MASSACHUSETTS

GST™ Leaching Systems

Design Manual for
Pressure and Gravity Applications

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Introduction

Geomatrix Systems, LLC's (Geomatrix) GST™ Leaching System (GST) is an adaptation of the time-proven stone leaching system. This traditional leaching system has been improved with the use of a removable form to accurately shape and construct leaching fingers along the sides of a central distribution channel. The fingers are typically constructed with ½" – ¾" washed stone and are surrounded with ASTM C-33 (see Sand Specification on Page 2.) These fingers serve to increase the sidewall surface area by more than six times that of a traditional stone leaching trench. Additionally, the narrow profile of the leaching fingers and central distribution channel, combined with the uniform profile of the sand treatment media, serve to enhance oxygen transfer efficiencies. Enhanced oxygen transfer results in better treatment of the wastewater pollutants and a leach field with a longer lifespan. GST can be configured with standard gravity, pressure, and/or time-dosed distribution

The GST is available in models that are 37 inches and 62 inches wide; both models can be installed in heights of 6, 12, 18, 24, 30, and 36 inches.

While some codes do not require the use of pressure distribution (PD), pretreatment units, flow equalization, or SoilAir®, Geomatrix highly recommends the use of these features to enhance treatment and system lifespan, especially where high flows and challenging waste streams are present.

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.

GST is manufactured under U.S. patents; See patents at www.geomatrixsystems.com.

GeoMat and GeoGuard are trademarks of Geomatrix.

Designing a GST System

GST Leaching Systems shall be designed in accordance with all State regulations and local regulations. The requirements Title 5, 315 CMR 15.000 shall apply unless otherwise set forth in this Design Manual. GST is approved for General and Remedial Use.

GST is constructed with ½ – ¾ inch washed stone surrounded with ASTM C-33 (see Sand Specification on Page 2.)

GST can be utilized in H-20 wheel load configurations (H-20) provided that a minimum of 12 inches of specified crushed aggregate fill (see Figure 7) is utilized above the GST system.

In the instance when GST is installed deeper than 24 inches or below impervious areas that limit oxygen transfer, the use of SoilAir should be considered. At a minimum, the installation of an airline for future use should be included (see Figure 10).

Use Tables 1 thru 3 for system sizing.

Sand Specification

All references to ASTM C-33 sand in this Manual refer to the specifications in this table. All ASTM C-33 sand used in constructing GST systems must strictly meet this specification.

Sand Specification

ASTM C-33 SIEVE SIZE		Range of % Passing
3/8"		100.00
No. 4		95.00-100.00
No. 8		80.00-100.00
No. 16		50.00-85.00
No. 30		25.00-60.00
No. 50		10.00-30.00
No. 100		2.00-10.00
No. 200		0.00-3.00

GST in Trench & Bed Configurations

GST can be installed in trench configuration in native soil or trench and bed configurations in a sand fill package. GST can be loaded at a maximum loading rate of 0.74 gallons per day per square foot of surface area; please refer to Tables 1 – 3. A minimum of 2 inches of ASTM C-33 Sand (see Sand Specification on Page 2) must be placed beneath the GST. A minimum of 2 inches of this specification of sand should be installed on the sides and the ends of the GST.

Gravity or Pressure Distribution (PD) may be utilized.

Daily Design Flow and Application Rates

Daily design flows shall be in accordance with the design flows established in Section 15.203 of Title 5.

Table 1: Design Flows

Per Bedroom	110 gpd (Minimum design flow of 330 gpd per residence)

Application rates for GST shall be those established in Title 5, Section 15.242: LTAR – Effluent Loading Rate, set forth in Table 2.

Table 2: GST Application Rates by Percolation Rate

	Application Rate			
Perc. Rate min/inch	SOIL CLASS I GPD/sqft	SOIL‡ CLASS II GPD/sqft	SOIL CLASS III GPD/sqft	SOIL* CLASS IV GPD/sqft
≤5	0.74	0.60	-	-
6	0.70	0.60	-	-
7	0.68	0.60	-	-
8	0.66	0.60	-	-
10	-	0.60	-	-
15	-	0.56	0.37	-
20	-	0.53	0.34	-
25	-	0.40	0.33	-
30	-	0.33	0.29	-
40	-	-	0.25	-
50	-	-	0.20	0.20
60	-	-	0.15	0.15

* - Must be reviewed by Geomatrix

Minimum Absorption Area Required

The minimum absorption area required is calculated by determining the Design Flow from Table 1 and dividing it by the Application Rate from Table 2.

GST Absorption Area

Tables 3 and 4 set forth the effective leaching area per linear foot for each model of GST.

Table 3: GST Approved Effective Leaching Area In Trench Configuration (SF/LF)

GST Model	Dimensions (W x H)	Effective Leaching Area Approved (SF/LF)	Edge to Edge Spacing (Inches)
3706	37" x 6"	6.2	6
3712	37" x 12"	8.35	6
3718	37" x 18"	10	12
3724	37" x 24"	11.69	12
3730	37" x 30"	11.69	12
3736	37" x 36"	11.69	12
6206	62" x 6"	6.68	6
6212	62" x 12"	8.35	6
6218	62" x 18"	10	12
6224	62" x 24"	11.69	12
6230	62" x 30"	11.69	12
6236	62" x 36"	11.69	12

Table 4: GST Approved Effective Leaching Area In Bed Configuration (SF/LF)

GST Model	Dimensions (W x H)	Effective Leaching Area Approved (SF/LF)
3706	37" x 6"	5.71
3712	37" x 12"	5.71
3718	37" x 18"	5.71
3724	37" x 24"	5.71
3730	37" x 30"	5.71
3736	37" x 36"	5.71
6206	62" x 6"	9.19
6212	62" x 12"	9.19
6218	62" x 18"	9.19
6224	62" x 24"	9.19
6230	62" x 30"	9.19
6236	62" x 36"	9.19

System Design Steps – Trench Configuration

Step 1. Determine Design Flow by referring to Table 1.

