

# **Home Septic System Site Evaluation And System Design**

**For**

**Brenda Woods  
2634 Wilford Dr.  
Toledo OH 43615**

**616-990-1649**

**Property Location:  
Same As Above**

**Sylvania Township, Lucas County**

**Replacement Leach Trench System**

**By**

**Nathan Wright**

**Geophyta, Inc.  
2685 C.R. 254  
Vickery, OH 43464**

**419-547-8538**

**January 28 , 2017**



### **To The Homeowner:**

A septic system is designed based on all the information you provide and Geophyta Inc collects at the site. It must be accurate. This information includes local soil limits and topography, plus existing and future locations of your home, number of bedrooms, out buildings, driveways, drinking water wells, ponds, septic systems, and property lines. Geophyta Inc. relies on this information to construct detailed design drawings that must meet local health department regulations before installation.

Any design changes required by the local health department to meet existing regulations are the responsibility of Geophyta Inc.

Any information changes made by you after the initial site inspection are your responsibility and will result in additional charges to you above the original quote for services. These charges may include additional site inspection work, system redesign, and resubmitted drawings.

### **To The Installer:**

The registered installer of this septic system design is responsible for preparing an “as-built” record, as stated in the Ohio Administrative Code Chapter 3701-29-09, Par. F (p.32) of the “Sewage Treatment System Rules,” Ohio Department of Health, January 1, 2015. Additionally, the installer is responsible for measuring and recording distal pressure head and float switch settings as baseline measures for future operation and maintenance of any pressure distribution system (3701-29-15, Appendix B, Par. V(p.93) of above referenced rules.

If the installer requests “as-built” record creation from Geophyta Inc., additional charges will be billed to the installer by Geophyta Inc. and must be arranged prior to installation.

Geophyta Inc. must assume that any registered installer has the knowledge, equipment, ability, and experience to properly layout, install, and create as-built drawings for any septic system design approved by a local board of health. This includes the ability to read detailed design prints with an associated bill of materials. For this reason, any Geophyta Inc project supervision prior to or during installation will be billed to the installer.

**Any product substitution made by the installer that is not specifically permitted in the design prints may result in Health Dept. disapproval and will result in additional re-design costs billed to the installer.**



# HSTS Site/Soil Evaluation Information Sheet, Geophyta, Inc.

## Customer:

Name:	BRENDA Woods
Address:	2634 WILFORD DR
City, State:	TOLEDO OH 43615
Home Phone:	616-990-1649
Cell Phone:	same
Email:	brendaemily@hotmail.com

## Property:

Parcel #:	7859116
Current Owner:	Steve and Brenda Woods
Address:	2634 Wilford Dr.
City, State:	Toledo, OH 43615
Lot Size:	336' x 334' = 2.54 acres
Right of Ways?	no
Easements?	no

## Existing or Proposed or Lot Split: (circle one)

House Size: Rooms	4 bedrooms	electric:	overhead or buried
House Dim.w/Garage:	45' x 25' ft.xft.	phone:	overhead; buried; n/a
Detached Garage Size:	2 cars, 20' x 22' ft.xft.	gas:	natural propane n/a
Water Source:	well; public; cistern	hot tub:	yes no
Water Softener:	no yes		
Outbuildings:	no yes size: 3 x 5	geothermal system:	no; yes: (horizontal or vertical)
Pond:	no yes, size:		
System Type:	new or replacement		
Replacement Reason:	failed; addition; n/a		

## Comments:

I agree that the above information is accurate and can be used by Geophyta, Inc. to prepare a site/soil evaluation for septic system suitability. The site/soils report is for information purposes to be used by a designer and your local health department. This report does not guarantee build ability of a lot or approval of any septic system design. This is not a property boundary survey.



Customer Signature

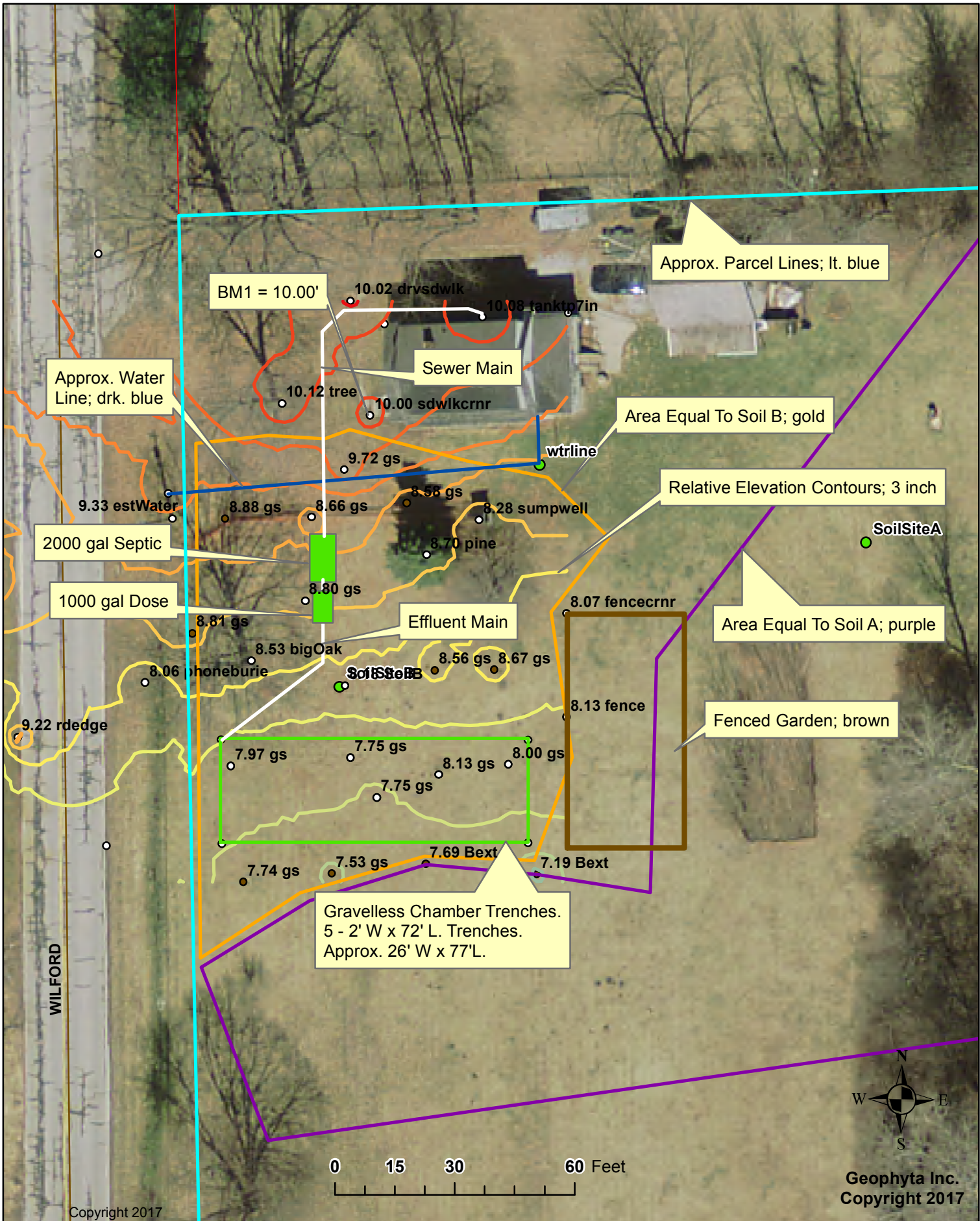
12/12/16  
Date

Payment received:

Copyright, 2015  
Geophyta, Inc.



# HSTS Layout - 2634 Wilford Dr





# Site and Soil Evaluation for Sewage Treatment and Dispersal

County: Lucas  
 Township / Sec.: Sylvania  
 Property Address: 2634 Wilford Dr.  
 OR Location: Toledo  
 Applicant Name: Brenda Woods  
 Address: 2634 Wilford Dr.  
Toledo OH 43615  
 Phone #: 616-990-1649  
 Lot #: \_\_\_\_\_  
 Test Hole #: A  
 Latitude/Longitude: 83°41'48.731"W 41°40'8.392"N  
 Method: \_\_\_\_\_ Pit \_\_\_\_\_ Auger X Probe; 1 1/4" dia.

Land Use / Vegetation: Residential Turf  
 Landform: Glacial Lake Plain  
 Position on Landform: Hillslope  
 Percent Slope: 1 - 2  
 Shape of Slope: Concave - Linear  
 Approximate Soil Type: Granby VFS  
 Date: 12-Dec-16  
 Evaluator: Nathan Wright  
Geophyta, Inc.  
2685 C.R. 254  
Vickery, OH 43464  
 Phone#: 419-547-8538

Control #: 16 - 223 - A



Certification #: 19395

Signature: Nathan Wright

Soil Profile		Estimating Soil Saturation			Estimating Soil Permeability							Other Soil Features
		Munsell Color (hue, value, chroma)										
Horizon	Depth (inches)	Matrix Color	Redoximorphic Features		Texture			Structure			Consistence	
			Concentrations	Depletions	Class	Approx. % Clay	Approx. % Fragments	Grade	Size	Type (shape)		
A1	0.0-7.5	Gley1 2.5/N	uniform	uniform	VFS	5	0	1-WEAK	medium	gr	v.friable	
A2	7.5-11.0	Gley1 2.5/N	1%2.5YR3/3	none	VFS	5	0	1-WEAK	medium	gr	v.friable	
Bwg	11.0-22.0	10YR4/1	15%10YR3/6	matrix	VFLS	10	0	1-WEAK	medium	gr	friable	
C1g	22.0-36.0	10YR5/1	20%10YR4/6	matrix	VFLS	10	0	1-WEAK	coarse	gr	friable	
C2g	36.0-48.0	10YR5/1	30%10YR4/6	matrix	VFLS	10	0	0-NONE	-	m	firm	
Limiting Conditions		Depth to (in.)		Descriptive Notes			Remarks / Risk Factors:					
Perched Seasonal Water Table		none					No Tyler Values; <8" to AWT					
Apparent Water Table		7.5		Restricted in C2g and below C2g								
Highly Permeable Material		>48										
Bedrock		>60		By Tile Probe								
Other Restrictive Layer		36.0		Massive and firm structure								

Note : The evaluation shall include a complete site plan or site drawing including all requirements in paragraphs (B)(1) through (B)(4) of OAC 3701-29-08.



# Site and Soil Evaluation for Sewage Treatment and Dispersal

County: Lucas  
 Township / Sec.: Sylvania  
 Property Address: 2634 Wilford Dr.  
 OR Location: Toledo  
 Applicant Name: Brenda Woods  
 Address: 2634 Wilford Dr.  
Toledo OH 43615  
 Phone #: 616-990-1649  
 Lot #: \_\_\_\_\_  
 Test Hole #: B  
 Latitude/Longitude: 83°41'50.474"W 41°40'8.017"N  
 Method: \_\_\_\_\_ Pit \_\_\_\_\_ Auger X Probe; 1 1/4" dia.

