 gallons per day. The liquid capacity shall be as measured from the invert elevation of the inlet fitting.
- (2) Each dosing tank shall be provided with an access manhole and a manhole cover, both having a minimum horizontal measurement of 18 inches.
- (3) Each dosing tank proposed to serve a commercial facility containing more than one pump or siphon shall be provided with one or more manhole accesses that provide adequate area to construct, install, service and operate the equipment in accordance with provision of these rules.
- (4) Besides meeting the requirements in OAR 340-073-0025(13), the installation manual shall describe the installation of pump or siphon, piping, valves, controls, and wiring to manufacturer's specifications.
- (5) Dosing tanks with siphons shall be designed and sized for each specific project. The tank manufacturer shall specify the type or model of siphon, screen and related apparatus to be used with that tank.
- (6) The inlet fitting shall extend below the lowest operating level of the pump or siphon.

[Publications: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 5-1982, f. & ef. 3-9-82; DEQ 15-1986, f. & ef. 8-6-86; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0055 DOSING ASSEMBLIES: EFFLUENT PUMPS, CONTROLS AND ALARMS, AND DOSING SIPHONS

- (1) Design and equipment shall emphasize ease of maintenance and longevity and reliability of components, and shall be proven suitable by operational experience, test, or analysis suitable to the Department.
- (2) Easy means of electrical and plumbing disconnect shall be provided. All apparatus shall be constructed and installed to facilitate ease of service without having to alter any other component.
- (3) Component materials shall be durable and corrosion resistant such as Type 316 stainless steel, suitable plastics, or 85-5-5-5 bronze.
- (4) Pumps, Siphons, Controls, and Alarms: All pumps, siphons, controls and related apparatus shall be field tested under working conditions and found to operate and perform satisfactorily in order to be considered in compliance with these rules. Electrical components used in on-site sewage disposal systems shall comply with State of Oregon Electrical Code, and the following provisions:
 - (a) Motors shall be continuous-duty, with overload protection;
 - (b) Pumps shall have durable impellers of bronze, cast iron, or other materials approved by the Department;
 - (c) Submersible pumps shall be provided with an easy, readily accessible means of electrical and plumbing disconnect, and a non-corrosive lifting device as a means of removal for servicing;
 - (d) Except where specifically authorized in writing by the Agent, the pump or siphon shall be placed within a corrosion-resistant screen that extends above the maximum effluent level within the pump chamber. The screen shall have at least twelve (12) square feet of surface area, with one-eighth (1/8) inch openings. In lieu of the screen, the Agent may allow other methods with equal or better performance in preventing the passage of suspended solids to the pump or siphon;
 - (e) Pumps shall be automatically controlled by float switches with a minimum rating of twelve (12) amps at one hundred fifteen (115) volts A.C. or by a Department approved equivalently reliable switching mechanism. Except as otherwise required in this division, the switches shall be installed so that no more than twenty (20) percent of the projected daily sewage flow is discharged each cycle. The pump "off" level shall be set to maintain the liquid level above the top of the pump or to the pump manufacturer's specifications;
 - (f) An audible and visual high water level alarm with manual silence switch shall be located in or near the building served by the pump. The audible alarm only may be user cancelable. The switching mechanism within a dosing tank or chamber controlling the high water level alarm shall be located so that at time of activation the tank has one-third (1/3) of its capacity remaining for effluent

- storage. Commercial applications utilizing duplex pumps are not subject to the 1/3 storage reserve capacity requirement;
- (g) When a system has more than one (1) pump, the Department may require they be wired into the electrical control panel to function alternately after each pumping cycle. If either pump should fail the other pump will continue to function, while an audible (user cancelable) and visual alarm (not user cancelable) indicating pump malfunction will activate. A cycle counter shall be installed in the electrical control panel for each pump;
 - (h) All pump installations shall be designed with adequate sludge storage area below the effluent intake level of the pump;
 - (i) All commercial systems with a design flow greater than 600 gallons shall be constructed in duplex (two or more alternating pumps) unless otherwise authorized in writing by the Department. Controls shall be provided such that an alarm shall signal when one (1) of the pumps malfunctions;
 - (j) All pumps serving commercial systems shall be operated through a pre-manufactured electrical control panel. Means of monitoring pump performance through the use of elapsed time meters and cycle counters are required;
 - (k) Where multiple pumps are operated in series, an electrical control panel shall be installed which will prevent the operation of a pump or pumps preceding a station which experiences a high level alarm event.
- (5) Dosing Siphons. Dosing siphons used in on-site sewage disposal systems shall comply with all of the following minimum requirements:
- (a) The siphon shall be constructed of corrosion-resistant materials;
 - (b) The siphon shall be installed in accordance with the manufacturer's recommendations;
 - (c) The manufacturer's installation and maintenance instructions shall be kept on site;
 - (d) The installation shall include an electrically operated device which tracks the operation of the siphon by measuring cycle events and records them by means of an event counter mounted within the dwelling or structure served.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 23-1981(Temp), f. & ef. 9-2-81; DEQ 5-1982, f. & ef. 3-9-82; DEQ 15-1986, f. & ef. 8-6-86; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95; DEQ 12-1997, f. & cert. ef. 6-19-97

340-073-0056 EFFLUENT FILTERS

Effluent filters used in on-site sewage disposal systems shall meet the following criteria:

- (1) Filters shall be of durable, resilient, corrosion resistant, non-degradable materials resistant to deformation under normal operating conditions.
- (2) Filters shall be designed to prevent the escape of sludge or scum during normal operation and in the event of a malfunction, including filter clogging.
- (3) The filter shall retain all particles greater than 1/8 inch in size.
- (4) The filter assembly shall baffle the sludge and scum layers to prevent the escape of gross solids during sludge bulking or gas ebullition.
- (5) Filters shall be designed and positioned to allow for easy, trouble-free removal from and reinstallation to the screen apparatus from the assembly.
- (6) The assembly shall be capable of withstanding stresses placed upon it by installation, operation and service.
- (7) The assembly shall perform as a conventional tank outlet, meeting the requirements of OAR 340-073-0025(6), when the filter is removed.
- (8) The assembly shall be vented with nominal 1/2 inch diameter opening to an elevation above the top of the tank.
- (9) The filter must be designed to handle the flow of the system it is to serve and not result in excessive maintenance. For a single family dwelling, maintenance is considered "excessive" when the filter requires service or cleaning more than 1 time per year. Service shall be performed each time the tank is pumped, and in accordance with the manufacturer's specifications.
- (10) To obtain Department approval, the manufacturer of an effluent filter shall provide the Department with the necessary technical data to show that the design and materials comply with these rules. Each manufacturer shall provide an operation and maintenance manual with each unit distributed.

Stat. Auth.: ORS 454.625 & 468.020
Stats. Implemented: ORS 454.615
Hist.: DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0060 PIPE MATERIALS AND CONSTRUCTION