Design Flows (same Table as on page3)

Per Bedroom	110 gpd (minimum design flow of 330 gpd per residence)

_____ ✘ _____ ✘ 110gpd = _____

Bedrooms | Number of Bedroom (Min. of 3) | Design Flow (gpd)

Step 2. Determine the required Effective Leaching Area by dividing Design Flow from Step 1 by Application rate from Table 2.

GST Application Rates by Percolation Rate (same Table as on page 3)

	Application Rate			
Perc. Rate min/inch	SOIL CLASS I GPD/sqft	SOIL CLASS II GPD/sqft	SOIL CLASS III GPD/sqft	SOIL* CLASS IV GPD/sqft
≤5	0.74	0.60	-	-
6	0.70	0.60	-	-
7	0.68	0.60	-	-
8	0.66	0.60	-	-
10	-	0.60	-	-
15	-	0.56	0.37	-
20	-	0.53	0.34	-
25	-	0.40	0.33	-
30	-	0.33	0.29	-
40	-	-	0.25	-
50	-	-	0.20	0.20
60	-	-	0.15	0.15

* - Must be reviewed by Geomatrix

_____ ÷ _____ = _____

Design Flow from Step 1 | Application Rate area from Table 2 | Total Absorption Area required

Step 3. Determine model of GST and effective leaching area using Table 3:

GST Approved Effective Leaching Area In Trench Configuration (SF/LF) (same Table as on page 4)

GST Model	Dimensions (W x H)	Effective Leaching Area Approved (SF/LF)	Edge to Edge Spacing (Inches)
3706	37" x 6"	6.2	6
3712	37" x 12"	8.35	6
3718	37" x 18"	10	12
3724	37" x 24"	11.69	12
3730	37" x 30"	11.69	12
3736	37" x 36"	11.69	12
6206	62" x 6"	6.68	6
6212	62" x 12"	8.35	6
6218	62" x 18"	10	12
6224	62" x 24"	11.69	12
6230	62" x 30"	11.69	12
6236	62" x 36"	11.69	12

Step 4: Determine linear feet of GST required:

Divide required effective leaching area from Step 2 by desired trench width to determine the total length that is required among all trenches/beds.

_____		_____		_____
Required area from Step 2	÷	GST Effective Leaching Area from Table 3	=	Total GST required (linear feet)

If the residence includes a garbage grinder or disposal, GST calculated in this Step must be increased by 50%.

Step 5. Determine number and length of trench(es): GST may be designed in multiple trenches. If a single trench is longer than desired for the site, the required effective leaching area can be divided among multiple trenches. When using multiple trenches, trenches should be the same length.

Divide the total trench length from Step 4 by the desired number of trenches or desired bed width to determine each trench length or bed size.

_____		_____		_____
Linear feet of GST from Step 4	÷	Number of trenches/beds	=	Length of each trench

Step 6. Determine sand and stone required using GST model (Step 3), linear feet of GST (Step 4), and Table 5: Sand and stone required for GST installation is set forth in Table 5.

Table 5: Sand and Stone Volume Guide

37" series

GST Model	Amount of ¾" Stone Required	Amount of ASTM C-33 Required (see Sand Specification on Page 2)
	Yards per. Linear Foot	
3706	0.16	0.18
3712	0.19	0.25
3718	0.22	0.32
3724	0.25	0.39
3730	0.28	0.46
3736	0.31	0.53

62" series

GST Model	Amount of ¾" Stone Required	Amount of ASTM C-33 Required (see Sand Spefication on Page 2)
	Yards per Linear Foot	
6206	0.20	0.25
6212	0.27	0.35
6218	0.35	0.46
6224	0.43	0.56
6230	0.50	0.66
6236	0.58	0.76

Use the following formula to determine sand and stone required (*use for each sand and stone*).

_____	✖	_____	=	_____
Linear feet of GST from Step 4		Sand or Stone from Table 5		Amount of Sand or stone Required

System Design Steps – Bed Configuration

Step 1. Determine Design Flow by referring to Table 1.

Design Flows (same Table as on page3)

Per Bedroom	110 gpd (Minimum design flow of 330 gpd per residence)

_____ ✖ _____ ✖ 110gpd = _____

Bedrooms | Number of Bedroom (Min. of 3) | Design Flow (gpd)

Step 2. Determine the required Effective Leaching Area by dividing Design Flow from Step 1 by Application rate from Table 2.

Table 2: GST Application Rates by Percolation Rate

	Application Rate			
Perc. Rate min/inch	SOIL CLASS I GPD/sqft	SOIL CLASS II GPD/sqft	SOIL CLASS III GPD/sqft	SOIL* CLASS IV GPD/sqft
≤5	0.74	0.60	-	-
6	0.70	0.60	-	-
7	0.68	0.60	-	-
8	0.66	0.60	-	-
10	-	0.60	-	-
15	-	0.56	0.37	-
20	-	0.53	0.34	-
25	-	0.40	0.33	-
30	-	0.33	0.29	-
40	-	-	0.25	-
50	-	-	0.20	0.20
60	-	-	0.15	0.15

* - Must be reviewed by Geomatrix

_____ ➗ _____ = _____

Design Flow from Step 1 | Application Rate Area from Table 2 | Total Absorption Area Required

If the residence includes a garbage disposal or griner, the amount of absorption area calculated in this Step must be increased by 50%.

Step 3. Determine minimum sand bed area required by referring to Table 6.