Land Use / Vegetation: Residential Turf  
 Landform: Glacial Lake Plain  
 Position on Landform: Hillslope  
 Percent Slope: 2 - 3  
 Shape of Slope: Linear - Convex  
 Approximate Soil Type: Ottokee S  
 Date: 12-Dec-16  
 Evaluator: Nathan Wright  
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Signature: Nathan Wright

Soil Profile		Estimating Soil Saturation			Estimating Soil Permeability							Other Soil Features
		Munsell Color (hue, value, chroma)										
Horizon	Depth (inches)	Matrix Color	Redoximorphic Features		Texture			Structure			Consistence	
			Concentrations	Depletions	Class	Approx. % Clay	Approx. % Fragments	Grade	Size	Type (shape)		
A	0.0-12.0	10YR3/2	uniform	uniform	S	<5	0	0-NONE	-	sg	loose	
E	12.0-20.0	10YR6/4	uniform	uniform	S	<5	0	0-NONE	-	sg	loose	
C1	20.0-40.0	10YR5/6	none	1%10YR5/3	FS	<5	0	0-NONE	-	sg	loose	
C2g	40.0-48.0	10YR5/1	10%10YR4/4	matrix	VFS	<5	0	0-NONE	-	m	firm	
Limiting Conditions		Depth to (in.)		Descriptive Notes			Remarks / Risk Factors:					
Perched Seasonal Water Table		none					Tyler Table: A - C1 horizon (4.0 - 40.0) ILR: S, HLLR: FS					
Apparent Water Table		40.0		Restricted in C2g and below C2g			ILR(>30mg/L) = 0.8 gal/day/ft <sup>2</sup> , ILR(<30mg/L) = 1.6 gal/day/ft <sup>2</sup>					
Highly Permeable Material		>48					HLLR = 5.5 gal/day/ft					
Bedrock		>60		By Tile Probe			4 bedroom min. required absorption area = 600 sq.ft.					
Other Restrictive Layer		40.0		Massive and firm structure			5xW Soil Absorption Box: 34'Wx87'L					

Note : The evaluation shall include a complete site plan or site drawing including all requirements in paragraphs (B)(1) through (B)(4) of OAC 3701-29-08.



Landforms
Upland*
Terrace
Flood Plain
Lake Plain
Beach Ridge
*Includes glacial till plain and end moraine

Position on Landform
Depression
Flat
Knoll
Crest
Hillslope
Footslope

Shape of Slope
Convex
Concave
Linear
Complex

Horizon Nomenclature				
Master Horizons		Horizon Suffixes		Horizon Modifiers
O	Predominantly organic matter (litter & humus)	a	Highly decomposed organic matter	Numerical Prefixes: Used to denote lithologic discontinuities.
A	Mineral, organic matter (humus) accumulation, loss of Fe, Al, clay	b	Buried genetic horizon	
E	Mineral, loss of Si, Fe, Al, clay, organic matter	d	Densic layer (physically root restrictive)	Numerical Suffixes: Used to denote subdivisions within a master horizon.
B	Subsurface accumulation of clay, Fe, Al, Si, humus; sesquioxides; loss of CaCO <sub>3</sub> ; subsurface soil structure	e	Moderately decomposed organic matter	
C	Little or no pedogenic alteration, unconsolidated earthy material, soft bedrock	g	Strong gley	
R		i	Slightly decomposed organic matter	
		p	Plow layer or artificial disturbance	
		r	Weathered or soft bedrock	
		t	Illuvial accumulation of silicate clay	
		w	Weak color or structure within B	
		x	Fragipan characteristics	

Soil Texture			
Texture Class Abbreviations		Textural Class Modifiers	
Course Sand	cos	Gravelly	GR
Sand	s	Fine Gravelly	FGR
Fine Sand	fs	Medium Gravelly	MGR
Very Fine Sand	vfs	Coarse Gravelly	CGR
Loamy Coarse Sand	lcos	Very Gravelly	VGR
Loamy Sand	ls	Extremely Gravelly	XGR
Loamy Fine Sand	lfs	Cobbly	CB
Loamy Very Fine Sand	lvfs	Very Cobbly	VCB
Coarse Sandy Loam	cosl	Extremely Cobbly	XCB
Sandy Loam	sl	Stony	ST
Fine Sandy Loam	fsl	Very Stony	VST
Very Fine Sandy Loam	vfsl	Extremely Stony	XST
Loam	l	Bouldery	BY
Silt Loam	sil	Very Bouldery	VBV
Silt	si	Extremely Bouldery	XBV
Sandy Clay Loam	scl	Channery	CN
Clay Loam	cl	Very Channery	VCN
Silty Clay Loam	sicl	Extremely Channery	XCN
Sandy Clay	sc	Flaggy	FL
Silty Clay	sic	Very Flaggy	VFL
Clay	c	Extremely Flaggy	XFL
*Estimate approximate clay percentage within 5 percent			

Soil Structure					
Grade		Size		Type (Shape)	
Structureless	0	Very Fine	vf	Granular	gr
Weak	1	Fine	f	Angular Blocky	abk
Moderate	2	Medium	m	Subangular Blocky	sbk
Strong	3	Coarse	co	Platy	pl
		Very Coarse	vc	Prismatic	pr
		Extr. Coarse	ec	Columnar	cpr
		Very Thin*	vn	Single Grain	sg
		Thin*	tn	Massive	m
		Thick*	tk	Cloddy	CDY
		Very Thick*	vk		
* The sizes Very Thin, Thin, Thick, and Very Thick, are used when describing platy structure only. Substitute thin for fine, and thick for coarse when describing platy structure.					

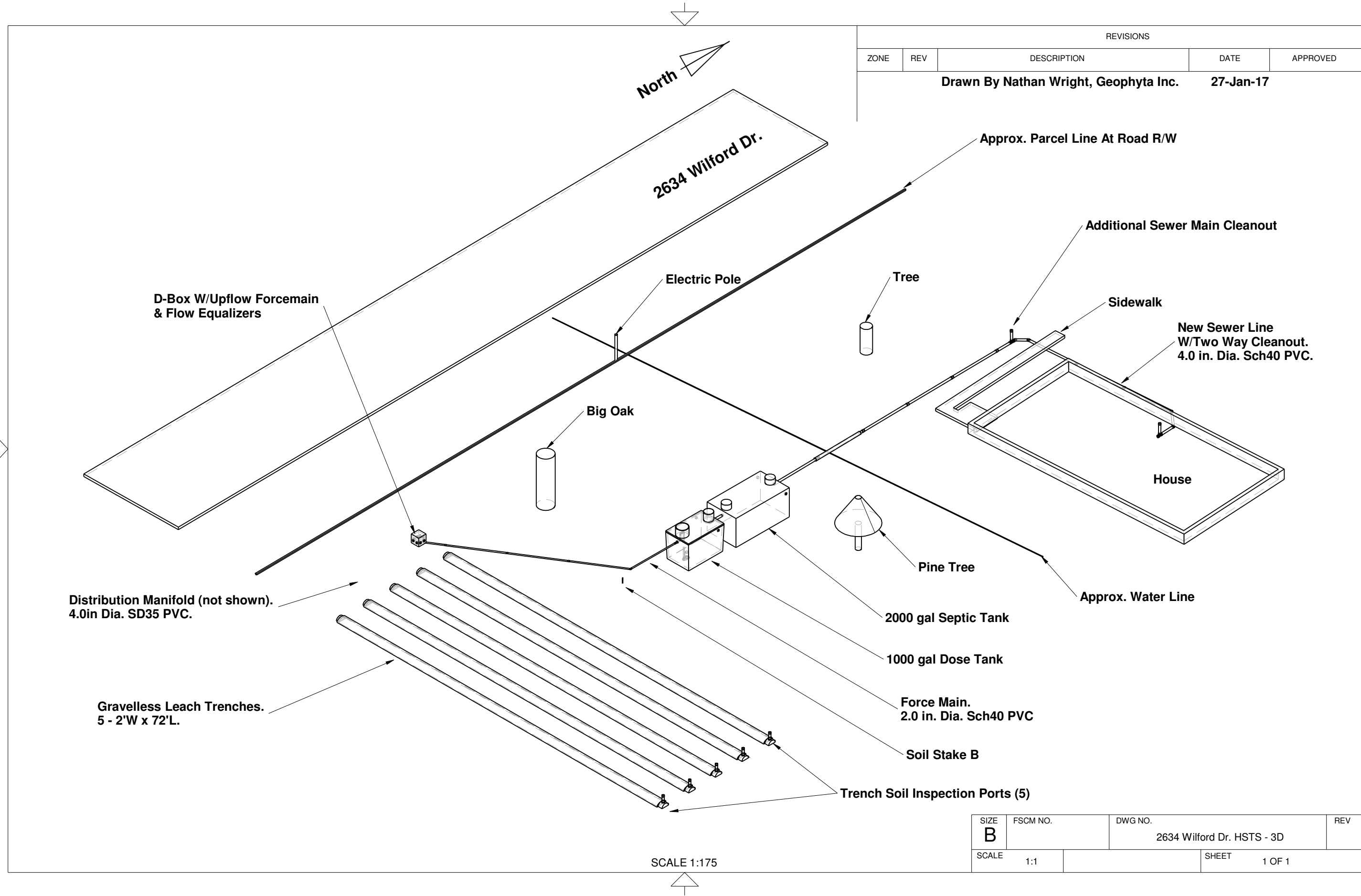
Moist Consistence	
Loose	l
Very Friable	vfr
Friable	fr
Firm	fi
Very Firm	vfi
Extremely Firm	efi

For a more detailed explanation on describing and sampling soils, please refer to the "Field Book for Describing and Sampling Soils" Schoeneberger, P.J., Wysocki, D.A., Benham, E.C., and Broderson, W.D. (editors) 2002. Field book for describing and sampling soils, version 2.0. Natural Resources Conservation Service, USDA, National Soil Survey Center, Lincoln, NE.



<b><u>In-Soil Leachfield Calculations - Gravelless Chambers</u></b>				
<b><u>Owner: 2634 Wilford Dr., Site B</u></b>	<b><u>Min. Required</u></b>	<b><u>Actual</u></b>		
Home Size (bedrooms)	4			
Water Use (120 gal/day/bedroom)	480	576		
Limiting Condition	AWT			
Depth To Limiting Condition (inches)	40.0			
Depth To Bottom of Leach Trench (in.)	36.0			
Infiltration Depth (in.)	4.0			
Most Limiting Soil Texture	S			
<b><u>Tyler Table Values</u></b>				
Infiltration Loading Rate (gal/day/sq. ft)	0.8	0.8		
Hydraulic Linear Loading Rate (gal/day/ft)	5.5	5.5		
Active Trench Bottom Width (ft)(HLLR/ILR)	6.88			
Absorption Line Lengths (ft)(DDF/HLLR)	88			
<b><u>Leachfield Design Requirements</u></b>	<b><u>Minimum</u></b>			
	<b><u>Required</u></b>	<b><u>Actual</u></b>		
Active Absorption Area (DDF/ILR)(sq. ft.)	600			
Active Absorption Area Adjusted (0.75)(sq. ft.)	450	576		
25% Resting Absorption Area (sq.ft.)	113	144		
Total Adjusted Absorption Area (sq.ft.)	563	720		
Individual Trench Bottom Width (ft)	2.0	2.0		
Total Trench Bottom Width (ft)	6.39	10.0		
Total Number of Leach Lines	4	5		
Active Leach Lines	3	4	- To Adjust For Length	
Resting Leach Lines	1	1		
Total Lineal Feet of Trench (ft)	352	360		
Trench Separation Distance (ft)	6	6		
Total Leachfield Width (ft)	20	26		
Total Leachfield Length (ft)	88	72	- 18% Length Reduction	

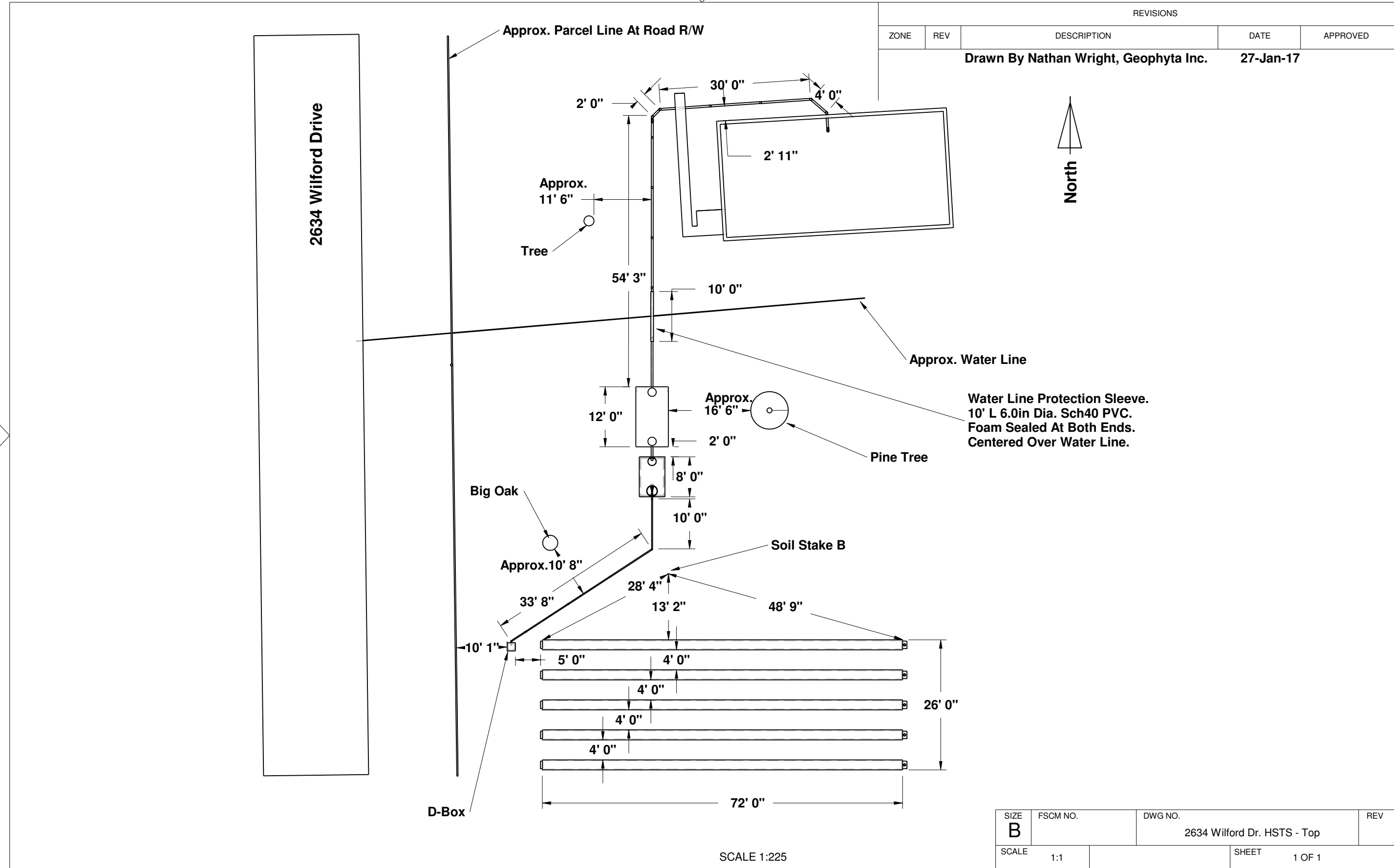




REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
Drawn By Nathan Wright, Geophyta Inc.			27-Jan-17	

SIZE <b>B</b>	FSCM NO.	DWG NO. 2634 Wilford Dr. HSTS - 3D	REV
SCALE 1:1		SHEET 1 OF 1	

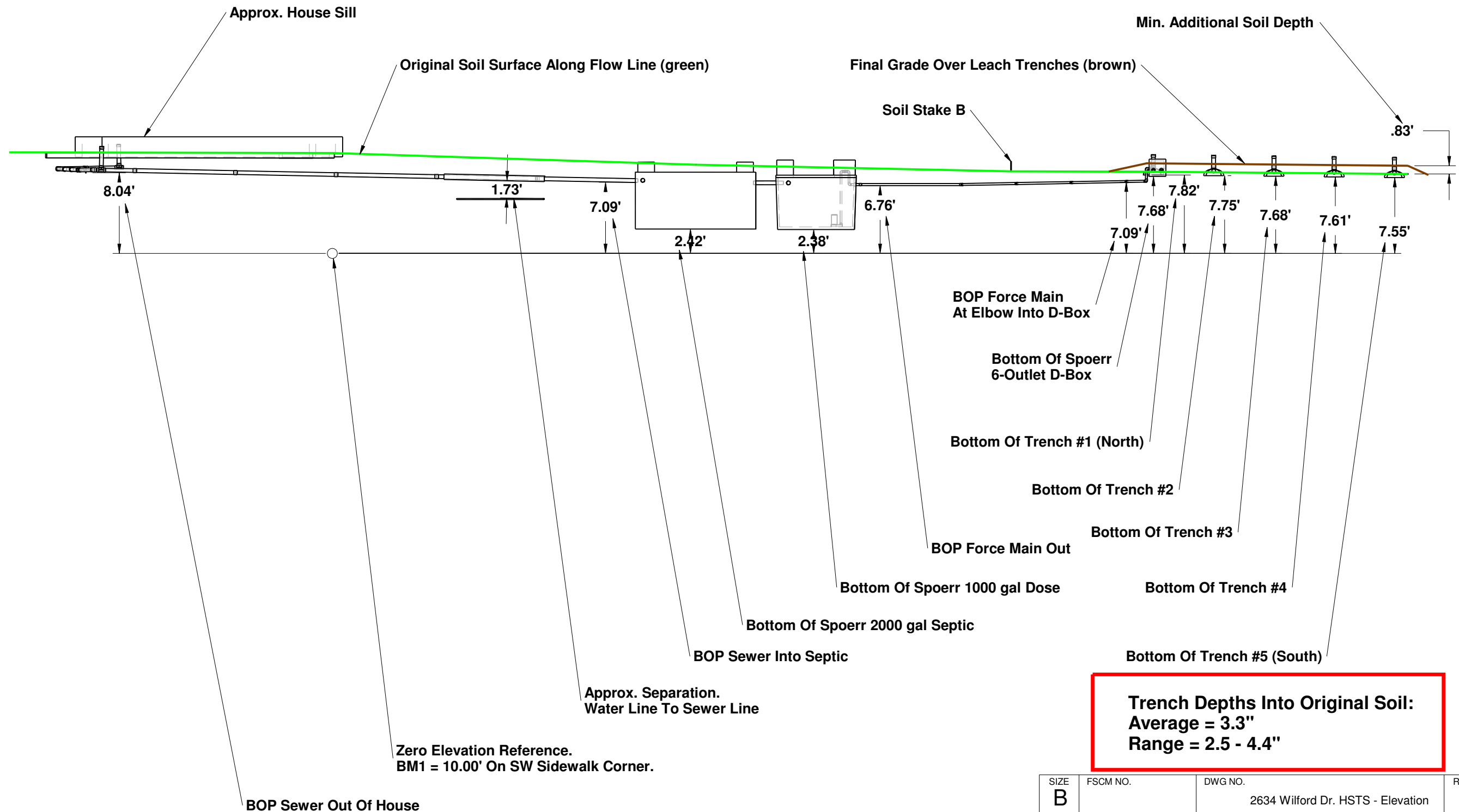






Elevation View  
From East, Looking West  
South

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
Drawn By Nathan Wright, Geophyta Inc.			27-Jan-17	



SCALE 1:125

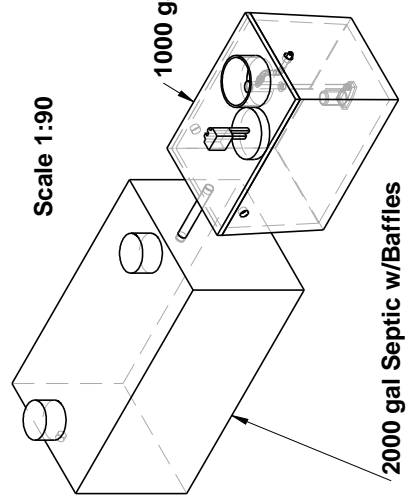
SIZE	FSCM NO.	DWG NO.	REV
B		2634 Wilford Dr. HSTS - Elevation	
SCALE	1:1	SHEET	1 OF 1



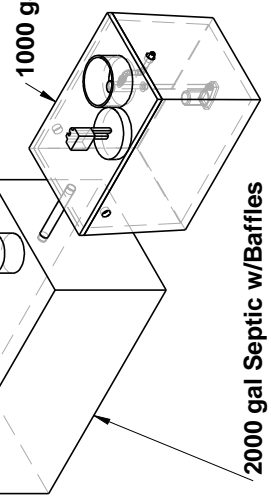
REVISIONS			
ZONE	REV	DESCRIPTION	DATE
			20-Dec-12

Drawn By Nathan Wright, Geophyta Inc.

# See Bill Of Materials For All Component Details



Scale 1:90



2000 gal Septic w/Baffles

Minimum Distance. Actual Will Vary.

Risers As Grade Requires: 6, 12, 18, 24"

31"

26"

Sch 40 PVC Pipe  
Diameters Will Vary  
By Design.

Pump Controller.  
Liquid Level Control  
Will Vary By Design.

Spoerr Concrete Pad  
w/Control Panel Station.

Union Quick  
Disconnect

Effluent Pump.  
No Concrete Block  
Supports Needed.