- (1) Effluent Sewer Pipe: The effluent sewer shall be constructed with materials in conformance to building sewer standards, as identified in the Oregon State Plumbing Laws and Administrative Rules. The effluent sewer pipe shall have a minimum diameter of 3 inches. When the septic tank is fitted with an effluent filter, the minimum nominal diameter of piping may be reduced to 1-1/4 inches.
- (2) Distribution and Header Pipe and Fittings:
 - (a) Plastic Pipe and Fittings:
 - (A) Styrene-rubber plastic distribution and header pipe and fittings shall meet the most current **ASTM** (American Society for Testing and Materials) **Specification D 2852** and **Sections 5.5 and 7.8 of Commercial Standard 228**, published by the U.S. Department of Commerce. Pipe and Fittings shall also pass a deflection test withstanding 350 pounds/foot without cracking by using the method found in **ASTM 2412**. In addition to the markings required by **ASTM 2852**, each manufacturer of styrene-rubber plastic pipe shall certify, in writing to the Department, that the pipe to be distributed for use in absorption facilities within the State of Oregon will comply with all requirements of this section;
 - (B) Polyethylene distribution pipe in ten foot lengths and header pipe in lengths of ten feet or greater of which pipe and fitting shall meet the current **ASTM Specification F 405**. Pipe and fittings shall also pass a deflection test withstanding 350 pounds per foot without cracking or collapsing by using the method found in **ASTM 2412**. Pipe used in absorption facilities shall be heavy duty. In addition to the markings required by **ASTM F 405**, each manufacturer of polyethylene pipe shall certify, in writing to the Department that the pipe to be distributed for use in absorption facilities within the State of Oregon will comply with all requirements of this section;
 - (C) Polyvinyl chloride (PVC) distribution and header pipe and fittings shall meet the most current **ASTM Specification D 2729**. Pipe and fittings shall pass a deflection test withstanding 350 pounds per foot without cracking or collapsing by using the method found in **ASTM 2412**. Markings shall meet requirements established in **ASTM Specification D 2729**, subsections 9.1.1, 9.1.2 and 9.1.4. Each manufacturer of polyvinyl chloride pipe shall certify, in writing to the Department, that pipe and fittings to be distributed for use in absorption facilities within the State of Oregon will comply with all requirements of this section;
 - (D) Polyethylene smooth wall distribution and header pipe (10 foot lengths) and fittings shall meet the most current **ASTM Specification F 810**. Pipe and fittings shall also pass a deflection test of 350 pounds per foot without cracking or collapsing by using the method found in **ASTM 2412**. Markings shall meet the requirements established in **ASTM Specification F 810, Section 9**. Each manufacturer of polyethylene

smooth wall pipe shall certify, in writing to the Department that the pipe to be distributed for use in absorption facilities within the State of Oregon will comply with all requirements of this rule;

- (E) The four types of plastic pipe described above shall have two rows of holes spaced 120 degrees apart and 60 degrees on either side of a center line. For distribution pipe, a line of contrasting color shall be provided on the outside of the pipe along the line furthest away and parallel to the two rows of perforations. Markings, consisting of durable ink, shall cover at least 50 percent of the pipe. Markings may consist of a solid line, letters, or a combination of the two. Intervals between markings shall not exceed 12 inches. The holds of each row shall be not more than five inches on center and shall have a minimum diameter of 1/2 inch.
- (b) Concrete tile in 12 inch lengths shall meet the current **ASTM Specification C 412**. Each manufacturer of concrete tile shall certify, in writing to the Department, that the pipe to be distributed for use in absorption facilities within the State of Oregon will comply with all of the requirements of this section;
- (c) Clay drain tile in 12 inch lengths shall meet the current **ASTM Specification C 4**. Tile used as part of an absorption facility shall bear the ASTM number above and some identification as to which quality standard it meets (Standard, Extra-Quality, Heavy Duty). In addition to the markings required above, each manufacturer of clay tile shall certify, in writing to the Department, that the pipe to be distributed for use in absorption facilities within the State of Oregon shall comply with all of the requirements of this section;
- (d) Bituminized fiber solid pipe and fittings shall meet the current **ASTM Specification D 1861**. Perforated bituminized fiber pipe shall meet the current **ASTM Specification D 2312**. Each length of pipe and each fitting shall be marked with the nominal size, the manufacturer's name or trademark, or other symbol which clearly identifies the manufacturer and the appropriate ASTM specification number above. Markings on pipe shall be spaced at intervals not greater than two feet. In addition to the markings required above, each manufacturer of bituminized pipe shall certify, in writing to the Department, that the pipe to be distributed for use in absorption facilities within the State of Oregon shall comply with all requirements of this section. In addition, all bituminized pipe that is to be installed as part of an absorption facility shall comply with the following requirements. The pipe shall have two rows of holes spaced 120 degrees apart and 60 degrees on either side of a center line. For distribution pipe, a line of contrasting color shall be provided on the outside of the pipe along the line furthest away and parallel to the two rows of perforations. Markings, consisting of durable ink, shall cover at least 50 percent of the pipe. Markings may consist of a solid line, letters, or a combination of the two. Intervals between markings shall not exceed 12 inches. The holes of each row shall not be more than five inches on center and shall have a minimum diameter of 1/2 inch;
- (e) Polyvinyl chloride (PVC) pressure transport pipe, pressure manifolds, and pressure lateral pipe and fittings shall meet the current requirements for Class 160

PVC 1120 pressure pipe as identified in **ASTM Specification D 2241**. The pipe and fittings shall be marked as required by **ASTM Specification D 2241**.

[**Publications:** The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 5-1982, f. & ef. 3-9-82; DEQ 9-1982, f. & ef. 6-16-82; DEQ 15-1986, f. & ef. 8-6-86; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

NONWATER-CARRIED WASTE DISPOSAL FACILITIES, MATERIALS, AND CONSTRUCTION

340-073-0065 PRIVIES AND PORTABLE TOILET SHELTERS

- (1) Privies and portable toilet shelters shall comply with the following general requirements:
 - (a) Structures shall be free of hostile surface features, such as exposed nail points, sharp edges, and rough or broken boards, and shall provide privacy and protection from the elements;
 - (b) Building ventilation shall be equally divided between the bottom and top halves of the room. All vents shall be screened with 16 mesh screen of durable material;
 - (c) Buildings shall be of fly-tight construction and shall have self-closing doors with an inside latch;
 - (d) Pits, tanks or vaults shall be vented to the outside atmosphere by a flue or vent stack having a minimum inside diameter of 4 inches. Vents shall extend not less than 12 inches above the roof;
 - (e) Interior floors, walls, ceilings, partitions, and doors shall be finished with readily cleanable impervious materials resistant to wastes, cleansers and chemicals. Floors and risers shall be constructed of impervious material and in a manner which will prevent entry of vermin;
 - (f) Seat tops shall be not less than 12 inches nor more than 16 inches above the floor. The seat openings shall be covered with attached, open-front toilet seats with lids, both of which can be raised to allow use as a urinal;
 - (g) The distance between the front of the riser and the building wall shall be not less than 21 inches.
- (2) Privies: In addition to complying with the requirements specified in section (1) of this rule, privies shall be provided with:
 - (a) Adequate ventilation shall be provided to allow for the free escape of gases and odors;

- (b) A minimum clear space of 24 inches between seats in multiple-unit installations and a clear space of 12 inches from the seat opening to the building wall in both single and multiple units.
- (3) Portable Toilet Shelters: Portable toilet shelters may be prefabricated, skid mounted or mobile. In addition to complying with the requirements specified in section (1) of this rule, portable toilet shelters shall:
- (a) Provide screened ventilation to the outside atmosphere having a minimum area of one square foot per seat;
 - (b) Provide a minimum floor space outside of the riser of nine square feet per seat;
 - (c) Be furnished with a toilet tissue holder for each seat;
 - (d) Be located in areas readily accessible to users and to pumping/cleaning services;
 - (e) Provide separate compartments with doors and partitions or walls of sufficient height to insure privacy in multiple-unit shelters except that separate compartments are not required for urinals.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615 & 454.775

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0070 UNSEALED EARTH PITS FOR PRIVIES

- (1) The pit shall be constructed of such material and in such a manner as to prevent rapid deterioration, provide adequate capacity, and facilitate maintenance in a satisfactory manner under ordinary conditions of usage.
- (2) The pit shall provide a capacity of 50 cubic feet for each seat installed in the privy building and shall be at least five feet deep. The area within 16 inches of the surface grade shall not be counted as part of the 50 cubic-foot capacity.
- (3) Pit cribbing shall fit firmly and be in uniform contact with the earth walls on all sides, and shall rise at least 6 inches above the original ground line and descend to the full depth of the pit. However, pit cribbing below the soil line may be omitted in rock formations.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615 & 454.775