Table 6: Minimum Sand Bed Area (in Square Feet)

Perc Rate min/inch	2 Bedroom @220GPD				3 Bedroom @330GPD				4 Bedroom @440GPD			
	SOIL CLASS				SOIL CLASS				SOIL CLASS			
	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS I	CLASS II	CLASS III	CLASS IV
≤5	400	400	-	-	400	400	-	-	400	440	-	-
6	400	400	-	-	400	400	-	-	400	440	-	-
7	400	400	-	-	400	400	-	-	400	440	-	-
8	400	400	-	-	400	400	-	-	400	440	-	-
10	-	400	-	-	-	400	-	-	-	440	-	-
15	-	400	400	-	-	400	535	-	-	471	714	-
20	-	400	400	-	-	400	582	-	-	498	776	-
25	-	400	400	-	-	495	600	-	-	660	800	-
30	-	400	455	-	-	600	683	-	-	800	910	-
40	-	-	528	-	-	-	792	-	-	-	1056	-
50	-	-	660	660	-	-	990	990	-	-	1320	1320
60	-	-	880	880	-	-	1320	1320	-	-	1760	1760

Perc Rate min/inch	5 Bedroom @550GPD				6 Bedroom @660GPD				Add'l Bedroom @110GPD			
	SOIL CLASS				SOIL CLASS				SOIL CLASS			
	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS I	CLASS II	CLASS III	CLASS IV
≤5	446	550	-	-	535	660	-	-	89	110	-	-
6	471	550	-	-	566	660	-	-	94	110	-	-
7	485	550	-	-	582	660	-	-	97	110	-	-
8	500	550	-	-	600	660	-	-	100	110	-	-
10	-	550	-	-	-	660	-	-	-	110	-	-
15	-	589	892	-	-	707	1070	-	-	118	178	-
20	-	623	971	-	-	747	1165	-	-	125	194	-
25	-	825	1000	-	-	990	1200	-	-	165	200	-
30	-	1000	1138	-	-	1200	1366	-	-	200	228	-
40	-	-	1320	-	-	-	1584	-	-	-	264	-
50	-	-	1650	1650	-	-	1980	1980	-	-	330	330
60	-	-	2200	2200	-	-	2640	2640	-	-	440	440

Step 4. Determine model of GST and effective leaching area using Table 4:

GST Approved Effective Leaching Area In Bed Configuration (SF/LF) (same Table as on page 4)

GST Model	Dimensions (W x H)	Effective Leaching Area Approved (SF/LF)
3706	37" x 6"	5.71
3712	37" x 12"	5.71
3718	37" x 18"	5.71
3724	37" x 24"	5.71
3730	37" x 30"	5.71
3736	37" x 36"	5.71
6206	62" x 6"	9.19
6212	62" x 12"	9.19
6218	62" x 18"	9.19
6224	62" x 24"	9.19
6230	62" x 30"	9.19
6236	62" x 36"	9.19

Step 5. Determine linear feet of GST required:

Using the larger of Total Absorption Area Required from Step 2 or the Minimum Bed Area from Step 3, divide the required area by desired GST Effective Leaching Area in Table 4 to determine the total linear feet of GST required.

_____		_____		_____
Required area from Step 2 or Step 3 (Use larger area)		GST Effective Leaching Area from Table 4		Total GST required (linear feet)

Step 6. Determine the dimension of bed(s): Using the Linear Feet of GST Required in Step 5, determine dimension of bed(s). If a single bed is larger than desired for the site, the required bottom area can be divided among multiple beds.

Divide the linear feet of GST from Step 5 by the desired bed width to determine each bed size.

_____		_____		_____
Linear feet of GST		Desired Width		Bed Length

Step 7. Determine sand and stone required using GST model (Step 3), linear feet of GST (Step 4), and Table 4: Sand and stone required for GST installation is set forth in Table 5.

Use the following formula to determine sand and stone required (*use for each sand and stone*).

_____	✖	_____	=	_____
Linear feet of GST from Step 4		Sand or stone from Table 5		Amount of Sand or stone Required

Table 5: Sand and Stone Volume Guide

37" series

GST Model	Amount of ¾" Stone Required	Amount of ASTM C-33 Sand Required (see Sand Specification on Page 2)
	Yards per. Linear Foot	
3706	0.16	0.18
3712	0.19	0.25
3718	0.22	0.32
3724	0.25	0.39
3730	0.28	0.46
3736	0.31	0.53

62" series

GST Model	Amount of ¾" Stone Required	Amount of ASTM C-33 Sand Required (see Sand Specification on Page 2)
	Yards per Linear Foot	
6206	0.20	0.25
6212	0.27	0.35
6218	0.35	0.46
6224	0.43	0.56
6230	0.50	0.66
6236	0.58	0.76

Basic Design Considerations

In gravity systems, GST pipe will be 2- 4 inch perforated pipe.

For non-H-20 applications, a minimum cover depth of 6 inches shall be present above the GST system. Suitable cover material above the distribution pipe is clean sandy fill and topsoil that is suitable for growing grass. For H-20 applications, ensure that a minimum of 12 inches of specified crushed aggregate fill (see figure 7) is utilized above the GST system and covered with clean sandy fill and topsoil that is suitable for growing grass.

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

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

- When possible, the preservation of the native soil between trenches and minimizing its disruption and compaction during construction is preferable. Consequently, construction is to be trench-by-trench when possible unless a layer of specified sand is utilized as a continuous base beneath and also around and covering the GST;

- Keep the top of the GST shallow, ideally 6-18 inches below finish grades. When cover increases above 24 inches, SoilAir should be considered. Try to keep cover depth as consistent as possible over the laterals to balance air flux rates through the soil;

- Keep the bottoms of the GST laterals level unless a step down is necessary;

- Separation from the bottom of the GST to the seasonal high water table is (a) four feet in soils with a recorded percolation rate of more than two minutes per inch and (b) five feet in soils with a recorded percolation rate of two minutes or less per inch unless otherwise approved;

- When designed for residences with garbage disposals, the amount of GST must be increased by 50%.