1/4" Drainback Hole,  
REQUIRED.

Scale 1:30

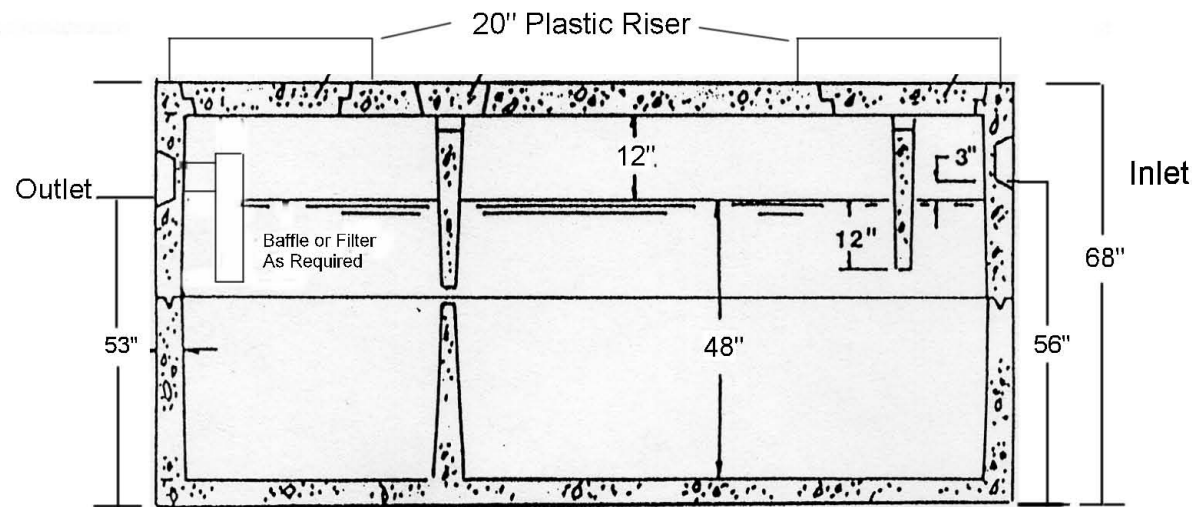
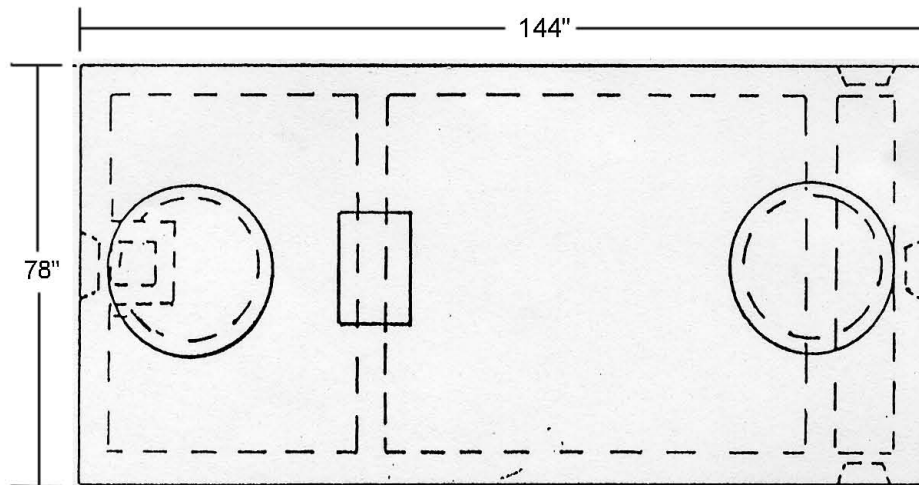
4" Sch40 PVC

PL 122 Filter  
Attached Here.  
Not Shown

See Septic Tank  
Detail Print For  
Internal Structure.

SIZE	FSCM NO.	DWG NO.	REV
A		Spoerr 2000 Septic/1000 Dose w/Pump&Filter	
SCALE	various	SHEET	





(A) SECTION VIEW (SIDE)

# SPECIFICATIONS:

1. PIPE PENETRATIONS - MEET OR EXCEED ATMC C- 1644-06
2. JOINT SEALANT - BUTYL RUBBER BLEND - MEETS OR EXCEEDS ASTM C990
3. CONCRETE - 4500 psi @ 28 DAYS
4. RISERS - CAST INTO LID AT TIME OF PRODUCTION
5. WEIGHT 15,990 lbs



2020 CALDWELL ST.  
SANDUSKY, OH 44870  
PHONE 1-800-252-5205

PROPRIETARY AND CONFIDENTIAL  
THE INFORMATION CONTAINED IN THIS  
DRAWING IS THE SOLE PROPERTY OF  
SPOERR PRECAST CONCRETE INC.  
ANY REPRODUCTION IN PART OR AS  
WHOLE WITHOUT THE WRITTEN  
PERMISSION OF SPOERR PRECAST  
CONCRETE INC. IS PROHIBITED

## NOTES:

Excavation 7' 6" x 13'

## 2000 Gallon Septic Tank

DESIGNER	JHP		
ENGINEER	GKM	SCALE	VARIES
REVISION		DRAWING #	1 OF 1



## PL-122 Filter

The PL-122 was the original Polylok filter. It was the first filter on the market with an automatic shut-off ball installed with every filter. When the filter is removed for regular servicing, the ball will float up and prevent any solids from leaving the tank. Our patented design cannot be duplicated.

### Features:

- Offers 122 linear feet of 1/16" filter slots, which significantly extends time between cleaning.
- Has a flow control ball that shuts off the flow of effluent when the filter is removed for cleaning.
- Has its own gas deflector ball which deflects solids away.
- Installs easily in new tanks, or retrofits in existing systems.
- Comes complete with its own housing. No gluing of tees or pipe, no extra parts to buy.
- Has a modular design, allowing for increased filtration.

### PL-122 Installation:

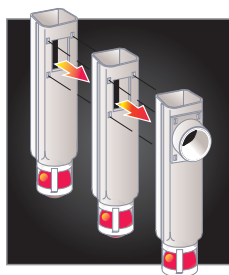
Ideal for residential waste flows up to 1,500 gallons per day (GPD). Easily installs in any new or existing 4" outlet tee.

1. Locate the outlet of the septic tank.
2. Remove the tank cover and pump tank if necessary.
3. Glue the filter housing to the outlet pipe, or use a Polylok Extend & Lok if not enough pipe exists.
4. Insert the PL-122 filter into tee.
5. Replace and secure the septic tank cover.

### PL-122 Maintenance:

The PL-122 Effluent Filter will operate efficiently for several years under normal conditions before requiring cleaning. It is recommended that the filter be cleaned every time the tank is pumped, or at least every three years.

1. Do not use plumbing when filter is removed.
2. Pull PL-122 cartridge out of the tee.
3. Hose off filter over the septic tank. Make sure all solids fall back into septic tank.
4. Insert filter back into tee/housing.



**Polylok offers the only filter on the market where you can get more GPD by simply snapping our filters together!**

1 Filter = 1500 GPD  
2 Filters = 3000 GPD  
3 Filters = 4500 GPD

Patent Numbers  
6,015,488 & 5,871,640

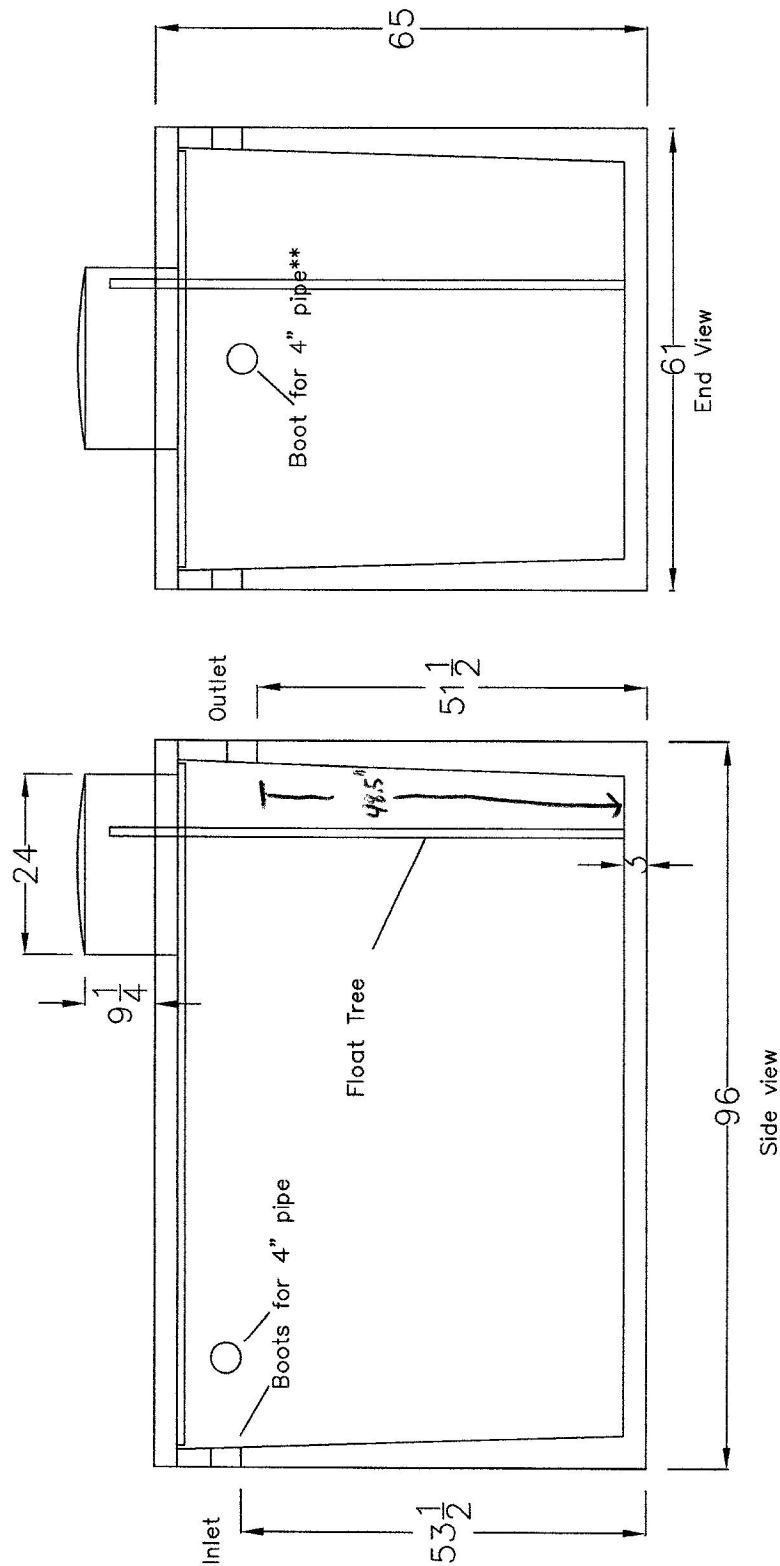


Filter Ready Adapter  
Connects to Septic Tank Wall



**Outdoor SmartFilter® Alarm**  
Polylok, Zabel & Best filters accept the SmartFilter® switch and alarm.





Concrete 4500 PSI @ 28 Days Max cover on top of tank 48" Inlet/Outlet boots for 4" pipe Boots meet ASTM C923 Sedant: Meets ASTM C990 **Optional 4x2 slip reducer available 20.8 Gallon/inch		1000 Gallon Pump Tank Excavation 6' x 9'	
			09/22/09

<b>Spoerr Precast Concrete Inc.</b> 2020 Caldwell St Sandusky, OH 44870 800-252-5205		Concrete 4500 PSI @ 28 Days Max cover on top of tank 48" Inlet/Outlet boots for 4" pipe Boots meet ASTM C923 Sedant: Meets ASTM C990 **Optional 4x2 slip reducer available 20.8 Gallon/inch	
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# SJE VERTICALMASTER® II LC CONTROL Switch

**Mechanically-activated control switch designed to activate low current control panels and alarms.**

This control switch offers reliable control for AC and DC applications in non-potable water, and wastewater. The internal switching mechanism has sealed gold cross-point contacts for reliable low current operation. Common applications include PLC (programmable logic controller) panels, IS panels, with intrinsically safe barriers, low current solar barriers, low current solar applications, and other low current control panel and alarm applications.

