VERMONT

GeoMat™ Leaching Systems

Design Manual for
Pressure and Gravity Applications

March 1, 2023

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VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Drinking Water & Groundwater Protection Division
THIS IS SUBJECT TO PROVISIONS OR CONDITIONS LISTED IN PERMIT
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Introduction

The GeoMat Leaching System ("GeoMat"), is a low profile leaching system designed for maximum treatment and infiltration of wastewater into soil. GeoMat is nominally 1 inch thick and available in widths of 6, 12, and 39 inches. It is comprised of an entangled filament core covered by a hydroscopic membrane with an incorporated distribution pipe.

Due to the shallow burial depth and the high surface area to void space ratio in the GeoMat, gas exchange has been shown to be significantly greater in GeoMat than in other leach field technologies. This increased oxygen transfer rate results in increased removal of pathogens, B.O.D., T.S.S., and nutrients such as nitrogen and phosphorus in a shallower soil profile.

The combination of the highly transmissive core and hygroscopic membrane draw the water between the application points and uniformly apply the water to the surrounding soil. The soil then draws the water away from the surrounding membrane through capillary action. This results in a much more uniform application of water to the soil and minimizes the point loading associated with other low profile systems.

In general, GeoMat can be utilized in many different configurations; please check with your regulatory agency or contact Geomatrix for the configurations that may be available in your area. GeoMat can be installed in trench and bed layouts and function with gravity, pump to gravity, and pressure distribution (PD) system configurations. GeoMat with 6 inches of ASTM C33 sand beneath it can be configured to achieve NSF Standard 40 treatment levels.

Geomatrix products are the result of intensive research and development, including in house and third-party testing. Test reports are available by contacting Geomatrix, LLC.

Geomatrix products are manufactured under one or more of the following U.S. patents; 6,485,647, 6,726,401, 6,814,866, 6,887,383, 6,923,905, 6,959,882, 6,969,464, 7,157,011, 7,309,434, 7,351,005, 7,374,670, 7,465,390; Also see patents at www.geomatrix systems.com. GeoMat and GeoGuard are trademarks of Geomatrix Systems, LLC

Designing a GeoMat System

GeoMat shall be designed in accordance with **all State and local regulations.**

The designer is responsible for specifying the diameter of the distribution pipe used (typically 1" - 2"), the spacing of the orifice holes, and for calculating frictional losses. Distal head should be a **minimum** of 2.3 feet and a **maximum** of 6 feet of residual head (static pressure) at the end of each drainfield distribution lateral.

Systems with high peak loading events can benefit from time dosing.

Design software for pump, lateral line, transport pipe, manifold, orifice size and associated frictional losses is available by emailing request to info@geomatrixsystems.com.

GeoMat for Filtrate Effluent Treatment

GeoMat installed on six inches of ASTM C33 sand is approved for filtrate effluent treatment credit. ***Use GEOMAT FOR FILTRATE TREATMENT DESIGN MANUAL to design systems for filtrate effluent treatment.***

GeoMat in a Sand Bed

A minimum of 6 inches of ASTM C33 sand must be placed beneath the GeoMat and 2 inches of this specification of sand should be placed over the GeoMat fabric membrane.

GeoMat must be designed and installed utilizing the following parameters:

- GeoMat with less than 4 inches of separation utilize the rating without 4 inch spacing on page 4 and the Tables 3-8 on pages 6-11 for recommended GeoMat sizing.
- GeoMat with a minimum of 4 inches apart utilize the rating with 4 inch spacing on page 4 and the Tables 3-8 on pages 6-11 for recommended GeoMat sizing.
- Gravity or pressure distribution may be utilized.
- A minimum of 12 inches of sand should surround the perimeter of the GeoMat in a bed configuration.

GeoMat in Trench Configuration

GeoMat in trench configuration may be installed directly in or on top of suitable native soils. GeoMat in trench configuration may also be installed with six inches of ASTM C33 sand beneath.

GeoMat when installed in trench configuration should be designed and installed utilizing the following parameters:

- Trenches shall be separated, sidewall to sidewall, from adjacent trenches by a minimum of 4 feet. Tables 3-8 below are used for recommended GeoMat calculation.
- Gravity or pressure distribution may be utilized.

GeoMat Sizing

GeoMat is approved for use in the State of Vermont at the loading rates in Table 1.

Table 1
GeoMat Loading Rate

Texture	Structure	Application Rate	Minimum Bed Area (ft2)				Max System Slope
			2 Bedroom 280 gpd	3 Bedroom 420 gpd	Add'l Bedrooms 70 gpd	Non-Residential Rate 100gpd	
Very Coarse Sand or Coarser	SG	2.0	140	210	35	50	20%
Coarse Sand, Sand	SG	2.0	140	210	35	50	
Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	SG	1.6	175	263	47	63.5	
	MA/PL	0.8	350	525	88	83	
	PR/SBK/ABK/GR	1.2	233	350	58	83	
Sandy Loam, Coarse Sandy Loam	MA/PL	0.8	350	525	88	125	
	PR/SBK/ABK/GR	1.2	233	350	58	83	
Fine Sandy Loam, Very Fine Sandy Loam	MA/PL	0.8	350	525	88	125	
	PR/SBK/ABK/GR	1.0	280	420	70	100	
Loam	MA/PL	0.8	350	525	88	125	
	PR/SBK/ABK/GR	1.0	280	420	70	100	
Silt Loam, Silt	MA/PL	0.4	700	1050	175	250	10%
	PR/SBK/ABK/GR	0.6	467	700	117	167	15%
Sandy Clay Loam, Clay Loam, Silty Clay Loam	MA/PL	0.4	700	1050	175	250	10%
	PR/SBK/ABK/GR	0.4	700	1050	175	250	
Sandy Clay, Clay, Silty Clay							

GeoMat rating (square foot per lineal foot) is set forth in Table 2:

Table 2

GeoMat Square Foot per Lineal Foot

	Rating – square foot per lineal foot without 4" spacing	Rating – square foot per lineal foot with 4" spacing	Total Storage Volume – gallons per lineal foot	Max dose volume (50% of void space)– gallons per lineal foot per dose
GeoMat 600	0.50	0.67	0.32	0.16
GeoMat 1200	1.00	1.17	0.64	0.32
GeoMat 3900	3.25	3.42	2.02	1.01

System sizing is inherently related to cost. While more surface area is always beneficial, the cost per acre of land, additional construction costs, septic fill, septic tank/pretreatment efficiency, leaching system components, etc. must be balanced against the type of use, useful life and performance of the system.

Ultimately what and how much the user puts down the drain will determine the ultimate system lifespan and performance. Performance testing and Government standards do not necessarily address all situations/users.

When a leaching system is not being used, the organic matter that has accumulated over time can dry out and breakdown in a process similar to composting. Zoned systems can be utilized to run and rest portions of the system and facilitate this resting process if the use pattern of the system will not naturally facilitate it. Inorganic materials that are put down the drain will be unaffected and not breakdown.

The installation of an air introduction point is advisable to allow rejuvenation of the system should this be necessary at some point in the future.

A frank, honest discussion between the designer and the property owner about how the system will be utilized is the best way to determine what type of design, specific components and what sizing/safety factor is best to apply to any given design. Geomatrix encourages the designer and property owner to make the system as big as possible; but any final design is ultimately a compromise between cost, performance and longevity. If cost is not an issue...designing as conservatively as possible is encouraged.

As there are many variables affecting septic systems performance, when possible, increasing surface area is beneficial. Designing at the highest approved hydraulic loading rate, just because it is allowed, may not be in the property owners best long-term interest.
Leach fields are typically designed based on the following standard residential wastewater effluent strength from a primary septic tank BOD_5[(1)]of <180 mg/l, TSS[(2)] <100 mg/l

and FOG[3] <10 mg/l. When effluent exceeds typical residential wastewater strength, the leach field surface area needs to be increased to allow a greater soil surface are (sq.ft) to effluent (gpd) ratio to ensure increased oxygen transfer. Failure to increase the square foot area will result in premature leach field failure.

1) Biochemical Oxygen Demand (BOD)-determines the approximate of oxygen required to treat wastewater.

2) Total Suspended Solids (TSS) – determines the amount of solids that do not settle out in the tank and can pass through to the leach field.

3) Oil Grease (OG) – interferes with the biological action of the treatment process and cause maintenance issues and clogging of the leach field.

Leach fields are designed based on a peak design flow measured in gallons per day (GPD) set by Local or State Agencies. The peak factor is typically 1.5 to 2 times the average water consumption over a 30 day period. Leach fields are not designed to be loaded at the peak design flow for an extended period of time. Leach fields that are loaded at the peak design for an extended period may experience premature failure. It is important to repair leaking water fixtures promptly and if the ,system is designed for residential uses, high water uses such as laundry needs to spread out throughout the week instead of doing several loads in one day.

When Possible, Geomatrix recommends that the following Tables 3 - 8 be utilized for system design.

Step 1. Determine GeoMat model and configuration.

Step 2. Determine recommended lineal feet of GeoMat using Tables 3 – 8 below. Ensure that you are using the correct table based on GeoMat model used, whether minimum 4 inch spacing between adjacent rows is present and effluent quality.* If sufficient space for recommended GeoMat is not available, the designer should use input from the system owner/user to design a system based on the approved loading rates and minimum bed sizing that will be effective based on site and use conditions.

GeoMat is typically sold in 100 foot rolls.

For all applications other than single family residential applications, contact Geomatrix or a Geomatrix certified design professional for assistance.

Table 3

Lineal Feet of GeoMat 600 on 6" of Sand

			Lineal Feet Of GeoMat Per Bedroom				
GeoMat Product	**Texture**	**Structure**	**2**	**3**	**4**	**5**	**For Each Add'l Bedroom Add**
600	Course Sand, Very Course Sand or Coarser, Sand	SG	280	420	490	560	70
	Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	SG	350	525	6123	700	88
		PR/SBK/ABK/ GR	467	700	817	934	117
		MA/PL	700	1050	1225	1400	175
	Sandy Loam, Coarse Sandy Loam	PR/SKB/ABK/ GR	467	700	817	934	117
		MA/PL	700	1050	1225	1400	175
	Fine Sandy Loam, Very Fine Sandy Loam	MA/PL	700	1050	1225	1400	175
		PR/SBK/ABK/ GR	560	840	980	1120	140
	Loam	MA/PL	1400	2100	2450	2800	350
		PR/SBK/ABK/ GR	934	1400	1634	1867	234
	Silt Loam, Silt	MA/PL	1400	2100	2450	2800	350
		PR/SBK/ABK/ GR	1400	2100	2450	2800	350
	Sandy Clay Loam, Clay Loam, Silty Clay Loam	MA/PL	280	420	490	560	70

Table 4

Lineal Feet of GeoMat 600 on Native Soil

			Lineal Feet Of GeoMat Per Bedroom				
GeoMat Product	**Texture**	**Structure**	**2**	**3**	**4**	**5**	**For Each Add'l Bedroom Add**
600	Very Course Sand or Coarser	SG	699	1048	1397	1746	349
	Fine Sand; Very Fine Sand; Loamy Fine Sand; Loamy Very Fine Sand; Sandy Loam; Fine Sandy Loam; Very Fine Sandy Loam; Loam	SG/PR/SBK/ ABK/GR	887	1330	1773	2216	443
	Fine Sand; Ver Fine Sand; Loamy Fine Sand; Loamy Very Fine Sand; Sandy Loam; Coarse Sandy Loam; Fine Sandy Loam; Very Fine Sandy Loam	MA/PL	1101	1652	2203	2754	551
	Silt Loam; Silt; Sandy Clay Loam; Clay Loam; Silty Clay Loam; Sandy Clay; Clay; Silty Clay	MA/PL/PR/ SBK/ABK/ GR	1343	2015	2687	3358	672

Table 5

Lineal Feet of GeoMat 1200 on 6" of Sand

			Lineal Feet Of GeoMat Per Bedroom				
GeoMat Product	**Texture**	**Structure**	**2**	**3**	**4**	**5**	**For Each Add'l Bedroom Add**
1200	Course Sand, Very Course Sand or Coarser, Sand	SG	140	210	245	280	35
	Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	SG	175	2623	307	350	44
		PR/SBK/ABK/ GR	234	350	409	467	59
		MA/PL	350	525	613	700	88
	Sandy Loam, Coarse Sandy Loam	PR/SKB/ABK/ GR	234	350	409	467	59
		MA/PL	350	525	613	700	88
	Fine Sandy Loam, Very Fine Sandy Loam	MA/PL	350	525	613	700	88
		PR/SBK/ABK/ GR	280	420	490	560	70
	Loam	MA/PL	700	1050	1225	1400	175
		PR/SBK/ABK/ GR	467	700	817	934	117
	Silt Loam, Silt	MA/PL	700	1050	1225	1400	175
		PR/SBK/ABK/ GR	700	1050	1225	1400	175
	Sandy Clay Loam, Clay Loam, Silty Clay Loam	MA/PL	140	210	245	280	35

Table 6

Lineal Feet of GeoMat 1200 on Native Soil

			Lineal Feet Of GeoMat Per Bedroom				
GeoMat Product	**Texture**	**Structure**	**2**	**3**	**4**	**5**	**For Each Add'l Bedroom Add**
1200	Very Course Sand or Coarser	SG	140	280	420	490	70
	Fine Sand; Very Fine Sand; Loamy Fine Sand; Loamy Very Fine Sand; Sandy Loam; Fine Sandy Loam; Very Fine Sandy Loam; Loam	SG/PR/SBK/ ABK/GR	239	359	479	598	120
	Fine Sand; Ver Fine Sand; Loamy Fine Sand; Loamy Very Fine Sand; Sandy Loam; Coarse Sandy Loam; Fine Sandy Loam; Very Fine Sandy Loam	MA/PL	319	479	638	798	160
	Silt Loam; Silt; Sandy Clay Loam; Clay Loam; Silty Clay Loam; Sandy Clay; Clay; Silty Clay	MA/PL/PR/ SBK/ABK/ GR	479	718	957	1197	239

Table 7

Lineal Feet of GeoMat 3900 on 6" of Sand

			Lineal Feet Of GeoMat Per Bedroom				
GeoMat Product	**Texture**	**Structure**	**2**	**3**	**4**	**5**	**For Each Add'l Bedroom Add**
3900	Course Sand, Very Course Sand or Coarser, Sand	SG	43	65	73	83	11
	Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	SG	54	81	95	107	14
		PR/SBK/ABK/ GR	72	108	126	144	18
		MA/PL	108	162	189	216	27
	Sandy Loam, Coarse Sandy Loam	PR/SKB/ABK/ GR	72	108	126	144	18
		MA/PL	108	162	189	216	27
	Fine Sandy Loam, Very Fine Sandy Loam	MA/PL	108	162	189	216	27
		PR/SBK/ABK/ GR	87	130	151	173	22
	Loam	MA/PL	108	162	189	216	27
		PR/SBK/ABK/ GR	87	130	151	173	22
	Silt Loam, Silt	MA/PL	216	324	377	431	54
		PR/SBK/ABK/ GR	144	216	252	288	36
	Sandy Clay Loam, Clay Loam, Silty Clay Loam	MA/PL	216	324	377	431	54
		PR/SBK/ABK/ GR	216	324	377	431	54

Table 8

Lineal Feet of GeoMat 3900 on Native Soil

			Lineal Feet Of GeoMat Per Bedroom				
GeoMat Product	**Texture**	**Structure**	**2**	**3**	**4**	**5**	**For Each Add'l Bedroom Add**
3900	Very Course Sand or Coarser	SG	137	205	274	342	68
	Fine Sand; Very Fine Sand; Loamy Fine Sand; Loamy Very Fine Sand; Sandy Loam; Fine Sandy Loam; Very Fine Sandy Loam; Loam	SG/PR/SBK/ ABK/GR	174	261	347	434	87
	Fine Sand; Ver Fine Sand; Loamy Fine Sand; Loamy Very Fine Sand; Sandy Loam; Coarse Sandy Loam; Fine Sandy Loam; Very Fine Sandy Loam	MA/PL	216	324	432	539	108
	Silt Loam; Silt; Sandy Clay Loam; Clay Loam; Silty Clay Loam; Sandy Clay; Clay; Silty Clay	MA/PL/PR/ SBK/ABK/ GR	263	395	526	658	132

* The above tables apply only to single family residential properties. Contact Geomatrix or a Geomatrix certified design professional for all other applications.

Basic Design Considerations

If the system is configured for gravity distribution, dosing volume does not inherently apply.

In gravity systems, internal GeoMat pipe will be Geomatrix 2 inch perforated pipe or SDR35 3 or 4 inch perforated pipe.

Cover depth shall maintain a minimum of 6 inches above the GeoMat distribution pipe. Use clean sandy fill and topsoil suitable for growing grass.

Minimum perimeter sand fill beyond the GeoMat on a sand bed shall be 12 inches. The GeoMat cover material should be finial graded to a 2% pitch over the GeoMat system and for 24 inches beyond the outermost edge of the GeoMat. If the cover material over the GeoMat is above the original grade, it shall maintain the 2% pitch for a minimum of 24 inches beyond the outermost edge of the GeoMat and then run at a 3:1 slope to original grade.

Remember to follow these design parameters when designing and installing GeoMat:

- Preservation of the native soil between trenches and minimizing its disruption and compaction during construction is essential to maintaining soil structure and therefore water and gas movement in the soil around the trenches. For this reason, construction is to be trench-by-trench when possible unless a C33 sand layer is utilized as a continuous base beneath, around and covering the GeoMat;

- Keep the bottom of the GeoMat shallow (8-20 inches below existing and finish grades);

- Separation from the bottom of the GeoMat in native soil to the seasonal high water table is 3 feet and separation to bedrock is 4 feet, unless otherwise approved;

- Keep the bottoms of the individual GeoMat laterals level;

- Do not over-dig the width or depth of the drainfield trenches unless specified sand is utilized as fill;

- Avoid working soils that are moist or wet because they can easily smear and compact;

- Scarify the drainfield base before installing components.

When first reviewing a site and developing a design, position the GeoMat laterals parallel to ground surface contours whenever possible. This will help make it easier to keep drainfield base elevations uniform. Designing perpendicular to a surface contour will mean that the down gradient end of the drainfield trench will be shallow-placed, whereas the up gradient end will be much deeper.

When pressure distribution is used, within reason, small frequent doses of effluent to the GeoMat are preferred over fewer larger doses; however, rest/reaeration intervals must also be provided for; 4 – 8 doses a day is typical (minimum 4 doses under Vermont rules.) Pump chambers should preferably be designed with float switches controlling high water alarm, pump on/off, and low water/redundant off. An event counter is recommended. Time dosing can also enhance performance.

GeoMat Excavation Requirements

The soil between the dispersal trenches shall remain undisturbed when possible. If the presence of boulders or other obstacles make trench construction impractical, the entire leach field area may be excavated as necessary, backfilled with a suitable sand fill such as ASTM C-33 or other approved sand to the design elevation of the bottom of trench and the GeoMat constructed and backfilled in C33 sand.

Gravity Distribution Design Parameters

Gravity GeoMat laterals shall not exceed 50 feet.

Parallel distribution shall be utilized whenever possible.

Laterals for gravity systems can either be 2 inch SCH40 pipe with min. ½ inch perforations or 4 inch SDR35 perforated pipe.

It is recommended that an effluent filter be utilized.

Pressure Distribution Design Parameters

Generally, the pressure transport pipe from the septic tank or treatment unit to the GeoMat is 1-½“ to 3” schedule 40 PVC pipe. The actual pipe size will depend upon such factors as distance, pump head, scour velocity, frictional losses and desired pressure at the distal orifices. The transport pipe should be sloped either back to the pump basin or toward the GeoMat to drain the line after each dose. In some cases, it may be better to slope the transport line in both directions. This should be done to prevent freezing in cold weather. An anti-siphon device should be used where any chance of siphoning of the pump tank may occur.

GeoMat distribution manifolds are typically 1 ½” to 3” schedule 40 PVC. Distribution laterals are typically 1” to 2” schedule 40 PVC. Size will vary depending on design and site conditions. Distribution laterals should have flow equalization valves installed to provide equal flow of effluent to all rows when GeoMat laterals are at varying elevations. Flow equalization valves are often installed in the pump chamber for easy operation, protection from damage and

prevention of freezing. A disconnect/throttle valve should be installed downstream of the pump to throttle and shut off flow to the GeoMat piping.

Designs should account for a minimum of 2.3 feet of distal head and a maximum of 6 feet at the distal end of each GeoMat distribution lateral.

Design software for pump, lateral line, transport pipe, manifold, orifice size and additional head losses is available by emailing request to info@geomatrixsystems.com.

Based on the system design a series of orifice holes are drilled downward (six o'clock position) and spaced according to the dosing requirements of the system. Orifice sizing is typically ⅛ – 3/16" I.D.; with the smaller sizes utilized for pretreated effluent and the larger sizes for septic tank effluent. During construction/fabrication of the distribution lateral a new/sharp drill bit should be used to assure as smooth an orifice as possible. All drill shavings and burrs must be removed from the piping with a slug and/or brush. Geomatrix GeoGuard™ orifice shields must be installed over the orifice holes and glued in place with PVC primer and glue.

Schedule 40 PVC or sweep elbows or two 45 degree elbows (also called turn ups) shall be attached to the distal end of each GeoMat distribution lateral to facilitate setting and measuring distal head, maintenance and inspection. A standard ninety elbow should not be used because it will interfere with maintenance activities. The open end (upward end) of the turn up needs to be closed off with either a ball valve or threaded plug or cap. These turn ups also serve as distal head ports for measuring and setting distal head on GeoMat laterals at different elevations.

The installation of a pressure filter, approved by Geomatrix, is recommended between the pump and the laterals on pressure distribution systems.

Zoned Drain Fields and Trenches at Different Elevations

Smaller pumps can be used on larger drainfields and result in acceptable frictional losses by utilizing automatic sequencing valves such as manufactured by K-Rain. These valves automatically direct flow to each respective zone or distribution lateral, in a prescribed order.

Site conditions may not facilitate installing drainfield trenches at the same elevation. In these situations, distribution valves can be used to provide uniform wastewater distribution; alternatively throttle valves can also be utilized for the same purpose. Access points must be installed for each valve. Valves can be located in the pump tank or in valve boxes.

Drain Field Cover

When covering the system, construction staples can be utilized to hold down piping components and the GeoMat, but they should not penetrate the top fabric. Drainfield cover shall be a minimum of 6". Uniform cover depth over the drainfield results in uniform oxygen transfer to the entire system. The final grade over and around the drainfield should direct storm water sheet flow away from drainfield. The area over the drainfield and extending out from the outermost edge of the GeoMat, for a minimum distance of 24", shall be finial graded at a 2% slope. If the GeoMat system is elevated above the original grade, the slope beyond the area requiring the 2% slope shall be graded no steeper than a 3:1 slope. Care should be exercised to keep a minimum of 6" of cover material over the system before operation of low ground pressure equipment. Excavation equipment should not exceed 10 psi ground pressure. Turning excavation equipment on top of the GeoMat should be avoided. Take care to not operate excavation equipment in the same location as this can compact this region relative to other areas.

The area directly above and adjacent to any septic drainfield should be protected from heavy vehicle traffic and excess weight loads before, during and post construction.

On all new construction, it is recommended that the proposed drainfield location be staked and flagged/fenced to prevent encroachment during construction. If vehicle encroachment is expected to be a problem after construction, a structure, such as garden timbers, railroad ties, fences or walls should be used to protect the drainfield area. If the GeoMat drainfield will be subject to traffic, contact Geomatrix for design assistance. The drainfield area should be free of debris and planted with grass. Impermeable materials and structures should not be installed or stored over the drainfield. Trees and shrubs should be kept a minimum distance of ten (10) feet from the drainfield unless a root barrier is utilized. Roots from nearby moisture loving trees such as willow, black locust and red maple may cause problems with roots clogging drainfield. Greater setback distances are recommended for these tree species without use of a root barrier.

Maintenance Requirements

Overtime, biosolids or slime can accumulate in GeoMat lateral pipes and orifices and create uneven wastewater distribution along the lateral. To unclog the orifices, locate the distal port valve boxes and open the turn ups on the end of each lateral line. Manually engage the pump to purge any loose solids. Once all noticeable solids are purged, shut off the pump. A bottle brush (of the same size of the lateral pipe) attached to a small plumbers snake is then pushed down each lateral line. With the bottle brush removed, manually engage the pump again to flush out any loose solids in the lateral line. To increase the flushing action and velocity, before and after bottle brushing, open only one equalization valve at a time. Alternatively, a small jetter may be used to clean the lines.

It is recommended that low pressure lateral lines be typically serviced annually. If being used in conjunction with a pressure filter it may be possible to extend this service frequency. An indication of orifice clogging is distal head pressure increasing by more than 20% or pump run times increase by greater than 20% relative to number of doses.

The septic tank and treatment system should be pumped, maintained and operated according to the requirements of the manufacturer and applicable regulatory agency.

Septic Do's and Don'ts

Do:

- DO conserve water to reduce the amount of wastewater that must be treated and disposed.
- DO repair any leaking faucets and toilets.
- DO only discharge biodegradable wastes into system.
- DO restrict garbage disposal use.
- DO divert downspouts and other surface water away from your drain field & tanks.
- DO keep your septic tank cover accessible for tank inspections and pumping.
- DO have your septic tank pumped regularly and checked for leaks and cracks.
- DO call a professional when you have problems.
- DO compost your garbage or put it in the trash.

Don't:

- DON'T flush sanitary napkins, tampons, condoms, cigarette butts, diapers, wipes and such products into your system.
- DON'T dump solvents, oils, paints, paint thinner, disinfectants, pesticides or poisons down the drain.
- DON'T dig in your drain field or build anything over it.
- DON'T plant anything other than grass over your drain field.
- DON'T drive over your drain field or compact it in any way.

GeoMat Schematics

Figure 1

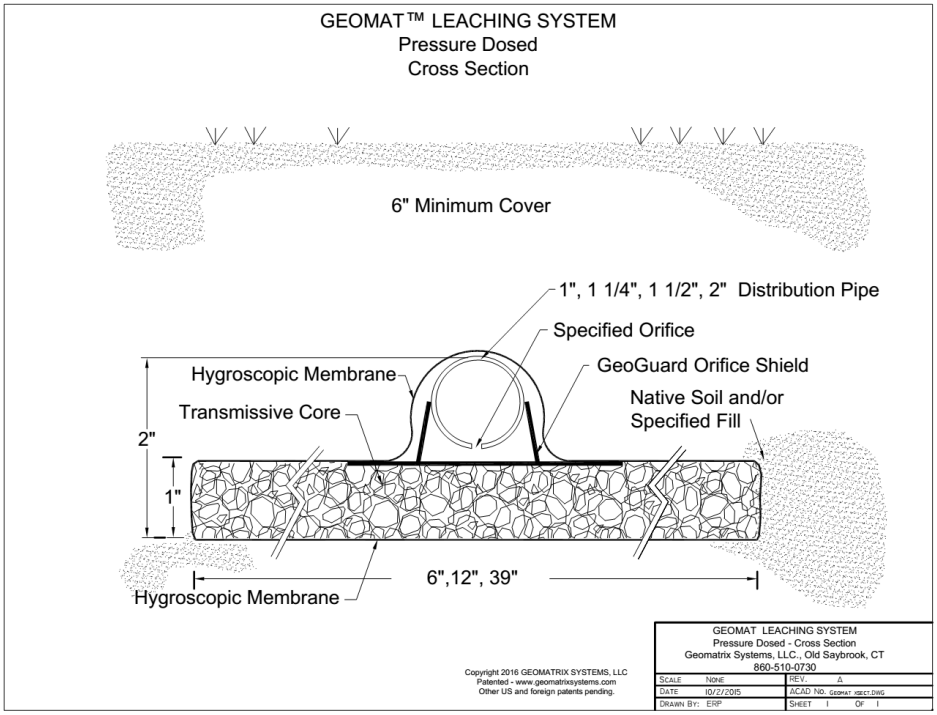
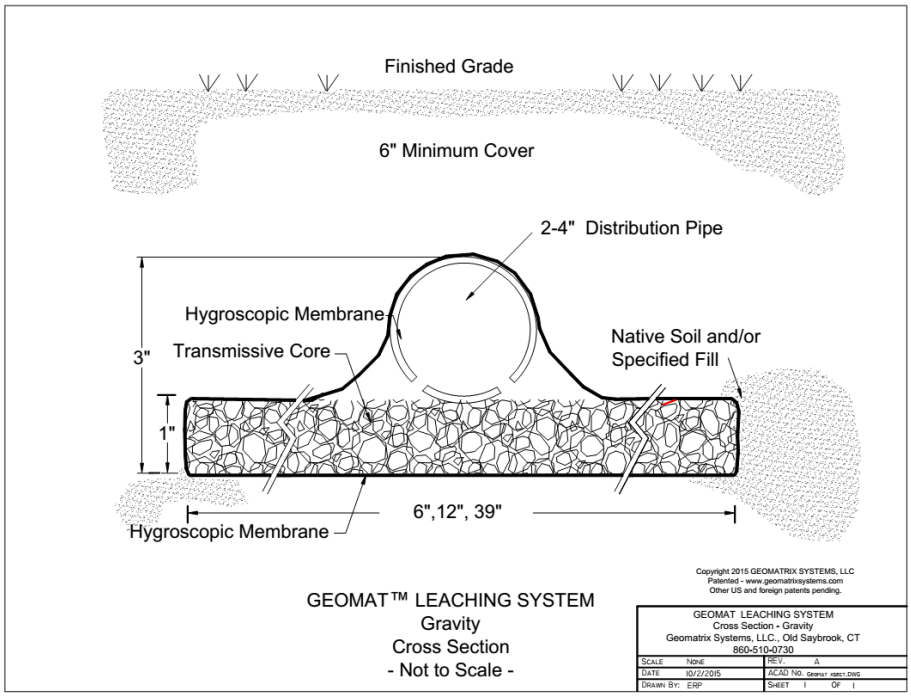


Figure 2



GeoMat Schematics (continued)

Figure 3

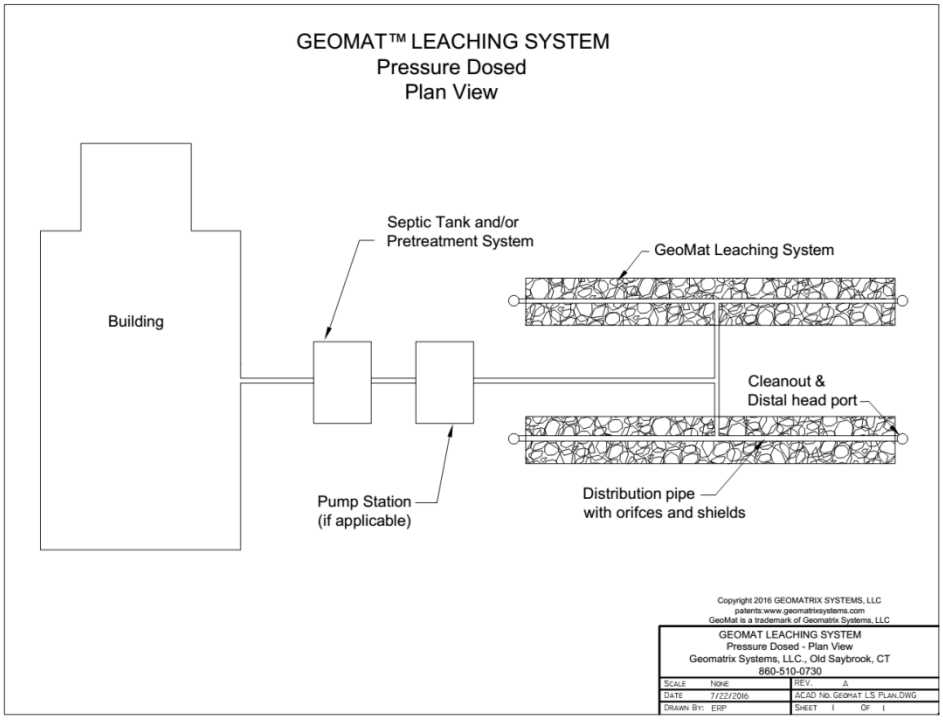
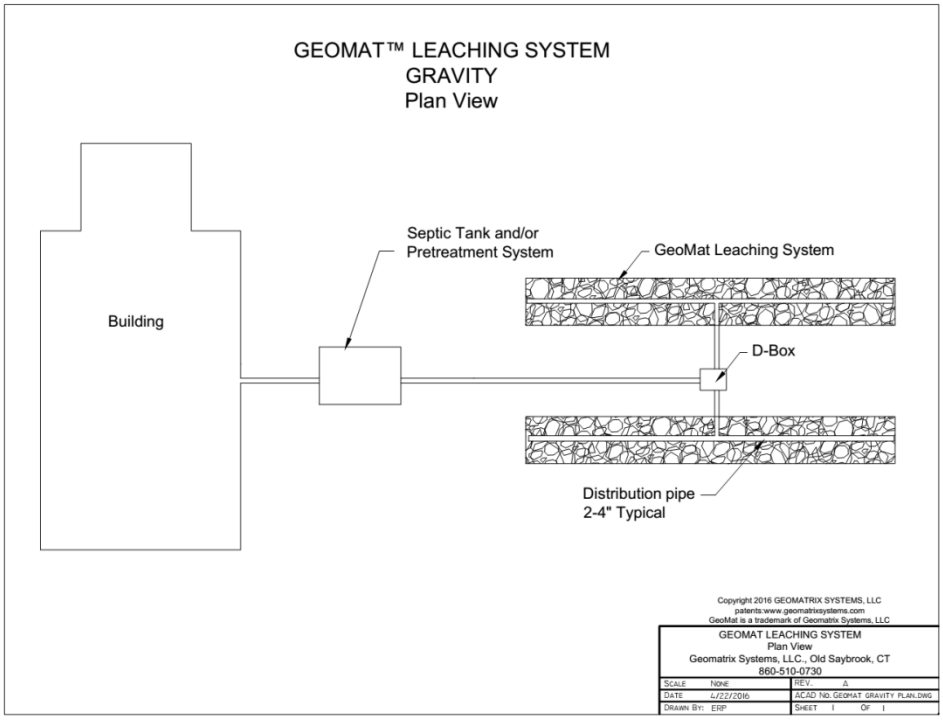
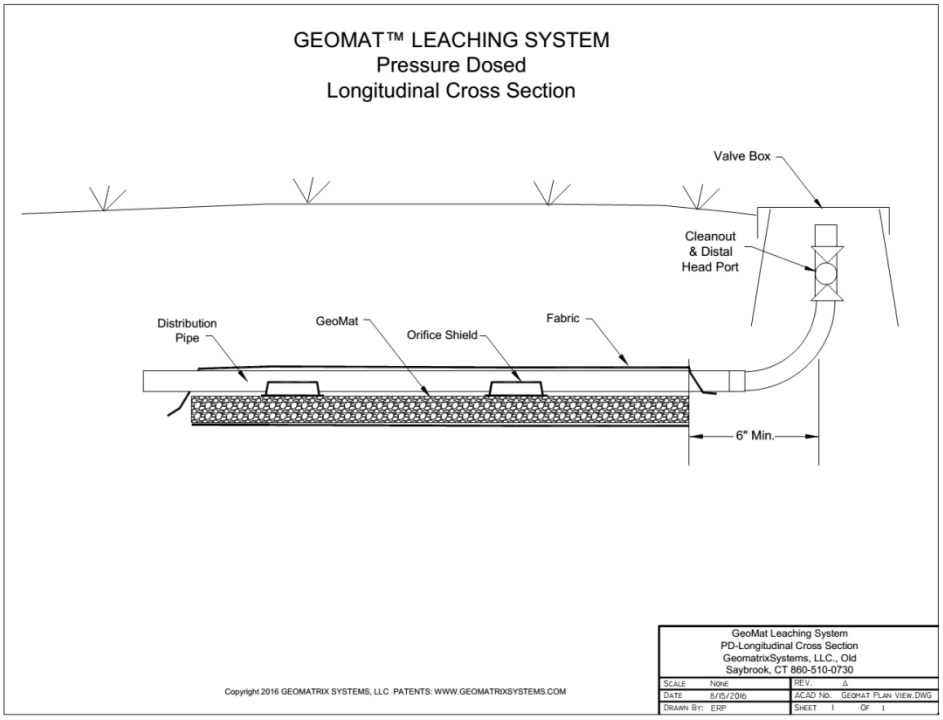


Figure 4



GeoMat Schematics (continued)

Figure 5



Distal Port & Flow Equalization Valve Schematics

Figure 6

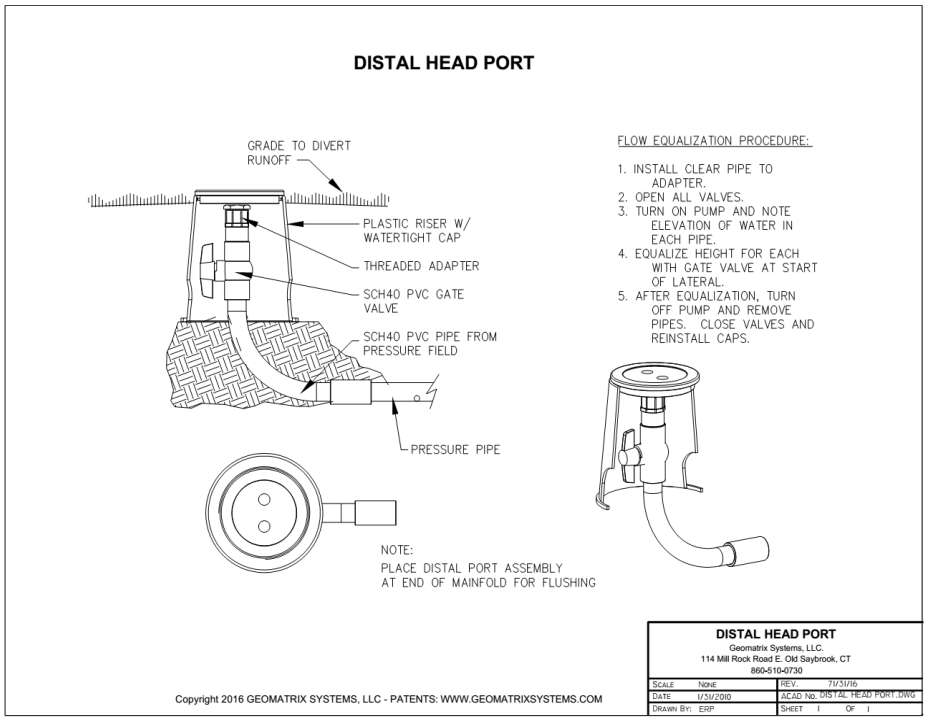
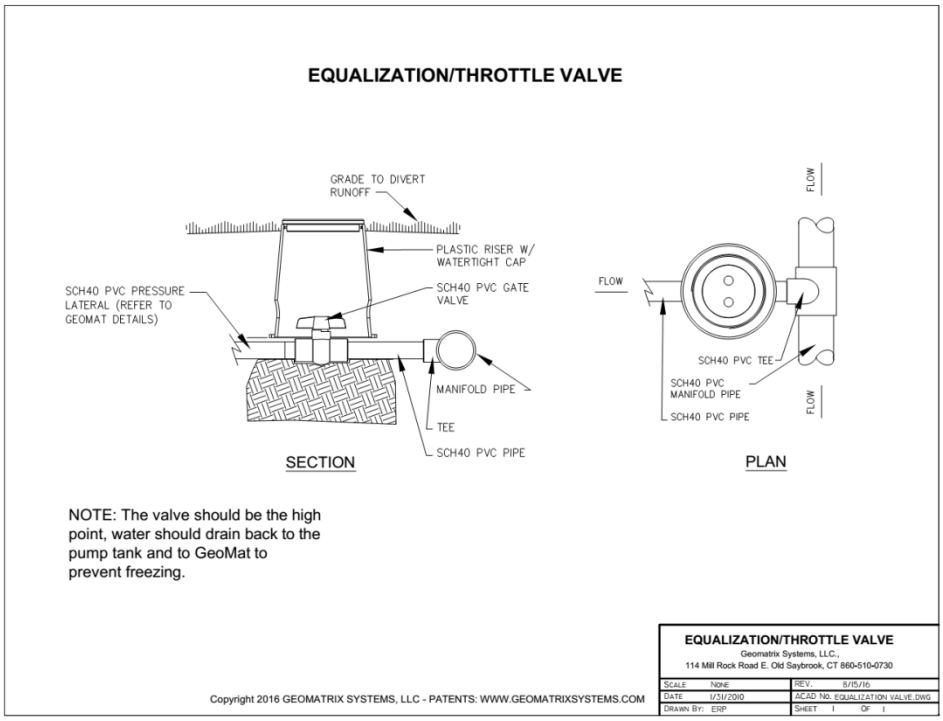


Figure 7



GeoMat System Design Examples

Figure 8

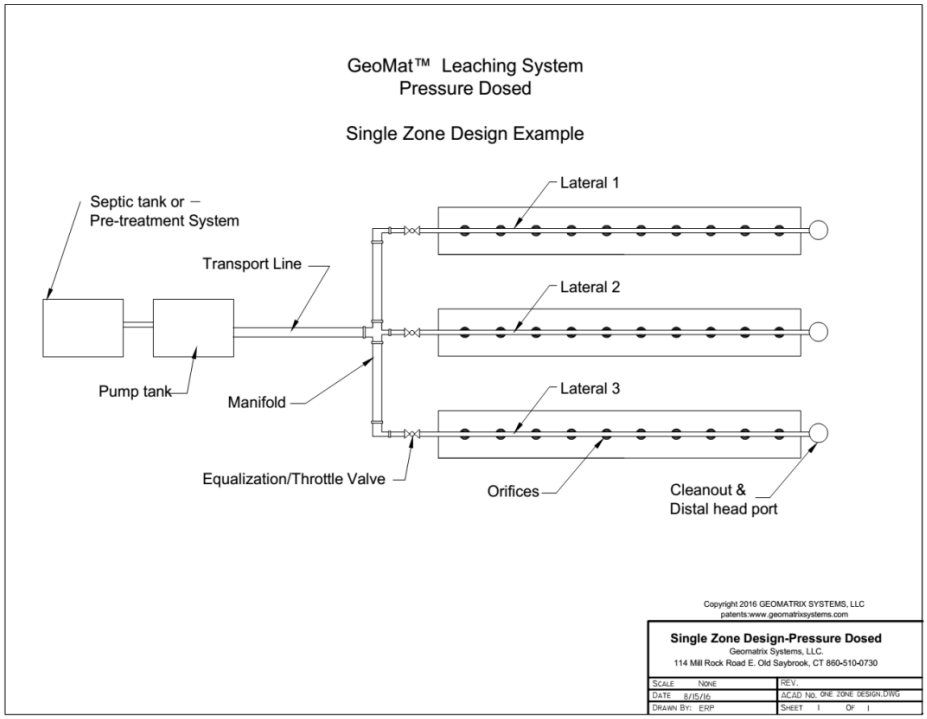
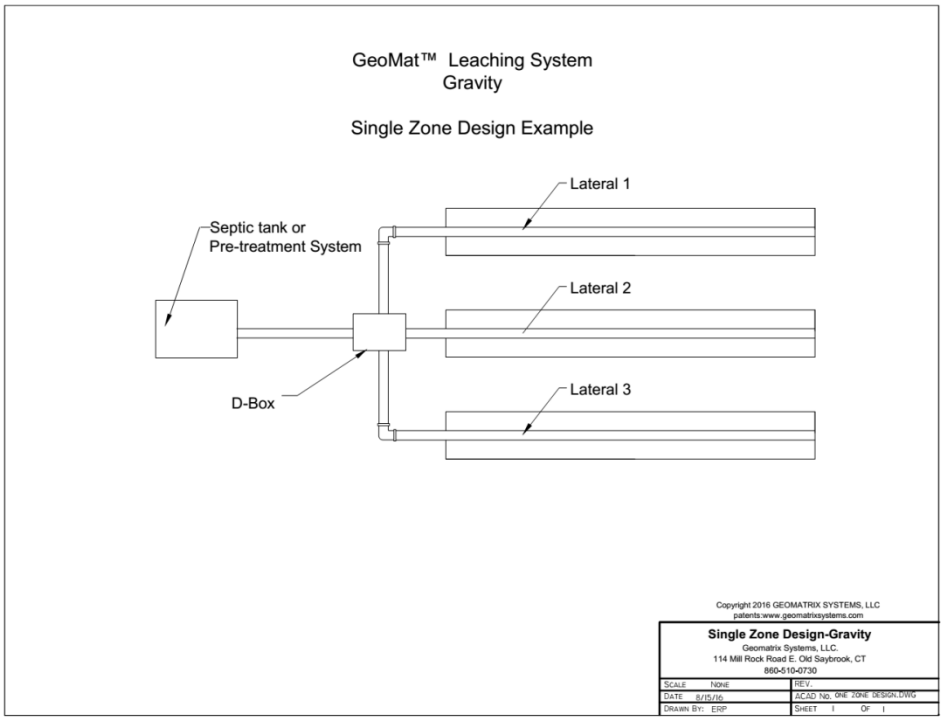


Figure 9



GeoMat System Design Examples (continued)

Figure 10

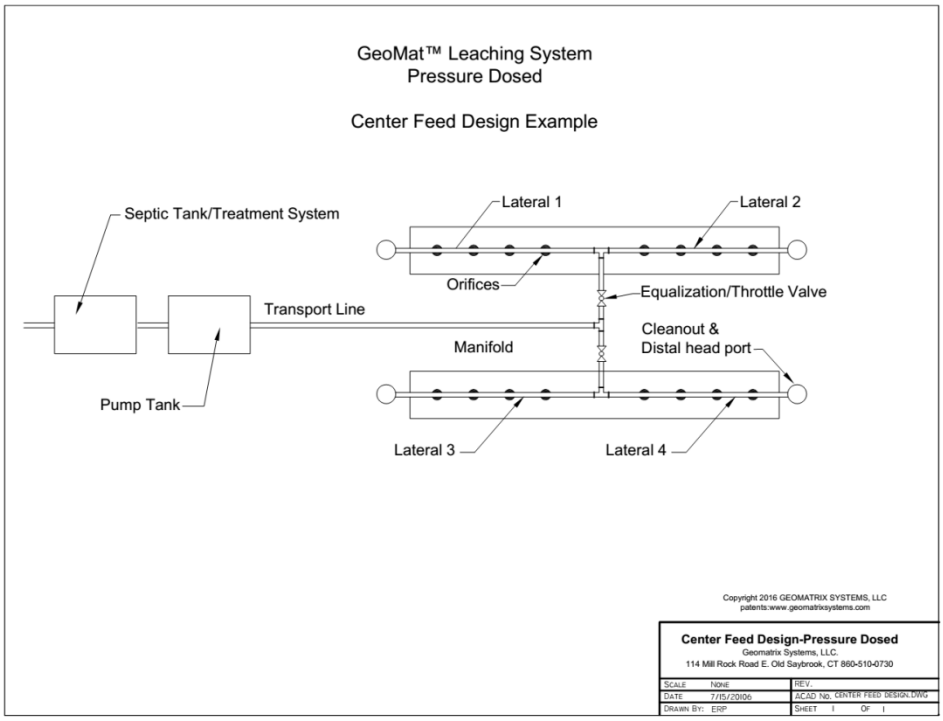
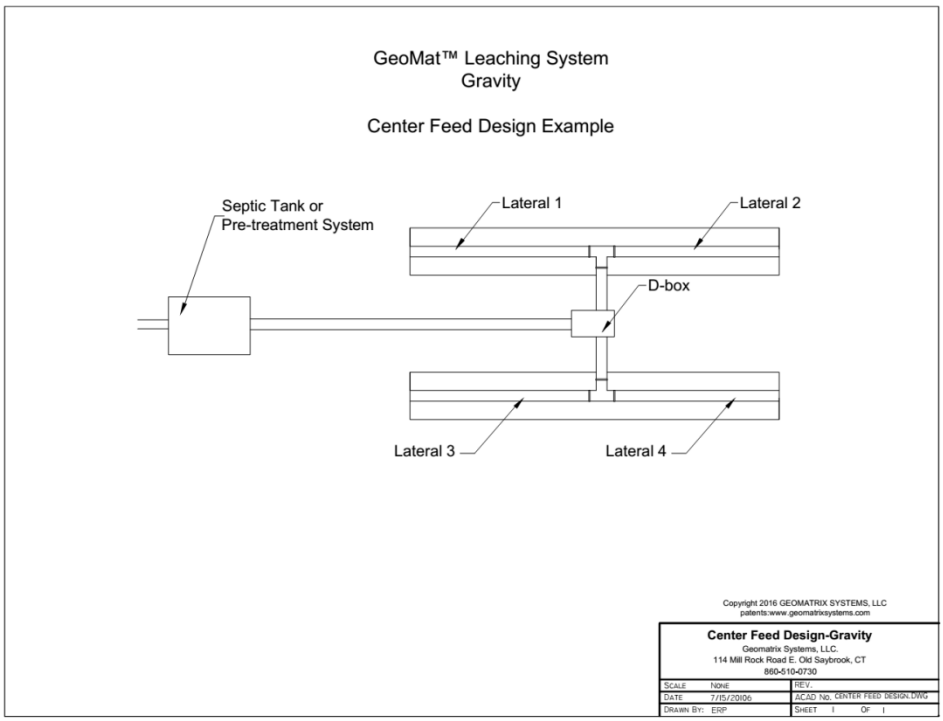


Figure 11



GeoMat System Design Examples (continued)

Figure 12

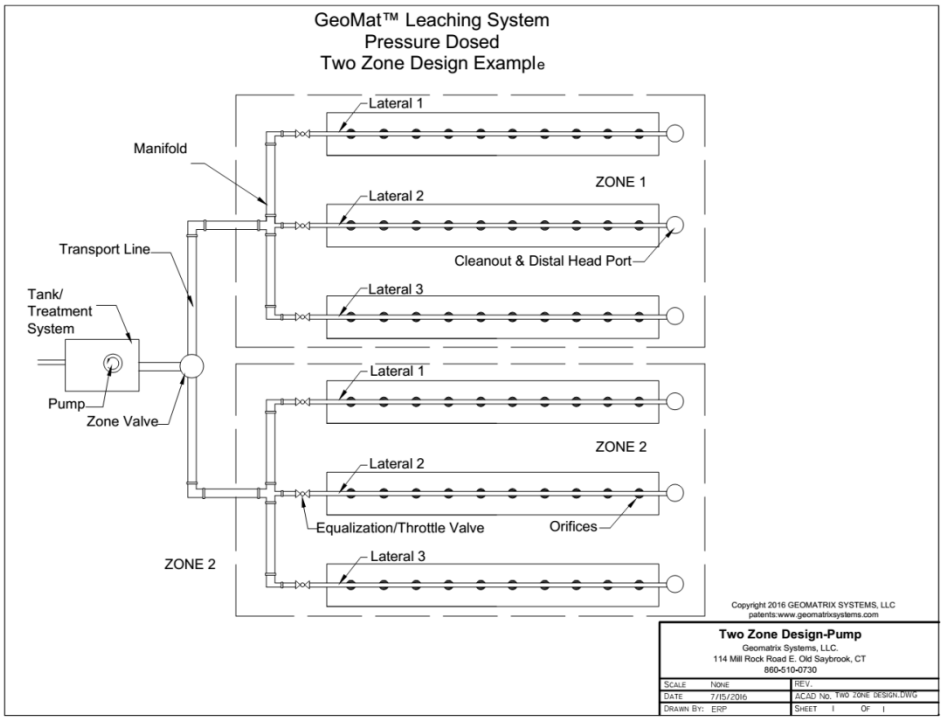
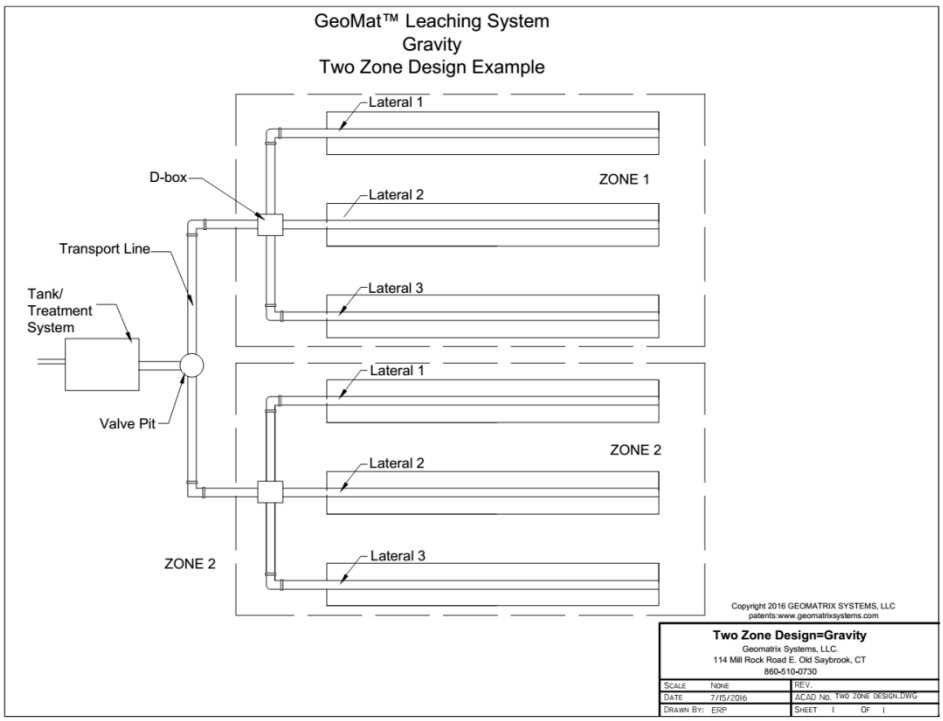


Figure 13



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