

Southern Soil Consultants, LLC

PO Box 218
Blackstone, VA 23824

Invoice

Date	Invoice #
12/8/2022	7649

Bill To
Darrell Bishop 3200 K-V Road Kenbridge, VA 23944

Terms
Due on receipt

Item	Description	Amount
AOSE Permit	property located 3188 & 3200 K-V Road	1,200.00
Permit Note	This permit must be submitted to the county health department. Upon receipt of an approval letter this system may be installed. I will need at least 48 hours notice of an inspection. The completion statements will not be sent to the county health department until this invoice is paid in full.	0.00
Total		\$1,200.00

*Paid
ch # 2236
12/15/22*

OSE/PE Report for:

Construction Permit Certification Letter Subdivision Approval

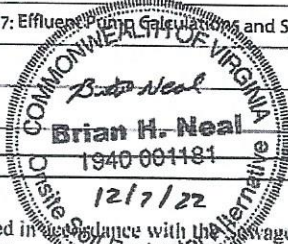
Property Location:
 911 Address: 3188 and 3200 K-V Road City: Kenbridge
 Lot _____ Section 2.31 Acres (Total) Subdivision _____
 GPIN or Tax Map # PRN(s) 4795 & 10230 Health Dept ID # _____
 Latitude _____ Longitude _____

Applicant or Client Mailing Address:
 Name: Darrell Bishop
 Street: 3200 K-V Road
 City: Kenbridge State VA Zip Code 23944

Prepared by:
 OSE Name Brian H. Neal License # 1940-001181
 Address PO Box 218
 City Blackstone State VA Zip Code 23824
 PE Name: _____ License # _____
 Address _____
 City _____ State _____ Zip Code _____

Date of Report 12/07/22 Date of Revision #1 _____
 OSE/PE Job # Bishop Job Date of Revision #2 _____

Contents/Index of this report (e.g., Site Evaluation Summary, Soil Profile Descriptions, Site Sketch, Abbreviated Design, etc.)	
Page 1: OSE Cover Sheet	Page 9-10: Soil Profile
Page 2-3: Drainfield/Well Construction Specifications	Page 11-17: Effluent Pump Calculations and Specifications
Page 4-6: Construction Drawings	
Page 7-8: Construction Notes Page	

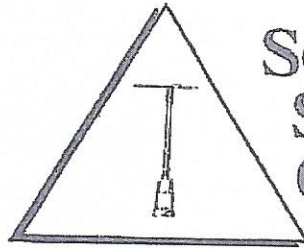


Certification Statement
 I hereby certify that the evaluations and/or designs contained herein were conducted in accordance with the Sewage Handling and Disposal Regulations (12 VAC5-610), the Private Well Regulations (12 VAC5-630) and the evaluation laws, regulations and policies implemented by the Virginia Department of Health. I further certify that I currently possess any professional license required by the laws and regulations of the Commonwealth that have been duly issued by the applicable agency charged with licensure to perform the work contained herein.

The work attached to this cover page has been conducted under an exemption to the practice of engineering, specifically the exemption in Code of Virginia Section 54.1-402.A.11

I recommend that a (select one): construction permit certification letter subdivision approval
 be (select one) issued denied .

OSE/PE Signature Brian H. Neal Date 12/7/22



SOUTHERN SOIL CONSULTANTS, LLC

DRAINFIELD & WELL CONSTRUCTION SPECIFICATIONS & CALCULATIONS

New Repair Expanded

Date: 12/07/22

Owner(s): Darrell Bishop

Address: 3200 K-V Road
Kenbridge, VA 24944

For a Type **II Conventional Drainfield (Repair)**
that is to be constructed on/at: #3188 and #3200 K-V Road, Kenbridge, VA 23944

DRAINFIELD DESIGN INFORMATION:

Building Sewer: 4 I.D. PVC 40, or equivalent. Slope 1.25" per 10' (minimum).

Septic Tank: Capacity 1250 gal tanks. (minimum)

Tank must meet the July 2000 Regs.

Inlet-Outlet structure: 4" tees PVC 40, or equivalent

Distribution Box: Precast concrete with 12+ ports

Header Lines: 4" I.D. 1500 lb. Crush strength plastic or equivalent from distribution box to 2' into absorption trench.

Percolation lines: Gravity 4" plastic 1,000 lb. Per-foot bearing load or equivalent,
Slope 2"-4" per 100' or as specified

Conveyance Line: 100' of 1.5" inside diameter SCH 40 pipe

Effluent Filter: N/A

Pump station: 1250 gallon top seam tank.

Pump: Goulds PE 31 effluent pump or equivalent

Force Mains: 1.5" ID. PVC 40

Stilling Basin: 8 port Concrete D-Box or 10' of 4" SCH 40 Pipe

Horizontal Pump Distance approx. (feet): 100'

Vertical Pump Distance approx. (feet): 14.9'

Anticipated Flow approx. (gpm): 28

Control Panel: Simplex Demand Dose Panel

* SYSTEM MUST BE INSTALLED ONLY DURING DRY CONDITIONS.

* Cover with soil up to bottom of riser lids. (Lids must remain exposed).

* Contractor is responsible for stabilization (grading & seeding) upon completion of installation to promote drainage away from site.

PROPOSED USE: Repair for houses #3188 and #3200 KV Road, Kenbridge, VA

DESIGN LAYOUT: ___ PAD SYSTEM X TRENCH SYSTEM

Soil percolation rate: 75 min/in. at 18" deep Texture Group: III.

Soil percolation rate used for design: 75 mpi.

Separation distance required 18 in. Limited depth: 36".

Number of Bedrooms: 4 Design Flow: 600 gpd Each House is a 2 Bedroom

Drainfield Square Footage Required: 1788 sq. ft.

TRENCH DESIGN LAYOUT:

Loading Rate: 447 sqft/Bedroom

Design layout for primary drainfield:

600 gpd: 9 lines x 70 ft. in length x 3 ft. wide = 1890 sq. ft.

Depth of aggregate: EZ Flow 1203H pipe Center to center spacing: 9'.

Depth of trenches: 18 in.

Reserve drainfield required: Yes ___ No X; 0% available

Proposed reserve drainfield: REPAIR

Soil percolation rate ___ mpi at ___ deep

NOTES: System must be installed on contour.

WELL DESIGN INFORMATION:

Existing Class: (2) IIIC Well(s)

COMMENTS AND CONCERNS:

Due to the potential liability and/or responsibility of SSC for the installation and function of the drainfield, a representative of SSC must be present at an on-site preconstruction meeting with the builder and drainfield contractor. A representative of SSC must also be called for a final inspection, before the health department's final inspection. If there are any problems during installation SSC must be called immediately.

All utilities should be placed in a manor to avoid the primary and reserve area. Careful planning should be used when adding any driveway, detached garage, storage shed, swimming pool, large deck, or other permanent structures to be sure room is left available for the primary and reserve drainfield area.

If any changes to the Proposed Use or location of home site as shown on the attached sketch. Water Supply, or Proposed Installation are desired, please contact SSC as soon as possible. Also, if there are any questions concerning the Soil Information Summary, Design Information, Comments and Concerns, Detailed Soil Profile Descriptions, or Site Sketch please call SSC. Any desired changes will be considered; but not always possible. They may require a simple revision of this report, but could involve additional in-field evaluation and/or expense.

SIGNATURE:



Brian H. Neal
OSE #1940-001181

K-V Road

Field

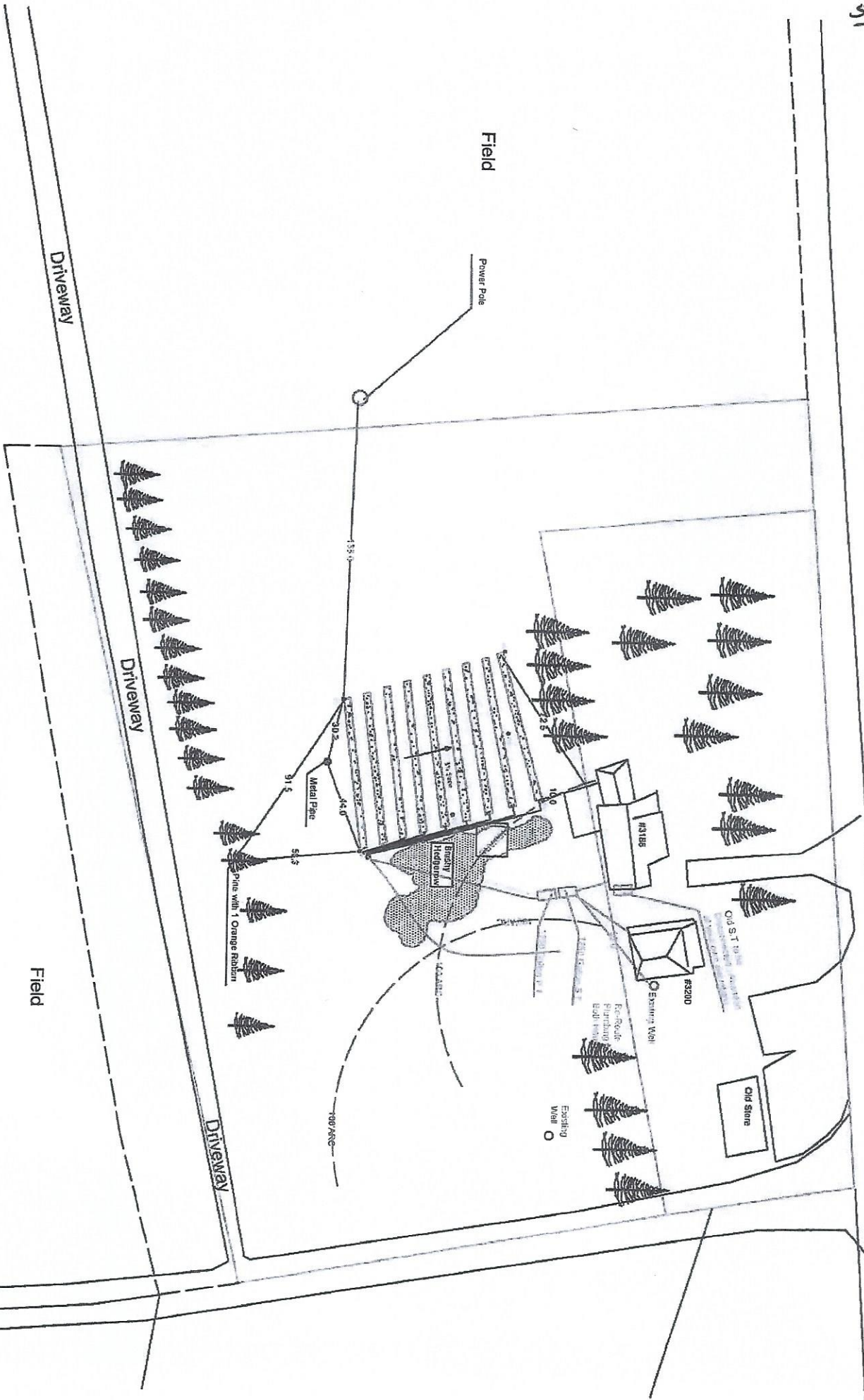
Power Pole

Driveway

Driveway

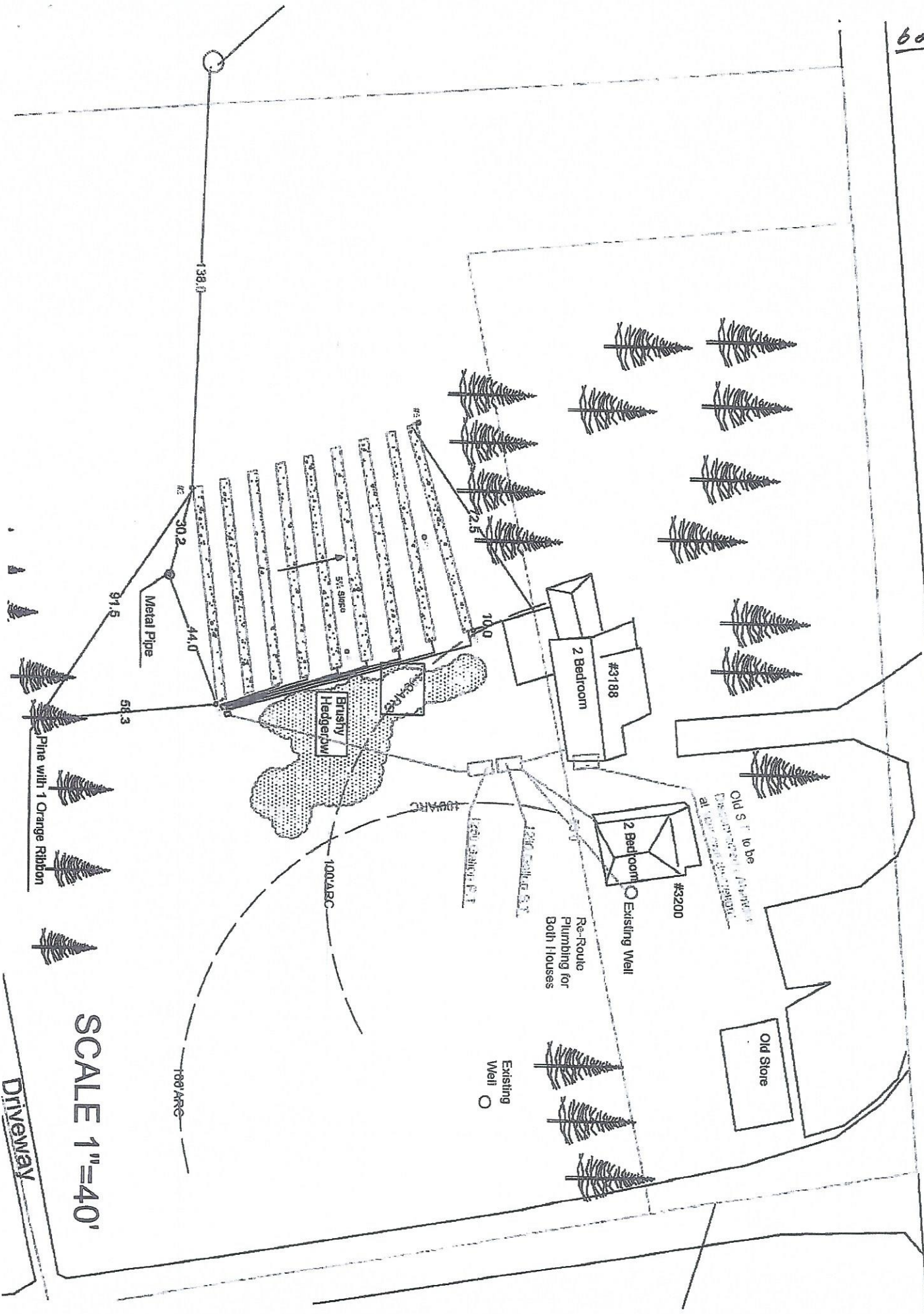
Field

Driveway



SCALE 1"=60'

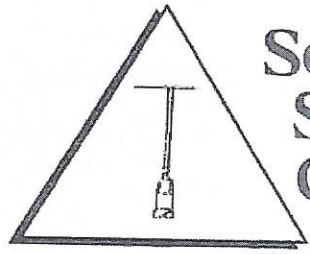
K-V Road



SCALE 1"=40'

DRIVEWAY

705 17



**SOUTHERN
SOIL
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Notes: The septic tank must be kept a minimum of 10 feet a foundation or 20' from the foundation if over a basement.

The Two Houses (#3188 and # 3200) are sharing the existing drainfield. The two houses will share the new drainfield also. The existing S.T. is located under the foundation of house # 3188, this tank needs to be disconnected and the sewer lines for both houses re-routed to the new 1250 gall S.T. Keep the new tanks a minimum of 50' from all wells.

Water Supply: Existing

Discharge Area: 9-70' ditches @ 18" deep
Keep fall in Trenches 2" to 4" max
9' Center to Center Spacing
EZ Flow 1203H pipe

Gravel-less system Requirements: 9-70' ditches at 18" using EZ Flow 1203H Gravel-less Pipe

Septic Tank: New 1250 gallon Septic Tank

Pump Tank: 1250 gallon Pump Tank

Distribution Box: Concrete 12+ ports minimum

Surge Box: 8 port concrete Box or a 10' Section of 4" SCH 40 pressure Pipe

Conveyance Line: Approx. 100' of 1.5" SCH 40 pipe

System must be installed on contour and at the specified depth.

The system must be installed under dry conditions only!

A \$250.00 dollar inspection fee is due at the time of the inspection, and is to be paid by the contractor installing the system, if the fee is not paid then a completion statement will not be issued All septic contractors must be licensed by DPOR and have a valid license number before installing the sewage system.

8-18-18

- 10. When pumping effluent to overcome gravity, any open-bottom gravelless material shall provide a high-flow splash plate at the inlet of the trench or other suitable method approved by the manufacturer to reduce effluent velocity.
- 11. When enhanced flow distribution is required by the Regulations, open-bottom gravelless material shall contain a percolation pipe that extends a minimum of 10 feet from the trench's intersection with the header line. The percolation pipe shall be installed in accordance with the manufacturer's approved installation manual. The dosing volume shall be a minimum 39 gallons per 100 linear feet of absorption trench.
- 12. Gravelless material with general approval may be used for low pressure distribution in accordance with the manufacturer's approved installation manual, Table 1 and the applicable requirements of the Regulations.
- 13. See Table 1 for minimum area sizing when gravelless material is utilized. When gravelless material is utilized, the width of the trench excavation shall be used to calculate minimum area requirements for absorption trenches.

Table 1:
Required minimum Area for Gravelless Material

Percolation Rate (Minutes/Inch)	(Ft ² /100 Gallons)	(Ft ² /Bedroom)
5	83	124
10	90	135
15	99	149
20	110	164
25	119	178
30	131	195
35	143	215
40	157	236
45	172	258
50	188	282
55	206	309
60	227	339
65	248	372
70	272	408
75	299	447
80	328	492
85	359	539
90	394	590
95	489	733
100	536	804
105	588	882
110	645	967
115	707	1061
120	775	1163

Date: 12/07/22Location: #3188 and #3200 K-V Road, Kenbridge, VA 23944**DETAILED SOIL PROFILE DESCRIPTIONS:**

HOLE #	HORIZON	DEPTH (INCHES)	DESCRIPTION OF SOIL CHARACTERISTICS	TEXTURE GROUP
1	A	0-15	2.5Y 6/4 SL	
	E/Bt1	3-32	2.5Y 6/6 to 6/8 Lt. SCL to SCL with 2.5Y 7/8 and 8/4 lithochromic colors	II
		Bt1	32-36	2.5Y 6/6 to 6/8 Lt. SCL (slightly platy) with 2.5Y 7/8 and 8/4 lithochromic colors
		36"	becoming more platy and dense	
2	A	0-8	2.5Y 6/4 SL	
	Et1	8-24	2.5Y 7/4 SL	II
	E/Bt1	24-34	2.5Y 6/6 to 6/8 Lt. SCL with 2.5Y 7/8 and 8/4 lithochromic colors	II
		Bt1	34-36	2.5Y 6/6 to 6/8 Lt. SCL (slightly platy) with 2.5Y 7/8 and 8/4 lithochromic colors
3	A	0-12	2.5Y 6/4 SL	
	Et1	12-22	2.5Y 6/6 SL	II
	E/Bt1	22-28	2.5Y 6/8 to 6/8 Lt. SCL with 2.5Y 7/8 and 8/4 lithochromic colors	II
		Bt1	28-36	2.5Y 6/8 SCL with 2.5Y 8/4 lithochromic colors
4	A	0-18	2.5Y 5/4 SL	
	Et1	18-27	2.5Y 6/8 SCL with 2.5Y 7/4 lithochromic colors	II
	Bt1	27-36	2.5Y 6/8 heavy SCL with 5YR 6/8 and 10YR 6/8 lithochromic colors	III
5	A	0-15	2.5Y 5/4 SL	
	Et1	15-20	10YR 6/8 CL with 5YR 5/8, 6/8 and 7/8 lithochromic colors	III
	Bt1	20-36	5YR 5/8 heavy CL with 10YR 6/8, 5YR 6/8 and 7/8 lithochromic colors	III
6	A	0-18	2.5Y 6/4 SL	
	Et1	18-32	2.5Y 7/4 Lt SCL	II
	E/Bt1	32-36	2.5Y 7/6 Lt. SCL (slightly platy)	II

SOIL INFORMATION SUMMARY:

Position in landscape satisfactory: Yes No

Description of Landscape: Up-Land Convex Side slope

Slope: 5% Depth to Cr or Rock: Max. Min. None

Depth to Redox Mottles: N/A in. Depth to Chroma 2 Mottles: N/A in.

Depth to Restrictive feature: 36" in.

Soil Percolation Rate (estimated): 75 min/in. (Estimated).

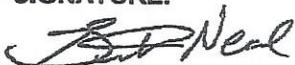
Soil Percolation Rate used in design: 75 min/in. (Estimated). Texture Group III

CERTIFICATION STATEMENT:

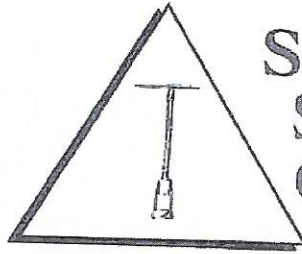
This is to certify according to Section 32.1-163.5 of the Code of Virginia that work submitted for the referred property is in accordance to and complies with the Sewage Handling and Disposal Regulations of the Virginia Department of Health. I recommend that a permit be issued.

Note: By accepting this report the customer acknowledges that soil descriptions are an inexact science and septic systems are prone to failure from several different sources beyond our control and that liability does not necessarily follow such failure. The customer also acknowledges by acceptance of this report that the maximum liability of Southern Soil Consultants, LLC is the amount of the payment for our services.

SIGNATURE:



Brian H. Neal
OSE # 1940-001181



PUMP CALCULATIONS

Static Head:

Elevation from top of pump to ground at pump station = 4'

Elevation from ground at pump station to stilling basin = 3'

Friction Head:

Length of force main = 100'

Length from top of pump to ground at pump station = 4'

Fittings used: 90 Elbow = $5.5 \times 4 = 22.0'$

Check Valve = $13.0 \times 1 = 13.0'$

Gate Valve = $1.2 \times 1 = 1.2'$

Quick Disconnect = $2.0 \times 1 = 2.0'$

Total = 38.2'

Added Equivalent length due to joints = 38.2'

Total equivalent length of pipe = 142.2'

@ 28 gal/min and 1.5" I.D. PVC 40 pipe

Friction loss/ 100 feet of pipe = 5.53

Total equivalent length of pipe divided by 100 feet x 1.42

Friction Head = 7.9'

Static Head = 7.0'

Total Dynamic Head = 14.9'

Pump:

Goulds PE 31 Effluent pump @ 28 gpm

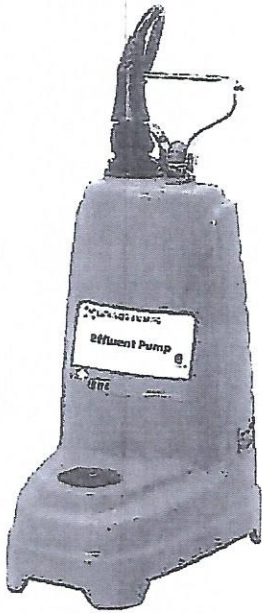


ITT

Residential Water Systems

Goulds Pumps

PE Submersible Effluent Pump



FEATURES

- Corrosion resistant construction.
- Cast iron body.
- Thermoplastic impeller and cover.
- Upper sleeve and lower heavy duty ball bearing construction.
- Motor is permanently lubricated for extended service life.
- Powered for continuous operation.
- All ratings are within the working limits of the motor.
- Quick disconnect power cord, 20' standard length, heavy duty 16/3 SJTW with 115 or 230 volt grounding plug.
- Complete unit is heavy duty, portable and compact.
- Mechanical seal is carbon, ceramic, BUNA and stainless steel.
- Stainless steel fasteners.



Goulds Pumps is a brand of ITT Water Technology, Inc.
- a subsidiary of ITT Industries, Inc.

www.goulds.com

Engineered for life

130617



ITT

GOULDS PUMPS Residential Water Systems

APPLICATIONS

Specially designed for the following uses:

- Mound Systems
- Effluent/Dosing Systems
- Low Pressure Pipe Systems
- Basement Draining
- Heavy Duty Sump/
Dewatering

SPECIFICATIONS

Pump – General:

- Discharge: 1½" NPT
- Temperature: 104°F (40°C) maximum, continuous when fully submerged.
- Solids handling: ½" maximum sphere.
- Automatic models include a float switch.
- Manual models available.
- Pumping range: see performance chart or curve.

PE31 Pump:

- Maximum capacity: 53 GPM
- Maximum head: 25' TDH

PE41 Pump:

- Maximum capacity: 61 GPM
- Maximum head: 29' TDH

PE51 Pump:

- Maximum capacity: 70 GPM
- Maximum head: 37' TDH

MOTOR

General:

- Single phase
- 60 Hertz
- 115 and 230 volts
- Built-in thermal overload protection with automatic reset.
- Class B insulation.
- Oil-filled design.
- High strength carbon steel shaft.

PE31 Motor:

- .33 HP, 3000 RPM
- 115 volts
- Shaded pole design

PE41 Motor:

- .40 HP, 3400 RPM
- 115 and 230 volts
- PSC design

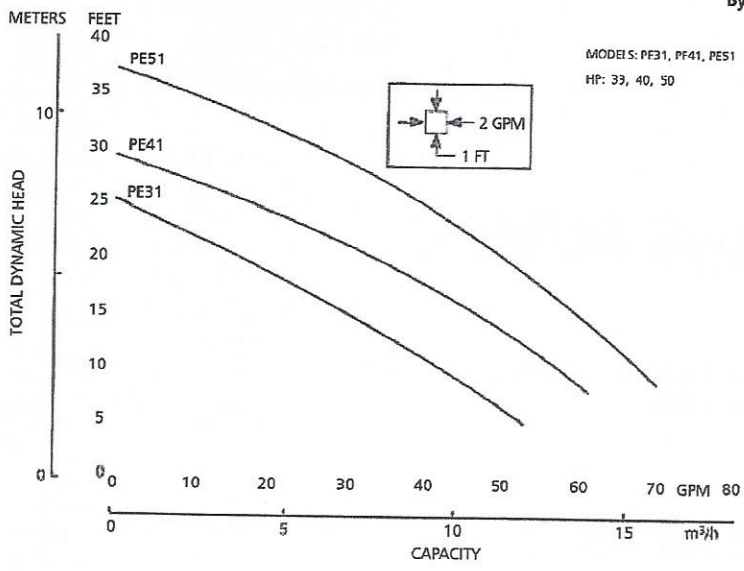
PE51 Motor:

- .50 HP, 3400 RPM
- 115 and 230 volts
- PSC design

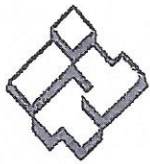
AGENCY LISTINGS



Tested to UL 778 and
CSA 22.2 108 Standards
By Canadian Standards Association
File #LR38549



Goulds Pumps is ISO 9001 Registered.



ITT

150217

GOULDS PUMPS Residential Water Systems

PERFORMANCE RATINGS

PE31

Total Head (feet of water)	GPM
5	52
10	42
15	29
20	16
25	0

PE51

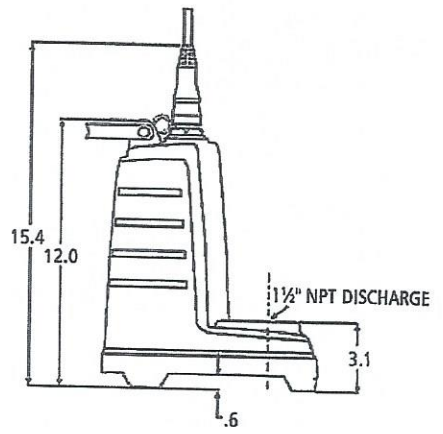
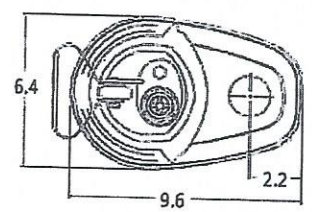
Total Head (feet of water)	GPM
10	67
15	59
20	50
25	39
30	26
35	8

PE41

Total Head (feet of water)	GPM
8	61
10	57
15	46
20	33
25	16

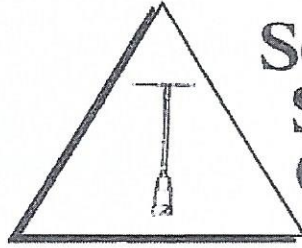
DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



PUMP INFORMATION

Order No.	HP	Volts	Amps	Minimum Circuit Breaker	Phase	Float Switch Style	Cord Length	Discharge Connection	Minimum Basin Diameter	Maximum Solids Size	Shipping Weight lbs/kg
PE31M	0.33	115	12	20	1	Manual / No Switch	20'	1.5"	18"	.5"	31 / 14.1
PE31P1						Piggyback Float Switch					
PE41M	0.4	230	7.5	15		Manual / No Switch					
PE41P1						Piggyback Float Switch					
PE42M	0.4	230	3.7	10		Manual / No Switch					
PE42P1						Piggyback Float Switch					
PE51M	0.5	115	9.5	20		Manual / No Switch					
PE51P1						Piggyback Float Switch					
PE52M		230	4.7	10		Manual / No Switch					
PE52P1						Piggyback Float Switch					



**SOUTHERN
SOIL
CONSULTANTS,
LLC**

PUMP SYSTEM CALCULATIONS & SPECIFICATIONS

Date: 12/7/22

Location: #3188 and #3200 K-V Road, Kenbridge, VA 23944

Design sewage flow: 600 gallons per day.

Total square footage of absorption area required for drainfield: 1890.

Width of Trenches: 3 ft.

Total linear feet of percolation piping required: 630
(1890 sq. feet / width of trench)

Each foot of 4 inch percolation piping contains 0.0872 cubic feet of volume.
(3.14 x .1667 ft. x .1667 x 1 ft.)

Since there are 7.48 gallons in a cubic foot, each foot of percolation piping contains 0.652 gallons if filled to capacity. (0.0872 cu. ft. x 7.48 gal./cu.ft.).

The dosing volume required will be 60 % of the volume of the percolation piping.

Each foot of percolation piping should be dosed with 0.39 gallons of effluent.
(0.652 gal. x 60 % of volume)

Dosing volume for this system: 245.7 gallons
(630 linear ft. x 0.39 gal./ft)

Pump will pump the dosing volume to the drainfield every 9.8 hours .
(600 gal./day/24hrs./day/ 245.7 dosing volume gal./cycle.)

Pump chamber: 1250 gallon pump tank.

Pump Tank Size	Dimensions	Gallons per inch of drawdown
1000 gallon	112" x 58" x 65"	<u>20.85</u> gallons
1250 gallon	159" x 59" x 61"	<u>32.45</u> gallons
1500 gallon	159" x 59" x 68"	<u>32.45</u> gallons
2000 gallon	151" x 82" x 72"	<u>44.02</u> gallons

Since there are 231 cubic inches in a gallon, each vertical inch of depth in the pump chamber is equivalent to 32.5 gallons.

The regulations require at least $\frac{1}{4}$ day of storage volume above the high water alarm. For this system the storage volume must be at least 150 gallons (600 gpd x .25) or 4.6 inches (150 storage volume gal./ 32.5 gal./in.).

Draw Down: 7.6 (245.7 dosing volume / 32.5 gal./in.).

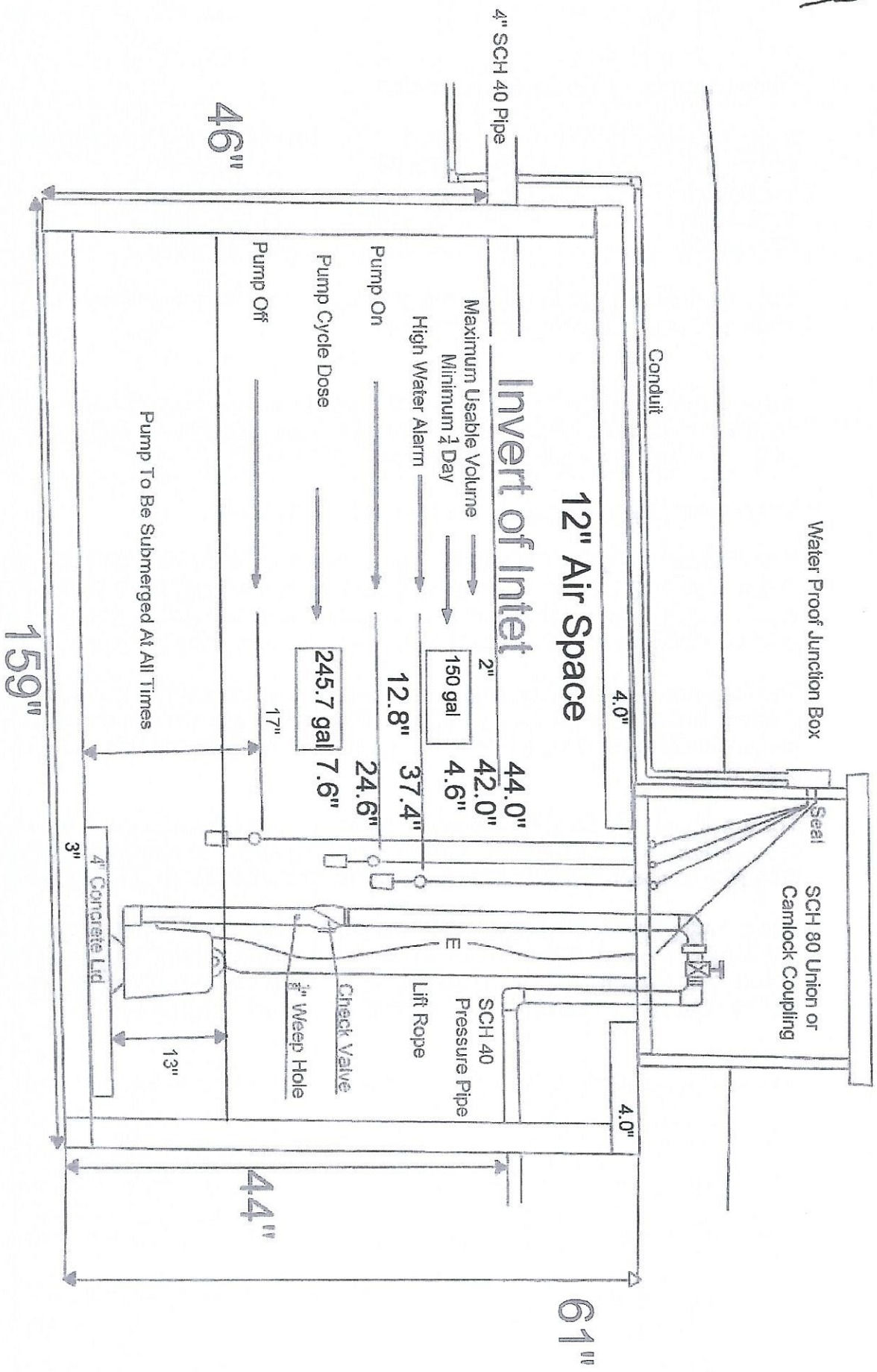
Force Mains: 1.5-inch SCH 40 PVC which has an inside diameter of 1.61 inches. The volume of one foot of 1.5-inch SCH PVC 40 pipe is 34.00 cubic inches (3.14 x 0.75 in. x 0.75 in. x 12 in.). Since there are 231 cubic inches in a gallon, each foot of 1.5-inch SCH 40 PVC pipe contains 0.0917 gallons (34.00 cu. in./ 231 cu. in./gal.).

The minimum velocity of the effluent in the force main cannot be less than 2 feet per second. Therefore, for a 1.5-inch SCH 40 PVC force main, the pump must be capable of pumping at least 17.64 gallons per minute (2 ft./sec. x 60 sec./min. x 0.091 gal./ft.) at system head.

The maximum velocity of the effluent in the force main cannot be more than 8 feet per second. Therefore, for 1.5-inch SCH 40 PVC force main, the pump must not pump more than 70.6 gallons per minute (8ft./sec. x 60 sec./min. x 0.091 gal./ft.) at system head.

At the final inspection Southern Soil Consultants, LLC should conduct a drawdown test. Southern Soil Consultants, LLC should expect the liquid level in the tank to fall 7.6 inches in no more than 8.8 minutes (245.7 dosing volume gal./ 28 gal./min.) and in no less than 3.5 minutes (245.7 dosing volume gal./ 70.6 gal./min.).

180 R 17



Pump Height is 13"
 Tank Gal/In = 32.5
 1250 Gallon Top Seam Pump Chamber

NOT TO SCALE