The SJE VerticalMaster® II LC (Low Current) switch is not sensitive to turbulence.

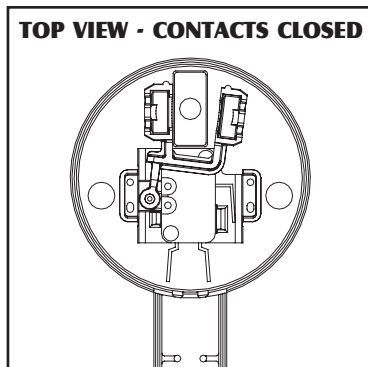
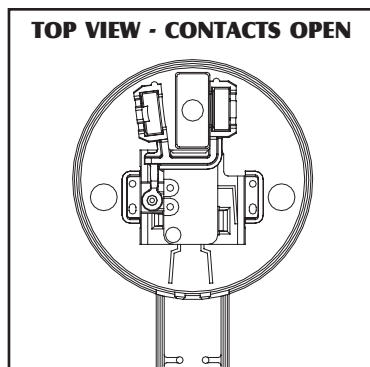
It is available in normally open (high level) operation only.



U.S. Patent No. 6,140,925  
CA Pats. 2,367,577 and 2,694,446  
Euro Pat. 1203360  
German Pat. DE69931196T2  
China Pat. 201110089665.0

## FEATURES

- Adjustable activation range of .75 to 6.5 inches (2 to 17 cm).
- Low current, non-arcing applications down to 0.160 mA at 125 VAC
- Includes standard boxed packaging.
- UL Recognized for use in non-potable water.
- CSA Certified.
- Five-year limited warranty.



## OPTIONS

**This switch is available:**

- in standard cable lengths of 10 and 20 feet (3 and 6 meters)

## SPECIFICATIONS

**CABLE:** flexible 18 gauge, 2 conductor  
(UL, CSA) SJTOW, SJTW

**MOUNTING BRACKET & HOSE CLAMP:**  
stainless steel

**LIFT ROD:** injection molded acetal plastic

**FLOAT STOP:** neoprene

**SWITCH AND FLOAT HOUSING:** high impact,  
corrosion resistant, PVC housing for use in  
non-potable water up to 52°C (125°F)

**Overall dimensions:** 12 inch high x 5 inch  
x 3 inch wide (30.5 cm high x 12.7  
cm x 7.6 cm wide)

**Switch housing dimensions (excluding  
cable entrance):** 2 inch high x 2.8 inch  
diameter (5 cm high x 7.1 cm diameter)

**Float housing dimensions:** 2.5 inch high x  
2.7 inch diameter (6.4 cm high x 6.9 cm  
diameter)

### ELECTRICAL:

#### 125 VAC

**Maximum Electrical Load:**  
0.1 amps

**Minimum Electrical Load:**  
0.160 milliamps

#### 30 VDC

**Maximum Electrical Load:**  
0.1 amps

**Minimum Electrical Load:**  
0.160 milliamps

#### 5 VDC

**Minimum Electrical Load:**  
1 milliamps

# SJE Rhombus®

PO Box 1708, Detroit Lakes, MN 56502  
1-888-DIAL-SJE • 1-218-847-1317  
1-218-847-4617 Fax

email: [customer.service@sjerhombus.com](mailto:customer.service@sjerhombus.com)

**[www.sjerhombus.com](http://www.sjerhombus.com)**

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SEE PRICE BOOK FOR LIST PRICE.**

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# SJE VERTICALMASTER® II LC CONTROL Switch

Mechanically-activated, control switch designed to activate low current control panels and alarms.

## ORDERING INFORMATION

Normally Open		Shipping Weight
Part Number	Description	
1025024	10VMILC BOX	1.65 lbs.
1039781	20VMILC BOX	2.36 lbs

SEE PRICE BOOK FOR LIST PRICE.

## OPTIONS

**MOUNTING BRACKET AND HOSE CLAMP ARE STANDARD**

**BOXED PACKAGING IS STANDARD**  
Bulk packaging is not available.

## SPECIFICATIONS

**ACTIVATION RANGE:** .75 to 6.5 inches (2 cm to 17 cm)

**CABLE:** flexible 18 gauge, 2 conductor SJTOW, SJTW (UL, CSA)

**MOUNTING BRACKET AND HOSE CLAMP:** stainless steel

**LIFT ROD:** injection molded acetal plastic

**FLOAT STOP:** neoprene

**SWITCH AND FLOAT HOUSING:** high impact, corrosion resistant, PVC housing for use non-potable water up to 52°C (125°F)

**Overall dimensions:** 12 inch high x 5 inch x 3 inch wide (30.5 cm high x 12.7 cm x 7.6 cm wide)

**Switch housing dimensions (excluding cable entrance):** 2 inch high x 2.8 inch diameter (5 cm high x 7.1 cm diameter)

**Float housing dimensions:** 2.5 inch high x 2.7 inch diameter (6.4 cm high x 6.9 cm diameter)

UL Recognized for  
Water & Sewage



## OTHER INFORMATION

### NORMALLY OPEN (HIGH LEVEL) OPERATION

The control switch closes (turns on) when the float rises signaling a high level, and opens (turns off) when the float drops.

### ELECTRICAL:

#### 125 VAC

**Maximum Electrical Load:**

0.1 amps

**Minimum Electrical Load:**

0.160 milliamps

#### 30 VDC

**Maximum Electrical Load:**

0.1 amps

**Minimum Electrical Load:**

0.160 milliamps

#### 5 VDC

**Minimum Electrical Load:**

1 milliamps

**SJE  
Rhombus**

[www.sjerhombus.com](http://www.sjerhombus.com)

[customer.service@sjerhombus.com](mailto:customer.service@sjerhombus.com)

**Call or fax your order!**

**1-888-DIAL-SJE (1-888-342-5753) ■ Fax 218-847-4617**

Product offering and pricing are subject to change without notice.  
Please visit [www.sjerhombus.com](http://www.sjerhombus.com) for the most current information.

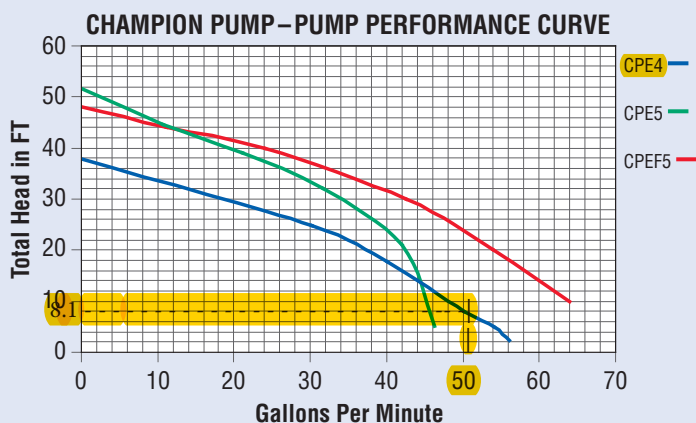


## FEATURES / BENEFITS

- High Efficient Motor With Upper & Lower Ball Bearings / Runs Cooler & Last Longer
- Cast Iron Vortex Impeller / Helps Prevent Clogging
- Inboard Seal-Rotating Components Of Seal Are In The Motor Housing, Lubricated By The Motor Oil / Seal Will Last Longer If Pump Runs Dry, Hair And Debris Cannot Wrap Around Seal Components
- Secondary Exclusion Seal / Keeps Debris From Entering Seal Cavity
- Sealed Entry-Replaceable Power Cord / Easy To Replace In The Field, Prevents Water From Entering The Motor Housing Through A Cut Power Cord (Up To 50' Available)
- Piggy-Back Switch Design / Defective Switches Can Be Diagnosed By Phone; Pump Can Be Operated Manually by Overriding The Switch
- Every Pump Is Tested In Water / Ensures That The Pump Meets Head & Flow Requirements

## APPLICATIONS

- Dewatering, Elevator Pits, Septic Systems



Distributed by:



**CPE5V-12**

**CPE5A-12**





<b>DISCHARGE</b>	2" NPT. Vertical
<b>SOLIDS HANDLING</b>	3/4"
<b>LIQUID TEMPERATURE</b>	140 Degrees F. (Intermittent)
<b>MOTOR HOUSING</b>	Cast Iron
<b>VOLUTE</b>	Cast Iron
<b>SEAL PLATE</b>	Cast Iron
<b>IMPELLER</b>	Cast Iron
<b>SHAFT</b>	Stainless Steel
<b>SHAFT SEAL</b>	Inboard Mechanical With Secondary Exclusion Seal Carbon - Rotating Face Ceramic - Stationary Face Buna-N - Elastomer 300 Series Stainless Steel - Hardware
<b>BEARING (UPPER &amp; LOWER)</b>	Single Row, Ball, Oil Lubricated
<b>HARDWARE</b>	300 Series Stainless Steel
<b>SQUARE RINGS</b>	Buna-N
<b>CORD</b>	(UL / CUL) Listed 16 AWG, Type SJTW 20' Length Standard. Other Lengths Available.
<b>CORD ENTRY</b>	Compression Grommet – Outer Jacket Seal Quick Disconnect Pin Terminals
<b>MOTOR (SINGLE PHASE)</b>	4/10 & 1/2 HP, 3450 RPM. 60Hz NEMA L Includes Overload Protection In The Motor. Oil Filled, Class B Permanent Split Capacitor
<b>WEIGHT</b>	35lbs (Manual)

Model	HP	Volts	Phase	Amps	Cord Length	Switch
CPE4-12 • CPE5-12 • CPEF5-12	4/10 • 1/2 • 1/2	115	1	6.6 • 7.2 • 8.5	20	Manual
CPE4-22 • CPE5-22 • CPEF5-22	4/10 • 1/2 • 1/2	230	1	3.3 • 3.6 • 4.3	20	Manual
CPE4-13 • CPE5-13 • CPEF5-13	4/10 • 1/2 • 1/2	115	1	6.6 • 7.2 • 8.5	30	Manual
CPE4-15 • CPE5-15 • CPEF5-15	4/10 • 1/2 • 1/2	115	1	6.6 • 7.2 • 8.5	50	Manual
CPE4A-12 • CPE5A-12 • CPEF5A-12	4/10 • 1/2 • 1/2	115	1	6.6 • 7.2 • 8.5	20	Float
CPE4A-22 • CPE5A-22 • CPEF5A-22	4/10 • 1/2 • 1/2	230	1	3.3 • 3.6 • 4.3	20	Float
CPE4A-13 • CPE5A-13 • CPEF5A-13	4/10 • 1/2 • 1/2	115	1	6.6 • 7.2 • 8.5	30	Float
CPE4V-12 • CPE5V-12 • CPEF5V-12	4/10 • 1/2 • 1/2	115	1	6.6 • 7.2 • 8.5	20	Vertical Float
CPE4V-22 • CPE5V-22 • CPEF5V-22	4/10 • 1/2 • 1/2	230	1	3.3 • 3.6 • 4.3	20	Vertical Float



<b><u>Demand Dosing Calculations To Leachfield</u></b>			
<b>Owner: 2634 Wilford Dr.</b>	<b><u>Design</u></b>		
	<u>Target</u>		
<b><u>Main Design:</u></b>			
Flow Rate Total (gpm)	50.0		
Diameter (in)	2.00	<b>Sch40 PVC</b>	
Length (ft)	44		
Gal. per Foot of Pipe (Clemons, 1991)	0.174		
Total Main Volume (gal)	7.66		
# Std 90deg Elbows	4		
Std 90deg Elbow Pipe Length Equivalent (ft)	9.0		
# Std 45deg Elbows	2		
Std 45deg Elbow Pipe Length Equivalent (ft)	4.0		
# Std Tees	0		
Std Tee Pipe Length Equivalent (ft)	11.0		
# Quick Disconnects	1		
Quick Disconnect Pipe Length Equivalent (ft)	2.0		
# Full Flow Ball Valves	0		
Ball Valves Pipe Length Equivalent (ft)	0.9		
Total Length Equivalent (pipe&fittings) (ft)	90.0		
Head Loss per 100 ft.(ft.)(Otis et al, 1978)(Zoeller)	4.78		
Total Main Head Loss (ft)	4.30		
<b><u>Dose Volume:</u></b>			
Drainback Volume: Main (gal)	7.7		
Dose Volume (gal)	55.0		
TOTAL dose (gal)	62.7		
Daily Design Flow (DFR)(120gal/day/bedroom)	480.0		
Is Dose <1/4 of Daily Design Flow?	yes		
Is Dose <1/8 of Daily Design Flow?	yes		
<b><u>Total Dynamic Head:</u></b>			
Static Lift - Main Ht. Above Surface (ft)	0.00		
Static Lift - Depth to Pump Off Below Surface (ft)	4.6		
Static Lift - Topo Difference (ft.)	-0.8		
Total Pipe & Fittings Headloss (ft)	4.3		
Network Loss (5ft head x 1.3) (ft)(includes laterals)	0.0		
Total Head Loss (ft)	8.1		
<b><u>Dose Tank Parameters</u></b>			
Volume (gal)	1000	48.5	inches effluent
Gallons Per Inch in Tank	20.62		
<b><u>Demand Dose Settings:</u></b>			
Total Gallons Per Pump Cycle W/drainback	62.7	3.04	inches drawdown
Total Pump Cycles Per 24 Hrs.	8.7		
Total Pump On Time - seconds	75		
Total Pump Off Time - hours	2.7		
Redundant Off Effluent Ht. from bottom (in)	10.0	( to prevent tank flotation)	
Timer Enable (low level cutout) Ht. From tank bottom (in)	13.0		
High Level Alarm Ht. from bottom (in.)	25.2	(provides 1 day reserve after alarm)	



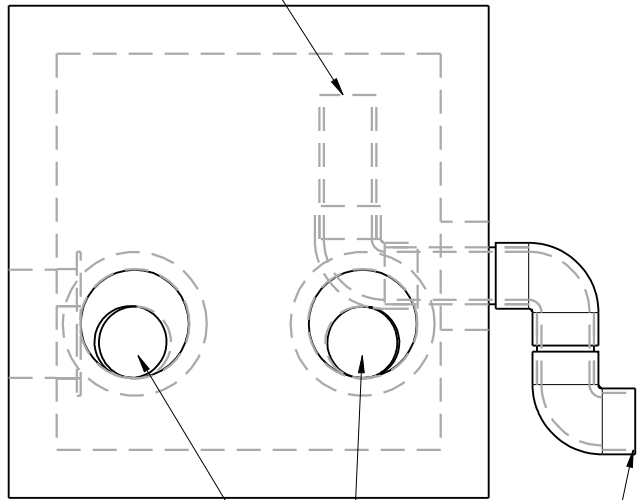


REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

**Drawn By Nathan Wright, Geophyta Inc. 24-May-16**

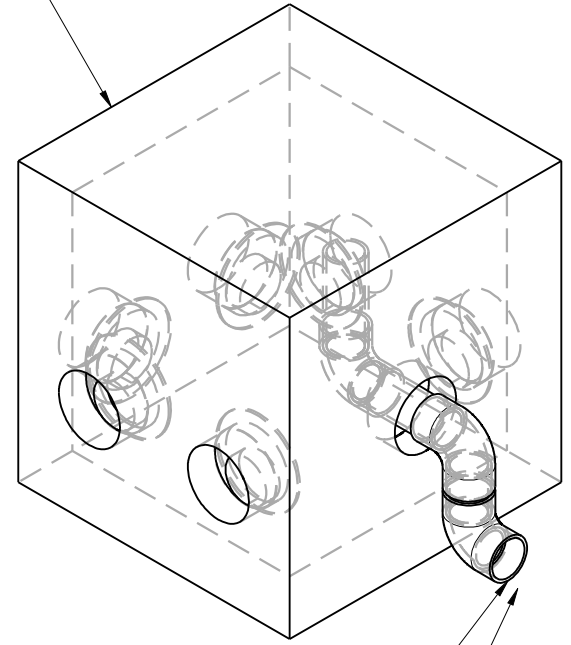
**Add Risers As Needed To Bring Lid Above Final Grade**

**Upflow Section Of Force Main**



**Roto-Flow or Equalizer Pipe Inserts  
For Each Outlet For Balanced Flow**

**Individual Designs May Not Require  
Double 90 Ell.**



**Force Main Diameter Will Vary By Design**

**Force Main Must Have  
Drainback For Freeze Protection**

SIZE <b>A</b>	FSCM NO.	DWG NO. 6 Outlet D-Box W/Upflow Forcemain	REV
SCALE 1:1		SHEET 1 OF 1	





## Roto-Flow



Roto-Flow enables equal distribution to your leaching fields. Available in 3" and 4" sizes.

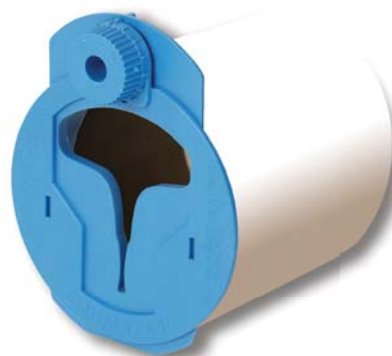
The Roto-Flow is the low cost solution to your D-Box flow regulating problems. The simple Roto-Flow for D-Box outlet pipes gives you the easiest **"set & forget"** flow regulator available.

The Roto-Flow fits Schedule 40, SDR 35 and thin wall pipe sizes. Both 3 inch and 4 inch sizes are available. Simply place the Roto-Flow into the D-Box outlet pipe then adjust to equalize flow.

The Roto-Flow is made from HDPE; it is designed to stand up in the septic environment without failing. Our Roto-Flow design ensures a good fit in all pipe sizes.

The Roto-Flow is made to fit pipes without collapsing or creating a loose fit. This will guarantee equal flow performance.

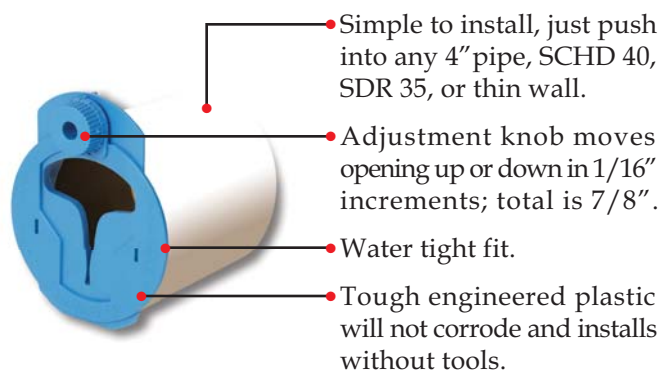
## Equalizer



The Equalizer's patented weir opening maintains equal flow, even in unlevel D-Boxes that continue to move their entire lives.

### Equalizer Features:

- Maintains equal flow from distribution box.
- Automatically compensates for box movement.
- Engineered plastic is non-corrosive.
- Extends septic system life.
- Inserts without tools.
- Resets equal flow when D-Box has moved.



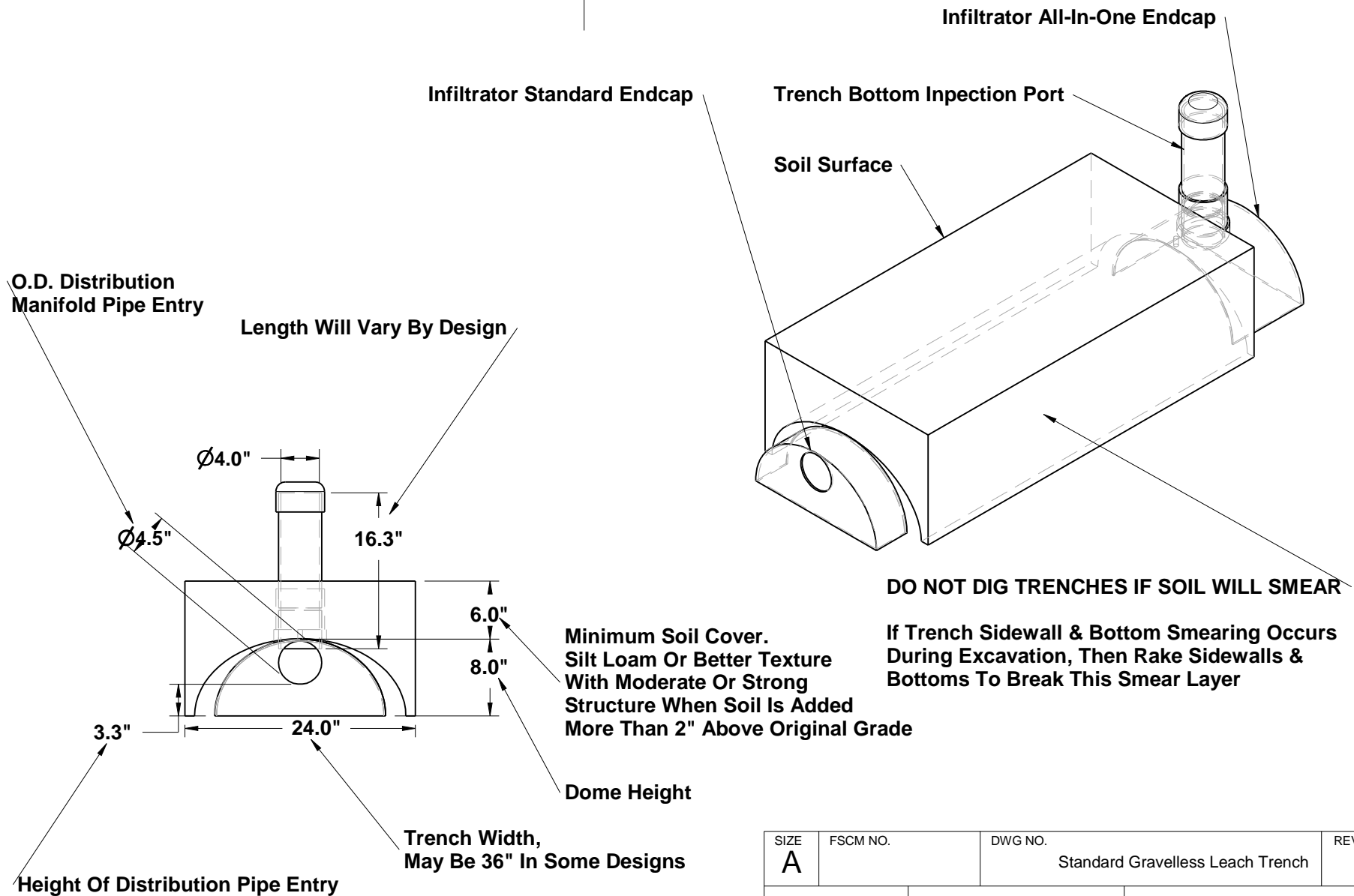
PATENTS: U.S.A. - 5,680,989 - 5,154,353 - 5,107,892



Custom Distribution Boxes with Equalizers installed

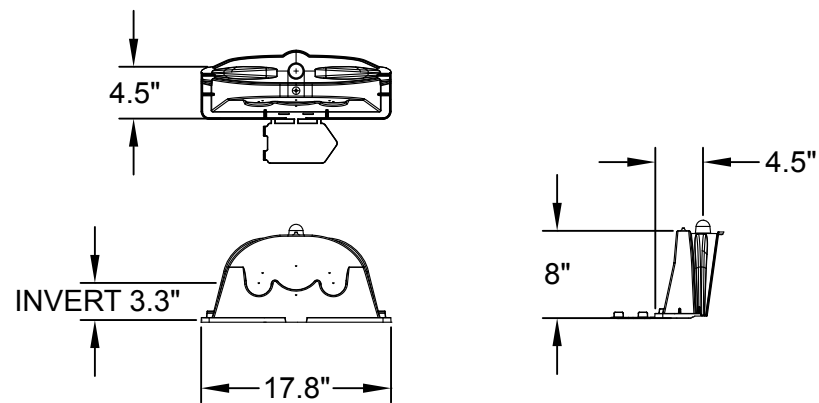


REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
Drawn By Nathan Wright, Geophyta Inc.			4-Apr-15	



SIZE <b>A</b>	FSCM NO.	DWG NO. Standard Gravelless Leach Trench	REV
SCALE <b>1:15</b>	SHEET		



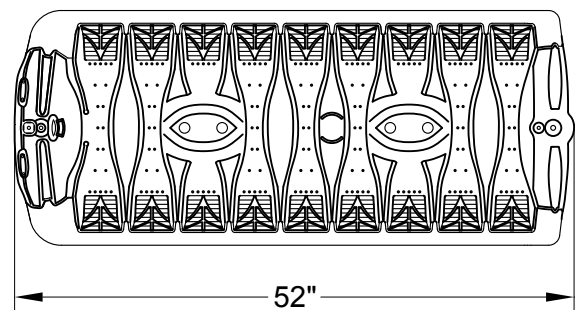


INFILTRATOR SYSTEMS, INC. 6 BUISNESS PARK ROAD P.O. BOX 768 OLD SAYBROOK, CT 06475 PH. (800) 221-4436 FX. (860) 577-7001 WWW.INFILTRATORSYSTEMS.COM		INFILTRATOR SYSTEMS QUICK4 PLUS ENDCAP	
Scale	NOT TO SCALE	Checked	DFH
Date	12/18/2009	ACAD No.	
Drawn By:	RWD	Sheet	1 1
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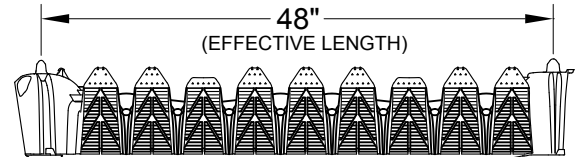


**QUICK4 PLUS EQUALIZER 36 LOW PROFILE (LP) CHAMBERS**

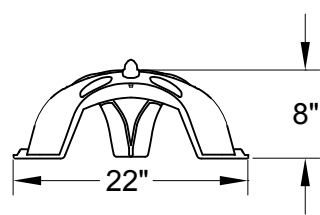
**TOP VIEW**



**FRONT VIEW**



**SIDE VIEW**



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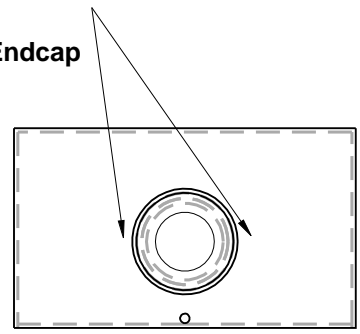


REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
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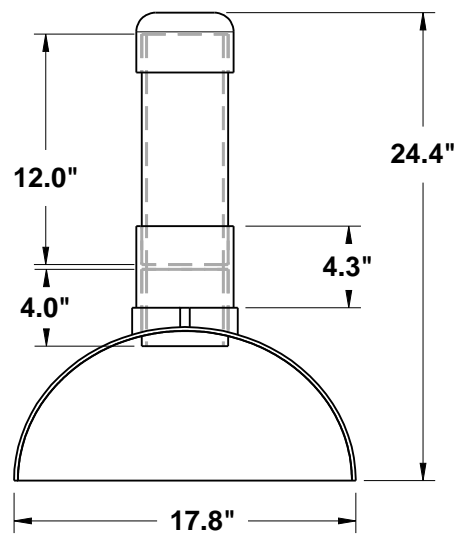
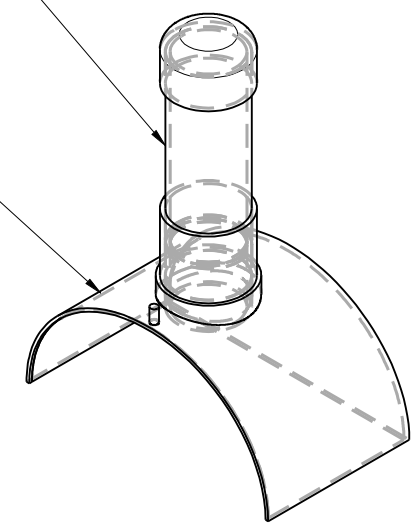
Drawn By Nathan Wright, Geophyta Inc. 9-Oct-13

A Minimum Of Two  
Stainless Steel Wood  
Screws Required To  
Attach PVC Pipe To Endcap



4" Sch40 PVC Pipe, Coupler, & Cap

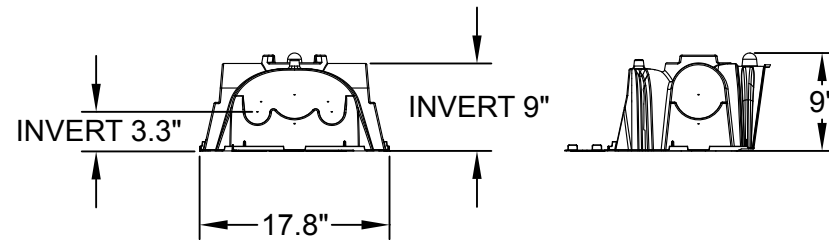
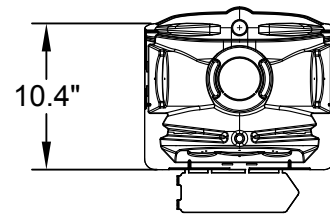
Infiltrator All-In-One Endcap.  
See B.O.M. For Actual Part Number



SIZE <b>A</b>	FSCM NO.	DWG NO. Trench End Soil Inspection Port	REV
SCALE <b>1:10</b>		SHEET	







INFILTRATOR SYSTEMS, INC. 6 BUISNESS PARK ROAD P.O. BOX 768 OLD SAYBROOK, CT 06475 PH. (800) 221-4436 FX. (860) 577-7001 WWW.INFILTRATORSYSTEMS.COM		INFILTRATOR SYSTEMS QUICK4 PLUS ALL-IN-ONE ENDCAP	
Scale	NOT TO SCALE	Checked	DFH
Date	12/18/2009	ACAD No.	
Drawn By:	RWD	Sheet	1 1
		Of	



Bill Of Materials - 2634 Wilford Dr. HSTS Shallow Leach Trenches			
Quantity	Part Name	Section	Comment
8	SCH40PVC4inchpipe10ft	Sewer Main	
1	SCH40PVC4inchpipe36in	Sewer Main	
2	SCH40PVC4inchpipe4ft	Sewer Main	
7	Sch40PVC4.0inchCoupler	Sewer Main	
2	Sch40PVC4.0inchTwoWayCleanoutTeeSxSxS	Sewer Main	
4	Sch40PVC4.0inch45Ell	Sewer Main	
3	SCH40PVC4inchpipe2ft	Sewer Main	
2	Sch40PVC4inchCap	Sewer Main	
1	SCH40PVC6inchpipe10ft	Water Line Protection Sleeve	
1	ClosedCellSprayFoam	Water Line Protection Sleeve	
1	Spoerr2000galSeptic12inchRisers	Septic Tank	Spoerr 2000 gal Septic
1	PolyLokPL122Filter	Septic Tank	PolyLok or equiv.
1	SCH40PVC4inchpipe3ft	Septic To Dose	
1	Spoerr1000DoseTankW18inRiser	Dose Tank	Spoerr 1000 gal Dose
1	Effluent Pump 2inchNPT0.4hp	Dose Pump Assembly	
1	SJERhombus Control SwitchForDemandDose	Dose Pump Assembly	
1	HighLevelAlarmFloat	Dose Pump Assembly	
~100 ft.	2 conductor w/ground, 14 gauge UG wire	Dose Pump Assembly	Pump Circuit; Standalone Breaker
~100 ft.	2 conductor w/ground, 14 gauge UG wire	Dose Pump Assembly	Alarm Circuit, Added To House Lighting Breaker
~100 ft.	Plastic conduit, to contain 6-14ga	Dose Pump Assembly	Pump & Alarm Circuit
3	Sch40PVC2.0inch90Ell	Dose Pump Assembly	
1	SCH40PVC2.0inchpipe12inW0.25weephole	Dose Pump Assembly	Must Have Drainback
1	SCH40PVC2.0inchpipe12in	Dose Pump Assembly	
1	SCH40PVC2.0inchAdapterMNPTtoSoc	Dose Pump Assembly	
1	SCH40PVC2.0inchpipe12.586in	Dose Pump Assembly	
2	SCH40PVC2.0inchpipe3in	Dose Pump Assembly	
1	SCH40PVC2.0inchpipe60.8in	Dose Pump Assembly	
2	SCH40PVC2.0inchpipe6in	Dose Pump Assembly	
1	Sch40PVC2.0inchUnionSxS	Dose Pump Assembly	
1	SCH40PVC2.0inchpipe3.5ft	Dose Pump Assembly	
3	Sch40PVC2.0inch90Ell	Force Main	
4	SCH40PVC2.0inchpipe10ft	Force Main	
4	Sch40PVC2.0inchCoupler	Force Main	
1	Sch40PVC2.0inch45Ell	Force Main	
1	DistributionBox6outlet	Distribution Manifold	Spoerr 6-Outlet
~	Misc. 4.0in Dia. SD35 PVC Pipe	Distribution Manifold	
~	Misc. 4.0in Dia. SD35 PVC Pipe Fittings	Distribution Manifold	
5	PolyLokRotoFlowInsert4.0inch	Distribution Manifold	PolyLok or equiv.
5	InfiltratorQ4PlusEQ36LPEndCap	Leach Trenches	
5	DomeStraightTrench2ftWx4ftLx8inH18SectQ4PlusEQ36LP72ftTotal	Leach Trenches	90 - Chambers
-	Topsoil	Leach Trenches	69.3 cu.yd. ~= 121 tons Fine Sandy Loam
5	Sch40PVC4inchCap	Trench Soil Inspection Port	
5	Sch40PVC4.0inchCoupler	Trench Soil Inspection Port	
5	SCH40PVC4inchpipe1ft	Trench Soil Inspection Port	
5	SCH40PVC4inchpipe4.0in	Trench Soil Inspection Port	
10	StainlessSteelWoodScrew	Trench Soil Inspection Port	
5	InfiltratorQ4PlusAllInOneEndCap	Trench Soil Inspection Port	
1	Grass Seed	2lbs./1,000 sq.ft.K.Bluegrass	~2000 sq. ft.; 4.0 lbs.
1	Straw Mulch For Grass Establishment	Homeowner's Choice	~2000 sq. ft.
1	Grass Establishment Fertilizer	10 lbs. 20-10-10/1,000 sq. ft.	~2000 sq. ft.; 20 lbs.
1	Call OUPS before you dig.		
Installer substitution of materials not specfied in this Bill Of Materials may void Health Dept. approval of this design and will result in a re-design fee and is the sole responsibility of the installer.			
Design Prints Take Precedence Over This Bill of Materials. This is a best estimate of materials required and is provided as a convenience to installers. This BOM is not required for design approval.			



# **Operation and Maintenance Procedures**

## **Home Septic Treatment Systems With Effluent Distribution Through In-Soil Leach Trenches**

Home septic treatment systems are biologically based systems. They rely on both anaerobic and aerobic microorganisms to process human waste. These systems may utilize processing, storage, and pumping tanks. A soil absorption component, the leachfield, also processes, treats, and disperses septic effluent. Any abuse of this biological treatment system will result in less efficient sewage treatment and early failure of your new system.

**Improper operation and/or maintenance of your home septic treatment system will result in its failure.**

**Geophyta, Inc. strongly recommends that a homeowner hire a professional service provider to inspect and maintain your system. Your county health department has a list of registered service providers. Make sure that your service provider has septic tank and leachfield maintenance experience.**

### **1) Homeowner Responsibility:**

- a) The system owner is responsible for the continuous operation and maintenance of this home septic treatment system
- b) Your county health department may require third-party inspection and maintenance of your home septic treatment system.
- c) Home Interior Design & Appliance Selection:
  - i) Install water conserving fixtures such as low flow shower heads, low flow toilets, and front loading washers.
  - ii) Space out water use throughout the day and week. Avoid doing all laundry in one day.
  - iii) Repair all water leaking fixtures.
  - iv) Eliminate garbage disposals, or limit their use. Collect food scraps with sink strainers for disposal as trash or for composting; this includes coffee grounds.
  - v) DO NOT pipe sump pump output into your sewer line.
- d) Home Landscaping Limitations:
  - i) Do not pipe roof downspouts or any other rainwater drainage into the septic or dose tanks.
  - ii) Divert all downspouts or other rainwater drainage away from your entire septic system.
  - iii) Divert all downspouts or other rainwater drainage away from the leachfield area.
  - iv) Do not drive or park cars, boats, heavy equipment, or other vehicles on or near septic system tanks and leachfield areas.



- v) Do not add additional soil fill on or near the leachfield. This will limit air movement into the soil needed for effluent treatment and may cause system failure.
- vi) Limit lawnmower traffic on the leachfield when soil is excessively wet.
- vii) Do not plant any deep rooted plants on top of or near your leachfield soil absorption area.
- e) Home Resident Responsibilities:
  - i) Only flush or drain bio-degradable human waste, toilet paper, laundry and dish and personal care soaps, and water into your home septic treatment system.
  - ii) Severely limit disposal of food fats, oils, and greases. These will clog your system.
  - iii) Do not flush or drain undiluted bleach, cleansers, or drain cleaners.
  - iv) Do not flush any non-biodegradable items. For example, plastic items.
  - v) Do not flush or drain motor oils, greases, anti-freezes, cleaners, etc.
  - vi) Do not flush cat litter.
  - vii) Do not flush paper towels, facial tissue, cigarette butts, disposable diapers, sanitary napkins, tampons, or condoms.
  - viii) Do not flush prescription or over-the-counter drugs. Antibiotics and cancer treatment drugs are very harmful to your home septic treatment system.
  - ix) Do not dump solvents like dry cleaning fluid, pesticides, photographic chemicals, paint thinner down the drain.
  - x) Don't use septic tank additives, unless health department approved.
  - xi) Don't drain a hot tub or large amounts of water into your septic system.
- f) Home Improvement/Expansion:
  - i) Contact your county sanitarian before adding new driveways, decks, patios, pools, and outbuildings not identified on your original layout plan to make sure all setback distances from your septic system tanks and mound are met.
  - ii) Contact your county sanitarian before adding bedrooms and/or increasing your home occupancy. This may overload your septic system. Septic system expansion may be required to prevent failure.
- g) Homeowner Cautions:
  - i) **DO NOT ENTER TANKS WITHOUT PROPER SAFETY EQUIPMENT.** Septic and dose tanks contain noxious and deadly gases.
  - ii) Pump or dose tanks and control boxes contain electrical components. **ELECTRICAL SHOCK HAZARD CAN EXIST WITH IMPROPERLY WIRED OR FAILING COMPONENTS.**
  - iii) Always keep tank fall guards in place, except for the time needed to replace components when safety equipment is present.
  - iv) Always replace and secure septic and dose tank lids after completing any inspection.
  - v) Any disconnection or removal of filters, screens, floats, alarms, and/or control panels will result in system failure.
  - vi) Contact your county sanitarian for allowed homeowner maintenance and repair of your septic system.



## 2) Inspection & Maintenance Requirements:

- a) Perform inspection & maintenance **every six months**.
- b) Review Baseline Operation and Maintenance Data:
  - i) The installer of your system set and recorded all float/liquid level heights, pump down times, cycles per day, and distal head pressures required in the design specifications.
  - ii) Review all previous six month inspection data.
- c) Identify any house additions, patios, pools, ponds, driveways, outbuildings, etc. added since the last inspection that may impact the home septic treatment system. Draw a sketch of these differences.
- d) Inspect the house sewer main two-way cleanout tee bottom:
  - i) Check for clogging.
  - ii) Check for continuous clear water flows from the home.
- e) Evaluate Septic Tank & Pump Tank:
  - i) Measure sludge and scum depths; pump tank when cumulative thickness is 1/3 of the tank depth.
  - ii) Look for signs of clogging and tank damage.
  - iii) Look for signs of tank and riser leakage.
  - iv) Clean & inspect septic tank outlet filter.
  - v) Make sure lids are securely attached to risers.
- f) Evaluate Pump/Dose Tank & Pumping Equipment:
  - i) Measure sludge and scum depths; pump tank when septic tank is pumped.
  - ii) Look for signs of clogging and tank damage.
  - iii) Look for signs of tank and riser leakage.
  - iv) Inspect and assure proper functioning of floats or other liquid level controls.
  - v) Clean and inspect dose pump outlet filter. May not be present in some designs.
  - vi) Inspect and assure proper condition and functioning of the effluent pump.
  - vii) Make sure lids are securely attached to risers.
- g) Evaluate Drain Fields:
  - i) Inspect all leachfield soil inspection tubes for surface condition, surface color, and depth of ponded effluent, if present.
  - ii) Look for surfacing effluent.
  - iii) Look for excessively moist soil around leachfield area.
  - iv) Identify appropriate vegetative cover.
  - v) Look for surface disturbances, compaction, abnormal settling, and erosion.
  - vi) Identify any deep rooted vegetation recently planted near the leachfield area.
- h) Switch leachfield resting trench in D-box:
  - i) Determine a rotation sequence for closing off flow to the resting trench/trenches.
  - ii) Open the previously rested leach trench.
  - iii) Close the next trench in sequence for resting.
- i) Measure Pump Run Time and/or Drawdown:
  - i) For demand dosed systems, verify original design effluent drawdown depth.



- ii) For time dosed systems, verify original design pump run time.
- iii) For systems with a cycle counter or run time meter, record the current values.
- j) Test Alarms:
  - i) Evaluate proper function of low liquid level alarm.
  - ii) Evaluate proper function of high liquid level alarm and warning light.

### **3) Findings & Repairs:**

- a) All findings during inspection and maintenance must be recorded.
- b) Any system adjustments must be recorded.
- c) Any system deficiencies, worn out components, and/or damage must be repaired to return your septic system to a properly functioning state.
- d) All repairs must be recorded.