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

- Scarify the drain field base before installing components; and

- GST may be installed under paved surfaces, including driveways and parking lots. SoilAir

must be used on all installations under paved surfaces.

When reviewing a site and developing a design, it is best to position the GST laterals parallel to ground surface contours. This will help make it easier to keep drain field base elevations and cover depths level and uniform. Designing perpendicular to a surface contour will mean that the down gradient end of the drain field trench being shallow-placed, whereas the upgradient end will be much deeper. Leaching systems that are parallel with surface contours also have a larger hydraulic window which maximizes site hydraulics.

When PD is used, the requirements of 310 CMR 255(2) shall not apply. Pressure dosing must be designed in accordance with Massachusetts Guidance Document Policy #BRP/DWM/WpeP/G02-2. The pressure distribution effluent rates in 310 CMR 15.242(1)(b) can be utilized. Small frequent doses of effluent to the GST are preferred over fewer larger doses; however, rest/reaeration intervals must also be provided for; 4 – 8 doses per day is typical (with a minimum of 4 doses). Pump chambers should preferably be designed with float switches controlling high water alarm, pump on/off, and low water/redundant off. A dose counter is recommended. Time dosing can also enhance performance.

Pump systems shall comply with the requirements of 310 CMR 231(6) with regard to the requirement of duplex pumps.

Soil excavation and/or plantings other than grass within a minimum of five feet of the system are not permitted unless a root barrier is utilized. Contact Geomatrix for design assistance.

System can be installed as close as 20 feet from a building cellar wall.

A fully complying replacement area is not required for systems utilizing GST as a remedial system.

Trenches constructed at different elevations shall be designed to prevent effluent from the higher trench(es) flowing into the lower trench(es). 310 CMR 15.251(3).

An inspection port shall be installed on every row of GST. The inspection port – PN: IPGST15 consists of a 4" PVC Tee with two slotted openings on the T ends. A threaded plug on top prevents debris from entering the inspection port. These inspection ports are designed to be stable and not move upwardly or downwardly over the life of the system. This will allow inspection or confirmation of the bottom elevation of the leaching system. during inspection or at any time. It is also possible to monitor effluent ponding levels through this port. If it is ever necessary to pump the leaching system out, the inspection port will prevent a "posthole" from being formed, as occurs when an open bottom pipe is utilized for pumping. The inspection ports can be finished in a valve box flush with grade or finished as a standpipe (see Figures 8 and 9).

GST 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 ASTM C-33 Sand (see Sand Specification on Page 2) to the design elevation of the bottom of the trench, and the GST constructed and backfilled in ASTM C-33 sand (see Sand Specification on Page 2.)

Gravity Distribution Design Parameters

Gravity GST laterals that exceed 50 feet shall be center fed.

Parallel distribution shall be utilized whenever possible.

Laterals for gravity systems are 2 - 4 inch SCH40 or 4 inch SDR35 perforated pipe with minimum ½ inch perforations.

A state-approved effluent filter shall be used.

Pressure Distribution Design Parameters

Systems utilizing PD shall be designed in accordance with Title 5. Generally, the pressure transport pipe from the pump tank or treatment unit to the GST is 1½ - 4 inch PVC pipe (Class 200 minimum). 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 tank or toward the GST to drain the line after each dose. In some cases, it may be better to slope the transport line in both directions. Sloping of the pipe 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.

GST distribution manifolds are typically 1½ - 4 inch SCH.40 PVC. Distribution laterals are typically 1 - 2 inch 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 GST laterals are at different elevations. Flow equalization valves are often installed in the pump chamber for ease of operation, protection from damage, and prevention of freezing. A disconnect/throttle valve should be installed downstream of the pump throttle and shut off flow to the GST piping.

Orifice holes must be a minimum of ⅛ inch (⅛ inch recommended for pretreated effluent and 3/16 inch recommended for septic tank effluent) and should be oriented in a downward (six o'clock) direction and be spaced according to the dosing requirements of the system. During fabrication of the distribution lateral, a new/sharp drill bit should be used to ensure as smooth an orifice as possible. Any loose and connected drill shavings should be removed from the pipe

with a bottle brush on an extension; failure to remove drill shaving can compromise the system. Geomatrix orifice shields must be installed over the orifice holes. Failure to use Geomatrix orifice shields results in voiding of the Geomatrix Limited Warranty.

Typical designs should account for a minimum of two feet of head pressure at the distal end of each GST distribution lateral.

Design software for pump, lateral line, transport pipe, manifold, orifice size, and additional head loss is available by emailing a request to info@geomatrixsystems.com or on our website https://www.geomatrixsystems.com/resources/ - Recommended dose volumes can be found in Table 7 of this manual.

Table 7: Storage Volume and Recommended Dose Volumes

GST Model	Storage Volume	Recommended Dose
3706	3.05	1.53
3712	6.11	3.05
3718	9.16	4.58
3724	12.22	6.11
6206	4.62	2.31
6212	9.23	4.61
6218	13.84	6.92
6224	18.45	9.23

Two SCH40 PVC 45-degree elbows or equivalent 90-degree sweep elbows (also called turn-ups) shall be attached to the distal end of each GST distribution lateral to facilitate setting and measuring distal head, maintenance, and inspection. A standard 90-degree elbow should not be utilized because it will interfere with maintenance activities. The open end (upward end) of the sweep 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 the GST laterals at different elevations.

The installation of a pressure filter, approved by Geomatrix, is recommended between the pump and the laterals on PD systems. The Sim/Tech STF-100 is preapproved.

Zoned Drain Fields and Trenches at Different Elevations

Smaller sized pumps can be used on larger drain fields and still maintain adequate distal head by utilizing automatic sequencing valves, such as those 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 all the drain field trenches at the same elevation. In these situations, distribution valves can be used to provide uniform wastewater distribution; alternatively, throttle valves can be utilized for the same purpose. Access points must be installed for each valve. Valves can be located in the pump tank or in the valve boxes.

Drain Field Cover

Drain field cover shall be a minimum of 6 inches over the top of the GST distribution pipe. Uniform cover depth and composition over the drain field results in equal oxygen transfer to the entire system. The final grade over and around the drain field should direct stormwater sheet flow away from the drain field.

The area directly above and adjacent to any septic drain field should be protected from heavy vehicle traffic and excess weight loads before, during, and post construction unless designed for H-20 (see Figure 7). On all construction projects, it is recommended that the proposed drain field location be staked and flagged/fenced to prevent encroachment. If vehicle encroachment is expected to be a problem before, during, or after construction, some structure, such as garden timbers, railroad ties, fences, or walls, should be used to protect the drain field area. The drain field area should be free of debris and planted with grass. Impermeable materials and structures should not be installed or stored over the drain field unless SoilAir is utilized to enhance aeration. When possible, trees and shrubs should be kept a minimum distance of ten feet beyond the drip line unless using a root barrier. If the drip line trees and shrubs must be closer than ten feet from the drain field, root barriers can be utilized to prevent roots from entering the drain field; contact Geomatrix for design assistance. Roots from nearby moisture-loving trees such as willow, black locust, and red maple may cause problems with roots clogging or otherwise damaging the drain field lateral orifices. If a root barrier is not utilized, greater setback distances are recommended for these tree species.

Septic System Design and Use Do's and Don'ts

It is important that system designers consider the following Do's and Don'ts when designing a GeoMat system and provide this information to system owners and users to help ensure function and maximum life of the system.

Do:

- Generally, systems should be designed at 1.5 to 2 times peak design flows as set by the responsible state agency.
- Understand expected peak design flows for the specific system and design system to meet demand.
- Instruct users to conserve water to reduce the amount of wastewater that must be treated and disposed.
- Instruct users to repair any leaking faucets and toilets.
- Instruct users to only discharge necessary biodegradable wastes into system.
- Consider garbage disposal use in system design by doubling system size and instruct users to restrict garbage disposal use.
- Ensure downspouts and other surface water is diverted away from the drain field & tanks.
- Keep the septic tank cover accessible for tank inspections and pumping.
- Instruct users to have the septic tank pumped regularly and checked for leaks and cracks.
- Provide information to use to enable them to call a professional when you have problems.
- Instruct users to compost garbage or put it in the trash.

Don't:

- DO NOT - Discharge water softeners, dehumidifiers, drain lines, stormwater, or other water discharging devices into the system; these devices should be discharged to a separate drain field.
- DO NOT - Use septic system additives; there are plenty of microorganisms present in wastewater and the surrounding soil for treatment to occur.
- DO NOT - Flush sanitary napkins, tampons, condoms, cigarette butts, diapers, wipes, and such products into your system.
- DO NOT - Dump solvents, oils, paints, paint thinner, disinfectants, pesticides, or poisons down the drain.
- DO NOT - Dig in your drain field or build anything over it.
- DO NOT - Plant anything other than grass over your drain field.
- DO NOT - Drive over your drain field unless it is designed for H-20 wheel loads.
- DO NOT create unnecessary compaction over your drain field.

GST Schematics

GST 37" Series

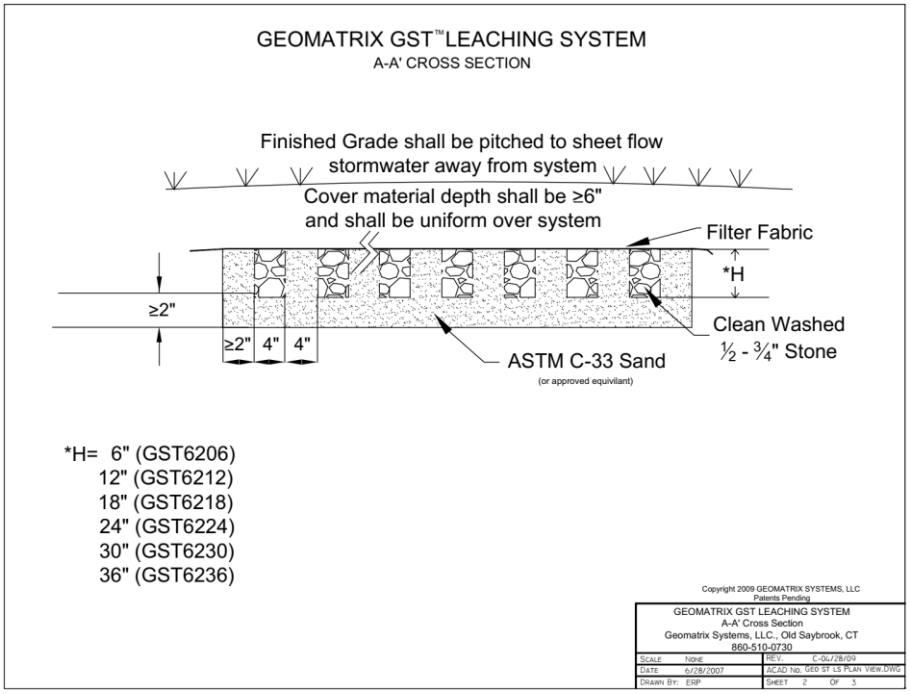


Figure 1

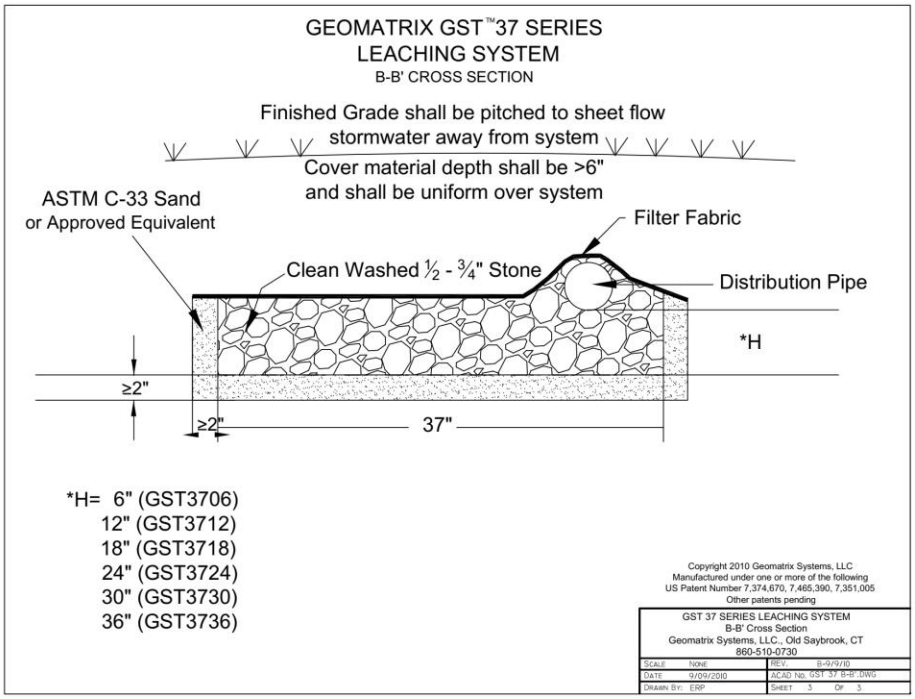
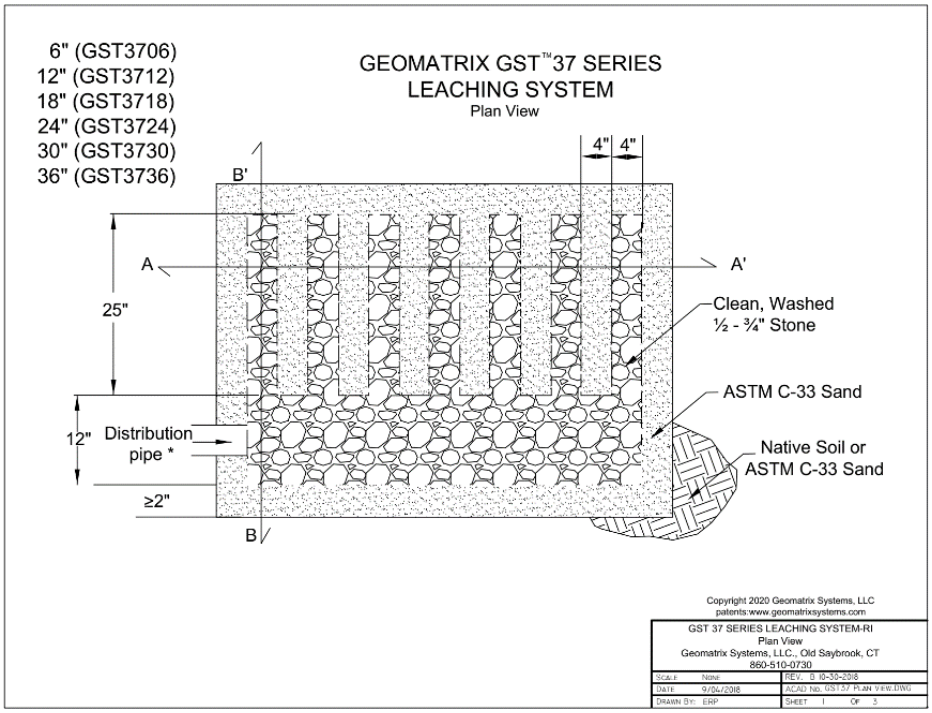


Figure 2


6" (GST3706)
12" (GST3712)
18" (GST3718)
24" (GST3724)
30" (GST3730)
36" (GST3736)
GEOMATRIX GST™37 SERIES
LEACHING SYSTEM
Plan View
4"
4"
B'
A
A'
25"
Clean, Washed
½ - ¾" Stone
ASTM C-33 Sand
12"
Distribution
pipe *
Native Soil or
ASTM C-33 Sand
≥2"
B
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GST 37 SERIES LEACHING SYSTEM-RI
Plan View
Geomatrix Systems, LLC., Old Saybrook, CT
860-510-0730
SCALE: NONE
REV.: B 10-30-2018
DATE: 9/04/2018
ACAD No. GST37 PLAN VIEW.DWG
DRAWN BY: ERP
SHEET 1 OF 3

