Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Western Region Eugene Office
165 East 7th Avenue, Suite 100
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
TTY 711

March 6, 2013

Doug Dilley
Willamette Graystone, Inc.
P.O. Box 7816
Springfield, OR 97475

Dear Mr. Dilley:

The Oregon Department of Environmental Quality (DEQ) has received the plans, specifications and other associated materials you provided for a proposed septic tank configuration to be manufactured by Willamette Graystone, Inc. This letter is to inform you that the following tank can be installed in the State of Oregon, based on your certification that the tank complies with all applicable Department rules and regulations:

- 1000 gallon partitioned dosing septic tank

Boeger & Associates, LLC was the engineering firm for all plans submitted. These plans were stamped by Dennis Boeger, P.E., CWE. A copy of the Department approved plans and installation manual dated March 5, 2013, are attached to this letter. Willamette Graystone, Inc. is authorized to manufacture and distribute the above mentioned tank for use in onsite wastewater treatment systems in Oregon until further notice, provided the following conditions are met:

1. The tanks must be manufactured in compliance with the Department's rules and the plans and design specifications provided. Any deviations from the plans and specifications are not permitted unless authorized in writing by the Department.

2. The concrete mix must be in accordance with the mix description on the plans prepared by your engineer. A twenty-eight day (28) compressive strength of 3,000 PSI, as specified in the plans provided by the engineer must be achieved. Samples must be tested for compressive strength. Three (3) concrete sample cylinders must be taken and tested for each tank manufactured until the minimum compressive strength is obtained. Thereafter, at least one (1) concrete sample cylinder for each five (5) tanks produced must be taken. Samples must be alternately broken at twenty-eight (28) days. All tanks must be field cured were the tanks are stored. Laboratory curing of additional samples may be done at the discretion of Willamette Graystone, Inc. Upon request, all test results must be made available to the Department for review.

3. Tanks shall not be removed from the manufacturing site to the job site until the tanks have cured for seven (7) days, or have reached two-thirds of the design strength. Proper curing techniques must be used to ensure watertight tanks.

4. Your business is responsible to ensure that each assembled tank delivered to a construction site is water-tight. It is expected that Willamette Graystone, Inc. will pre-test some percentage of the tanks at the plant to verify they are water-tight.

5. The riser and lid are to be constructed of ribbed Poly Vinyl Chloride (PVC).

6. Each tank must be installed with a minimum twenty four (24) inch diameter water-tight riser, at the inlet side and outlet side of the tank, extending to the ground surface when burial depths do not exceed thirty-six (36) inches. Burial depths thirty-six (36) to forty-eight (48) inches require a thirty (30) inch riser on the inlet and outlet side of the tank extending to the ground surface. All risers must be installed in accordance with Oregon Administrative Rule (OAR) 340-071-220(3)(b)(C).

7. Each tank must be delivered with an installation guide. The guide must be printed on water proof paper or an equivalent method of keeping the guide legible in adverse weather conditions.

8. Each tank is only acceptable for use at locations were the top loading will not exceed the engineering design parameters. Tanks proposed for use at other locations require engineering analysis of the potential top loading, and may require the preparation of site-specific plans and specifications.

9. Each tank must be marked on the upper most tank surface over the outlet with the liquid capacity, date of manufacture, burial depth limit and either the full business name or the assigned number 310.

This determination should not be construed in any way as the Department's endorsement of this product or any advertising. Moreover, the Department is not responsible for any situation which may result from use or misapplication of your product.

If you have any questions about this letter, please feel free to contact Daniel Wiltse at (541) 687-7436, toll free in Oregon at (800) 844-8467, or by email at wiltse.daniel@deq.staet.or.us.

Sincerely,

Michael E. Kucinski, Manager
Water Quality/ Onsite

Enc: Approved Plans
Installation Manual

Ec: All Contract County Offices (w/enclosures)
DEQ Direct Service Offices (w/enclosures)
Dennis Boeger P.E., Boeger & Associates, LLC (w/enclosures)

PLAN APPROVED
Date 3/5/13 Signed

1) **Hole Preparation**
Ensure hole is at least 12" longer and wider than the size of the tank, providing the excavated walls are straight up and down. If over digging depth occurs or you have unstable soils, you must use sand, crushed rock, or pea gravel, to bring up to grade. Grade from the house is ¼" per foot. From the bottom of said pipe, measure down the distance to the excavation, the same that is on the manufacturers card for inlet elevation. This would be the grade. Level from that point lengthwise, and crossways, to finish grading the bottom of the hole. All tanks shall be set level on a minimum 3-inch thick compacted ¾ minus, pea gravel or approved granular material overlying a firm uniform base.

2) **Setting the tank**
OSHA restrictions apply. Do not stand in hole while tank is being placed. Watch for water coming into the hole and walls sliding off in the hole. Stay away from edge of hole and watch the equipment operator. Be sure the tank is level. Check for proper alignment between inlet pipe and tank inlet

3) **Risers and Installation**
***Plastic Risers*:** Plastic risers are either poured into the concrete, or attached to a poured in flanged adapter, to facilitate the holding of a 24" diameter access riser. If a groove is in the concrete top around the manhole, a riser can be attached by using a 2-part epoxy (Weld-On 812).

4) **Lid**
The lid of the riser shall be attached with stainless steel bolts.

5) **Pipe Connection**
Pipe connection is done by applying ABS cement to the inside of the 4" coupler in the tank wall, and applying ABS cement to the pipe to be fitted; push together and hold for a few seconds. If PVC 3034 pipe is coming into the tank, an adapter (ASTM D2751) is supplied with the tank, and weld-on glue (Weld-On 794 ABS to PVC) is applied to the inside of the coupler in the tank and on the pipe coming in. This adapter makes up the difference in outside measurements of the two pipes. Neoprene Couplers are also an appropriate form of connection.

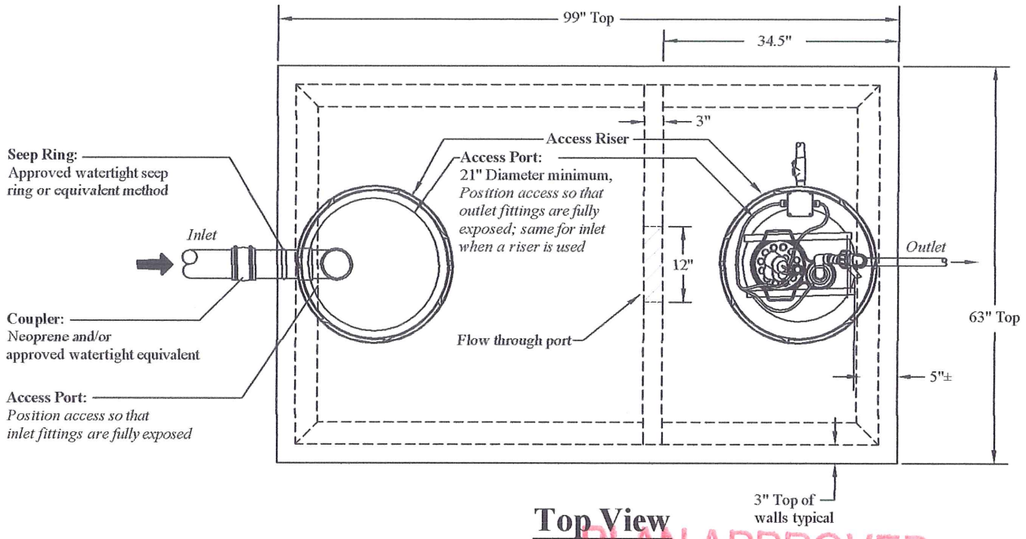
6) **Buoyancy Countermeasures**
Recommended minimum cover is 12" over tank. For groundwater conditions at the ground surface, an additional ¾ CY of concrete shall be placed on tank lid for cover depths of 12" – 24" to achieve neutral buoyancy. No measures are needed for cover depths of 24" or greater.

7) **Test Procedures**
If possible, backfill the tank to a point 10" down from the top of the tank. Fill the tank with water to point 2" above the top surface of the tank. No more than 2" of water into the riser. If water level drops in 24 hours--which may be due to concrete absorption, refill to the same mark for a re-test. The water level should not drop more than 1" in the riser.

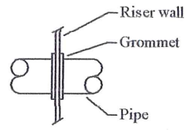
8) **Backfill Instructions**
Backfill should be of proper size and gradation. No stones over 2 1/2" in diameter No deleterious materials (i.e., any material that might puncture or damage the tank). Each layer should contain sufficient moisture to allow for proper compaction. If possible, the layers should be compacted with a hand tamper. Make sure inlet and outlet pipes have a compacted base under them to help provide support for the pipes. Ensure the final grade slopes away from the access riser.

9) **Pumping Equipment**
Follow equipment manufacturers guidelines for the proper installation of pumping equipment or siphons. OAR 73-00500(4&5), and OAR 73-0055(4&5), must also be followed for pumping equipment, alarm float placement, and electrical and outlet piping for the dosing chamber pass-through. All outlet piping and electrical penetrations shall have ASTM 564 rubber grommet seals to provide a water-tight pass-through.

Special Precautions
When backfilling with loader or backhoe bucket, be especially careful not to disturb riser, inspection port, or any unit that may be attached to the tank.



Top View



Water Tight Pipe Connections Detail

Note: Use for outlet piping and electrical penetrations

PLAN APPROVED

Date 3/5/13 Signed DW

General Notes:

Tank Volumes: Total Volume: 1181 gal±
Operating Volume: 904 gal±
Average unit volume full depth : 20.7 gal./in.±
Unit volume at typical operating depth : 21.2 gal./in.±

Loads: Top = 400 psf
Lateral Load = 62.4 pcf
Concentrated Wheel Load = 2500 lb.
The septic tank shall be capable of withstanding long-term hydrostatic loading, in addition to the soil loading, due to a water table maintained at ground surface. Soil Bearing = 1500 psf *(re-evaluate support base if soil bearing is less or unequal)*

Concrete: The walls and bottom slab shall be poured monolithically.
Reinforcing steel shall be ASTM A-615 Grade 60, fy = 60,000 psi.

The concrete shall achieve a minimum compressive strength of 3,000 psi in 28 days; fc' = 3,000 psi. Concrete shall be ready mix with cement conforming to ASTM C-150, Type II. There shall be a content of not less than six and one half (6 1/2) sacks per cubic yards and maximum aggregate size of 3/4 inch. Water/Cement ratio shall be kept below 0.4, (W:C 0.35±). Air-entraining agents and fibrous reinforcement will enhance workability, curing and watertightness of the tank; however, their usage is optional.

Tanks shall not be moved from the manufacturing site to the job site until the tank has cured for seven (7) days, or has reached two-thirds of the design strength. Proper curing techniques must be used to ensure watertight tanks.

Installation: Installation, bedding, compaction, etc., shall be in strict compliance with the manufacturers standards and state of Oregon's on-site rules 340-71 and 73. All tanks shall be set level on a minimum 3 inch thick compacted sand or *approved granular bedding overlying a firm uniform base. The base shall be stable and uniform in order to ensure* equal bearing across the tank bottom. Recommended minimum cover is 12" over tank. For ground water conditions at ground surface, an additional 3/4 cubic yards of concrete shall be placed on tank lid for cover depths of 12"-24" to achieve neutral boyancy. No measures are needed for cover depths of 24" or greater. A minimum cover of 24 inches is required over the tank in areas subject to occasional light wheel loads.

Dosing: Dosing volumes not to exceed maximum limits set by Oregon on-site rules 340-71 and 73. Maximum percent of projected daily flow: 10% to sandfilters or 20% in other applications. Maximum discharge rate from single compartment dosing septic tank 30 gpm. *Float and dosing levels may vary within the limits of the onsite rules.*

Test: Tanks shall be tested and certified watertight per Oregon On-Site Rules 340-71 and 73.

Tank Markings: Place marking on the upper most surface over the outlet.
Liquid capacity: 1000 gal.
Max burial depth: 4ft.
Max traffic (wheel): 2500 lbs.
Date manufactured:
Permit no.:

RECEIVED
MAR 05 2013
WESTERN REGION/EUGENE
DEPT ENVIRONMENTAL QUALITY

Boeger & Associates, LLC
Civil and Environmental Engineering
1607 Oak Street Ph: 541.302.4996
Eugene, OR 97401 Fax: 541.302.4998
dboeger@boegerassociates.com

REGISTERED PROFESSIONAL ENGINEER 16331 OREGON JAN. 19, 1993 DENNIS J. BOEGER
EXPIRES: 12/31/2013

Riser and Lid:
24" Dia. ribbed PVC riser w/latching lid and polyurethane gasket or approved

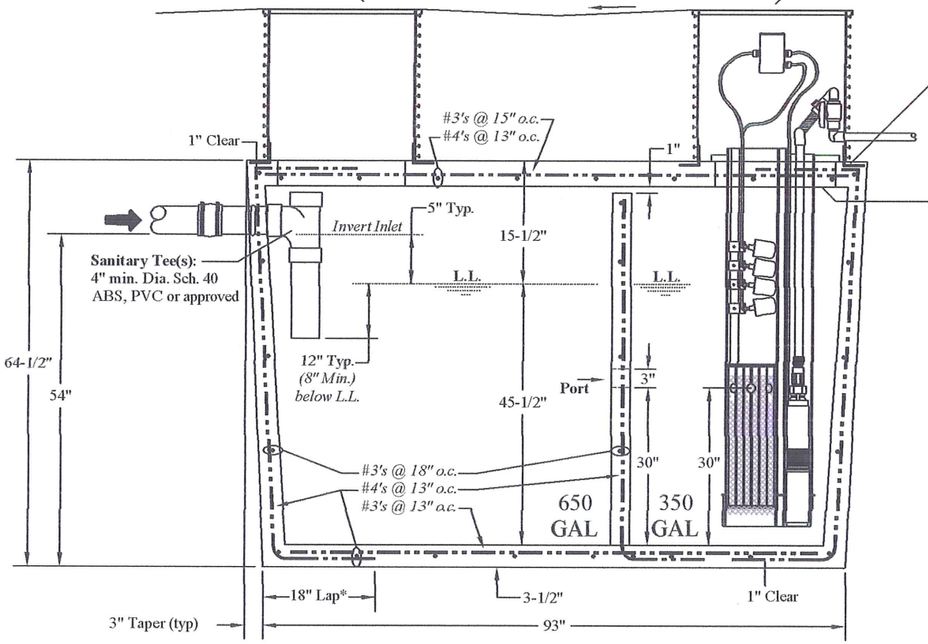
All risers shall be attached in a permanent and watertight manner

30" Diameter when depth of bury greater than 36"

Lids shall be kept securely fastened at all times with stainless steel bolts

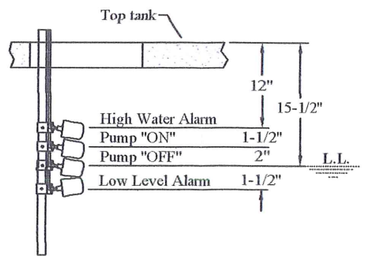
Riser/Tank adapter:
Cast into concrete top for adapting to riser. *(Bond the riser and adapter together w/PVC cement or 2-part epoxy. Spread around PVC or fiberglass riser adapter. If riser cast into tank embed 1-1/2±)*

Position access port so that sanitary tee fittings are fully exposed. Edge of access 5" from outside edge of wall



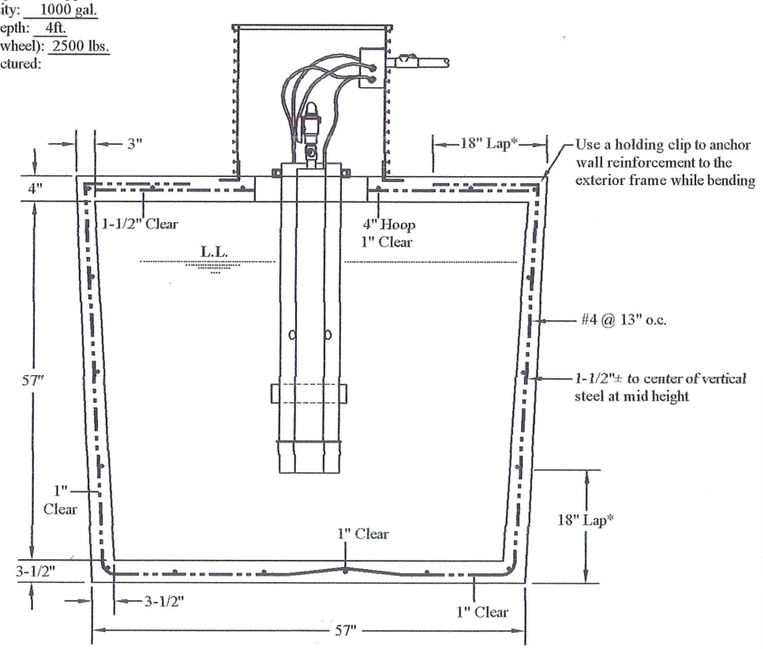
* 18" Minimum Lap Typical at all corners top and bottom

Side View



Float Detail

NTS



End View

WILLAMETTE GRAYSTONE, INC.
EUGENE, OR
1,000 GALLON 2-COMPARTMENT DOSING SEPTIC TANK

W.O. No.	215
Design	D. BOEGER
Drawn	L. NYGAARD
Date	1/24/2013
Scale:	215-WILLAMETTE GRAYSTONE
Sheet	1 of 1