Hist.: DEQ 10-1981, f. & ef. 3-20-81

340-073-0075 SELF-CONTAINED NONWATER-CARRIED TOILET FACILITIES

- (1) General Standards. All self-contained nonwater-carried toilet facilities shall comply with the following requirements:
 - (a) They shall have water-tight chambers constructed of reinforced concrete, plastic, fiberglass, metal, or of other material of acceptable durability and corrosion resistance, approved by the Department, and designed to facilitate the removal of the wastes;
 - (b) Black wastes shall be stored in an appropriate chamber until removal for final disposal elsewhere. Wastes shall be removed from the chamber whenever necessary to prevent overflow;
 - (c) Chemicals containing heavy metals, including but not limited to copper, cadmium and zinc, shall not be used in self-contained toilet facilities;
 - (d) All surfaces subject to soiling shall be impervious, easily cleanable, and readily accessible.
- (2) Vault Toilet Facilities:
 - (a) The minimum capacity of vaults shall be 350 gallons or, in places of employment, 100 gallons per seat;
 - (b) Caustic shall be added routinely to vault chambers to control odors.
- (3) Chemical Toilet Facilities:
 - (a) Toilet bowls shall be constructed of stainless steel, plastic, fiberglass, ceramic or of other material approved by the Department;
 - (b) Waste passages shall have smooth surfaces and be free of obstructions, recesses or cross braces which would restrict or interfere with flow of black wastes;
 - (c) Biocides and oxidants shall be added to waste detention chambers at rates and intervals recommended by the chemical manufacturer and approved by the Department;
 - (d) Chambers and receptacles shall provide a minimum storage capacity of 50 gallons per seat;
 - (e) Portable shelters housing chemical toilets shall display the business name of the licensed sewage disposal service that is responsible for servicing them.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615 & 454.775

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 9-1984, f. & ef. 5-29-84

340-073-0080 CONSTRUCTION OF GRAY WATER WASTE DISPOSAL SUMPS

A gray water waste disposal sump shall consist of a receiving chamber, settling chamber, and either a seepage chamber or disposal trench.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.610, 454.615 & 454.775

Hist.: DEQ 10-1981, f. & ef. 3-20-81; DEQ 8-1983, f. & ef. 5-25-83; DEQ 16-1986, f. & ef. 9-16-86; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95

340-073-0085 FLEXIBLE MEMBRANE LINERS FOR SAND FILTERS TREATING SEPTIC TANK EFFLUENT

- (1) Unsupported polyvinyl chloride (PVC) shall have the following properties:

Property	Test Method	
	(a) Thickness	ASTM D1593 Para 9.1.3
(b) Specific Gravity (Minimum)	ASTM D792 Method A	
(c) Minimum Tensile Properties (each direction)	ASTM D882	
(A) Breaking Factor (pounds/inch width)	Method A or B (1 inch wide)	69
(B) Elongation at Break (percent)	Method A or B	300
(C) Modulus (force) at 100% Elongation (pounds/inch width)	Method A or B	27
(d) Tear Resistance (pounds, minimum)	ASTM D1004 Die C	8
(e) Low Temperature	ASTM D1790	-20°F
(f) Dimensional Stability (each direction, percent change maximum)	ASTM D1204 212°F, 15 min.	±5
(g) Water Extraction	ASTM D1239	-0.35% max.
(h) Volatile Loss	ASTM D1203 Method A	0.7% max.
(i) Resistance to Soil Burial (percent change maximum in original value)	ASTM D3083	
(A) Breaking Factor		-5
(B) Elongation at Break		-20
(C) Modulus at 100% Elongation		±10
(j) Bonded Seam Strength (factory seam, breaking factor, ppi width)	ASTM D3083	55.2
(k) Hydrostatic Resistance	ASTM D751 Method A	82

- (2) Installation Standards:

- (a) Patches, repairs and seams shall have the same physical properties as the parent material;
- (b) Site Considerations and Preparation:
- (A) The supporting surface slopes and foundation to accept the liner shall be stable and structurally sound including appropriate compaction. Particular attention shall be paid to the potential of sink hole development and differential settlement;
- (B) Soil stabilizers such as cementations or chemical binding agents shall not adversely affect the membrane; cementations and chemical binding agents may be potentially abrasive agents.

- (c) Only fully buried membrane liner installation shall be considered to avoid weathering;
- (d) Un-reinforced liners have high elongation and can conform to irregular surfaces and follow settlements within limits. Unreasonable strain reduces effective thickness and may reduce life expectancy by lessening the chemical resistance of the thinner (stretched) material. Every effort shall be made to minimize the strain (or elongation) anywhere in the flexible membrane liner;
- (e) Construction and Installation:
 - (A) Surface Condition:
 - (i) Preparation of Earth Sub-grade. The prepared sub-grade shall be of soil types no larger than Unified Soil Classification System USCS sand (SP) to a minimum of four inches below the surface and free from loose earth, rock, fractured stone, debris, cobbles, rubbish and roots. The surface of the completed sub-grade shall be properly compacted, smooth, uniform and free from sudden changes in grade. Importing suitable soil may be required;
 - (ii) Maintenance of Sub-grade. The earth sub-grade shall be maintained in a smooth, uniform and compacted condition during installation of the lining.
 - (B) Climatic Conditions:
 - (i) Temperature. The desirable temperature range for membrane installation is 42° F. to 78° F. Lower or higher temperatures may have an adverse effect on transportation, storage, field handling and placement, seaming and backfilling and attaching boots and patches may be difficult. Placing liner outside the desirable temperature range shall be avoided;
 - (ii) Wind. Wind may have an adverse effect on liner installation such as interfering with liner placement. Mechanical damage may result. Cleanliness of areas for boot connection and patching may not be possible. Alignment of seams and cleanliness may not be possible. Placing the liner in high wind shall be avoided;
 - (iii) Precipitation. When field seaming is adversely affected by moisture, portable protective structures and/or other methods shall be used to maintain a dry sealing surface. Proper surface preparation for bonding boots and patches may not be possible. Seaming, patching and attaching “boots” shall be done under dry conditions.
 - (C) Structures. Where penetrations are necessary, liners shall be attached to pipes with a mechanical type seal supplemented by a chemically

compatible caulking or adhesives to effect a liquid-tight seal. The highest order of compaction shall be provided in the area adjacent to pipes to compensate for any settlement;

(D) Liner Placement:

- (i) Size. The final cut size of the liner shall be carefully determined and ordered to generously fit the container geometry without field seaming or excess straining of the liner material;
- (ii) Transportation, Handling and Storage. Transportation, handling and storage procedures shall be planned to prevent material damage. Material shall be stored in a secured area and protected from adverse weather;
- (iii) Site Inspection. A site inspection shall be carried out by the Agent and the installer prior to liner installation to verify surface conditions, etc.;
- (iv) Deployment. Panels shall be positioned to minimize handling. Seaming should not be necessary. Bridging or stressed conditions shall be avoided with proper slack allowances for shrinkage. The liner shall be secured to prevent movement and promptly backfilled;
- (v) Anchoring Trenches. The liner edges should be secured frequently in a backfilled trench;
- (vi) Field Seaming. Field seaming, if absolutely necessary, shall only be attempted when weather conditions are favorable. The contact surfaces of the materials should be clean of dirt, dust, moisture, or other foreign materials. The contact surfaces shall be aligned with sufficient overlap and bonded in accordance with the suppliers recommended procedures. Wrinkles shall be smoothed out and seams should be inspected by non-destructive testing techniques to verify their integrity. As seaming occurs during installation, the field seams shall be inspected continuously and any faulty area repaired immediately;
- (vii) Field Repairs. It is important that traffic on the lined area be minimized. Any necessary repairs to the liner shall be patched using the same lining material and following the recommended procedure of the supplier;
- (viii) Final Inspection and Acceptance. Completed liner installations shall be visually checked for punctures, rips, tears and seam discontinuities before placement of any backfill. At this time the installer shall also manually check all factory and field seams with an appropriate tool. In lieu of or in addition to manual

checking of seams by the installer, either of the following tests may be performed:

- (I) Wet Test: The lined basin shall be flooded to the 1 foot level with water after inlets and outlets have been plugged. There shall not be any loss of water in a 24 hour test period;
- (II) Air Lance Test: Check all bonded seams using a minimum 50 PSI (gauge) air supply directed through a 3/16 inch (typical) nozzle, held not more than two inches from the seam edge and directed at the seam edge. Riffles indicate un-bonded areas within the seam, or other undesirable seam construction.

Stat. Auth.: ORS 454.625 & 468.020

Stats. Implemented: ORS 454.615 & 454.780

Hist.: DEQ 5-1982, f. & ef. 3-9-82; DEQ 15-1986, f. & ef. 8-6-86; DEQ 27-1994, f. 11-15-94, cert. ef. 4-1-95