Figure 3

GST 62" Series

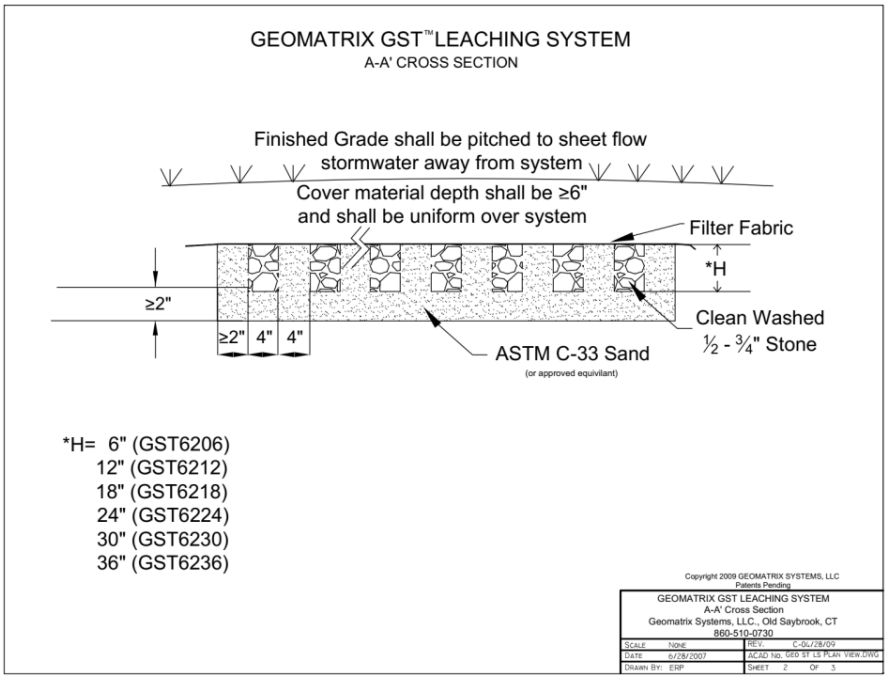

Figure 4

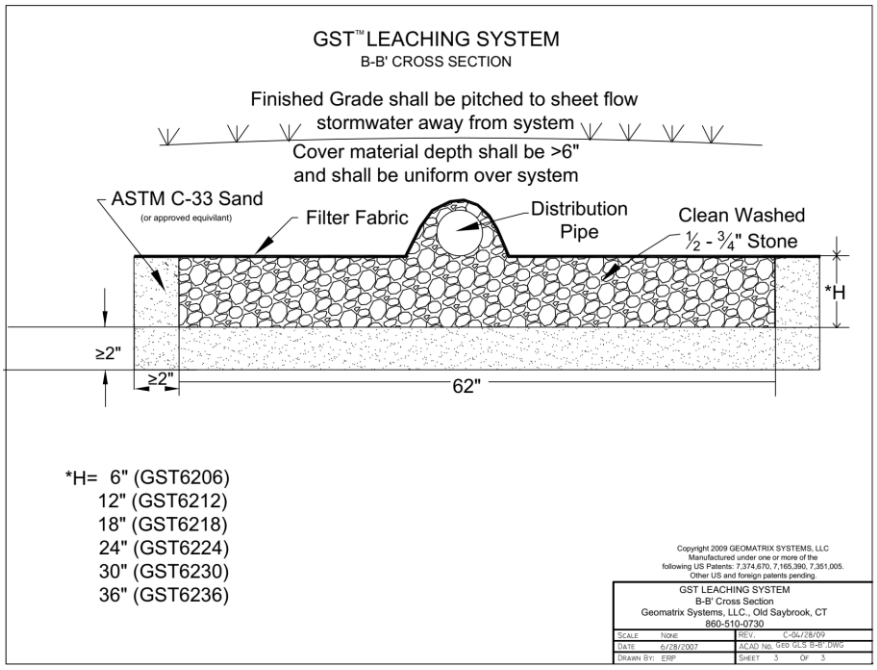

Figure 5

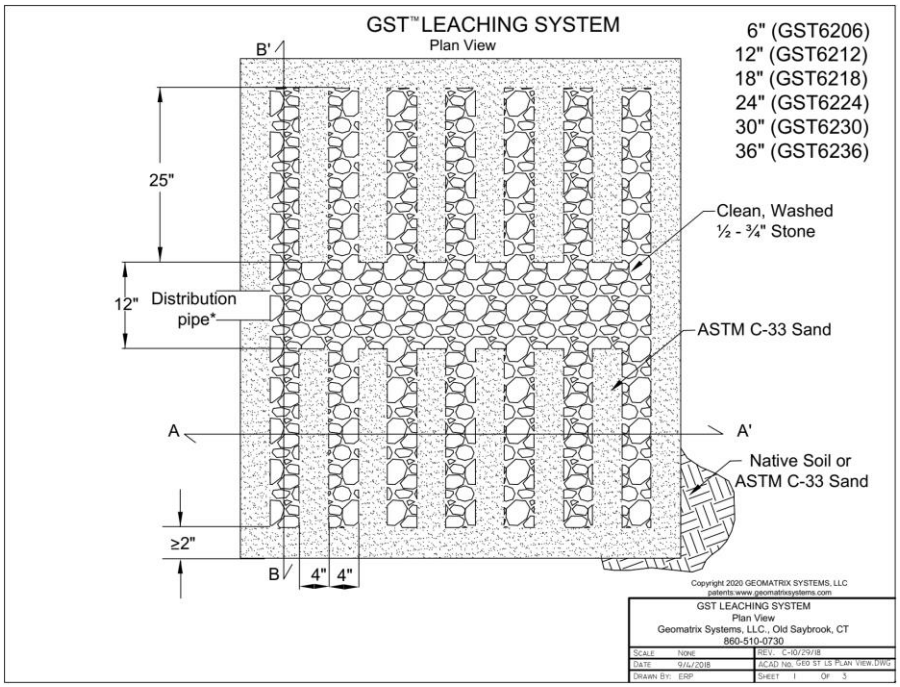

Figure 6

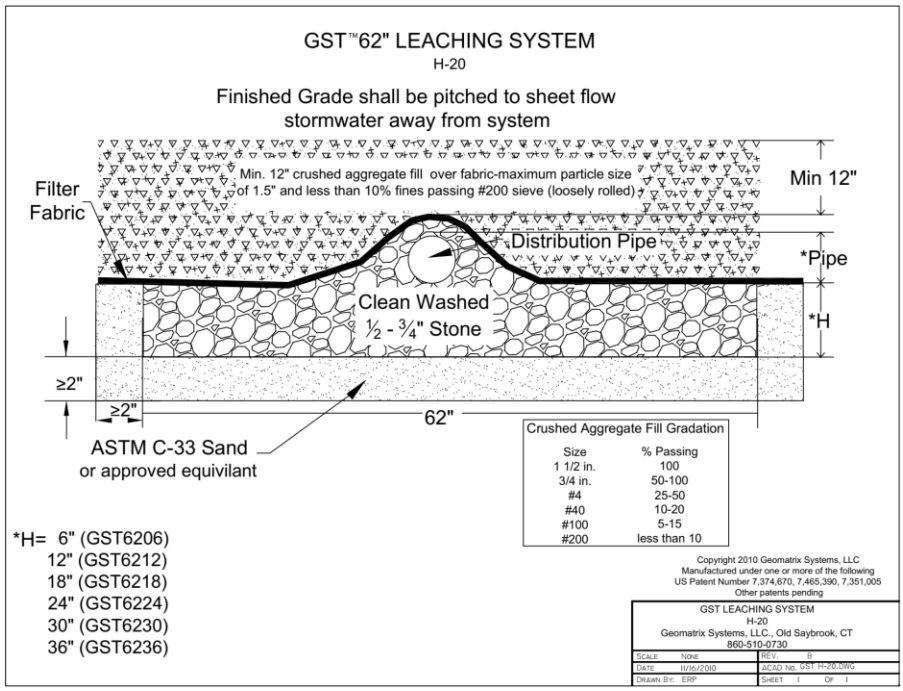

Figure 7

Geomatrix Systems GST Inspection Port

PN: IPGST15

4" pipe provided by installer

Figure 8

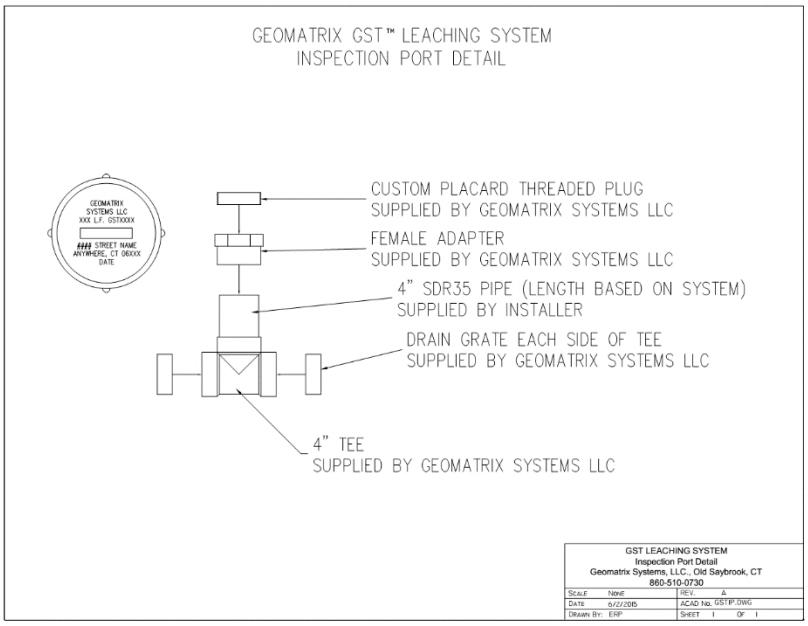

Figure 9

SoilAir Airline

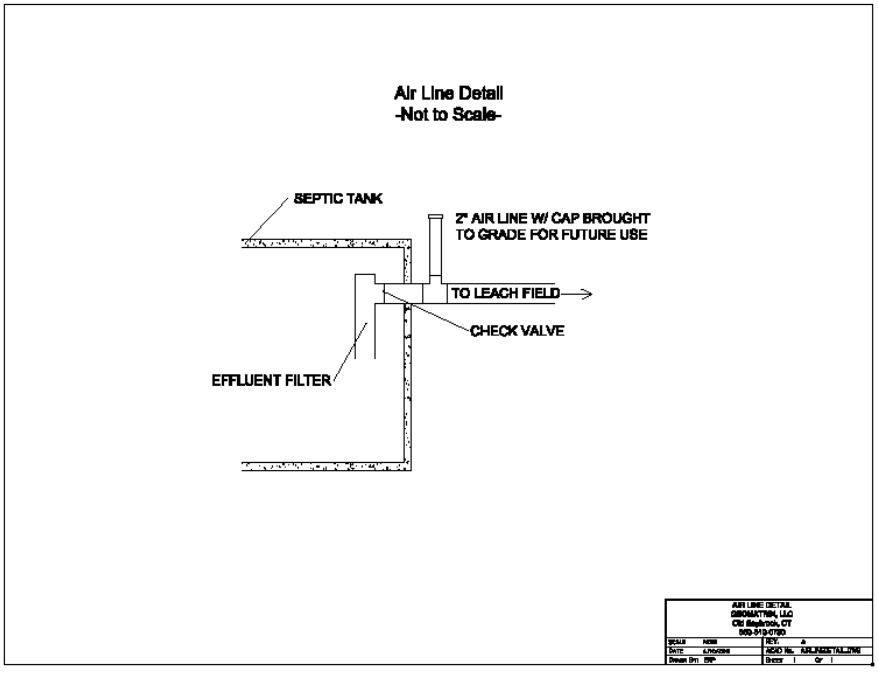

Figure 10

GEOMATRIX

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