

GEOPHYTA

Home Septic System Site Evaluation And Replacement System Design

For

Mark Holman

**1813 E. S.R. 18
Tiffin, OH 44883**

419-448-4083

Property Location:

**1813 E. S.R. 18
Tiffin, OH 44883**

Clinton Township, Seneca County

Engineered Sand Mound W/ Perimeter Drain

By

**Nathan Wright
Seth V. Layne**

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

419-547-8538

September 7, 2019

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:	MARK + DIANA HOLMAN
Address:	1813 E. ST. RT 18
City, State:	TIFFIN OHIO
Home Phone:	419-448-4083
Cell Phone:	
Email:	

Property:

Parcel #:	
Current Owner:	SAME
Address:	—
City, State:	—
Lot Size:	?
Right of Ways?	?
Easements?	?

Existing or Proposed or Lot Split: (circle one)

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

Diana Holman

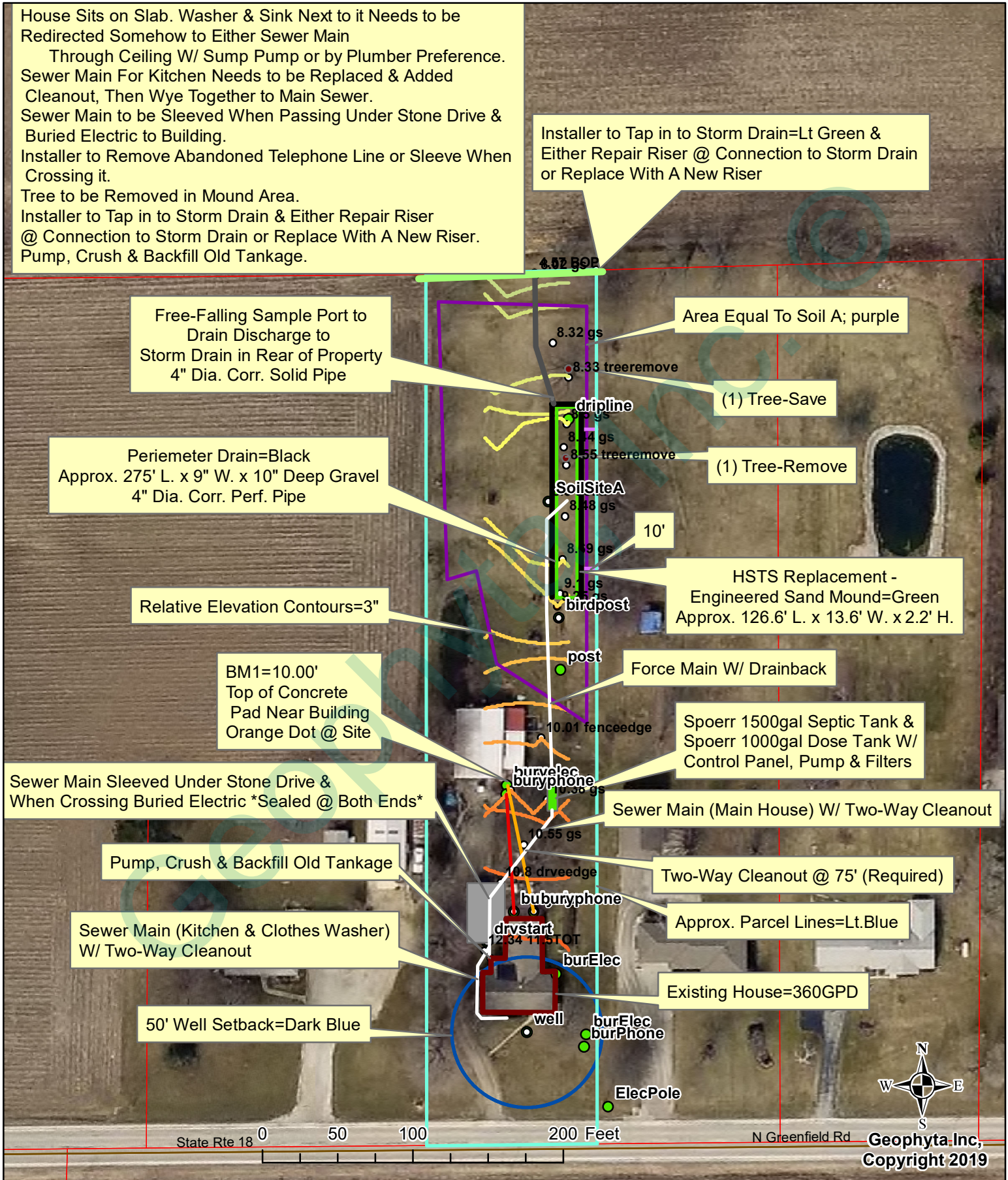
8-25-19

Customer Signature

Date

Payment received:

HSTS Replacement Layout - 1813 E. S.R. 18



Site and Soil Evaluation for Sewage Treatment and Dispersal

County: Seneca
 Township / Sec.: Clinton
 Property Address: 1813 E. S.R. 18
 OR Location: Tiffin
 Applicant Name: Mark Holman
 Address: 1813 E. S.R. 18
Tiffin OH 44883
 Phone #: 419-448-4083
 Lot #: _____
 Test Hole #: A
 Latitude/Longitude: 83°8'4.613"W 41°7'31.537"N
 Method: _____ Pit _____ Auger Probe; 1 1/4" dia.

Land Use / Vegetation: Residential Turf
 Landform: Glacial Till Plain
 Position on Landform: Flat
 Percent Slope: 1 - 2
 Shape of Slope: Linear - Linear
 Approximate Soil Type: Pewamo SiCL

Control #: 19- SEN - 26A - 207



Certification #: 19395

Date: 26-Aug-19
 Evaluator: Nathan Wright
Geophyta, Inc.
2685 C.R. 254
Vickery, OH 43464
 Phone#: 419-547-8538

Signature: *Nathan Wright*

Soil Profile		Estimating Soil Saturation			Estimating Soil Permeability							Other Soil Features
		Munsell Color (hue, value, chroma)			Redoximorphic Features		Texture			Structure		
Horizon	Depth (inches)	Matrix Color	Concentrations	Depletions	Class	Approx. % Clay	Approx. % Fragments	Grade	Size	Type (shape)	Consistence	
A1	0.0 - 8.0	10YR 3/3	none	none	SiCL	30	0	2-MOD	fine	sbk	friable	
A2	8.0 - 12.0	10YR 3/3	5% 7.5YR 4/6	10% 10YR 4/1	SiCL	30	0	2-MOD	fine	sbk	firm	
Btg	12.0 - 27.0	10YR 4/1	25% 10YR 4/6	matrix	SiCL	35	0	2-MOD	medium	pr	firm	
Cg	27.0 - 48.0	10YR 4/1	35% 10YR 4/6	matrix	SiCL	35	0	2-MOD	medium	sbk	firm	

Limiting Conditions	Depth to (in.)	Descriptive Notes	Remarks / Risk Factors: Values for Sand Mound
Perched Seasonal Water Table	8.0	Restricted in Btg and Cg	Tyler Table: A1 horizon (0.0 - 8.0) ILR: SiCL, HLLR: SiCL
Apparent Water Table	>48		ILR(>30mg/L) = .4 gal/day/ft ² , ILR(<30mg/L) = .6 gal/day/ft ²
Highly Permeable Material	>48		HLLR = 2.4 gal/day/ft
Bedrock	>60	By Tile Probe	3 bedroom min. required absorption area = 900 sq.ft.
Other Restrictive Layer	>48		5xW Soil Absorption Box: 30' W. x 150' 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	
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)
B	Subsurface accumulation of clay, Fe, Al, Si, humus; sesquioxides; loss of CaCO ₃ ; 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
			Numerical Prefixes: Used to denote lithologic discontinuities.
			Numerical Suffixes: Used to denote subdivisions within a master horizon.

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: Holman: Site A	Design		
Residence W/ 3 bedroom	Min. Design	Actual Design	Comment
Water Use (gal/day)(DFR)	360		
Limiting Condition	PSWT		
Depth To Limiting Condition (inches)	8.0		
Total Infiltration Depth (Soil+Sand) (in.)	14.0		
Sand Depth To Add (in.)	6.0		
Most Limiting Soil Texture	SiCL		
Site Slope % (Perpendicular To Contour)	0.0		
Tyler Table Values			
Soil Infiltration Loading Rate (gal/day/sq. ft)(BLR)	0.4		
Soil Hydraulic Linear Loading Rate (gal/day/ft)(HLLR)	2.4		
Sand Loading Rate (gal/day/sq. ft)(SLLR)	1.0		
Required Soil Absorption Area (sq. ft.) DFR/BLR	900.0		
Mound Design Requirements			
Sand Absorption Area Width (ft)(A)	2.4	3.70	
Sand Absorption Area Length (ft)(B)	150.0	112.0	25.3% Length Reduction
Sand Distribution Area for Laterals(sq. ft.)	360.0	414.4	
Min. Mound Basal Soil Width (ft)(I+A+J)(HLLR/BLR)	6.0	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 Endslope Width at 3:1 (in)(K)	78.0		
Mound Overall Length (ft)(L)	163.0	126.6	to use infiltrator domes, 4 ft. L
Mound Overall Width (ft)(W)	13.0	13.6	
Mound Overall Height (ft)	2.2	2.2	

	A	B	C	D
1	Mound Dosing Calculations: Gravelless Chambers			
2				
3	Owner: Holman: Site A	Design		
4		Target	Formula	Actual
5	Sand Absorption Area Width (ft)(A)	3.70		
6	Sand Absorption Area Length (ft)(B)	112.0		
7	Sand Distribution Area for Laterals(sq. ft.)	414.4	B5*B6	
8				
9	Area Per Orifice (sq. ft.)	6.00		
10	Orifice Quantity (Dist. Area/Std)	69.1	B7/B9, Rnd to Even; Divide by 4	68.0
11	Total Laterals Length (ft)	224.0		
12	Number of Laterals C	4		
13	Each Lateral Length (ft.)(B/C)	56.0	B11/B12	
14	Orifice Separation (length/# orifices)(ft.)	3.2	B11/B10	3.3
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)	1.00	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	Lateral Design:			
22	Diameter (in)	1.00	Sch40 PVC	
23	Flow Rate per Lateral (gpm)	7.1	B10/B12*B19	
24	Flow Rate Total (gpm)	28.3	B10*B19	
25	Gal. per Foot of Pipe (Clemons, 1991)	0.045	Sch40 PVC	
26	Total Lateral Volume (gal)	10.1	B11*B25	
27				
28	Manifold Design:	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	Main Design:			
49	Diameter (in)	2.00	Sch40 PVC	
50	Length (ft)	188		
51	Gal. per Foot of Pipe (Clemons, 1991)	0.174		
52	Total Main Volume (gal)	32.71	B36*B37	
53	# Std 90deg Elbows	3		
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	3		
58	Std Tee Pipe Length Equivalent (ft)	11.0		
59	# Quick Disconnects	1		
60	Quick Disconnect Pipe Length Equivalent (ft)	2.0		
61	# Full Flow Ball Valves	4	1.00" Dia.	
62	Ball Valves Pipe Length Equivalent (ft)	0.9		
63				
64	Total Length Equivalent (pipe&fittings) (ft)	257.6	B50+(B53-62)	

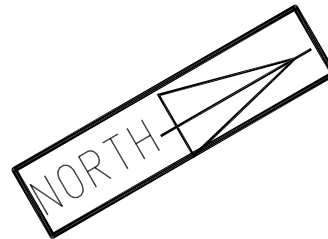
	A	B	C	D
1	Mound Dosing Calculations: Gravelless Chambers			
2				
3	Owner: Holman: Site A	Design		
4		Target	Formula	Actual
65	Head Loss per 100 ft.(ft.)(Otis et al, 1978)(Zoeller)	1.55		
66	Total Main Head Loss (ft)	3.99	(B64/100)*B65	
67				
68	Dose Volume:			
69	Total Lateral Volume (gal)	10.08	B26	
70	Total Manifold Volume (gal)	0.00	B32	
71	Total Main Volume (gal)	32.71	B52	
72				
73	Drainback Volume: Main+Manifold+Lateral (gal)	42.8	B69+B70+B71	
74	Lateral Vol x 6 (gal)	60.5	B69*5 (Minimum)	
75	TOTAL dose (gal)	103.3		
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	Total Dynamic Head:			
82	Static Lift - Lateral Ht. Above Surface (ft)	0.50	6.0 inch Sand	
83	Static Lift - Depth to Pump Off Below Surface (ft)	5.75	6.58 - .83	
84	Static Lift - Topo Difference (ft.)	-1.3	-	
85	Total Pipe & Fittings Headloss (ft)	4.0	B46+B66	
86	Network Loss (5ft head x 1.3) (ft)(includes laterals)	6.5	-	
87	Total Head Loss (ft)	15.5	sum(B81:B85)	
88				
89	Dose Tank Parameters			
90	Volume (gal)	1000	48.5	inches effluent
91	Gallons Per Inch in Tank	20.60		
92				
93	Timed Dose Settings:			
94	Total Gallons Per Pump Cycle W/drainback	103.3	5.01	inches drawdown
95	Total Pump Cycles Per 24 Hrs.	6.0		
96	Total Pump On Time - seconds	219		
97	Total Pump Off Time - hours	4.0		
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)	15.0		
100	High Level Alarm Ht. from bottom (in.)	22.3	(provides 1 & 1/2 day reserve after alarm)	

NOTES

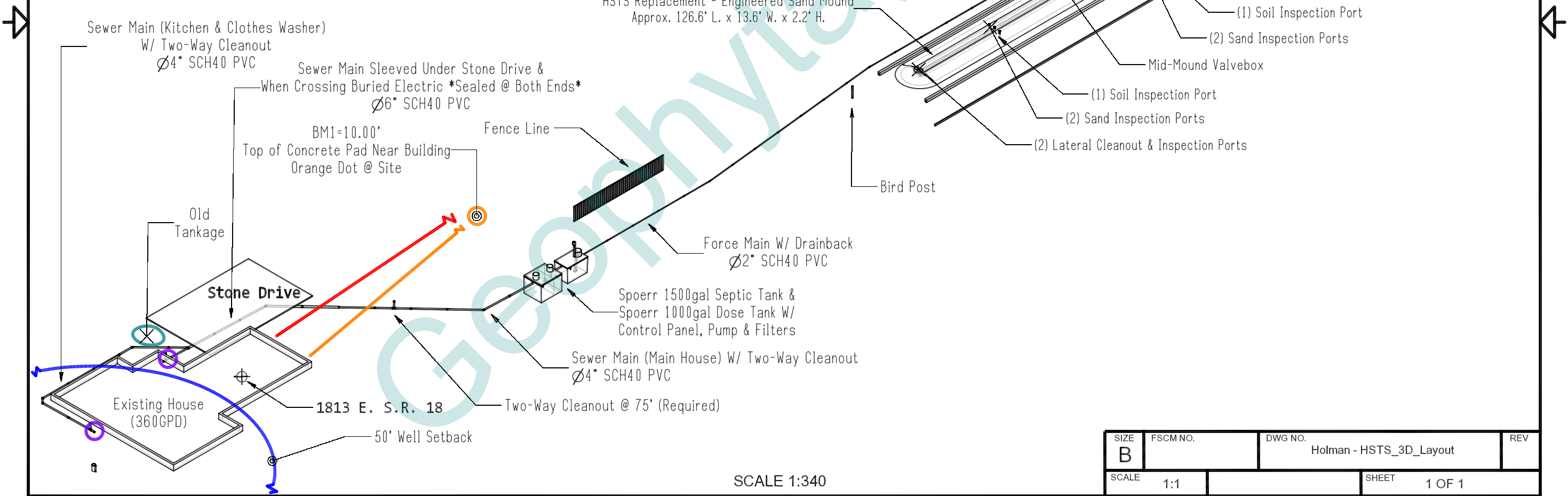
- ▷ House Sits on Slab. Washer & Sink Next to it Needs to be Redirected Somehow to Either Sewer Main Through Ceiling W/ Sump Pump or by Plumber Preference.
- ▷ Sewer Main For Kitchen Needs to be Replaced & Added Cleanout, Then Wye Together to Main Sewer
- ▷ Sewer Main to be Sleeved When Passing Under Stone Drive & Buried Electric to Building
- ▷ Installer to Remove Abandoned Telephone Line or Sleeve When Crossing it
- ▷ Tree to be Removed in Mound Area
- ▷ Installer to Tap in to Storm Drain & Either Repair Riser @ Connection to Storm Drain or Replace With A New Riser
- ▷ Pump, Crush & Backfill Old Tankage

LEGEND

- Sewer Mains —
- Soil Stake (A) —
- BM1/Buried Telephone —
- Old Tankage —
- Well —
- Buried Electric —



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
		DRAWN BY: SETH V. LAYNE, GEOPHYTA INC.	06.SEP.19	



SCALE 1:340

SIZE B	FSCM NO.	DWG NO. Holman - HSTS_3D_Layout	REV
SCALE 1:1		SHEET 1 OF 1	



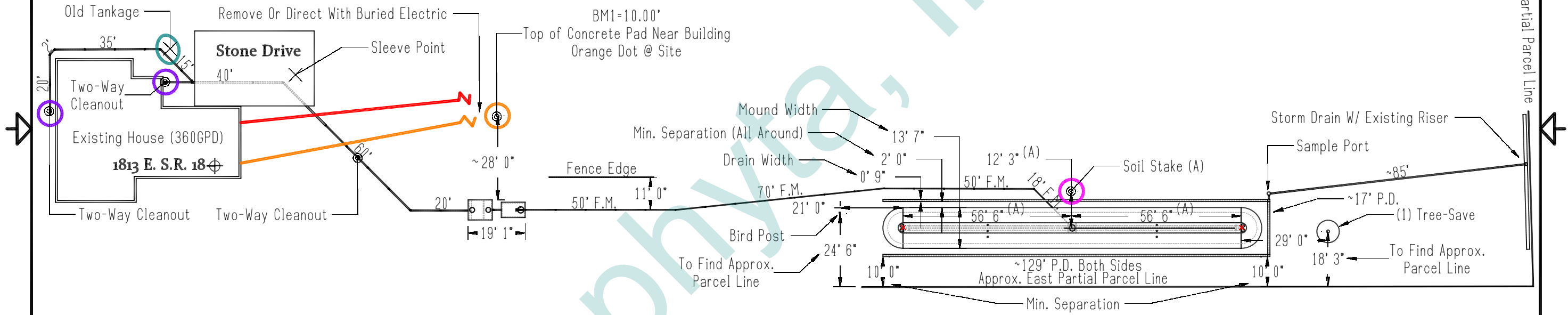
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
DRAWN BY: SETH V. LAYNE, GEOPHYTA INC. 07.SEP.19				

NOTES

- Mound Layout To Be Done Solely By Soil Stake (A) And Basic Mound Dimensions. All Other Dimensions Referencing Mound Are For The Convenience of Cross Checking The Layout And May Vary From Design
- 12' 3" E. & 56' 6" N. & S. From Soil Stake (A) Will Locate Mound Center Straight 113' 0".
- Or Mound Layout Can be Done From Bird Post & Tree Measurement Along With 12.75' Provided For 10' Min. Separation Between Perimeter Drain & East Parcel Line.
- Any Uncertainty to Locate East Parcel Line Should be Surveyed Before System Installation. Design Incorporates Auditor Prop. Lines Assisted W/ GPS & May Vary From Actual Property Boundary.

LEGEND

- Sewer Mains
- Soil Stake (A)
- BM1/Telephone Line
- Old Tankage
- Buried Electric
- F.M. = Force Main Length
- P.D. = Perimeter Drain Length

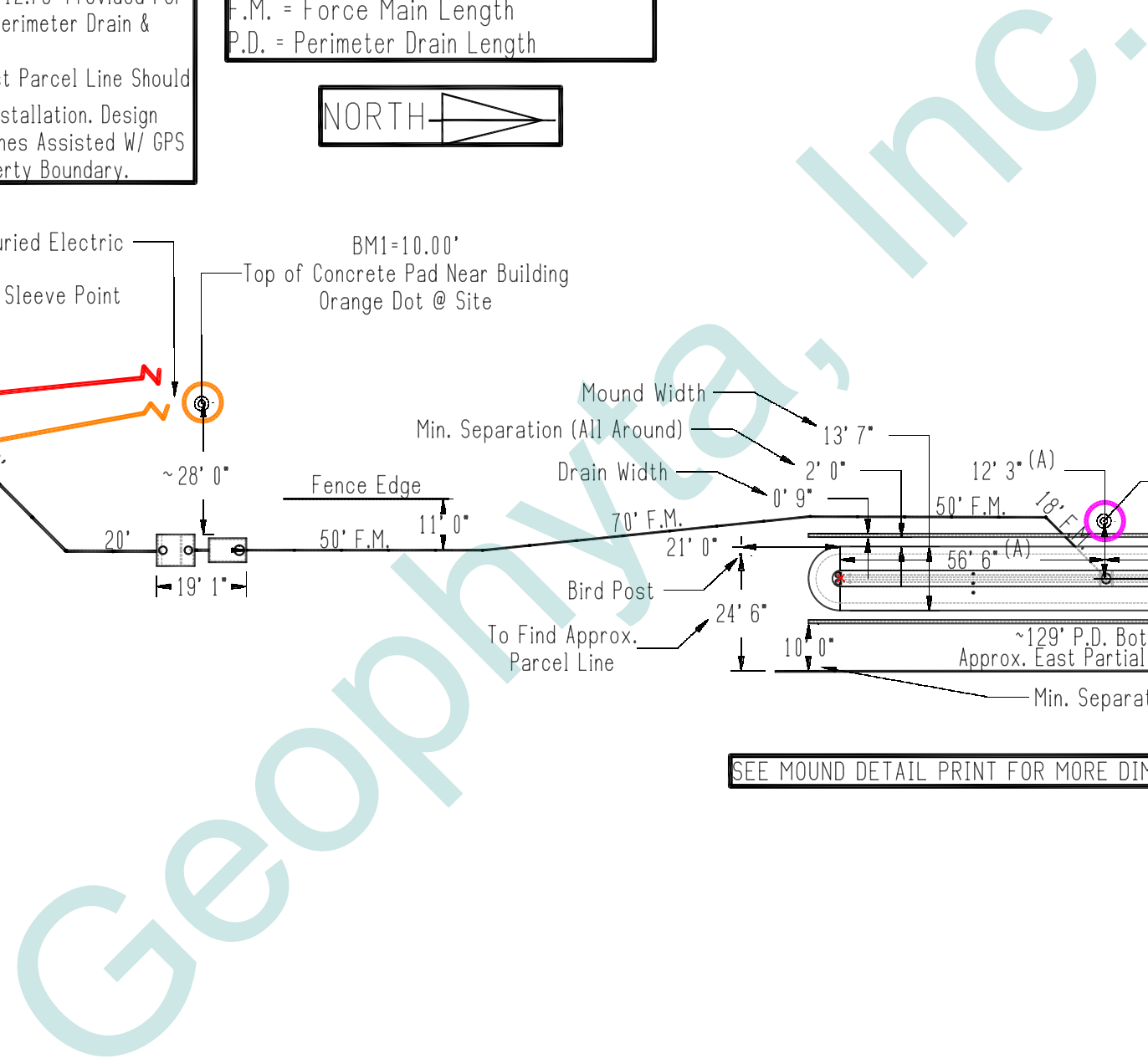


SEE MOUND DETAIL PRINT FOR MORE DIMENSIONS REFERENCING MOUND

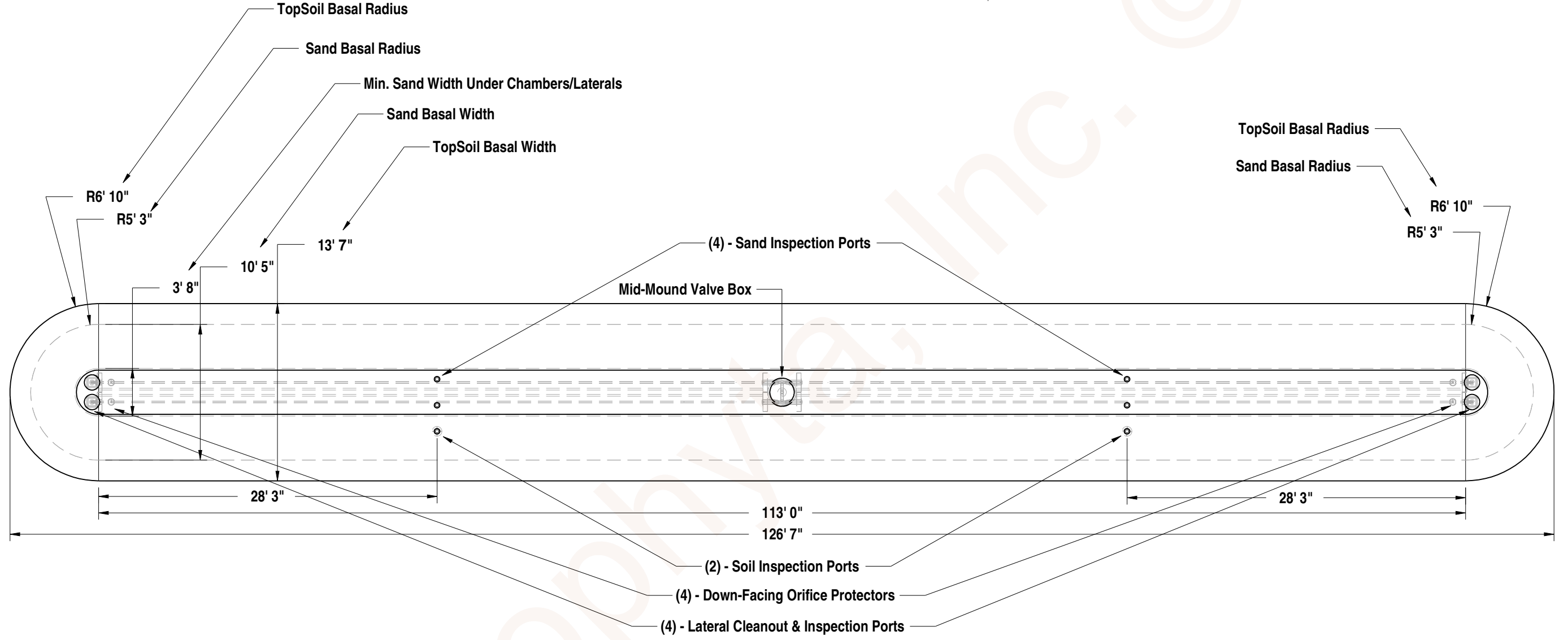
SCALE 1:410

SIZE B	FSCM NO.	DWG NO. Holman - HSTS_Top	REV
SCALE 1:1	SHEET 1 OF 1		

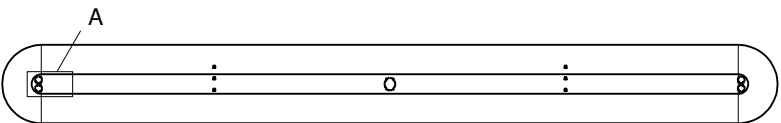
Approx. North Partial Parcel Line



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
DRAWN BY: SETH V. LAYNE, GEOPHYTA INC.			29.OCT.18	



SIZE B	FSCM NO.	DWG NO. HSTS_Mound Detail	REV
SCALE 1:1	SHEET 1 OF 1		



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 Difusers.

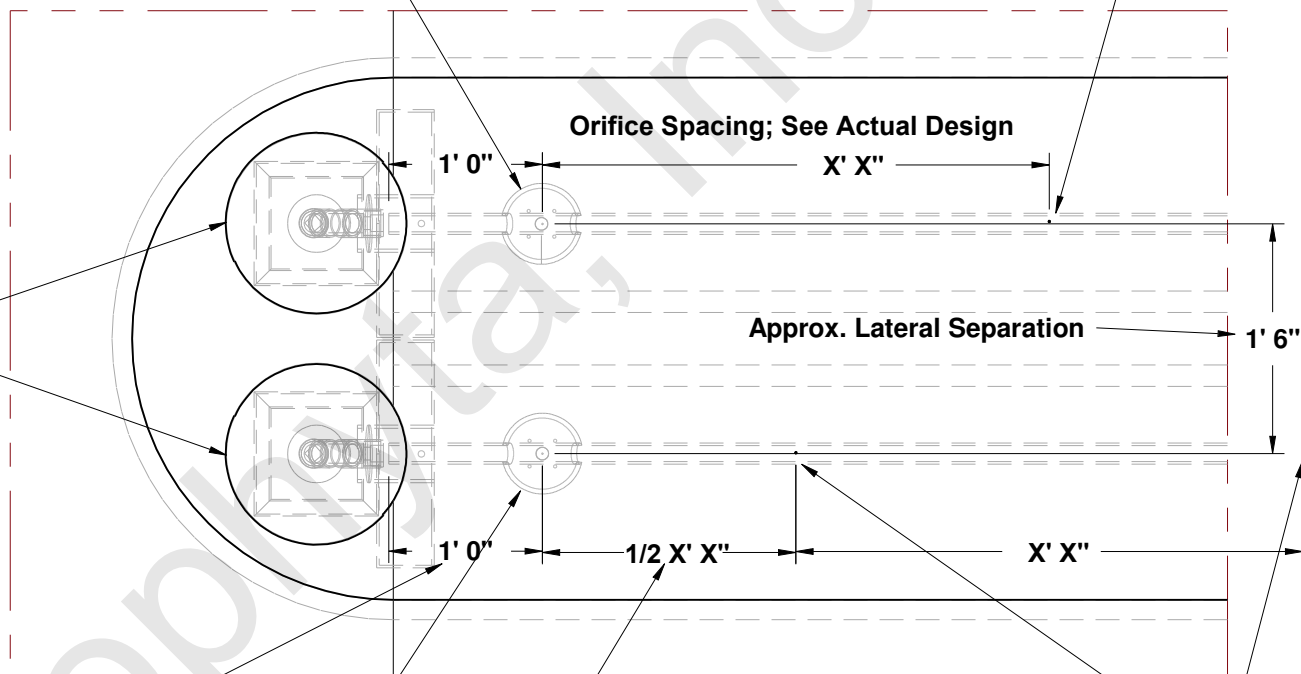
Can Be Adjusted To Help With Stagger

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.

6 O'Clock, End Drain Orifice With Orifice Protector

12 O'Clock Orifices; Remainder Of Lateral



Approx. Lateral Separation

12 O'Clock Orifices; Remainder Of Lateral

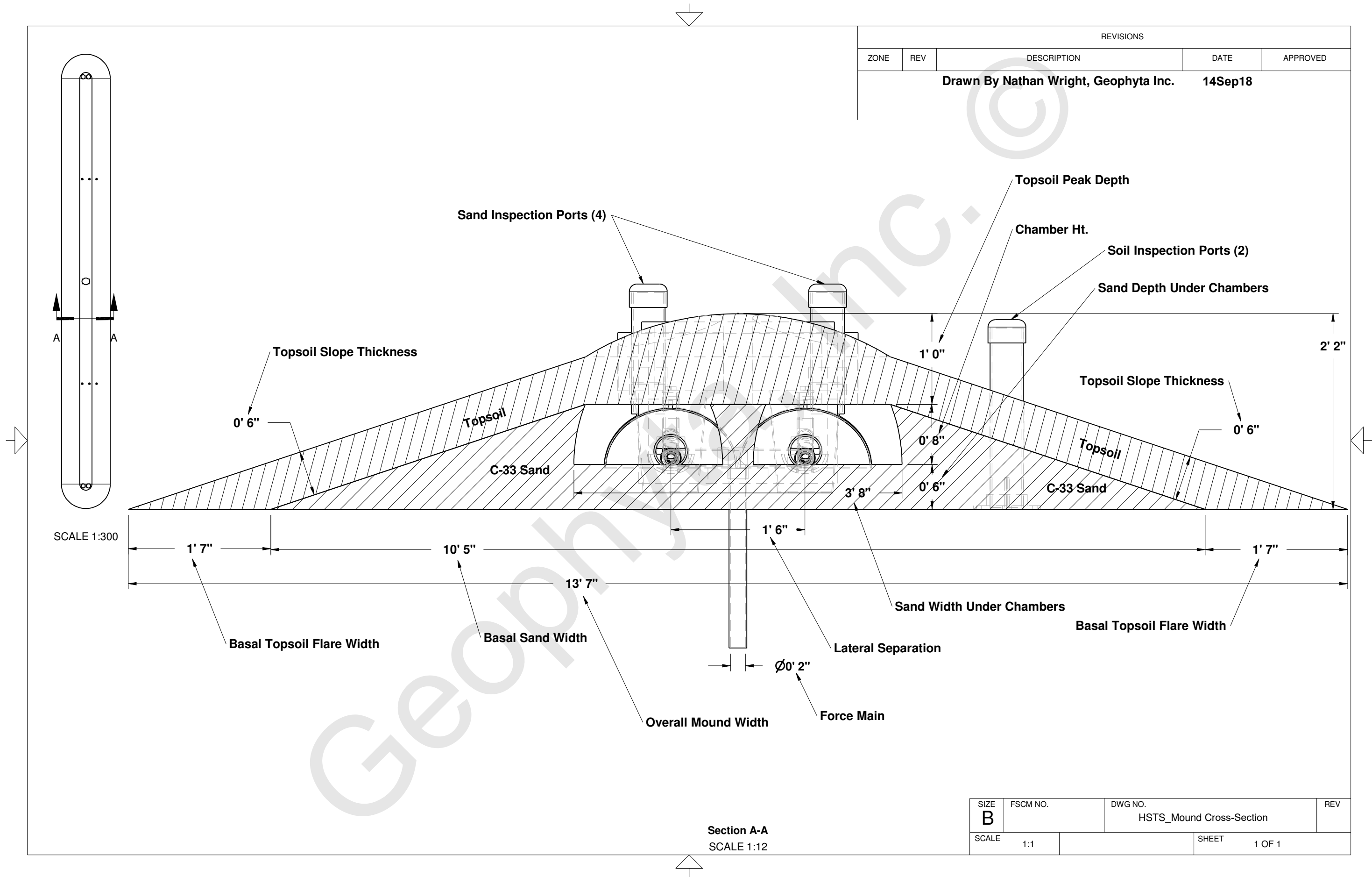
Detail A
SCALE 1:15

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

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

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

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
Drawn By Nathan Wright, Geophyta Inc.			14Sep18	



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

NOTES

- > Sand Depths Under Chambers Due To Soil Unevenness:
Avg. = 11.7" Range = 6.0" - 13.9"
- > Sewer Main to Have Suggested Fall or .125"/1'
- > Force Main Must Have Drainback With Suggested Fall or 1"/100'
- > Perimeter Drain & Discharge to Have Min. Fall 1.2"/100'
- > Perimeter Drain to Fall With Ground Surface, Bottom of Sample Port Incorporates This Fall From the Elevation Difference

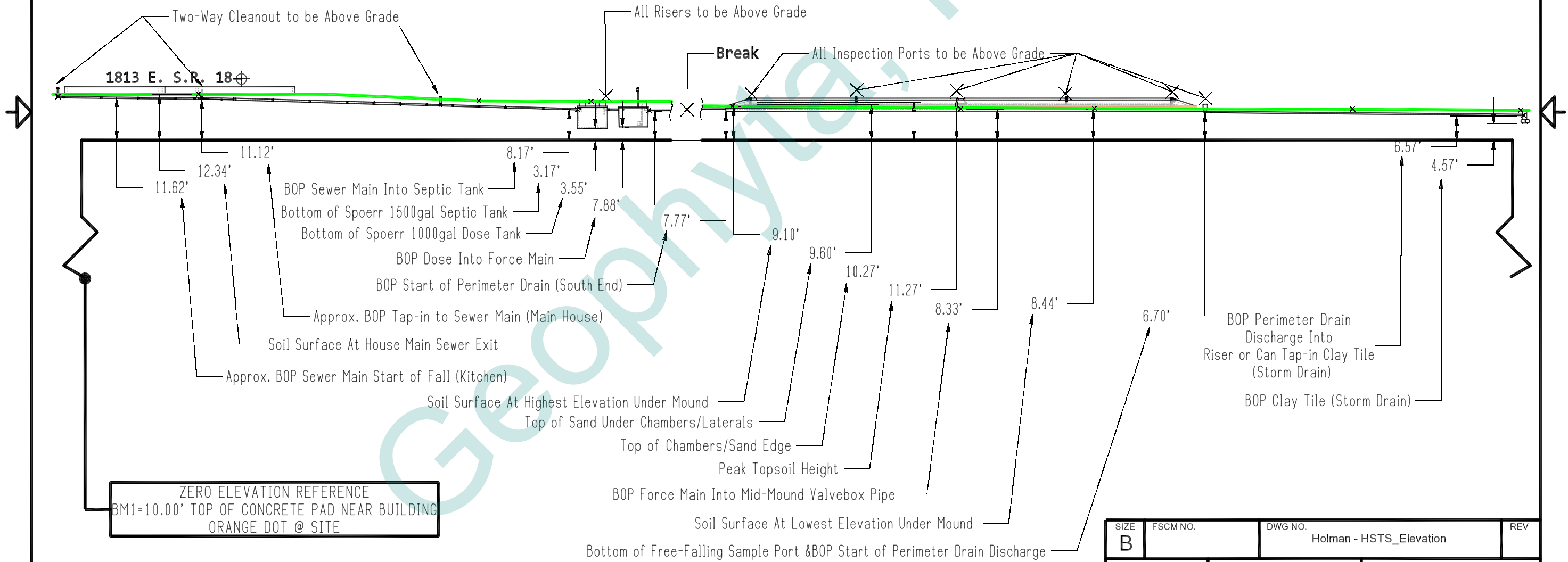
LEGEND

- Soil Surface —
- Extra Sand Fill —
- Zero Elevation Reference —

ELEVATION VIEW - EAST TO WEST
NORTH

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

DRAWN BY: SETH V. LAYNE, GEOPHYTA INC. 07.SEP.19

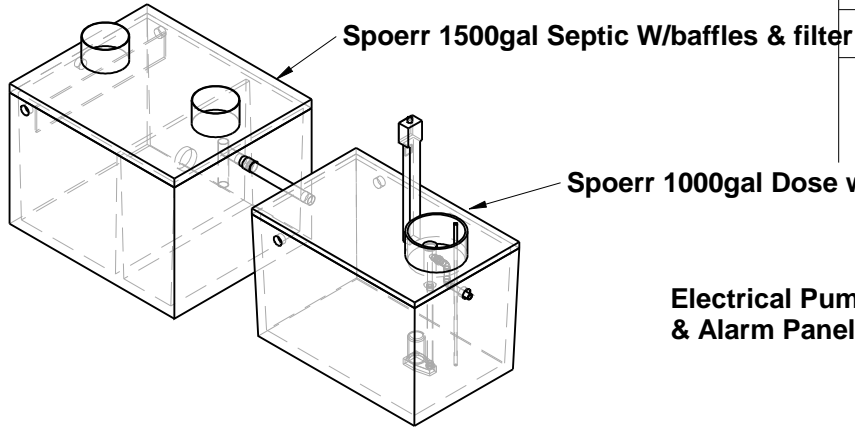


ZERO ELEVATION REFERENCE
BM1=10.00' TOP OF CONCRETE PAD NEAR BUILDING
ORANGE DOT @ SITE

SIZE B	FSCM NO.	DWG NO. Holman - HSTS_Elevation	REV
SCALE 1:1	SHEET 1 OF 1		



Scale 1:80



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

Drawn By Nathan Wright, Geophyta Inc. 26-Jan-15

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

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

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

PVC Pipe Dia. Will Vary Based On Design.

Ø24.00"

2.00"

Discharge Filter, 1/16" Slot Size.

Effluent Pump, 2" Discharge.

.25"

1/4" Drainback Hole, REQUIRED

Float Tree Rail

PL122 Filter, or equiv.

4" Sch40PVC

36.00"

Spoerr 1500 gal Septic

Spoerr 1000 gal Dose

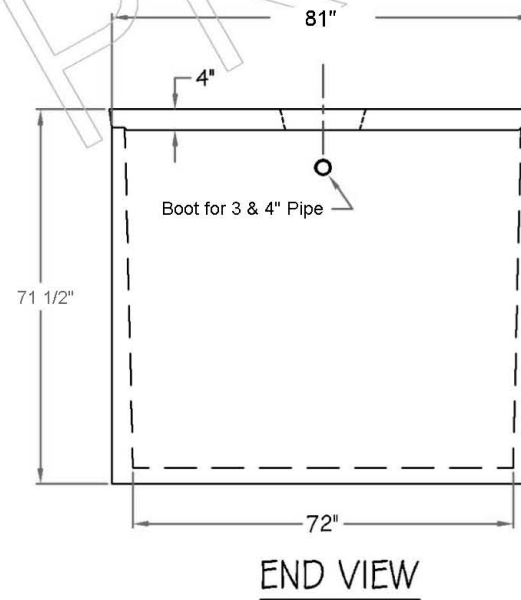
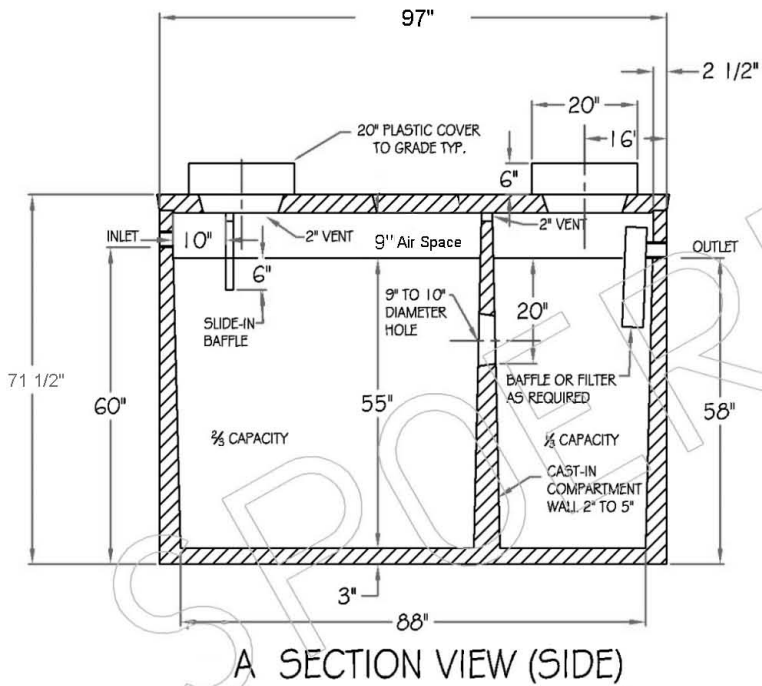
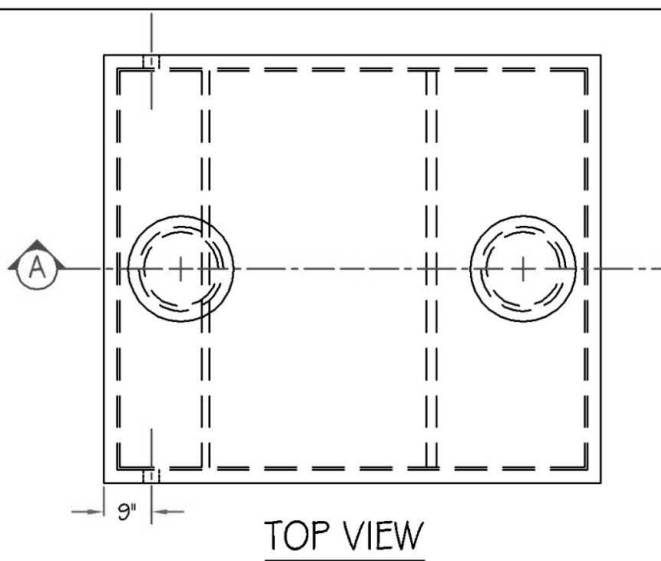
Scale 1:30

SIZE A	FSCM NO.	DWG NO. Spoerr 1500gal Septic/1000gal Dose+Controller	REV
SCALE various			SHEET



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



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

NOTES:

Excavation 7'9" x 9'

**1500 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:

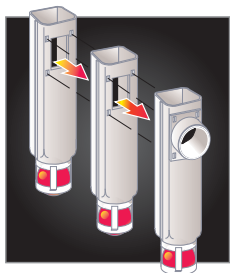
Ideal for residential waste flows up to 1,500 gallons per day (GPD). Easily installs in any new or existing 4" outlet tee.

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.

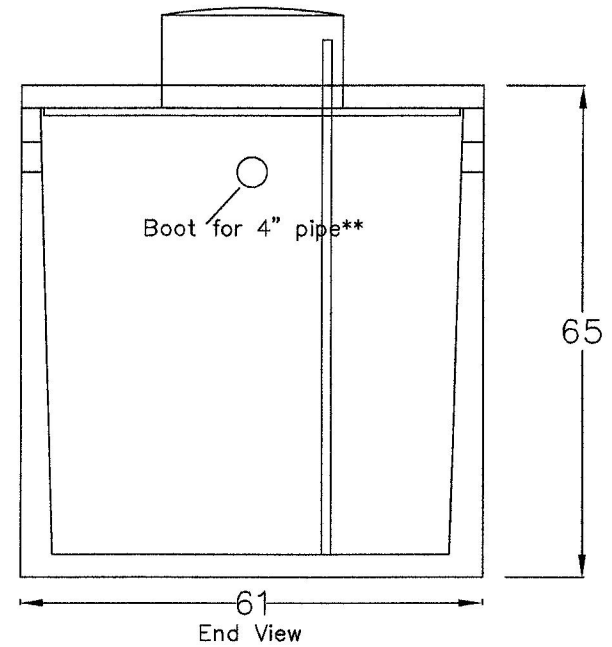
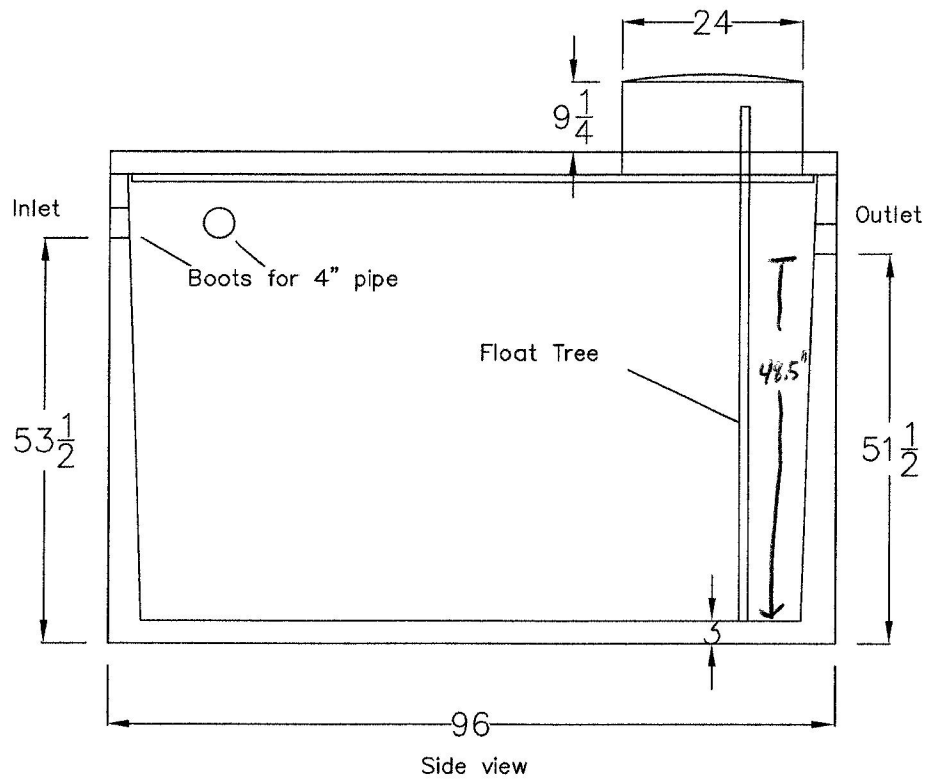


Polylok offers the only filter on the market where you can get more GPD by simply snapping our filters together!

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

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





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.

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
 Sealant: Meets ASTM C990
 **Optional 4x2 slip reducer available
 20.8 Gallon/inch

1000 Gallon Pump Tank
 Excavation 6' x 9'

09/22/09

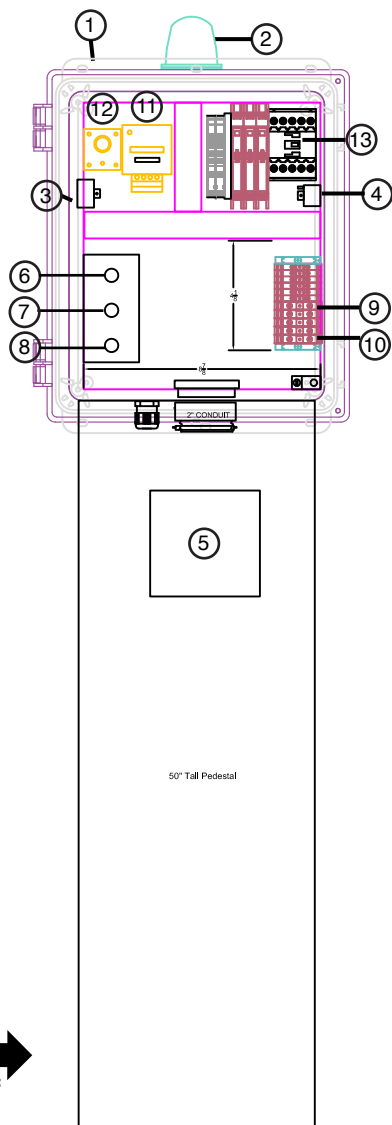
7937

Time Dose-Demand Simplex

120 VAC Single Phase Simplex Mounted on 50" Tall Pedestal

Description of Operation

The 7937 is a NEMA 4X (outdoor & indoor rated) SINGLE PHASE SIMPLEX Time Dose/Demand Dose control panel that will operate a 120/230VAC pump for water or wastewater applications. This panel operates with (3) float switches. A red alarm beacon is located on top of the control panel. Use the Time Dose/Demand Dose Selector switch inside the panel to choose your application. The panel includes alarm auto reset. When the high liquid level is cleared, the alarm will automatically reset.



Includes Qty 3
20' Normally Open Unimax
Control Floats



Curved post with included
2.5" Hub fits snug against
riser for easy and waterproof
installation. →

Electrical Ratings

- 1 Phase
- 0-15 Amps
- 120/230 VAC
- 60 Hz.

Features and Benefits

- Time Dose/Demand
- Alarm auto reset
- ETM/Event Counter
- 50" Tall Pedestal
- Qty 3 20' floats
- UL Listed

External Components

- ① 10X8X6 Padlockable
NEMA 4X Thermoplastic
- ② Moisture Tight Beacon
- ③ Alarm Buzzer (95dB)
- ④ Test Switch
- ⑤ 50" Pedestal With Access Door

Internal Components

- ⑥ Pump Run Indicator
- ⑦ HOA Switch
- ⑧ Time Dose/Demand Dose Selector Switch
- ⑨ Incoming Pump Power Terminal Blocks
- ⑩ Incoming Alarm Power Terminal Blocks
- ⑪ ETM & Event Counter
- ⑫ Timer
- ⑬ Motor Contactor

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

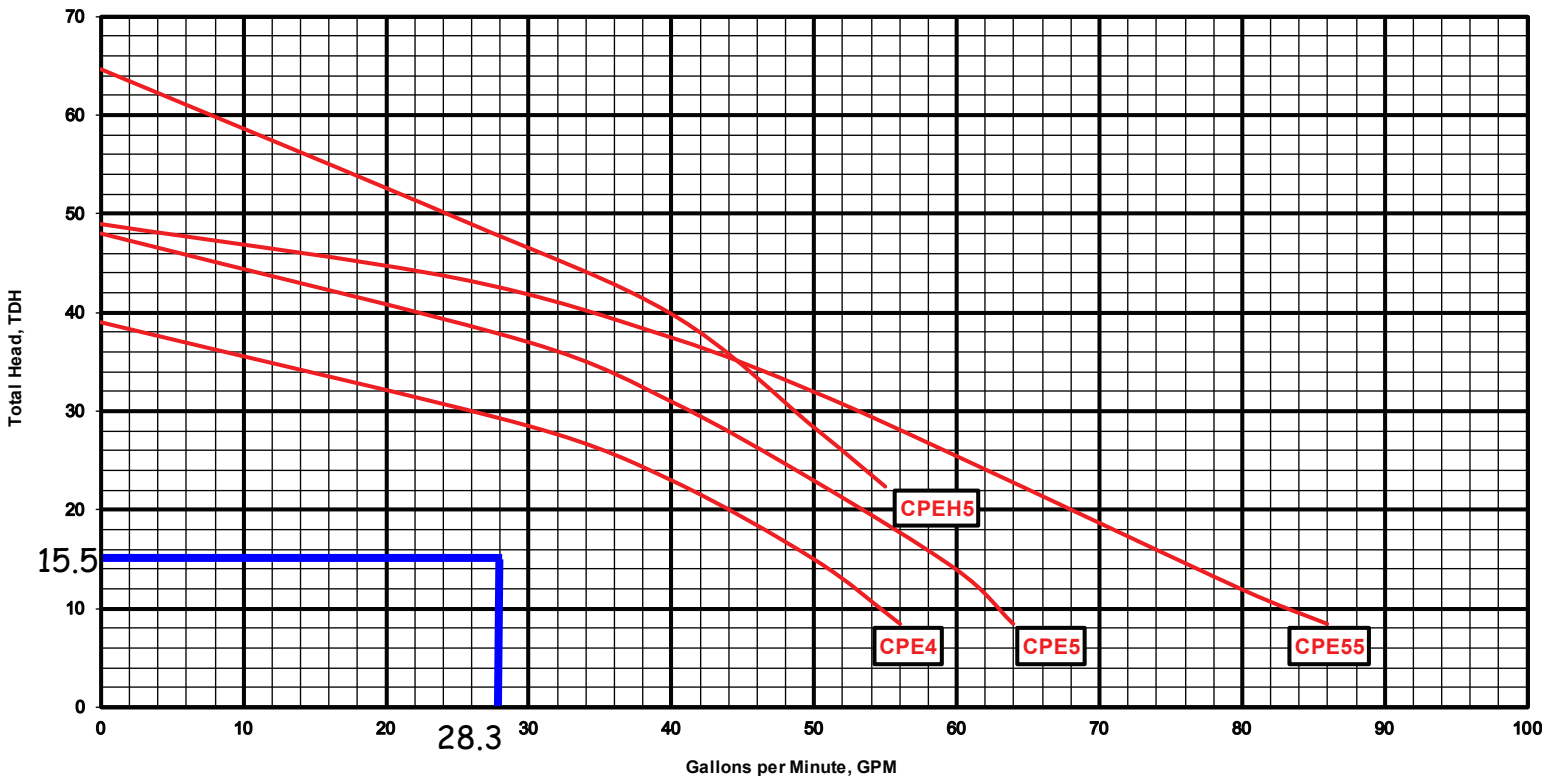


Vertical Float

Wide-Angle Float

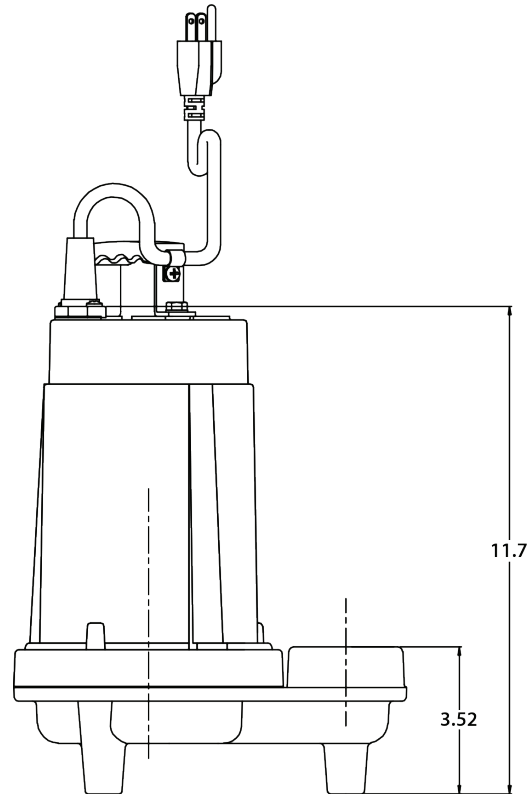
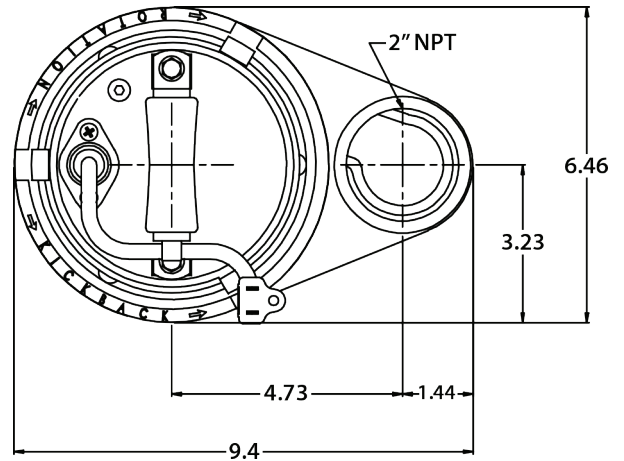
4/10-1/2 HP submersible pumps that handle up to 3/4" solids with 2" discharge

PERFORMANCE CURVE



TECHNICAL DATA

DISCHARGE	2" NPT. vertical standard
LIQUID TEMPERATURE	140 Degrees F. (Intermittent)
MOTOR HOUSING	Cast Iron
VOLUTE	Cast Iron
SEAL PLATE	Cast Iron
IMPELLER	Cast Iron / Vortex (CPEH thermoplastic vortex)
SOLIDS HANDLING	3/4"
SHAFT	Stainless Steel
SHAFT SEAL (SINGLE SEAL)	Inboard mechanical with secondary exclusion V-Seal, carbon rotating face, ceramic stationary face, Buna-N elastomer, 300 series stainless steel hardware
BEARINGS (UPPER & LOWER)	Single row, ball, oil lubricated
HARDWARE	300 Series stainless steel
O-RINGS	Buna-N
CORD	20' Length standard. Up to 100' available. (UL/CUL) Listed 16 AWG, Type SJTW
MOTOR (SINGLE PHASE)	4/10-1/2 HP 3450 RPM, 60 Hz, NEMA L Includes Overload Protection in the motor, oil filled, class B permanent split capacitor
WEIGHT	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)

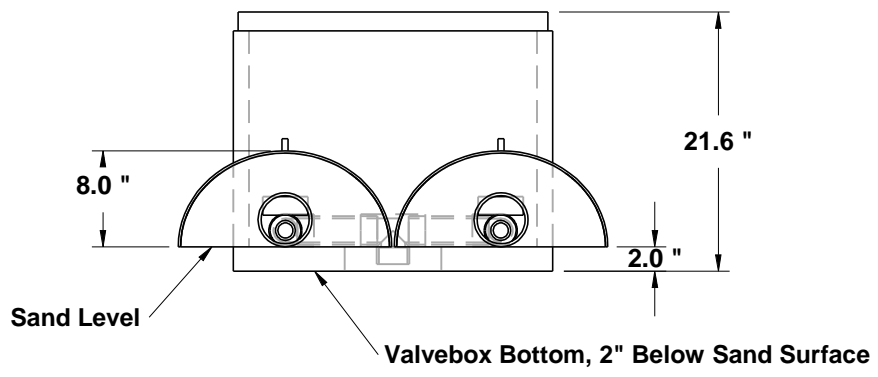
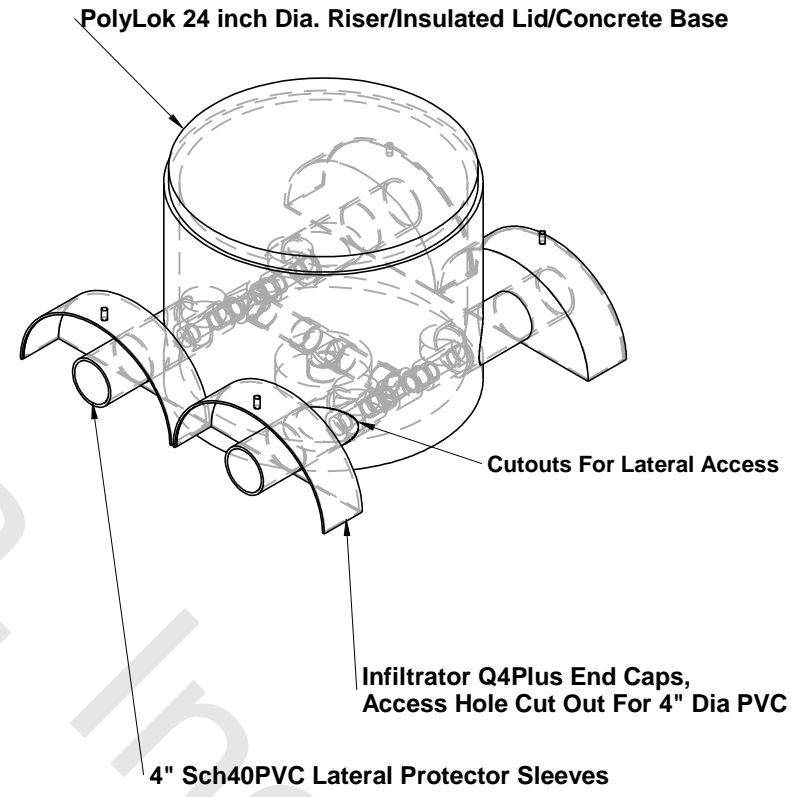
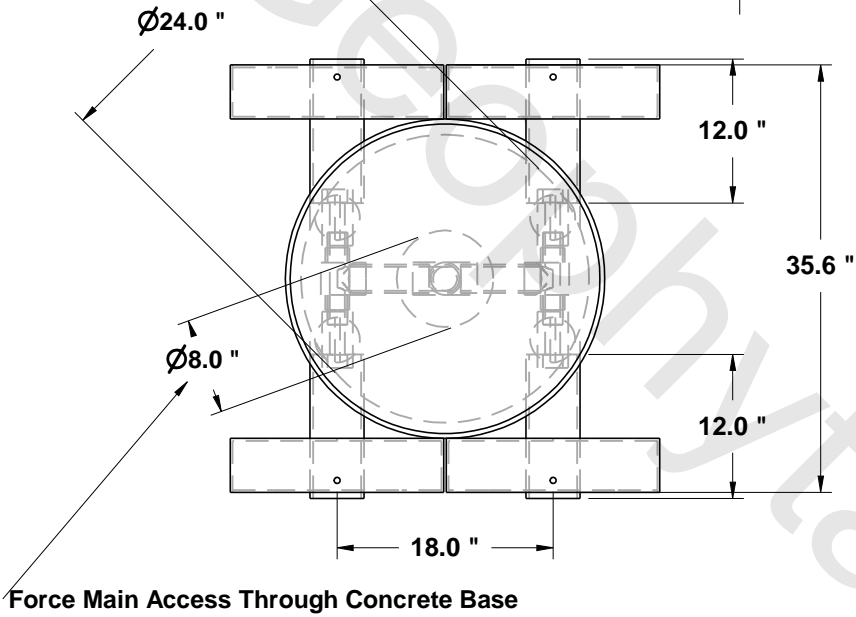
Socks easily install inside stainless steel screen.



REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
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Drawn By Nathan Wright, Geophyta Inc. 3-Oct-13



SIZE A	FSCM NO.	DWG NO. Spoerr 24" Dia. 4 - Valve Box	REV
SCALE 1:15	SHEET		





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:

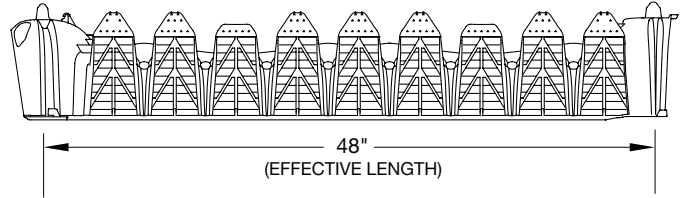
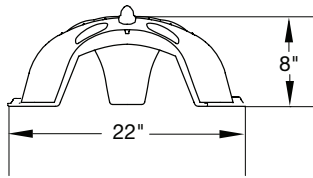
- Simple, flat design
- Allows installation of a pipe from the end only
- Piping drill points are set for gravity or pressure pipe



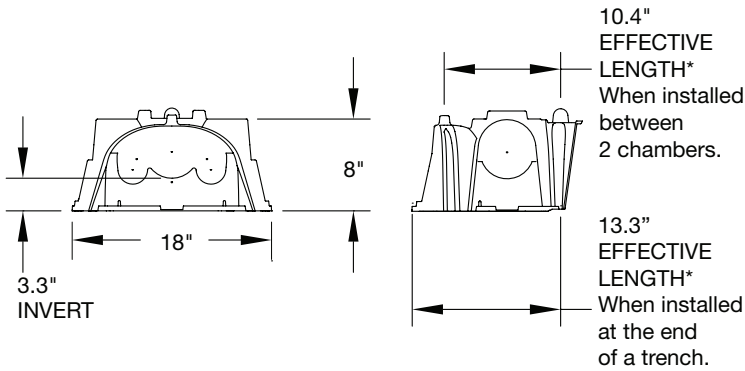
Certified by the International Association of Plumbing and Mechanical Officials (IAPMO)



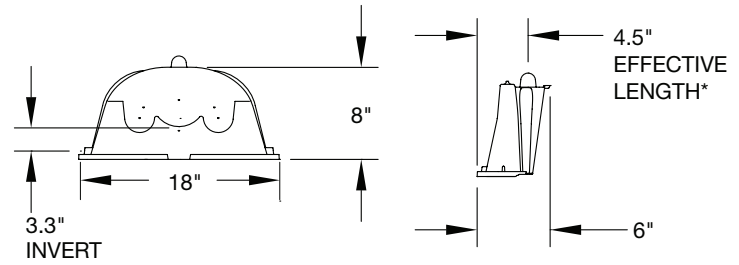
Quick4 Plus Equalizer 36 Low Profile Chamber



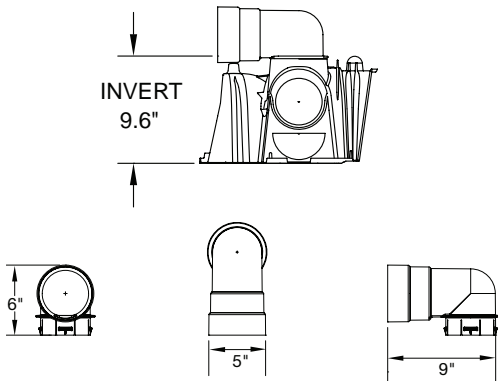
Quick4 Plus All-in-One 8 Endcap



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

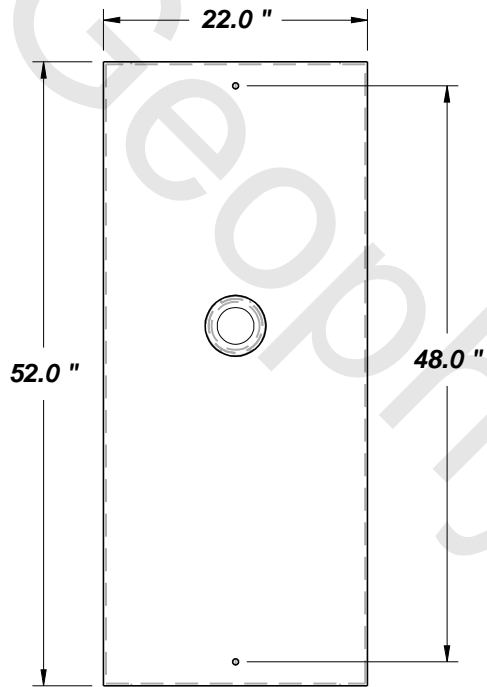
U.S. Patents: 4,759,661; 5,017,041; 5,156,488; 5,336,017; 5,401,116; 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,844 Canadian Patents: 1,329,959; 2,004,564 Other patents pending. Infiltrator, Equalizer, Quick4, and SideWinder are registered trademarks of Infiltrator Water Technologies. Infiltrator is a registered trademark in France. Infiltrator Water Technologies is a registered trademark in Mexico. Contour, MicroLeaching, PolyTuff, ChamberSpacer, MultiPort, PosiLock, QuickCut, 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.



REVISIONS

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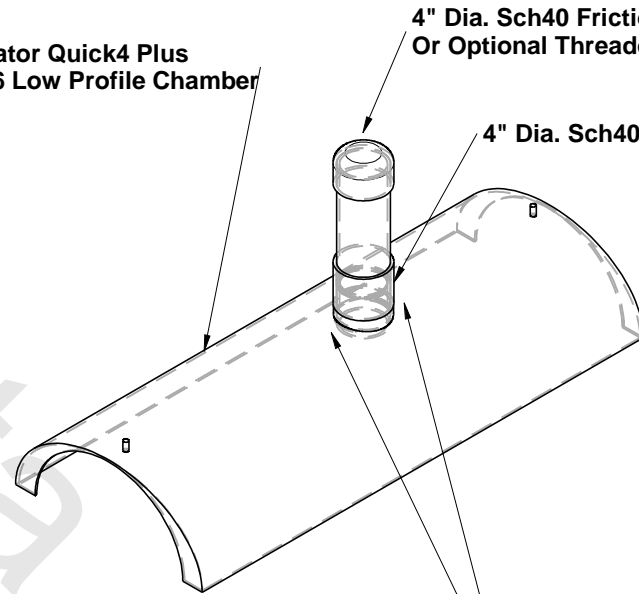
Drawn By Nathan Wright, Geophyta Inc. 22-Oct-13



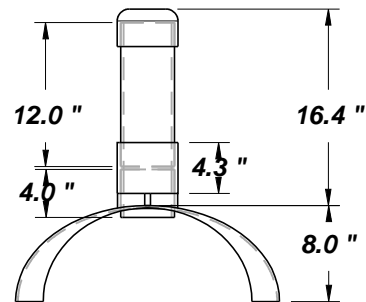
Infiltrator Quick4 Plus
Equalizer 36 Low Profile Chamber

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 A	FSCM NO.	DWG NO.	REV
SCALE 1:15	Sand Inspection Port For Dome Chamber Mounds		SHEET



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



REVISIONS

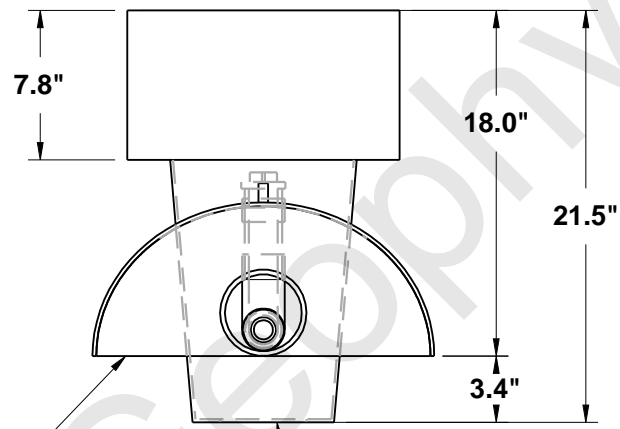
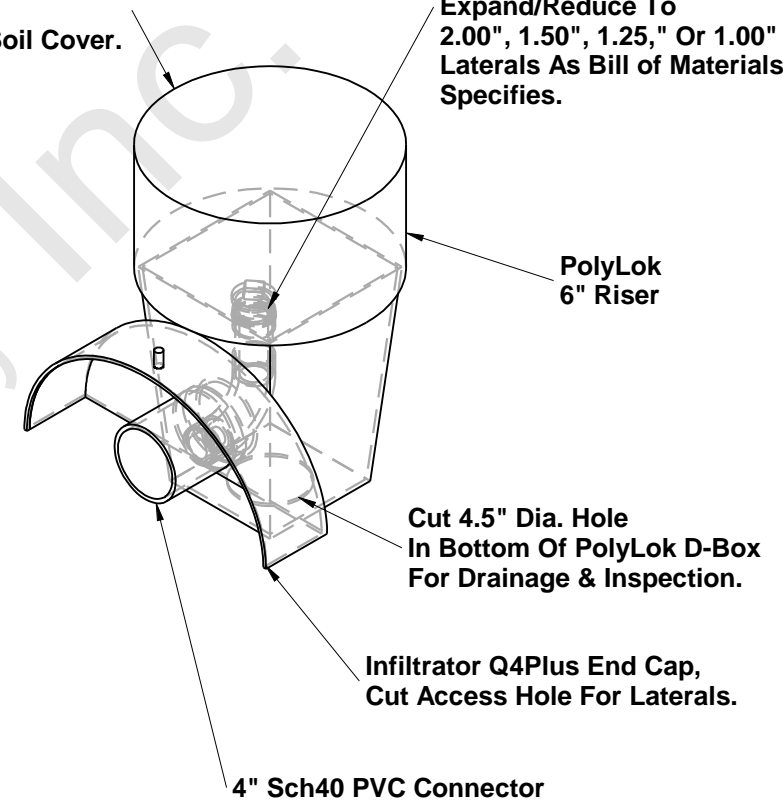
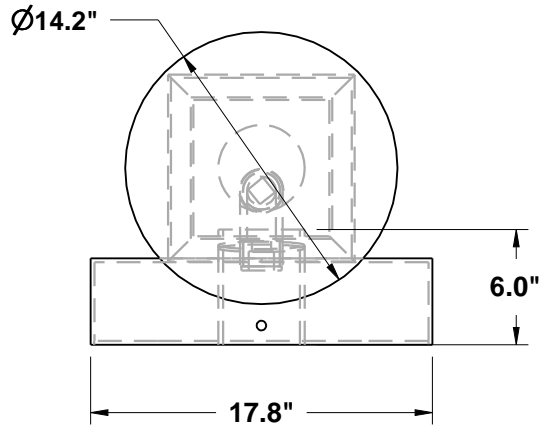
ZONE	REV	DESCRIPTION	DATE	APPROVED
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Drawn By Nathan Wright, Geophyta Inc. 19-Jan-15

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.



Sand Surface

Bottom Of PolyLok Box, 3.4" Into Sand

SIZE A	FSCM NO.	DWG NO. 12" PolyLok Cleanout Port For Chambers	REV
SCALE 1:10	SHEET		





REVISIONS

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



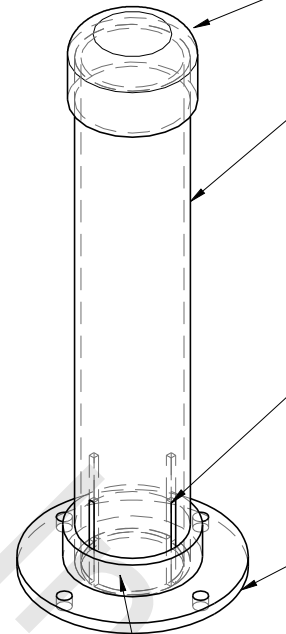
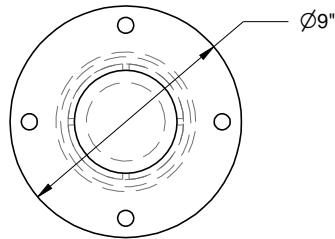
Length Will Vary Based On Location And Purpose. 20 - 36" Length. See Actual in BOM.

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

1/4"

24"

4"



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

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

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





REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
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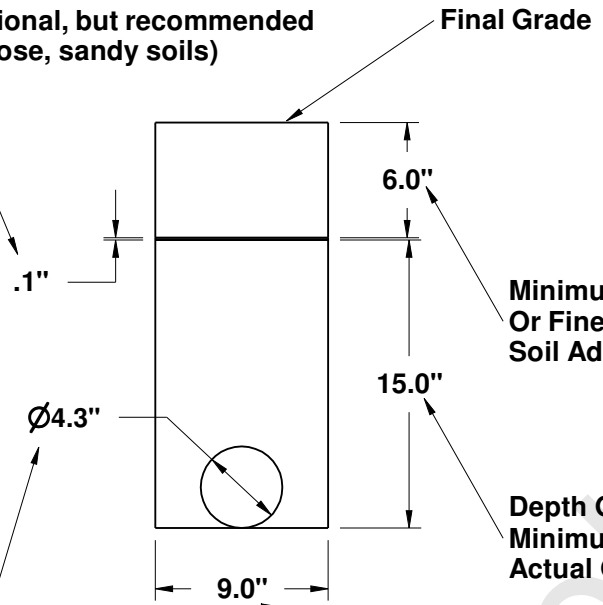
Drawn By Nathan Wright, Geophyta, Inc. 21-Jun-16

Cross Section Of Trencher Dug Interceptor/Perimeter/Engineered Drain

\\ Use of 4" Corrugated, Slotted Field Tile Still Requires Gravel Fill //

Section Of Trencher Dug Interceptor/Perimeter/Engineered Drain

Geofabric Cover On Gravel.
(Optional, but recommended
in loose, sandy soils)



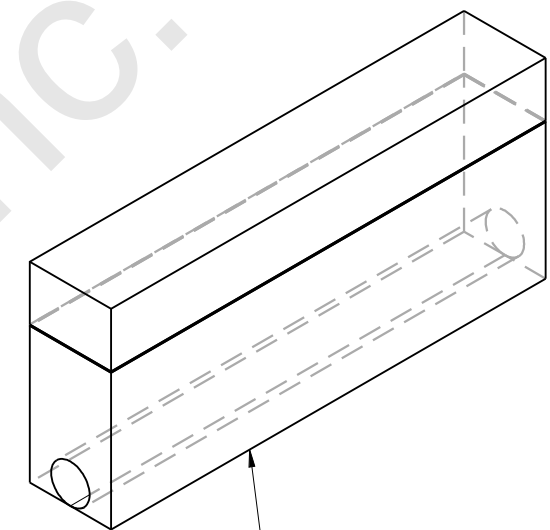
Final Grade
Minimum Soil Cover; Native Topsoil
Or Fine Sandy Loam When More Than 2"
Soil Added Above Original Grade.

Depth Of Gravel.
Minimum Acceptable Gravel Depth = 10.0".
Actual Gravel Depth: See Design Prints & Bill Of Materials.

Trench Width.
Acceptable Range: 6.0 - 24.0"

Pipe O.D.; Corrugated, Slotted Field Tile

SCALE 1:10



Trench Bottom Minimum
Slope = 1/10 ft (1.2 in.)/100 ft.

SCALE 1:15

**Installer Must Record Actual Trench Dimensions & Components
On As-Built Drawings Submitted To Health Department**

SIZE A	FSCM NO.	DWG NO. Trencher Dug Interceptor/Perimeter Drain	REV
SCALE 1:1	Copyright, 2016 Geophyta, Inc.	SHEET 1 OF 1	

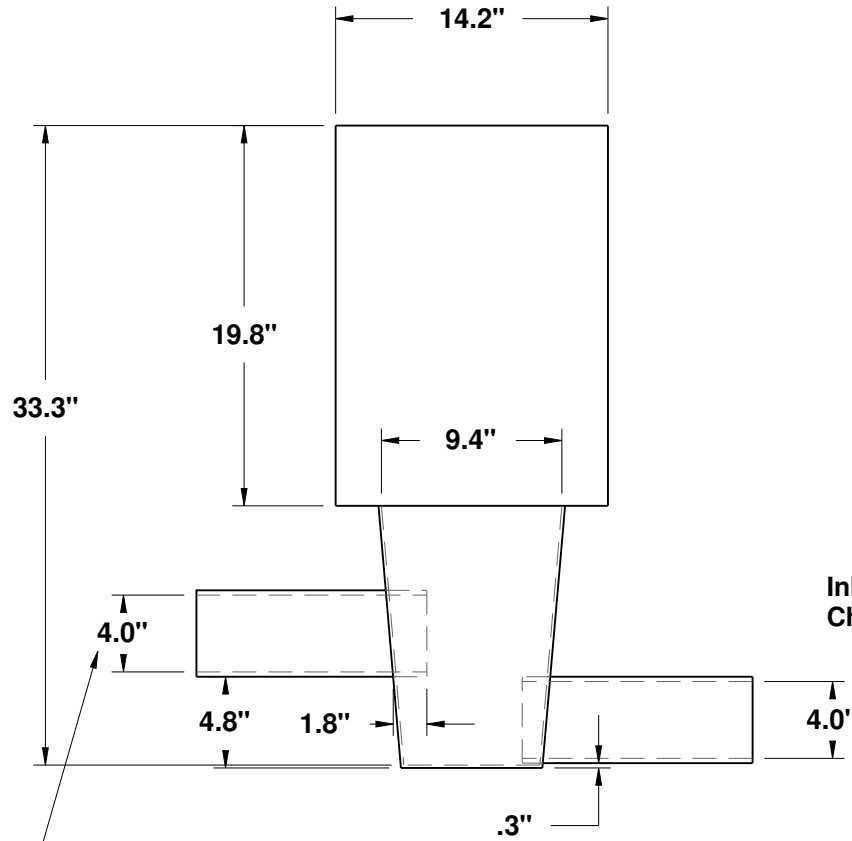




REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
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Drawn By Nathan Wright, Geophyta Inc. 31-Dec-15



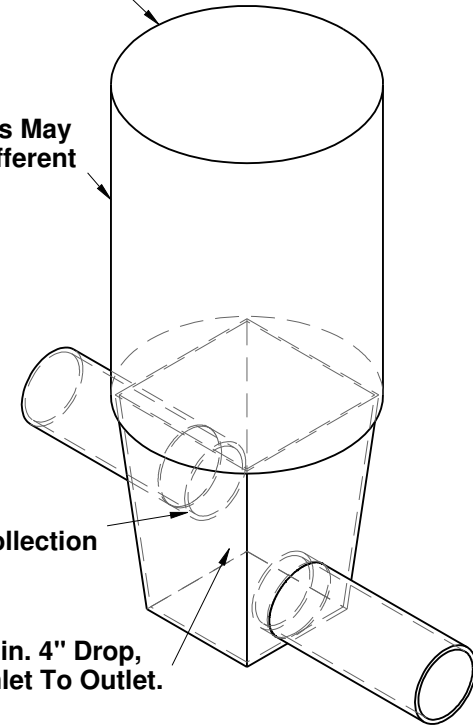
Pipe Diameter Will Range From 1.5" - 4.0" Dia. See BOM For Actual

PolyLok 12" D-Box With 3 - 6inch Risers And Lid

More Or Less Risers May Be Required For Different Installation Depths. See Actual BOM.

Inlet Must Extend Into Chamber For Sample Collection

Min. 4" Drop, Inlet To Outlet.



SIZE A	FSCM NO.	DWG NO. Free Falling Sampling Port	REV
SCALE 1:10	SHEET		



Bill of Materials - 1813 E. S.R. 18, HSTS Replacement - Engineered Sand Mound W/ Perimeter Drain

Quantity	Part Name	Section	Comment
2	SCH40PVC4inch Two-Way Cleanout Tee SxSxS	Sewer Main (Main House)	Two-Way Cleanout (Tee)
2	SCH40PVC4inch pipe2ft.		Two-Way Cleanout (Tee to Cap)
2	SCH40PVC4inch Cap		Two-Way Cleanout (Cap)
8	SCH40PVC4inch Coupler		Config. By Installer
2	SCH40PVC4inch 45Degree Ell		
1	SCH40PVC4inch Wye SxSxS		
12	SCH40PVC4inch pipe10ft.		
1	SCH40PVC4inch Two-Way Cleanout Tee SxSxS		
1	SCH40PVC4inch pipe2ft.		
1	SCH40PVC4inch Cap		Sewer Main (Kitchen)
5	SCH40PVC4inch Coupler		
3	SCH40PVC4inch 45Degree Ell		
1	SCH40PVC4inch pipe2ft.		
2	SCH40PVC4inch pipe5ft.		
6	SCH40PVC4inch pipe10ft.		
3	SCH40PVC6inch Coupler	Sewer Main Sleeve	Seal @ Both Ends
1	SCH40PVC6inch 45Degree Ell		
5	SCH40PVC6inch pipe10ft.		
1	Septic Tank	Septic Tank	Spoerr 1500gal Septic Tank W/ 18" Risers
1	Septic Tank Filter		Polylok PL-122 or Equiv. (See Detail Print)
1	SCH40PVC4inch pipe3ft.	Septic To Dose	Length May Vary
1	SCH40PVC4inch Coupler		
1	Dose Tank	Dose Tank	Spoerr 1000gal Dose Tank W/ 18" Riser
1	Control Panel	Panel For Pump & Timing	Alderon 7937 Control Panel (See Detail Print)
~45 ft.	2 conductor w/ground, 14 gauge UG wire	Dose Pump Assembly	Pump Circuit; Standalone Breaker
~45 ft.	2 conductor w/ground, 14 gauge UG wire		Alarm Circuit, Added To House Lighting Breaker
~45 ft.	Plastic conduit, to contain 6-14ga		Pump & Alarm Circuit
1	Effluent Pump 2inch NPT0.4HP		Champion CPE4-12
1	Pressure Filter		Polylok or Simtech Filter (See Detail Print)
1	SCH40PVC2inch pipe1ft. W/ 1/4" Weephole		1/4 inch Drainback Hole Required
2	SCH40PVC2inch 90Degree Ell		See Tank Assembly Print
1	SCH40PVC2inch pipe40inch		
1	SCH40PVC1inch pipe6.0ft. L. Float Tree		
1	SCH40PVC2inch Adapter MNPT to Soc		
1	SCH40PVC2inch Union SxS		
2	SCH40PVC2inch pipe3inch		
1	SCH40PVC2inch pipe6.5inch		
18	SCH40PVC2inch Coupler		
1	SCH40PVC2inch 45Degree Ell	Force Main	Config. By Installer
1	SCH40PVC2inch 90Degree Ell		
1	SCH40PVC2inch pipe8ft.		
18	SCH40PVC2inch pipe10ft.		

1	SCH40PVC2inchpipe1ft.	Force Main to Mid-Mound Valvebox	See Valvebox Print	
4	SCH40PVC1inchFullFlowBall Valve SxS	Mid-Mound Valvebox		
2	SCH40PVC1inchx1inchx2inchTee SxSxS			
4	SCH40PVC4inchpipe1ft.			
4	Infiltrator Q4 Plus End Cap Modified For Mound Valvebox			
1	PolyLok 24" Dia. Riser & Pan Plus Concrete Base Valvebox 20" Dia. W/ InsulLid			
1	SCH40PVC2inchTee SxSxS			
4	SCH40PVC1inchpipe2.5inch			
2	SCH40PVC2inchpipe6.66inch			
-	Sand Section 3.7 ft. W. x 113 ft. L. x 6.0 inch H. Basal 10.42 ft. W.			Sand Mound
-	Topsoil Cap 126.6 ft. L. x 13.6 ft. W. x 2.2 ft. H.		~34.0 yd.^3 @ 59.5 Tons (Silt Loam Or Better)	
56	Infiltrator Q4 Plus Equalizer 36 Low Profile Chambers	Infiltrator 4 ft. L 2 ft. W 8 inch H LP Chambers		
4	Orifice Protectors	Laterals	STF -106D (See Detail Print)	
4	SCH40PVC1inchPipe 56' L. 1/8" Orifices 3.3' Spacing W/ Cleanout End Drain		See Mound Laterals Details Print	
4	SCH40PVC4inchCap	Sand Inspection Port	See Sand Inspection Port Print	
4	SCH40PVC4inchCoupler			
4	SCH40PVC4inchpipe1ft.			
4	SCH40PVC4inchpipe4inch			
2	SCH40PVC4inchCap			
2	SCH40PVC4inchToilet Flange Soc	Soil Inspection Port	See Soil Inspection Port Print	
2	SCH40PVC4inchSand Observation Tube 2' L. W/ Slots			
4	SCH40PVC4inchpipe6inch	Cleanout Port Assembly	See Detailed Print	
8	SCH40PVC1.5inchpipe3.75inch			
4	Infiltrator Q4 Plus End Cap Modified For Mound Valvebox			
4	SCH40PVC1.5inchx1inchRedCouplerSpXs			
4	SCH40PVC1.5inchFiptCoupler			
8	SCH40PVC1.5inchDegree45Ell			
4	PolyLok 12" Dia. D-Box W/ (1) Riser W/ Insulated Lid Adapted For Mound			
4	SCH40PVC1.5inchMiptPlug			
1	Polylok 12" Dia. D-Box W/ (2) 6" Risers W/ Lid			
1	SDsolid4inchpipe22.25inchW/ Bell			Free-Falling Sample Port
-	Corrugated Perforated 4" Dia. Pipe 275 ft. L.			
-	Perimeter Drain 275' L. x 9" W. x 10" Deep Gravel	Perimeter Drain	See Detail Print	
-	Corrugated Solid 4" Dia. Pipe 85 ft. L.		~5.5 yd.^3 @ 7.3 Tons #57 Washed Stone	
-		Perimeter Drain Discharge	Length May Vary	
Additional Notes				
Pump, Crush & Backfill Old Tankage (Decommission)				
Clothes Washer & Adjacent Sink Need Replumbed to Either Sewer Main				
Repair/Replace Clay Tile (Storm Drain) Riser				
-	Grass Seed	2 lbs./1000 ft.^2 K. Bluegrass	~1750 ft.^2 @ 3.5 lbs.	
-	Straw Mulch For Grass Establishment	Homeowner's Choice	~1750 ft.^2	
-	Grass Establishment Fertilizer	10 lbs. 20-10-10/1000 ft.^2	~1750 ft.^2 @ 17.5 lbs.	
Call OUPS 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: _____

Septic Tank Condition:	Scum depth: Sludge depth: Filter cleaned?
Dose Tank Condition:	Sludge present?
Dose Pump Condition:	
Controls Condition:	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: