



# GEOPHYTA

## Home Septic System Site Evaluation And Replacement System Design

For:

Rhonda Morrow & Matt Erman (WPCLF 2021B)

10835 W. T.R. 41  
Fostoria, OH 44883

Property Location:

10835 W. T.R. 41  
Fostoria, OH 44883

Jackson Township, Seneca County

**SYSTEM TYPE:**

Engineered Sand Mound

Nathan Wright (Soil Scientist)  
Seth V. Layne (Designer)

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

419-547-8538

August 19, 2021

**APPROVED**

By Matt Beckman at 3:38 pm, Sep 13, 2021

### **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:	Rhonda Morrow Matt Erman
Address:	10835 W. Twp. Rd 41
City, State:	Fostoria, Ohio
Home Phone:	N/A
Cell Phone:	419-701-9318
Email:	Fitterpaw@aol.com

**Property:**

Parcel #:	
Current Owner:	Same as above
Address:	
City, State, Zip:	
Lot Size:	
Right of Ways?	
Easements?	

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

House Size: Rooms	3 bedrooms	electric:	overhead or buried
House Dim.w/Garage:	ft.xft.	phone:	overhead; buried; n/a
Garage Size:	1 cars, ft.xft.	gas :	natural propane n/a
Water Source:	well; public; cistern	garden/hot tub:	yes no
Water Softener:	no yes		
Outbuildings:	no yes, size:	geothermal heat/cooling system	no, yes: (horizontal or vertical)
Pond:	no yes, size:		
System Type:	new or replacement	Sump pump:	no yes
Replacement Reason:	failed; addition; n/a	Discharge where?	

**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.

*Rhonda Morrow*

Customer Signature

8-03-21

Date



# Site and Soil Evaluation for Sewage Treatment and Dispersal

County: Seneca      Land Use / Vegetation: Residential Turf      Control #: 21 - SEN - 46A - 255  
 Township / Sec.: Jackson      Landform: Glacial Till Plain  
 Property Address: 10835 TR 41      Position on Landform: Flat  
 OR Location: Fostoria, OH 44883      Percent Slope: 0-1  
 Applicant Name: Rhonda Morrow      Shape of Slope: Linear - Linear  
 Address: 10835 TR 41      Approximate Soil Type: Randolph Sil



Certification #: 19395

Date: 3-Aug-21      Signature: *Nathan Wright*  
 Evaluator: Nathan Wright  
 Geophyta, Inc.  
 2685 C.R. 254  
 Vicky, OH 43464  
 Phone #: 419-547-8538

Test Hole #: A  
 Latitude/Longitude: 83°22'41.552"W 41°11'8.871"N  
 Method: Pit Auger  Probe; 1 1/4" dia.

Soil Profile		Estimating Soil Saturation				Estimating Soil Permeability					
		Munsell Color (hue, value, chroma)		Redoximorphic Features		Texture		Structure		Other Soil Features	
Horizon	Depth (inches)	Matrix Color	Concentrations	Depletions	Class	Approx. % Clay	Approx. % Fragments	Grade	Size		Type (shape)
A	0.0 - 11.0	10YR 3/3	none	none	SIL	15	10	3 - strong	med	gr	friable
Bt	11.0 - 21.0	10YR 5/3	10% 10YR 5/6	none	CL	30	10	2 - mod	fine	sbk	friable
C1	21.0 - 25.0	10YR 4/4	none	none	CL	30	5	2 - mod	med	sbk	firm
C2	25.0 - 51.0	10YR 4/3	5% 7.5 YR 4/6	15% 10YR 5/2	L	20	10	1 - weak	med	sbk	firm
R	51.0 +	-	-	-	-	-	-	-	-	-	Fractured Limestone
<b>Limiting Conditions</b>											
Perched Seasonal Water Table	Depth to (in.)	Descriptive Notes									
Apparent Water Table	25.0	Restricted in C2									
Highly Permeable Material	none										
Bedrock	51.0	Fractured Limestone									
Other Restrictive Layer	none										
<b>Remarks / Risk Factors: Values For Sand Mound</b>											
Tyler Table: A - C1 horizon ( 0.0 - 25.0 ) ILR: SIL, HLLR: CL											
ILR(>30mg/L) = 0.6 gal/day/ft², ILR(<30mg/L) = 0.8 gal/day/ft²											
HLLR = 3.4 gal/day/ft											
3 bedroom min. required absorption area = 600 sq.ft.											
5xW Soil Absorption Box: 29' W x 106' 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 Dense 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 Hard bedrock	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 VBY
Silt si	Extremely Bouldery XBY
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.

Mound Calculations: Gravelless Chambers			
Owner: Morrow: Site A	Design		
Residence W/ 3 BEDROOMS	Min. Design	Actual Design	Comment
Water Use (gal/day)(DFR)	360		
Limiting Condition	PSWT		
Depth To Limiting Condition (inches)	25.0		
Total Infiltration Depth (Soil+Sand) (in.)	31.0		
Sand Depth To Add (in.)	6.0		Min. Sand Spec.
Most Limiting Soil Texture	CL		
Site Slope % (Perpendicular To Contour)	0.0		
Tyler Table Values			
Soil Infiltration Loading Rate (gal/day/sq. ft)(BLR)	0.6		SiL @ > 30 mg/L
Soil Hydraulic Linear Loading Rate (gal/day/ft)(HLLR)	3.4		Using (24"-48" Infiltration of CL)
Sand Loading Rate (gal/day/sq. ft)(SLLR)	1.0		
Required Soil Absorption Area (sq. ft.) DFR/BLR	600.0		
Mound Design Requirements			
Sand Absorption Area Width (ft)(A)	3.4	4.00	Using (2) 2' Wide Chambers
Sand Absorption Area Length (ft)(B)	105.9	92.0	13.1% Length Reduction
Sand Distribution Area for Laterals(sq. ft.)	360.0	368.0	
Min. Mound Basal Soil Width (ft)(I+A+J)(HLLR/BLR)	5.7	10.42	needed for 3:1 sand edge slope
Upslope Sand Depth (in)(D)	6.0		
Downslope Sand Depth (in)(E)	6.0		
Aggregate Depth (in)(F)	8.0		LP Dome Ht.
Edge Topsoil Cover (in)(G)	6.0		
Peak Topsoil Cover (in)(H)	12.0		
Mound Downslope Width at 3:1 (in)(I)	78.0		
Mound Upslope Width at 3:1 (in)(J)	78.0		
Mound End slope Width at 3:1 (in)(K)	78.0		
Mound Overall Length (ft)(L)	118.9	105.6	to use infiltrator domes, 4 ft. L
Mound Overall Width (ft)(W)	13.0	13.6	
Mound Overall Height (ft)	2.2	2.2	

**APPROVED**

By Matt Beckman at 3:39 pm, Sep 13, 2021

	A	B	C	D
1	<b>Mound Dosing Calculations: Gravelless Chambers</b>			
2				
3	<b>Owner: Morrow: Site A</b>	<b>Design</b>		
4		Target	Formula	Actual
5	Sand Absorption Area Width (ft)(A)	4.00		
6	Sand Absorption Area Length (ft)(B)	92.0		
7	Sand Distribution Area for Laterals(sq. ft.)	368.0	B5*B6	
8				
9	Area Per Orifice (sq. ft.)	6.00		
10	Orifice Quantity (Dist. Area/Std)	61.3	B7/B9, Rnd to Even; Divide by 2	62.0
11	Total Laterals Length (ft)	184.0		
12	Number of Laterals C	2		
13	Each Lateral Length (ft.)(B/C)	92.0	B11/B12	
14	Orifice Separation (length/# orifices)(ft.)	3.0	B11/B10	3.0
15	Orifice Separation Less Than Or Equal To 4 ft.?	yes		
16	Orifice Size (in)(Otis, 1982)	0.125	1/8"	
17	Lateral Diameter (in) (Otis, 1982)	1.25	SCH40 PVC	
18	Target Head at Lateral End (ft)	5.0		
19	Flow Rate per Orifice (gpm)(Otis et al, 1978)	0.41		
20				
21	<b>Lateral Design:</b>			
22	Diameter (in)	1.25	SCH40 PVC	
23	Flow Rate per Lateral (gpm)	12.6	B10/B12*B19	
24	Flow Rate Total (gpm)	25.4	D10*B19	
25	Gal. per Foot of Pipe (Clemons, 1991)	0.078	SCH40 PVC	
26	Total Lateral Volume (gal)	14.4	B11*B25	
27				
28	<b>Manifold Design:</b>	None - Main Direct To Laterals By Tee		
29	Diameter (in)	0.0		
30	Length (ft)	0.0		
31	Gal. per Foot of Pipe (Clemons, 1991)	0.0		
32	Total Manifold Volume (gal)	0.0	B30*B31	
33	# Std 90deg Elbows			
34	Std 90deg Elbow Pipe Length Equivalent (ft)			
35	# Std 45deg Elbows			
36	Std 45deg Elbow Pipe Length Equivalent (ft)			
37	# Std Tees			
38	Std Tee Pipe Length Equivalent (ft)			
39	# Quick Disconnects			
40	Quick Disconnect Pipe Length Equivalent (ft)			
41	# Check Valves			
42	Check Valves Pipe Length Equivalent (ft)			
43				
44	Total Length Equivalent (pipe&fittings) (ft)	0.0		
45	Head Loss per 100 ft.(ft.)(Otis et al, 1978)	0.0		
46	Total Manifold Head Loss (ft)	0.00		
47				
48	<b>Main Design:</b>			
49	Diameter (in)	2.00	SCH40 PVC	
50	Length (ft)	70		
51	Gal. per Foot of Pipe (Clemons, 1991)	0.174		
52	Total Main Volume (gal)	12.18	B50*B51	
53	# Std 90deg Elbows	5		



	A	B	C	D
1	<b>Mound Dosing Calculations: Gravelless Chambers</b>			
2				
3	<b>Owner: Morrow: Site A</b>	<b>Design</b>		
4		<b>Target</b>	<b>Formula</b>	<b>Actual</b>
54	Std 90deg Elbow Pipe Length Equivalent (ft)	9.0		
55	# Std 45deg Elbows	1		
56	Std 45deg Elbow Pipe Length Equivalent (ft)	4.0		
57	# Std Tees	1		
58	Std Tee Pipe Length Equivalent (ft)	9.0		
59	# Quick Disconnects	1	2" Dia. SCH40PVC in Gooseneck	
60	Quick Disconnect Pipe Length Equivalent (ft)	2.0		
61	# Full Flow Ball Valves	2	1.25" Dia.	
62	Ball Valves Pipe Length Equivalent (ft)	0.9		
63				
64	Total Length Equivalent (pipe&fittings) (ft)	131.8	B50+(B53-62)	
65	Head Loss per 100 ft.(ft.)(Otis et al, 1978)(Zoeller)	1.10	Using Linear Interpolation Formula	
66	Total Main Head Loss (ft)	1.45	(B64/100)*B65	
67				
68	<b>Dose Volume:</b>			
69	Total Lateral Volume (gal)	14.35	B26	
70	Total Manifold Volume (gal)	0.00	B32	
71	Total Main Volume (gal)	12.18	B52	
72				
73	Drainback Volume: Main+Manifold+Lateral (gal)	26.5	B69+B70+B71	
74	Lateral Vol x 5.017422 (gal)	72.0	B69*5 (Minimum)	
75	TOTAL dose (gal)	98.5		
76				
77	Daily Design Flow (DFR)(120gal/day/bedroom)	360.0		
78	Is Lateral Dose <1/4 of Daily Design Flow?	yes		
79	Is Lateral Dose <1/8 of Daily Design Flow?	no		
80				
81	<b>Total Dynamic Head:</b>			
82	Static Lift - Lateral Ht. Above Surface (ft)	0.50	6.0 inch Sand	
83	Static Lift - Depth to Pump Off Below Surface (ft)	5.5	6.33 - .83	
84	Static Lift - Topo Difference (ft.)	-0.12	-	
85	Total Pipe & Fittings Headloss (ft)	1.4	B46+B66	
86	Network Loss (5ft head x 1.3) (ft)(includes laterals)	6.5	-	
87	Total Head Loss (ft)	13.8	sum(B81:B85)	
88				
89	<b>Dose Tank Parameters</b>			
90	Volume (gal)	1000	48.5	inches effluent
91	Gallons Per Inch in Tank	20.60		
92				
93	<b>Timed Dose Settings:</b>			
94	Total Gallons Per Pump Cycle W/drainback	98.5	4.78	inches drawdown
95	Total Pump Cycles Per 24 Hrs.	5.0		
96	Total Pump On Time - seconds	233		
97	Total Pump Off Time - hours	4.7		
98	Redundant Off Effluent Ht. from bottom (in)	10.0	( to prevent tank flotation)	
99	Timer Enable (low level cutout) Ht. From tank bottom (in)	14.8		
100	High Level Alarm Ht. from bottom (in.)	22.3	(provides 1 & 1/2 day reserve after alarm)	

**APPROVED**

By Matt Beckman at 3:39 pm, Sep 13, 2021

DESIGNER: SETH V. LAVNE, GEOPHYTA INC. 19.AUG.21



SCALE 1:190

- (1) Soil Inspection Port (2X Total)
- (2) Sand Inspection Port (4X Total)

HSTS - Engineered Sand Mound  
Approx. 105.6' L x 13.6' W x 2.2' H.

Mound Valvebox

Force Main W/ Drainback Ø2" SCH40 PVC

Spoerr 1500gal Septic Tank W/ Filter & Spoerr 1000gal Dose Tank W/ Control Panel, Pump & Filters

Sewer Main Replaced to Foundation W/ Added Two-Way C/O Ø4" SCH40 PVC

E. Pole

E. Pole

Center of Bottom Step of Deck

8MI=10.00'

Existing Residence (3600sq ft)

Ashford Drive

W.T.R. 47

SCALE 1:285

See Mound & Detail Print For 90 Degree Turn

Firestop

Approx. North Parcel Line

Not Exact Corner

(2) Lateral Cleanout & Inspection Ports



NOTES

- Mound Area to be Scarified According to OSU Mound Systems for Onsite Wastewater Treatment Bulletin 813.
- Pump, Crush & Backfill Old Tankage.
- New Tanks May Require Rock Excavation.
- Fence Removal by Garage May be Needed For Install.

LEGEND

Sewer Main Exit	Soil Stake (A)	Property Irons/Posts	60' Well Setback	U.G. Electric Supply
8MI				P. Line

Morrow - HSTS\_3D\_Layout

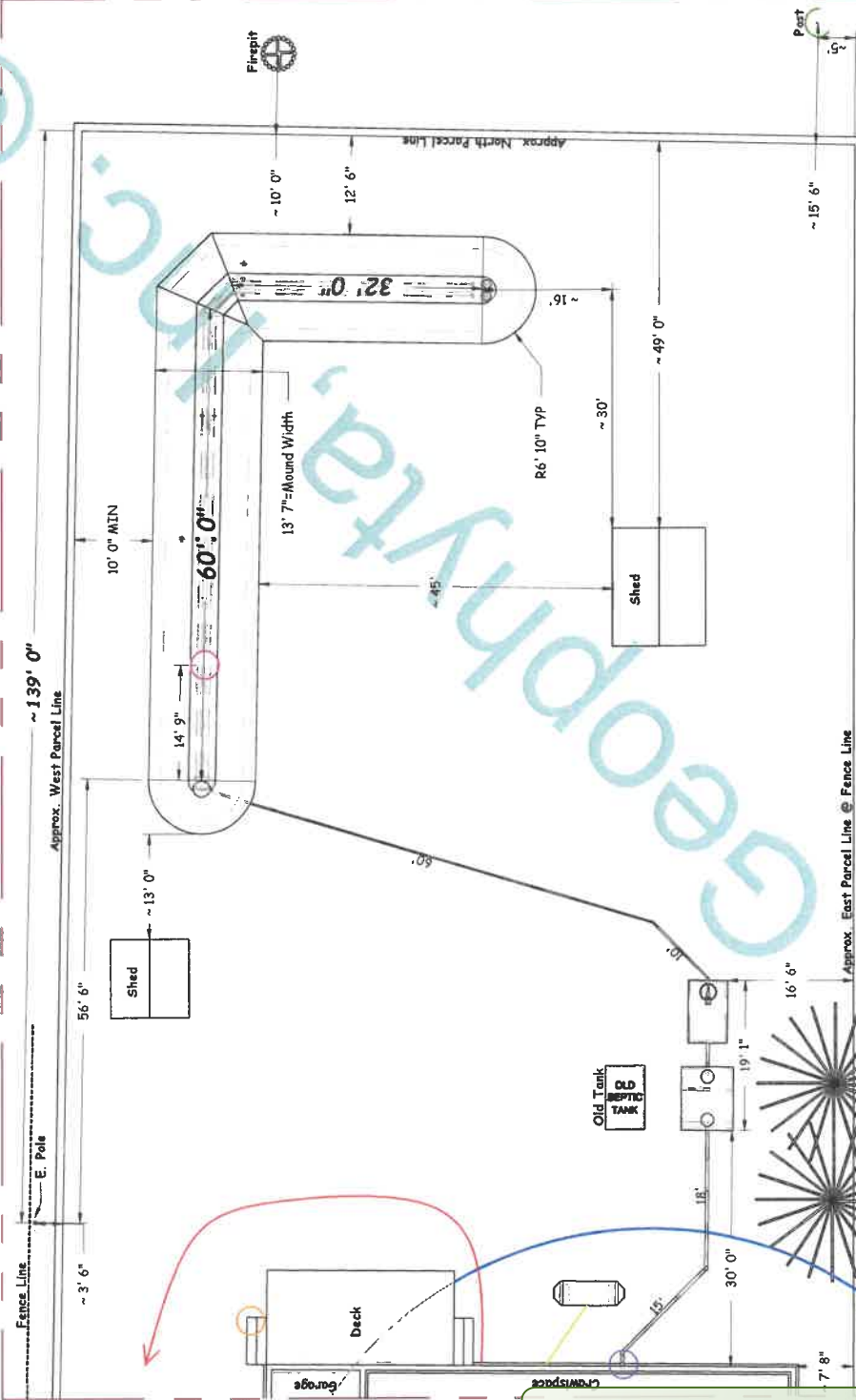
**APPROVED**

By Matt Beckman at 3:40 pm, Sep 13, 2021

DESIGNER: SETH V. LAYNE, GEOPHYTA INC. 19.AUG.21



Detail A SCALE 1:175



SCALE 1:1300

NOTES

Mound Layout by Property Lines & Other Structures onsite. Please Note That Property Post in Back is Not a Verified Property Corner.

LEGEND

- Sewer Main Exit
- Soil Stake (A)
- BMI
- Property Irons/Posts
- 50" Well Setback
- J.G. Electric Supply
- L.P. Line

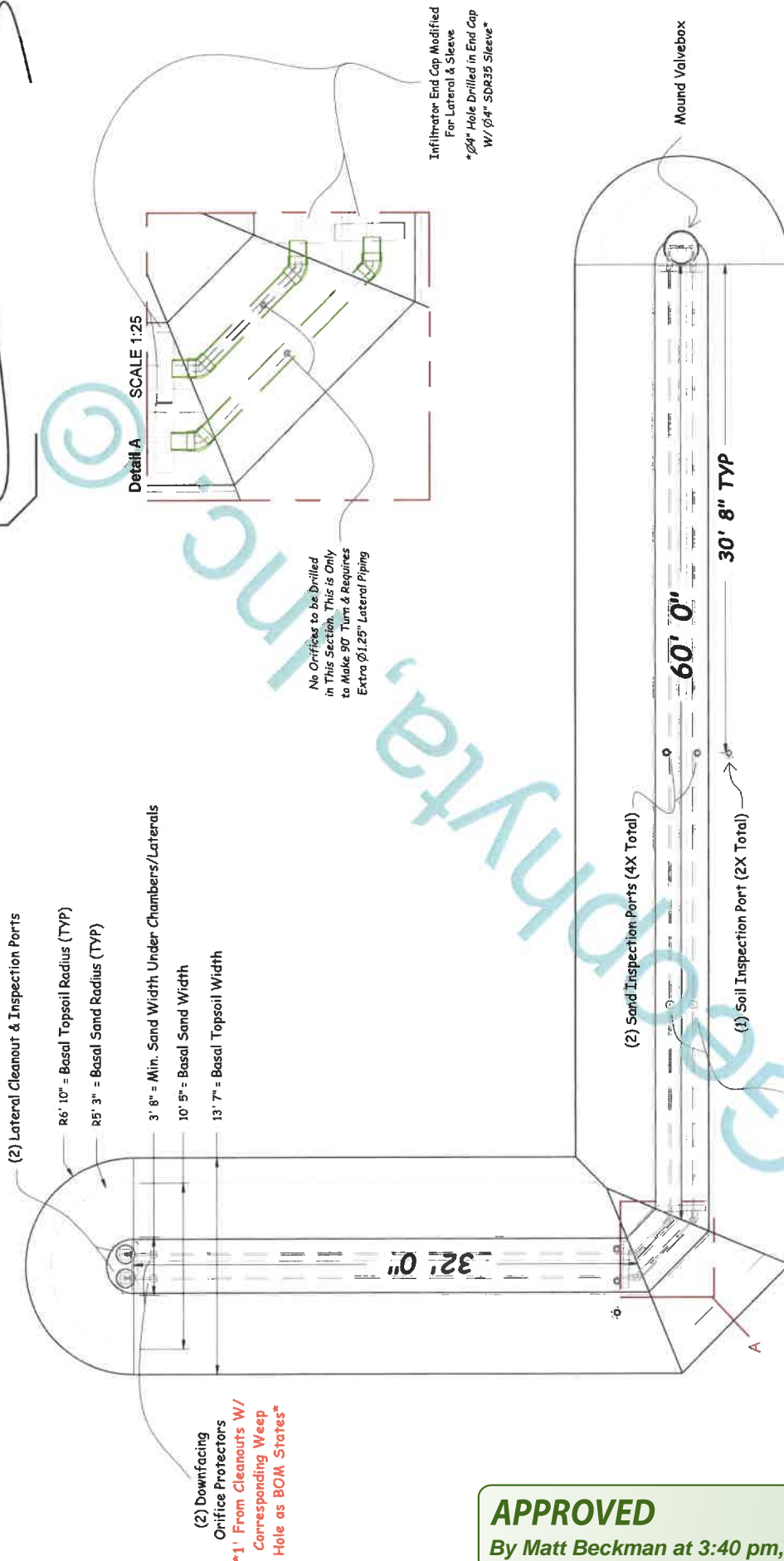


\*PLEASE SEE MOUND DETAIL PRINT FOR ALL MOUND SPECIFIC DIMENSIONS TO AID IN LAYOUT\*

Morrow - HSTS\_Top

**APPROVED**

By Matt Beckman at 3:40 pm, Sep 13, 2021



SCALE 1:75

(2) Downfacing Orifice Protectors  
 \*46' From Valvebox W/ Corresponding Weep Hole as BOM States\*

HSTS - Mound\_Detail

**APPROVED**

By Matt Beckman at 3:40 pm, Sep 13, 2021

REVISIONS

APPROVED

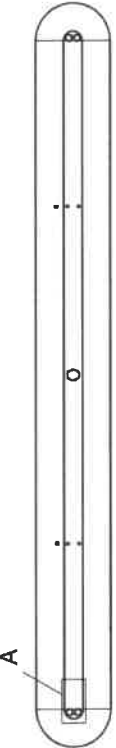
DATE

DESCRIPTION

REV

ZONE

Drawn By Nathan Wright, Geophyta, Inc. 21-Sep-18



SCALE 1:400

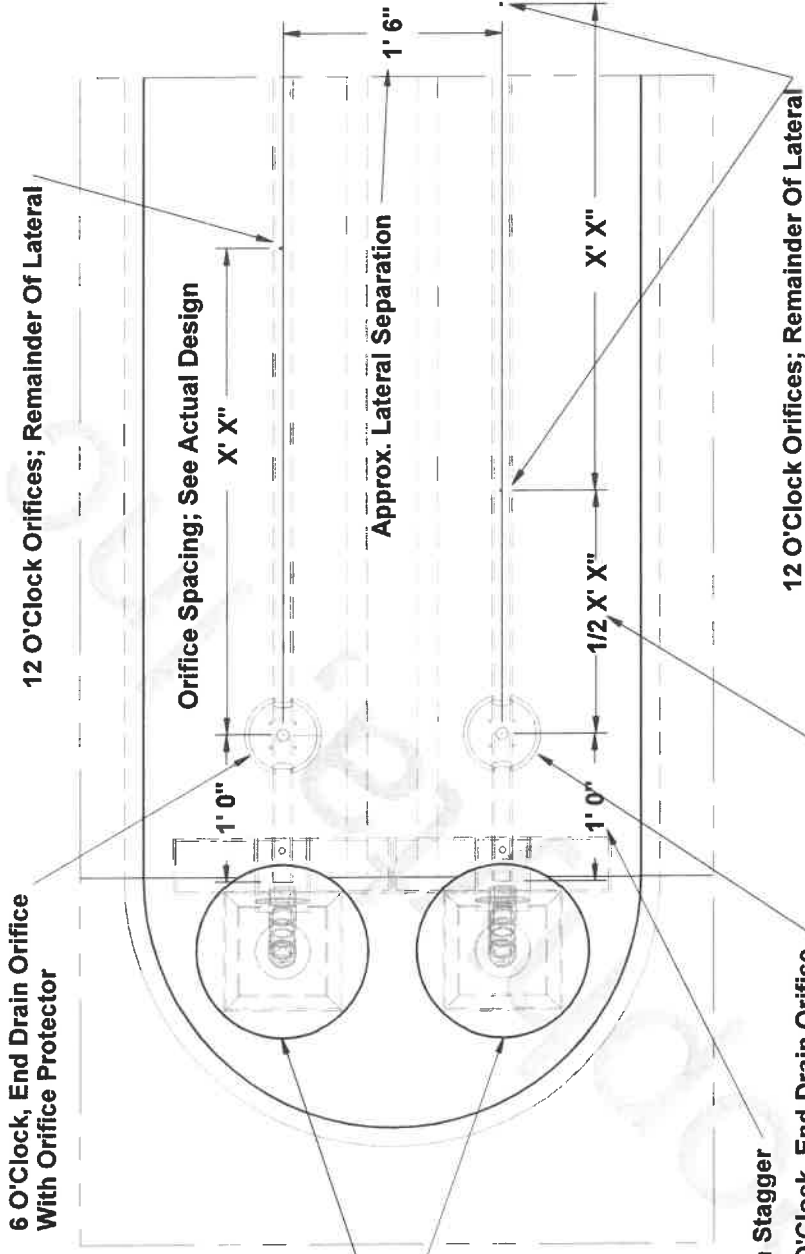
Lateral Diameters Are Determined From Each Individual Design And Can Be Found In The Calculations Pages As Well As Bill Of Materials.

Lateral Cleanouts & Sand Inspection Ports. Entire Lateral Lengths Are Covered With Gravelless Chambers As Effluent Diffusers.

Can Be Adjusted To Help With Stagger

6 O'Clock, End Drain Orifice With Orifice Protector

Stagger Orifices In Diamond Pattern Across Laterals, As Best As Possible. Number Of Orifices Per Lateral Takes Priority Over Exact Spacing.



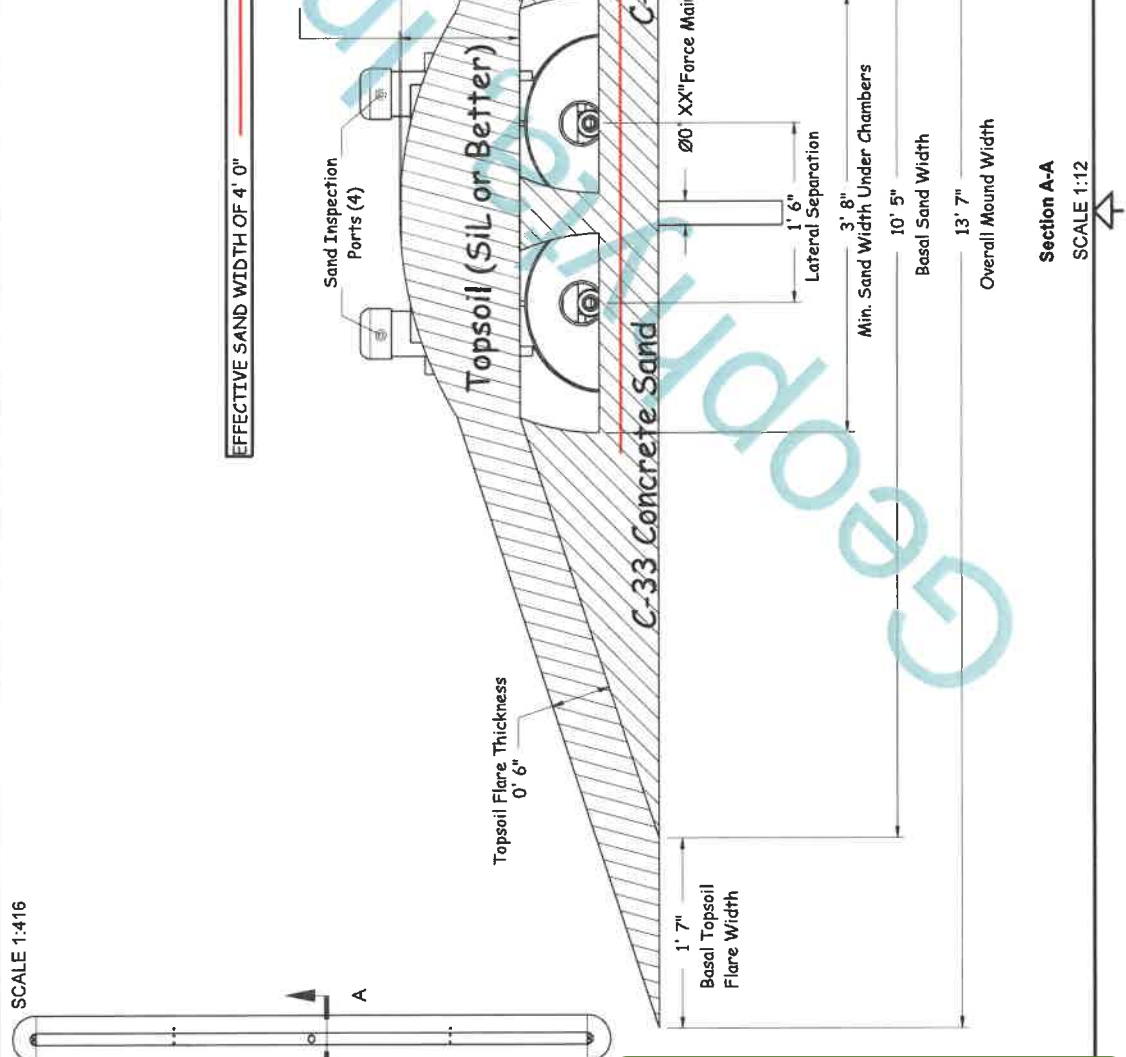
Detail A  
SCALE 1:15

SIZE	FSCM NO.	DWG NO.	REV
A		HSTS Mound Laterals Detail	
SCALE	1:1	SHEET	1 OF 1

**APPROVED**

By Matt Beckman at 3:40 pm, Sep 13, 2021

REVISIONS		DATE	APPROVED
ZONE	REV	DESCRIPTION	
DESIGNER: SETH V. LAYNE, GEOPHYTA INC. 03.JUNE.20			



SIZE	FSCM NO.	DWG NO.	HSTS_Mound Cross-Section	REV
B				
SCALE 1:1			SHEET	1 OF 1

Section A-A  
SCALE 1:12

**APPROVED**  
By Matt Beckman at 3:40 pm, Sep 13, 2021

DESIGNER: SETH V. LAYNE, GEOPHYTA INC. 19.AUG.21

**LEGEND**

Native Soil Surface  
Zero Elevation Reference

**NOTES**

- > Sand Depths Under Chambers Due To Soil Unevenness:  
Avg. = 7.8" Range = 6.0" - 10.7"
- > Sewer Main to Have Min. Fall .125'/1'
- > Force Main Must Have Drainback With Suggested Fall or 1"/100'
- > Tanks May Require Rock Excavation.

**VIEWPOINT**

ELEVATION VIEW - EAST TO WEST



**\*\*All Elevation Values Pointing to Surface Are of Native Grade\*\***

9.49' Highest Recorded Under Laterals/Chambers

9.10' Lowest Recorded Under Laterals/Chambers

\*More Sand Fill Required Here\*

9.61' \*Suggest 18" Risers\*

9.81'

7.37' = BOP Dose Into Force Main

3.03' = Bottom of Spoerr 1000gal Dose Tank

2.65' = Bottom of Spoerr 1500gal Septic Tank

7.65' = BOP Sewer Main Into Septic Tank

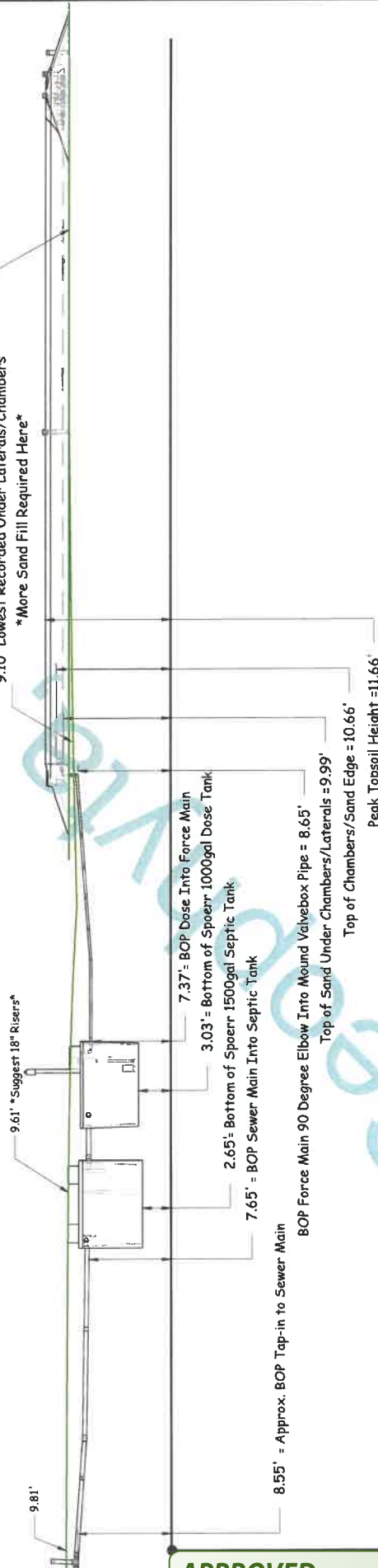
8.55' = Approx. BOP Tap-in to Sewer Main

BOP Force Main 90 Degree Elbow Into Mound Valvebox Pipe = 8.65'

Top of Sand Under Chambers/Laterals = 9.99'

Top of Chambers/Sand Edge = 10.66'

Peak Topsoil Height = 11.66'



SCALE 1:110

ZERO ELEVATION REFERENCE = 10.00' Corner of Bottom Step of Deck (SEE LAYOUT MAP)

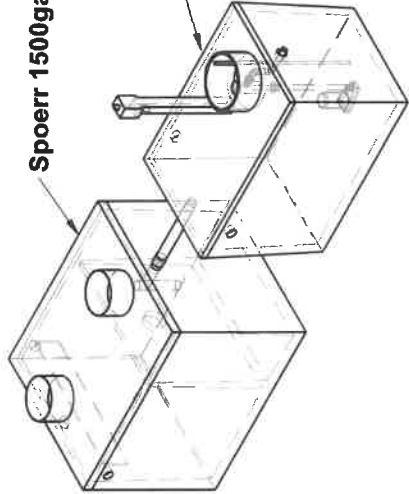
Morrow - HSTS\_Elevation

**APPROVED**

By Matt Beckman at 3:41 pm, Sep 13, 2021

Scale 1:80

Spoerr 1500gal Septic W/baffles & filter  
Spoerr 1000gal Dose w/Effl. Pump Assy.



See Bill Of Materials For All Component Details

Electrical Pump/Float Control & Alarm Panel, Tank Riser Mounted

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

Union Quick Disconnect

Actual Distance & Individual Connectors Will Vary Depending On Site Needs - Site Drawings Take Preference.

Risers As Grade Requires; 6, 12, 18, or 24"

PVC Pipe Dia. Will Vary Based On Design.

Ø24.00"

36.00"

2.00"

PL122 Filter, or equiv.

4" Sch40PVC

Discharge Filter, 1/16" Slot Size.

Effluent Pump, 2" Discharge.

.25"

1/4" Drainback Hole, REQUIRED

Float Tree Rail

Spoerr 1000 gal Dose

Spoerr 1500 gal Septic

REVISIONS

APPROVED

DATE

DESCRIPTION

REV

ZONE

26-Jan-15

Drawn By Nathan Wright, Geophyta Inc.

Scale 1:30

SIZE A

FSCM NO.

DWG NO.

REV

Spoerr 1500gal Septic/1000gal Dose+Controller

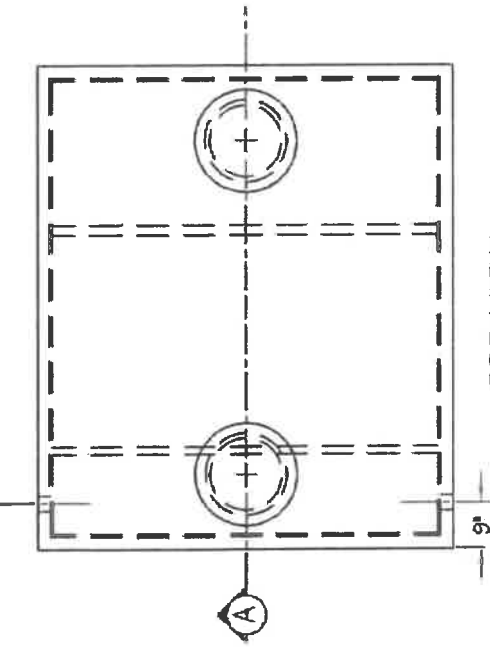
SHEET

SCALE various

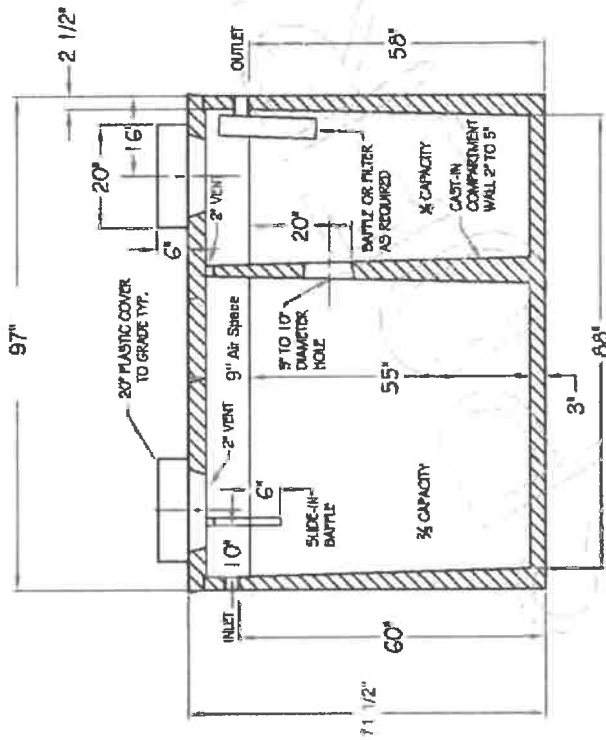
**APPROVED**

By Matt Beckman at 3:41 pm, Sep 13, 2021

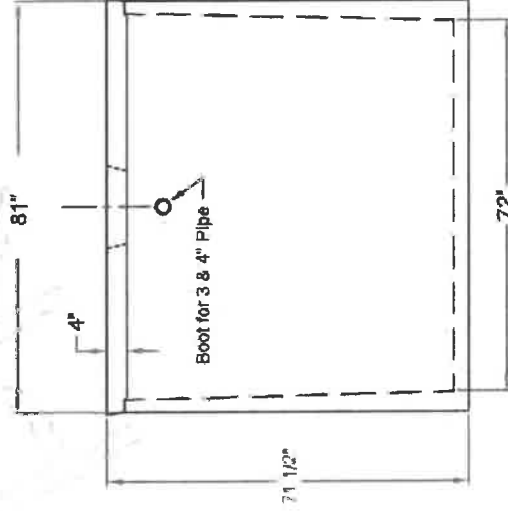




TOP VIEW



A SECTION VIEW (SIDE)



END VIEW

**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 - INLET AND OUTLET
5. WEIGHT 12,000 lbs

NOTES:



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

Excavation 7'9" x 9'

1500 Gallon  
Septic Tank

DESIGNER	JJP	SCALE	VARIES
ENGINEER	GRM	DRAWING #	1 OF 1
REVISION			



**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!

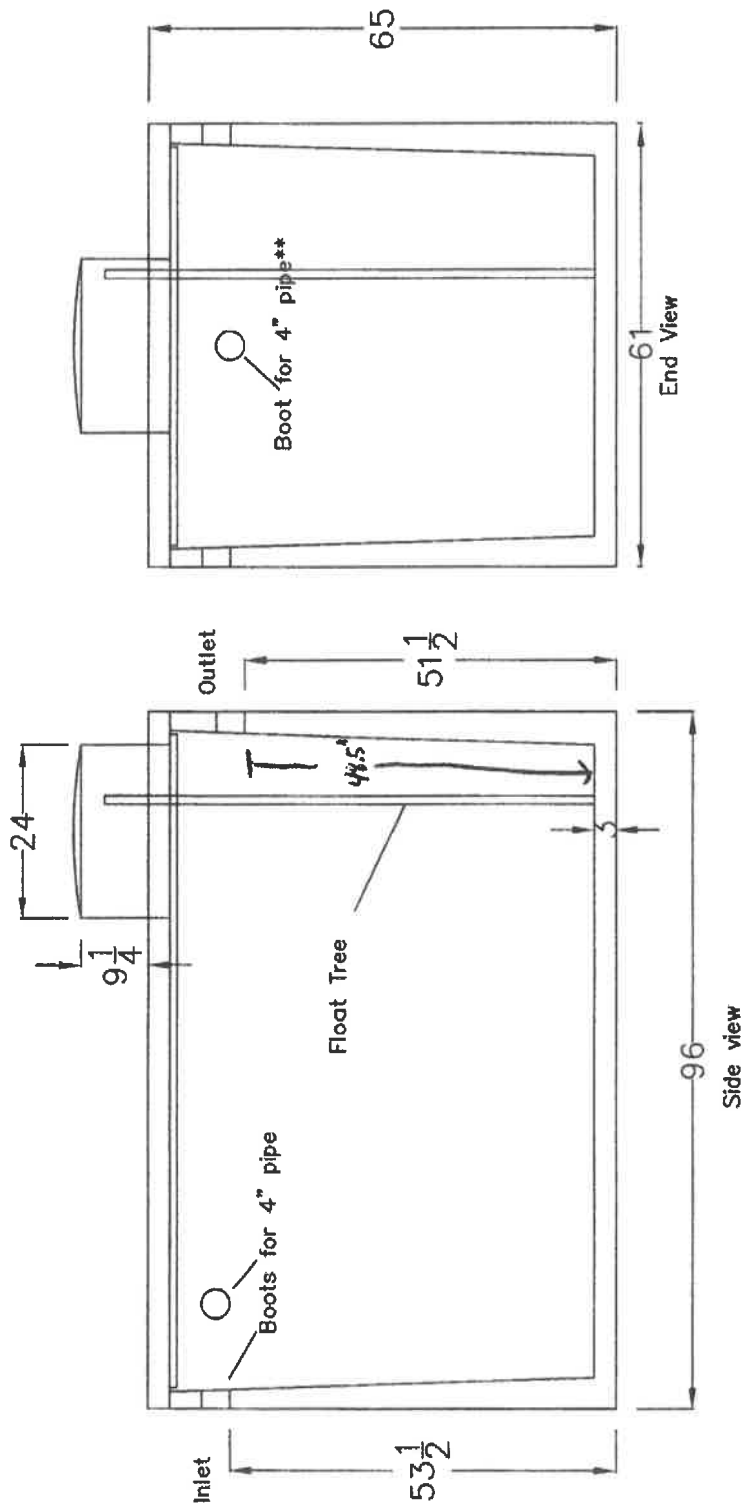
- 1 Filter = 1500 GPD
- 2 Filters = 3000 GPD
- 3 Filters = 4500 GPD

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.



Proprietary and Confidential  
 The information contained in this drawing is the sole property of Spoerr Precast Concrete Inc.  
 Any reproduction in part or as a whole without the written permission of Spoerr Precast Concrete Inc. is prohibited.

**Spoerr Precast Concrete Inc.**  
 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

1000 Gallon Pump Tank	
Excavation 6' x 9'	
	09/22/09



OHIO ELECTRIC  
CONTROL, INC.

## ECONOMY SERIES CONTROL PANELS

### Time Dose Control Panel

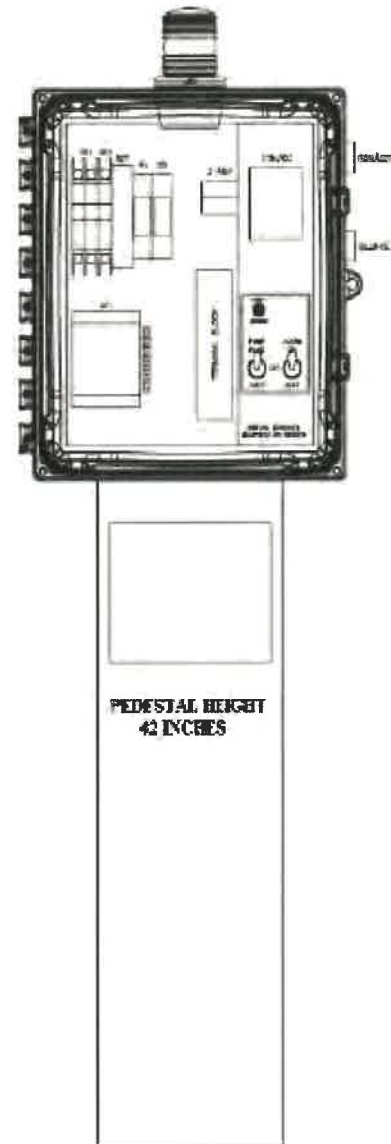
For single phase residential and commercial lift stations and holding tanks  
Float activated pump controllers for time dose applications

#### Features

- Circuit breaker for each pump
- Audible alarm with silence
- 360 degree visual alarm
- 3 float operation: Off, Enable, High level
- Externally mounted silence switch
- UL Type 4X enclosure padlockable
- Separate power feed for Pump and Control
- Clearly labeled terminal blocks
- Easy to use timer
- Individually adjustable On and Off Times
- DP Rated contactor
- ETM and Cycle Center
- All components UL Listed

#### Specifications

Voltage Input: 115VAC/230VAC 60Hz, single phase  
Pump ratings: 115VAC/230V – 2HP at 20FLA,  
single phase  
Enclosure: UL Type 4X rated, polycarbonate  
1 year limited warranty



Economy Series Control Panels

## ECP-TD-11

Every pump tested in water to ensure pump meets performance curve.



### FEATURES/BENEFITS

#### PERFORMANCE

- Heads up to 65' TDH
- Flows up to 86 GPM

#### MOTOR

- High efficient, 115v or 230v, oil filled, permanent split capacitor motor with upper and lower ball bearings and thermal overload protection
- Constant bearing lubrication
  - Maximum motor cooling
  - Runs cooler and lasts longer
  - Internal overload protection
  - Quiet operation
  - Fasteners and shaft made from rugged, corrosion resistant stainless steel

#### SEAL DESIGN

- Type 21 inboard seal design with secondary exclusion seal
- Rotating components of seal are in the motor housing, being lubricated by the motor oil preventing foreign matter from wrapping around the seal components
  - Seal will last longer if the pump runs dry
  - Secondary exclusion seal keeps debris from entering the seal cavity

#### IMPELLER DESIGN

- Non-clog style, cast-iron vortex impeller (CPEH Thermoplastic Vortex)
- Designed to help reduce clogging by foreign material

#### POWER CORD

- Sealed entry quick disconnect power cords
- Prevents water from entering the motor housing through a cut cord
  - Easy to replace in the field
  - Available in lengths up to 100'

#### SWITCH

- Piggy-back switch design
- Defective switches can be diagnosed over the phone
  - Pump can be operated manually or supplied with other piggy-back switches
  - Switch can be replaced without having to replace the pump

### APPLICATIONS

Dewatering, septic systems, residential and commercial developments, elevator pits and STEP systems

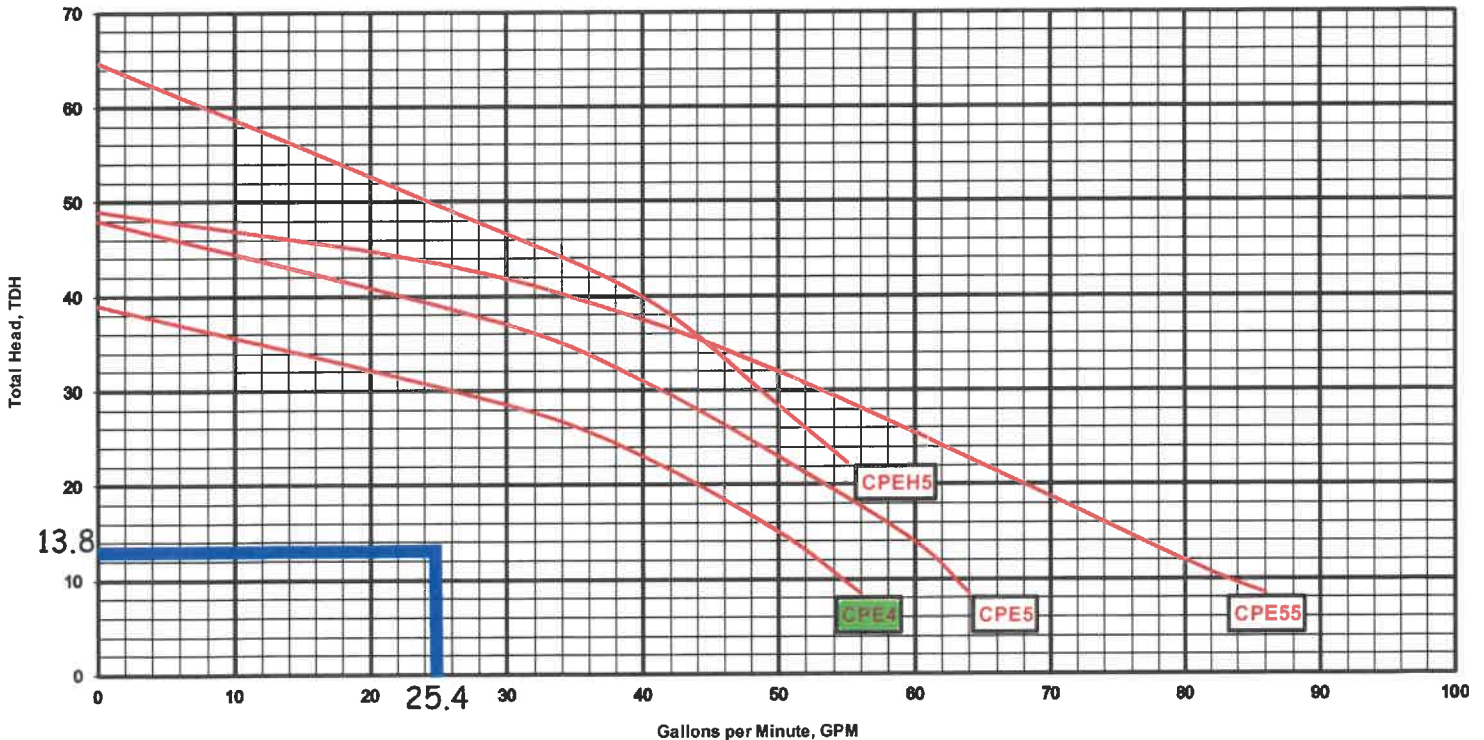


Vertical Float

Wide-Angle Float

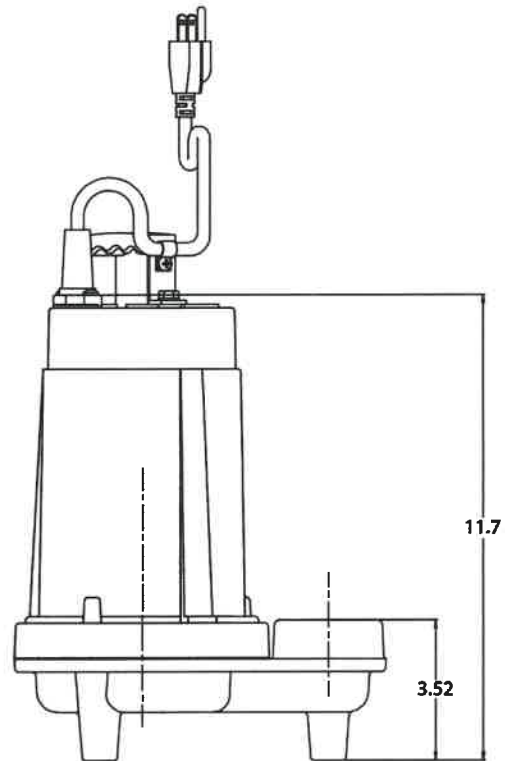
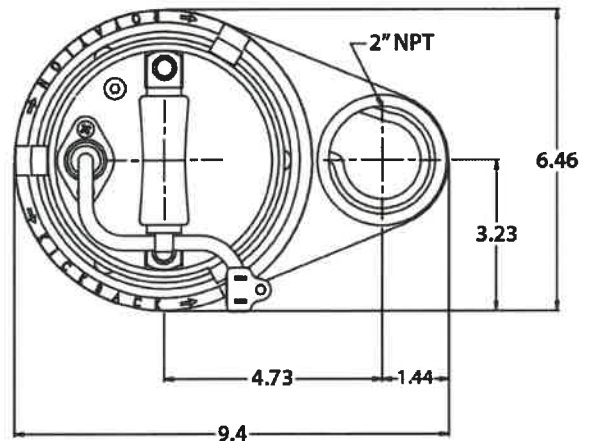
4/10-1/2 HP submersible pumps that handle up to 3/4" solids with 2" discharge

### PERFORMANCE CURVE



## TECHNICAL DATA

<b>DISCHARGE</b>	2" NPT. vertical standard
<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 / Vortex (CPEH thermoplastic vortex)
<b>SOLIDS HANDLING</b>	3/4"
<b>SHAFT</b>	Stainless Steel
<b>SHAFT SEAL (SINGLE SEAL)</b>	Inboard mechanical with secondary exclusion V-Seal, carbon rotating face, ceramic stationary face, Buna-N elastomer, 300 series stainless steel hardware
<b>BEARINGS (UPPER &amp; LOWER)</b>	Single row, ball, oil lubricated
<b>HARDWARE</b>	300 Series stainless steel
<b>O-RINGS</b>	Buna-N
<b>CORD</b>	20' Length standard. Up to 100' available. (UL/CUL) Listed 16 AWG, Type SJTW
<b>MOTOR (SINGLE PHASE)</b>	4/10-1/2 HP 3450 RPM, 60 Hz, NEMA L Includes Overload Protection in the motor, oil filled, class B permanent split capacitor
<b>WEIGHT</b>	37 lbs. (Manual)



## MODEL(S) INFORMATION

MODEL	HP	VOLTS	PHASE	AMPS	CORD LENGTH	SWITCH
CPE4-12 / CPE5-12 / CPE55-12 / CPEH5-12	4/10 - 1/2	115	1	6.6 / 8.5 / 10.5 / 11.5	20'	Manual
CPE4-13 / CPE5-13 / CPE55-13 / CPEH5-13	4/10 - 1/2	115	1	6.6 / 8.5 / 10.5 / 11.5	30'	Manual
CPE4-15 / CPE5-15 / CPE55-15 / CPEH5-15	4/10 - 1/2	115	1	6.6 / 8.5 / 10.5 / 11.5	50'	Manual
CPE4A-12 / CPE5A-12 / CPE55A-12 / CPEH5A-12	4/10 - 1/2	115	1	6.6 / 8.5 / 10.5 / 11.5	20'	Wide-Angle Float
CPE4A-13 / CPE5A-13 / CPE55A-13 / CPEH5A-13	4/10 - 1/2	115	1	6.6 / 8.5 / 10.5 / 11.5	30'	Wide-Angle Float
CPE4V-12 / CPE5V-12 / CPE55V-12 / CPEH5V-12	4/10 - 1/2	115	1	6.6 / 8.5 / 10.5 / 11.5	20'	Vertical Float
CPE4V-13 / CPE5V-13 / CPE55V-13 / CPEH5V-13	4/10 - 1/2	115	1	6.6 / 8.5 / 10.5 / 11.5	30'	Vertical Float
CPE4-22 / CPE5-22 / CPE55-22 / CPEH5-22	4/10 - 1/2	230	1	3.3 / 4.3 / 5.75 / 5.75	20'	Manual
CPE4A-22 / CPE5A-22 / CPE55A-22 / CPEH5A-22	4/10 - 1/2	230	1	3.3 / 4.3 / 5.75 / 5.75	20'	Wide-Angle Float
CPE4V-22 / CPE5V-22 / CPE55V-22 / CPEH5V-22	4/10 - 1/2	230	1	3.3 / 4.3 / 5.75 / 5.75	20'	Vertical Float

# Essential Components for Pressurized Systems

SIM/TECH offers many performance products engineered to protect effluent treatment systems and prevent costly repairs. From our pressurized filter, to the best orifice shield in the industry, we keep your systems performing at 100% efficiency.

Sometimes the simplest ideas are the best, so depend on a time proven leader... protecting effluent treatment systems is our business - SIM/TECH Filter.

STF-103  
Lid/screen removal wrench.  
(Holds lid after removal)

STF-107  
Alert w/latching light

STF-101 Pressure  
switch

STF-100  
Pressure filter

pump chamber  
(dosing tank)

septic tank

## STF-100 Sim/Tech Filter

Pressure system filter - molded in tough PVC plastic, with installed stainless steel screen.

Installs easily onto effluent pump in holding tank. The vortex scrubbing action helps keep the filter clean.

*The last line of defense before the laterals.*

## STF-102 Filter Screen STF-104 Filter Sock

Optional filter socks can lower the acceptable TSS size from .023 inches to .0039 inches, depending on the application.

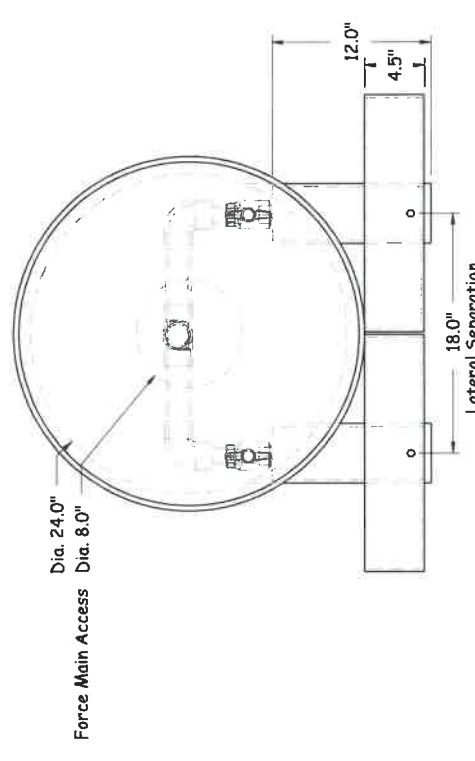
Our standard stainless steel screen will filter .062" in diameter. (1/16 of an inch)

Socks easily install inside stainless steel screen.



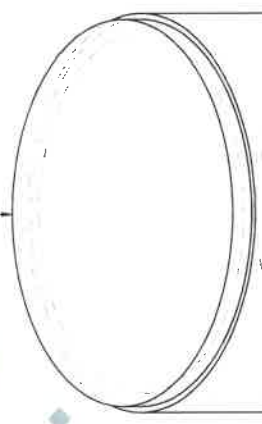
REVISIONS		DESCRIPTION	DATE	APPROVED
ZONE	REV			

DESIGNER: SETH V. LAYNE, GEOPHYTA INC. 24 JULY 20

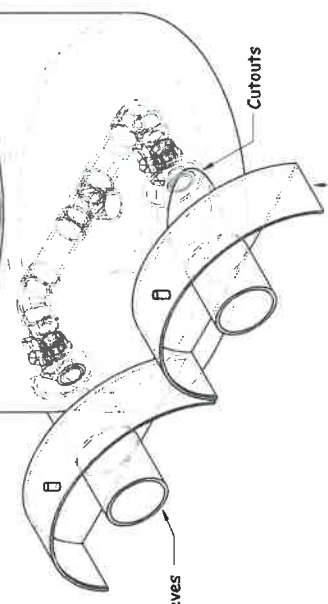


SCALE 1:9

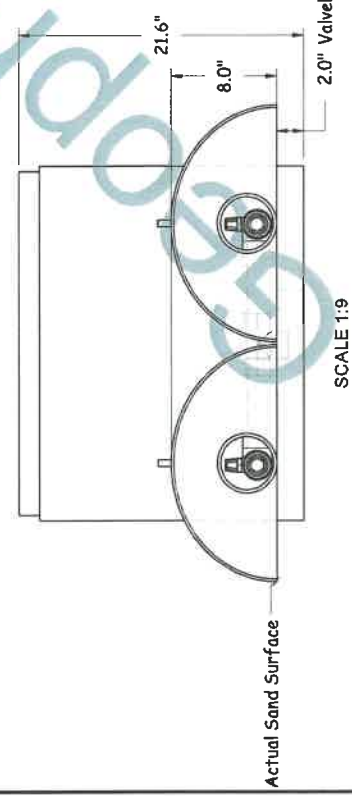
Polylok  $\phi$ 24" Riser, Insulated Lid & Concrete Base



SCALE 1:8



Infiltrator Q4 Plus EndCap  
Access Hole Cutout For  $\phi$ 4" SCH PVC Pipe



SCALE 1:9

SIZE	FSCM NO.	DWG NO.	REV
B		Polylok 24" Dia. D-Box (2) Valve Box Assembly	
SCALE	1:1	SHEET	1 OF 1





**INFILTRATOR**  
water technologies



# The Quick4® Plus Equalizer 36 Low Profile (LP) Chamber

## Quick4 Plus™ Series

The Quick4 Plus Equalizer 36 Low Profile (LP) offers maximum strength through its two center structural columns. This chamber can be installed in a 24-inch-wide trench. It is 4 inches shorter in height than other Equalizer 36 model chambers, allowing for shallower installation. Like the original line of Quick4 chambers, it offers advanced contouring capability with its Contour Swivel Connection™, which permits turns up to 15°, right or left. The Quick4 Plus All-in-One 8 and Quick4 Plus Endcaps provide increased flexibility in system design and configurations.



**Maximum Strength**

### Quick4 Plus Equalizer 36 LP Chamber Specifications

**Size**

22"W x 53"L x 8"H  
(559 mm x 1346 mm x 203 mm)

**Effective Length**

48" (1219 mm)

**Louver Height**

6.3" (160 mm)

**Storage Capacity**

20 gal (76 L)

**Invert Height**

3.3" (84 mm), 9.6" (244 mm)



### Quick4 Plus Equalizer 36 Low Profile (LP) Chamber Benefits:

- Low profile design makes this chamber ideal for shallow applications
- Reduces imported fill needed for cap and fill systems
- Two center structural columns offer superior strength
- Advanced contouring connections
- Latching mechanism allows for quick installation
- Four-foot chamber lengths are easy to handle and install
- Supports wheel loads of 16,000 lbs/axle with 12" of cover



### Quick4 Plus All-in-One Periscope Benefits:

- Allows for raised invert installations
- 180° directional inletting
- 12" raised invert is ideal for serial applications

### Quick4 Plus All-in-One 8 Endcap Benefits:

- May be used at the end of chamber row for an inlet/outlet or can be installed mid-trench
- Mid-trench connection feature allows center feed inletting of chamber rows
- Center-feed connection allows for easy installation of serial distribution systems
- Variable pipe connection options allow for side, end or top inletting
- Piping drill points are set for gravity or pressure pipe

### Quick4 Plus Endcap Benefits:

- Simple, flat design
- Allows installation of a pipe from the end only
- Piping drill points are set for gravity or pressure pipe

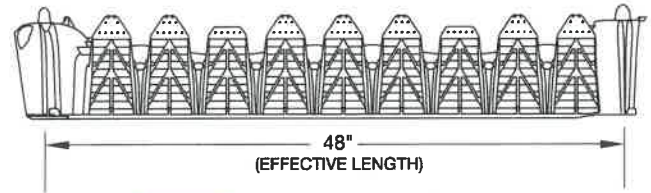
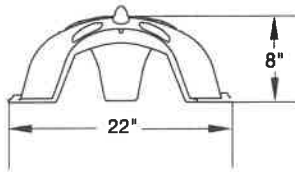


Certified by the International Association of Plumbing and Mechanical Officials (IAPMO)

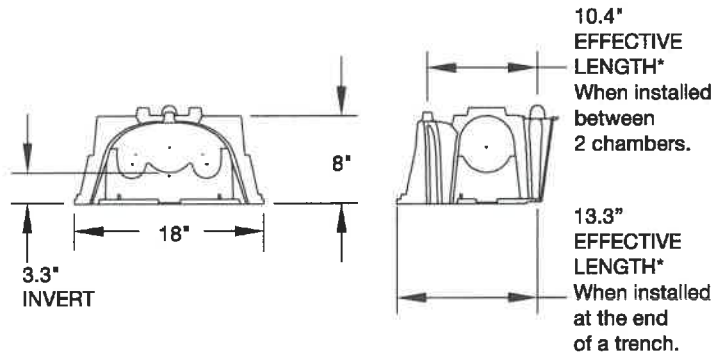


APPROVED in \_\_\_\_\_

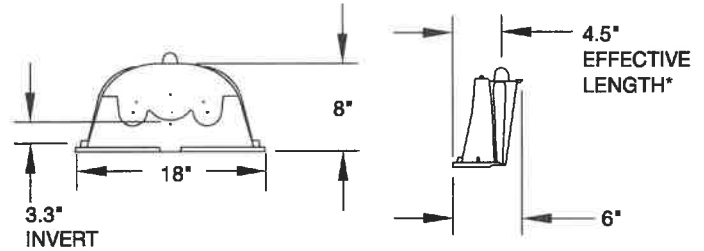
**Quick4 Plus Equalizer 36 Low Profile Chamber**



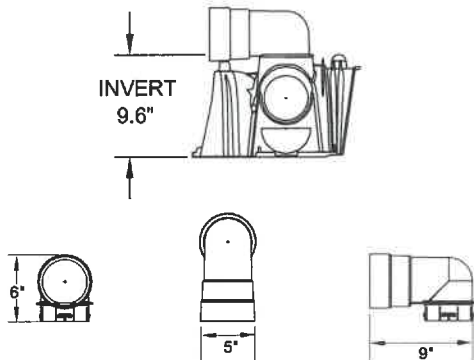
**Quick4 Plus All-in-One 8 Endcap**



**Quick4 Plus Endcap**



**Quick4 Plus All-in-One Periscope**



**INFILTRATOR WATER TECHNOLOGIES STANDARD LIMITED WARRANTY**

(a) The structural integrity of each chamber, endcap and other accessory manufactured by Infiltrator ("Units"), when installed and operated in a leachfield of an onsite septic system in accordance with Infiltrator's instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one year from the date that the septic permit is issued for the septic system containing the Units; provided, however, that if a septic permit is not required by applicable law, the warranty period will begin upon the date that installation of the septic system commences. To exercise its warranty rights, Holder must notify Infiltrator in writing at its Corporate Headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect. Infiltrator will supply replacement Units for Units determined by Infiltrator to be covered by this Limited Warranty. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Units.

(b) THE LIMITED WARRANTY AND REMEDIES IN SUBPARAGRAPH (a) ARE EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE UNITS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE

(c) This Limited Warranty shall be void if any part of the chamber system is manufactured by anyone other than Infiltrator. The Limited Warranty does not extend to incidental, consequential, special or indirect damages. Infiltrator shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs, or other losses or expenses incurred by the Holder or any third party. Specifically excluded from Limited Warranty coverage are damage to the Units due to ordinary wear and tear, alteration, accident, misuse, abuse or neglect of the Units; the Units being subjected to vehicle traffic or other conditions which are not permitted by the installation instructions; failure to maintain the minimum ground covers set forth in the installation instructions; the placement of improper materials into the system containing the Units; failure of the Units or the septic system due to improper siting or improper sizing, excessive water usage, improper grease disposal, or improper operation; or any other event not caused by Infiltrator. This Limited Warranty shall be void if the Holder fails to comply with all of the terms set forth in this Limited Warranty. Further, in no event shall Infiltrator be responsible for any loss or damage to the Holder, the Units, or any third party resulting from installation or shipment, or from any product liability claims of Holder or any third party. For this Limited Warranty to apply, the Units must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Infiltrator's installation instructions.

(d) No representative of Infiltrator has the authority to change or extend this Limited Warranty. No warranty applies to any party other than the original Holder.

The above represents the Standard Limited Warranty offered by Infiltrator. A limited number of states and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's Corporate Headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty, and should carefully read that warranty prior to the purchase of Units.



4 Business Park Road  
P.O. Box 768  
Old Saybrook, CT 06475  
860-577-7000 • Fax 860-577-7001  
1-800-221-4436  
www.infiltratorwater.com  
info@infiltratorwater.com

U.S. Patents: 4,759,661; 5,017,041; 5,156,488; 5,336,017; 5,401,116; 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,844 Canadian Patents: 1,329,959; 2,004,564 Other patents pending.  
Infiltrator, Equalizer, Quick4, and SlideWinder are registered trademarks of Infiltrator Water Technologies. Infiltrator is a registered trademark in France. Infiltrator Water Technologies is a registered trademark in Mexico.  
Contour, MicroLeaching, PolyTuff, ChamberSpacer, MultiPort, PosiLock, QuickCurt, QuickPlay, SnapLock and StraightLock are trademarks of Infiltrator Water Technologies.  
PolyLok is a trademark of PolyLok, Inc. TUF-TITE is a registered trademark of TUF-TITE, INC. Ultra-Rib is a trademark of IPEX Inc.

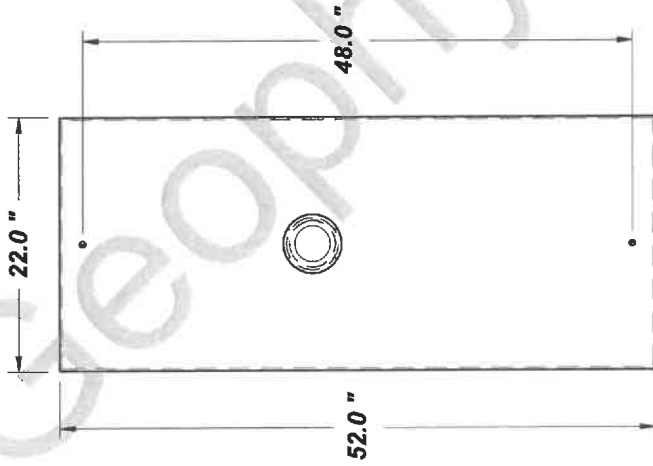
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PLUS06 0713

**Contact Infiltrator Water Technologies' Technical Services Department for assistance at 1-800-221-4436**

REVISIONS

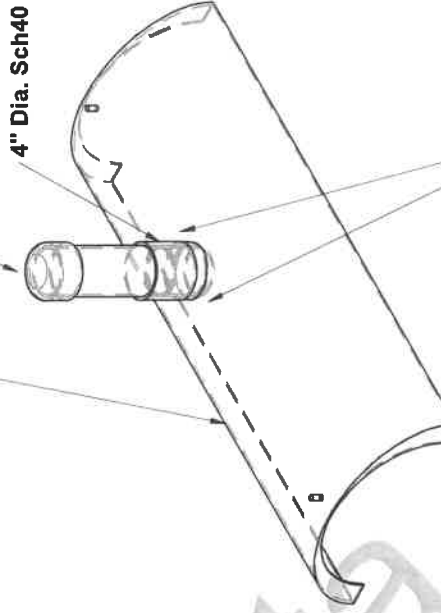
ZONE	REV	DESCRIPTION	DATE	APPROVED
		Drawn By Nathan Wright, Geophyta Inc.	22-Oct-13	



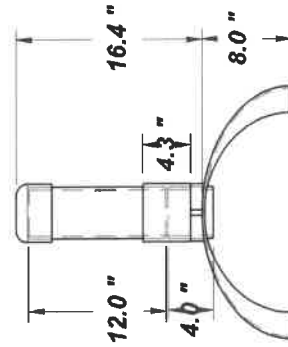
**Infiltrator Quick4 Plus  
Equalizer 36 Low Profile Chamber**

**4" Dia. Sch40 Friction Cap,  
Or Optional Threaded Cap Assembly**

**4" Dia. Sch40 Coupler**



**Minimum Two Stainless Steel Wood Screws  
Needed To Secure 4" Sch40 PVC To Dome**



SIZE	FSCM NO.	DWG NO.	REV
<b>A</b>			

Sand Inspection Port For Dome Chamber Mounds

SCALE	SHEET
<b>1:15</b>	

Sim/Tech Filter  
1455 Lexamar Drive  
Boyne City, MI 49712  
Office: 231-582-1020



Website: [www.gag-simtech.com](http://www.gag-simtech.com)  
Email: [sales@gag-simtech.com](mailto:sales@gag-simtech.com)  
Fax: 231-582-7324  
Toll Free: 888-999-3290

## Orifice Shields



### Why Use Orifice Shields?

Sim/Tech Filter orifice shields are designed to protect the discharge holes in pressurized systems from the outside. Most of these systems are designed with specific flow-rates, pressure heads, etc. to obtain “even distribution” in the drain field and thus allow for proper treatment. Much like our pressure filter prevents debris from obstructing the discharge holes from the inside, our orifice shields prevent blockage on the outside. As shown in the top picture to the left, drain media can block the small discharge holes, throwing the whole design and operation of a system out of whack. The bottom picture to the left shows our standard orifice shield installed on the lateral piping of a system. The orifice shield creates a protective void between the drain media and the discharge hole. The design allows the discharge hole to spray effluent into the shield where the much larger open area of the shield keeps the hole discharging at its designed flow rate.

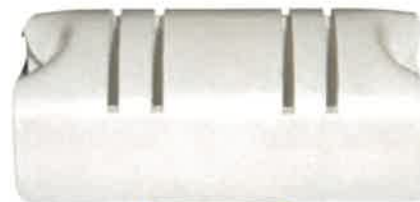
### Why Use Sim/Tech Filter Orifice Shields?

They have a large open area, 9 inches of gripping surface and a simple, but very effective design. The large open area of the interior of the shield prevents it from becoming easily blocked if you are not using a Sim/Tech pressure filter on your system. There is also a large open area for allowing effluent to drain from the shield. There are various slots depending upon the configuration you desire and both ends of the shield also have open area for drainage.

### Styles and Sizes Available

Sim/Tech Filter currently offers two orifice shield designs. The STF-106D is designed for systems that have discharge holes that point down. The STF-106TDS is designed for systems that have discharge holes that point up. Both versions of the Sim/Tech Filter orifice shield are available in four different sizes to fit the pipe sizes 3/4”, 1”, 1-1/4” & 1-1/2” and 2”. A 3” size is also available as a special custom order.

US Patent 6,167,914



STF-106D



STF-106TDS

*Solutions*

We offer free CAD detail drawings in DXF format to cover our complete product line.

For the protection and performance of wastewater systems by

[www.gag-simtech.com](http://www.gag-simtech.com)  
888-999-3290

**SIM/TECH**  
FILTER

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
		Drawn By Nathan Wright, Geophyta Inc.	19-Jan-15	

All Pipe & Fittings  
Sch 40 PVC, 1 1/4".

Expand/Reduce To  
2.00", 1.50", 1.25," Or 1.00"  
Laterals As Bill of Materials  
Specifies.

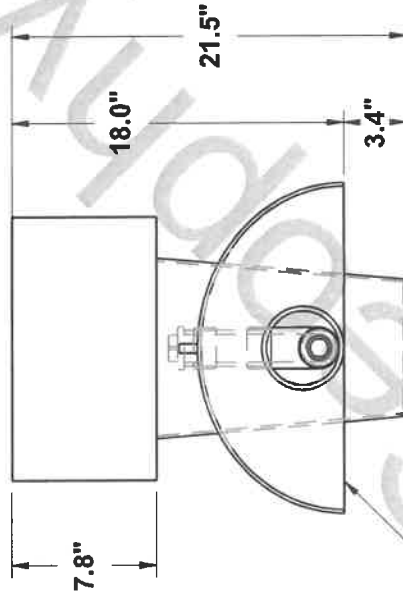
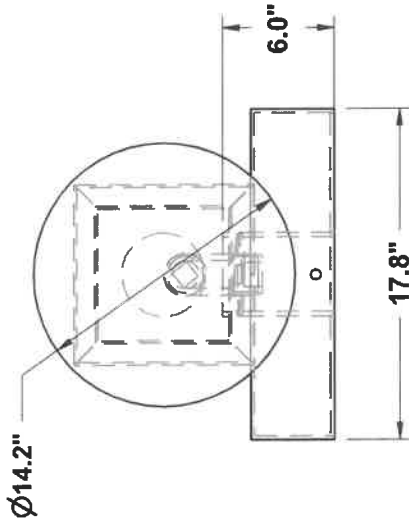
Removable PolyLok  
Lid - Insulated.  
Level With Mound Soil Cover.

PolyLok  
6" Riser

Cut 4.5" Dia. Hole  
In Bottom Of PolyLok D-Box  
For Drainage & Inspection.

Infiltrator Q4Plus End Cap,  
Cut Access Hole For Laterals.

4" Sch40 PVC Connector



Bottom Of PolyLok Box, 3.4" Into Sand

Sand Surface

SIZE	FSCM NO.	DWG NO.	REV
A			

12" PolyLok Cleanout Port For Chambers

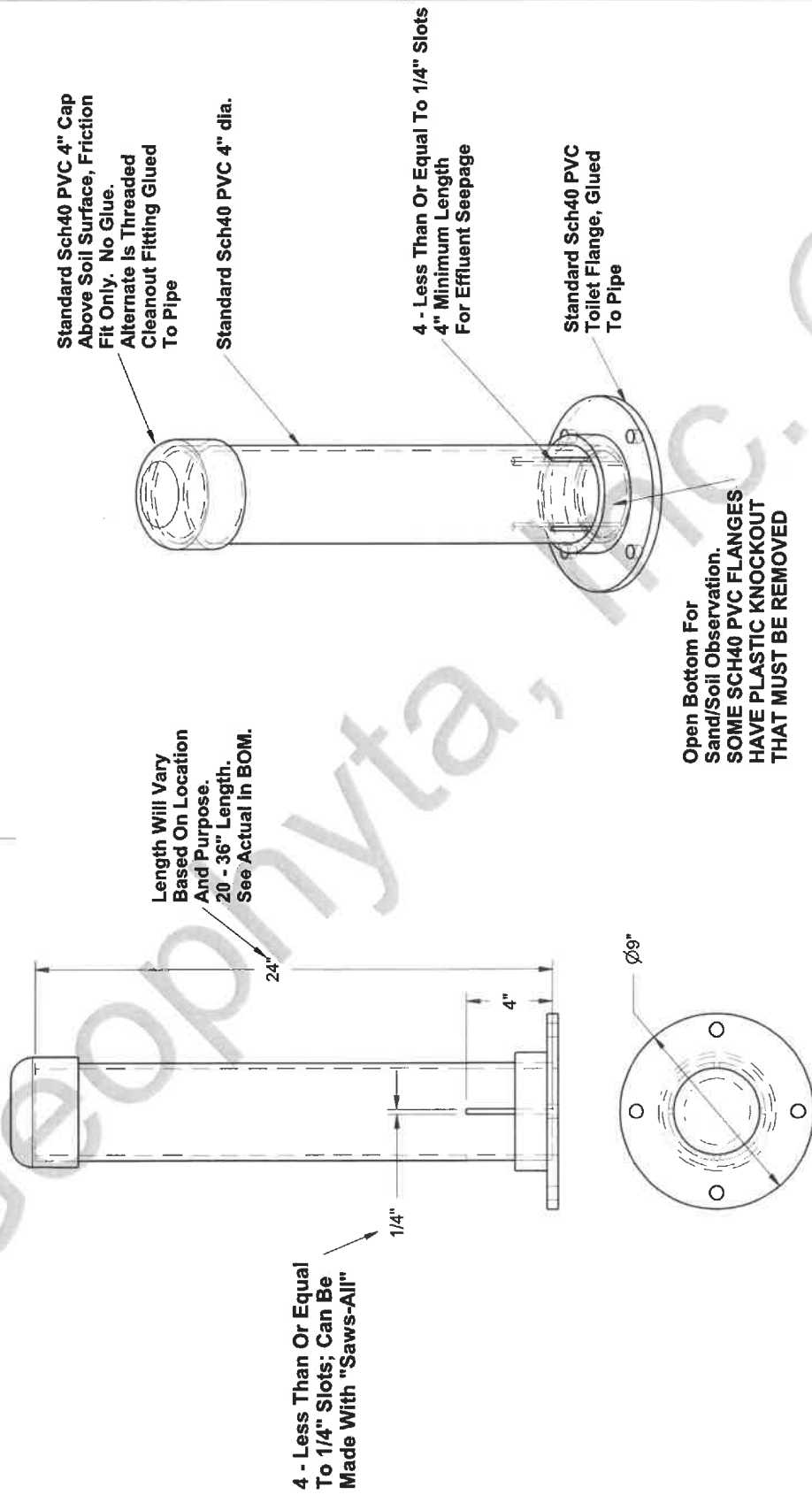
SCALE 1:10 SHEET

REVISIONS		
ZONE	REV	DESCRIPTION
		Drawn By Nathan Wright, Geophyta Inc. 25-Jan-2010

APPROVED

DATE

25-Jan-2010



Standard Sch40 PVC 4" Cap  
Above Soil Surface, Friction  
Fit Only. No Glue.  
Alternate Is Threaded  
Cleanout Fitting Glued  
To Pipe

Standard Sch40 PVC 4" dia.

4 - Less Than Or Equal To 1/4" Slots  
4" Minimum Length  
For Effluent Seepage

Standard Sch40 PVC  
Toilet Flange, Glued  
To Pipe

Length Will Vary  
Based On Location  
And Purpose.  
20 - 36" Length.  
See Actual in BOM.

4 - Less Than Or Equal  
To 1/4" Slots; Can Be  
Made With "Saws-All"

Open Bottom For  
Sand/Soil Observation.  
SOME SCH40 PVC FLANGES  
HAVE PLASTIC KNOCKOUT  
THAT MUST BE REMOVED

SIZE	FSCM NO.	DWG NO.	REV
A			Sand/Soil Observation Tube 20-36inch
SCALE	1:7		SHEET

Bill of Materials - 10835 W. T. R. 41, HSTS Replacement - Engineered Sand Mound		
Quantity	Part Name	Section
1	SCH40PVC4inchTwo-Way Cleanout Tee SxSxS	Sewer Main Replaced to Foundation Total Length of Pipe = ~35' MUST BE SCH40 PVC
1	SCH40PVC4inchpipe2ft.	
1	SCH40PVC4inchCap	
2	SCH40PVC4inchCoupler	
2	SCH40PVC4inch45DegreeEl	
1	SCH40PVC4inchpipe2ft.	
1	SCH40PVC4inchpipe5ft.	Septic Tank
1	SCH40PVC4inchpipe8ft.	
2	SCH40PVC4inchpipe10ft.	
1	Septic Tank	
1	Septic Tank Filter	
1	SCH40PVC4inchCoupler	
1	SCH40PVC4inchpipe3ft.	Septic To Dose
1	Dose Tank	Dose Tank
1	Control Panel	Pump Controller
~50 ft.	2 conductor w/ground, 14 gauge U6 wire	Dose Pump Assembly
~50 ft.	2 conductor w/ground, 14 gauge U6 wire	
~50 ft.	Plastic conduit, to contain 6-14 gauge	
1	Pressure Filter	
1	Effluent Pump 2inchNPT 0.4HP	
1	SCH40PVC2inchpipe1ft. W/ 1/4" Weephole	
2	SCH40PVC2inch90DegreeElbow	
1	SCH40PVC2inchAdapterMNPTtoSoc	
1	SCH40PVC2inchUnionSxS	
1	SCH40PVC1inchpipe6.0ft. L. Float Tree	
2	SCH40PVC2inchpipe3inch	Force Main Total Length of Pipe = ~70' MUST BE SCH40 PVC
1	SCH40PVC2inchpipe6.5inch	
1	SCH40PVC2inchpipe40inch	
5	SCH40PVC2.0inchCoupler	
1	SCH40PVC2.0inch22.5DegreeEl	
1	SCH40PVC2.0inch45DegreeEl	
1	SCH40PVC2.0inch90DegreeEl	
7	SCH40PVC2.0inchpipe10ft.	
1	SCH40PVC2.0inchpipe1ft.	
2	SCH40PVC1.25inch Full-Flow Ball Valve SxS	
1	SCH40PVC2.0inchx2.0inchx2.0inch Tee SxSxS	Force Main To Mound Valvebox
2	SCH40PVC2.0inchx1.25inch Reducer	
2	SCH40PVC4inchpipe1ft.	
2	Infiltrator Q4PPlus8PEndCap Modified For Mound Valvebox	
1	PolyLok 20" D-Box W/ 6" Riser W/ Insulated Lid As Two Valvebox	
2	SCH40PVC1.25inch90DegreeEl	
2	SCH40PVC2.0inchpipe3inch	Mound Valvebox
4	SCH40PVC1.25inchpipe2.5inch	

-	Sand Section 3.75ft. W. x 92 ft. L. x 6 inch H. Basal 10.42 ft. W.	Engineered Sand Mound	~29.0 yd. ^3 @ 50.75 (Tons ASTM C-33 Natural Sand)
-	Topsoil Cap 105.6 ft. L. x 13.6 ft. W. x 2.2 ft. H.		~29.0 yd. ^3 @ 50.75 (Tons Silt Loom Or Better)
46	Infiltrator Q4Plus Equalizer 36 LP Chambers		Infiltrator 4 ft. L. X 2 ft. W. X 8 inch H. LP Chambers
4	Orifice Shields (SEE MOUND DETAIL PRINT)		SIF-106B (See Detail Print)
2	SCH40PVC1.25inchPipe92ft. L. 1/8" Orifices 3.0ft. Spacing W/ Cleanout End Drain		All Holes 12 o'clock Except Holes At Orifice Shields Are 6 o'clock
4	Infiltrator Q4Plus8LPEndCap Modified For 90 Degree Chamber Turn		
4	SDR35PVC4inch45DegreeEl		
1	SDR35PVC4inchpipe2.75ft.		
1	SDR35PVC4inchpipe5ft.		
4	SCH40PVC1.25inch45DegreeEl		
1	SCH40PVC1.25inchpipe2.75ft.		
1	SCH40PVC1.25inchpipe5ft.		
4	SCH40PVC4inchCoupler		
4	SCH40PVC4inchCap		
4	SCH40PVC4inchpipe4inch		
4	SCH40PVC4inchpipe1ft		
2	SCH40PVC4inchCap		
2	SCH40PVC4inchToiletFlangeSoc		
2	SCH40PVC4inchSand Observation Tube 2ft. L W/ Slots		
2	SCH40PVC4inchpipe6inch		
4	SCH40PVC1.25inchpipe3.75inch		
2	Infiltrator Q4Plus8LP End Cap Modified For Mound Valvebox		
2	SCH40PVC1.25inchx1.25inch Coupler SxS		
2	SCH40PVC1.25inchFiptCoupler		
4	SCH40PVC1.25inchDegree45El		
2	PolyLok 12" D-Box W/ (1) 6" Riser W/ Solid Lid Adapted For Mound		
2	SCH40PVC1.25inchMiptPlug		
<b>Additional Notes</b>			
Mound Area to be Scarified According to OSU Mound Systems for Onsite Wastewater Treatment Bulletin 813.			
Pump, Crush & Backfill Old Tankage.			
New Tanks May Require Rock Excavation.			
Fence Removal by Garage May be Needed For Install.			
-	Grass Seed	2 lbs./1000 ft. ^2 K. Bluegrass	~1500 ft. ^2 @ 3.0 lbs.
-	Straw Mulch For Grass Establishment	Homeowner's Choice	~1500 ft. ^2
-	Grass Establishment Fertilizer	10 lbs. 20-10-10/1000 ft. ^2	~1500 ft. ^2 @ 15.0 lbs.
***Call CUPS before you dig.***			
Installer substitution of materials not specified 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 A Sand Mound

Home septic treatment systems are biologically based systems. They rely on both anaerobic and aerobic microorganisms to process human waste. These systems utilize processing, storage, and pumping tanks. A sand/soil absorption component, the mound, 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 “mound system” 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 sand/soil mound area.
  - iv) Do not drive or park cars, boats, heavy equipment, or other vehicles on or near septic system tanks and sand/soil mounds.

- v) Do not add additional soil fill on or near the sand/soil mound. This will limit air movement into the mound for effluent treatment and may cause system failure.
  - vi) Limit lawnmower traffic on the mound when soil is excessively wet.
  - vii) Do not plant any deep rooted plants on top of or near your mound sand/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.
  - 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 bottom of house sewer main two-way cleanout tee
  - 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 soil and sand inspection tubes plus maintenance ports for surface condition, surface color, and depth of ponded effluent, if present.
  - ii) Look for surfacing effluent.
  - iii) Look for excessively moist soil at mound sides and toe slopes.
  - 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 mound area.
- h) Evaluate Laterals:
  - i) Flush all distribution laterals, one at a time. Monitor flush output.
  - ii) Record new distal head pressures for all laterals.
  - iii) Perform additional lateral and orifice cleaning if lateral distal head pressures are not equal.
  - iv) Adjust lateral distal head pressures if needed after additional cleaning.
- 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. See attached "Mound System Inspection and Maintenance Record".
- 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.

## Mound System Inspection and Maintenance Record

System Owner: \_\_\_\_\_

Inspection Date: \_\_\_\_\_

System Address: \_\_\_\_\_

Inspector Name: \_\_\_\_\_

System Address: \_\_\_\_\_

Inspector Phone Number: \_\_\_\_\_

<b>Septic Tank Condition:</b>	Scum depth: Sludge depth: Filter cleaned?
<b>Dose Tank Condition:</b>	Sludge present?
<b>Dose Pump Condition:</b>	
<b>Controls Condition:</b>	Level controls functional? Alarm functional? Control box functional?

**Mound Area Evaluation:**

Landscape Changed?		Signs of Surface Ponding?		Mound Damaged?		New Construction Area?	
yes	no	yes	no	yes	no	yes	no

**Soil Inspection Tubes:**

	Tube 1		Tube 2	
Ponding?	yes	no	yes	no

**Sand Inspection Tubes:**

	Tube 1		Tube 2	
Ponding?	yes	no	yes	no

**Cleanout Ports:**

	Port 1		Port 2		Port 3		Port 4	
Ponding?	yes	no	yes	no	yes	no	yes	no
Pressure:		feet		feet		feet		feet

	Port 5		Port 6		Port 7		Port 8	
Ponding?	yes	no	yes	no	yes	no	yes	no
Pressure:		feet		feet		feet		feet

Comments/Sketches:

