Mitchell Environmental, P.A.

SEPTIC SYSTEM DESIGN

for

MAGNOLIA ACRES SUBDIVISION- LOT 41

Fuquay-Varina, Harnett County, North Carolina

Submitted to:
Harnett County Health Department
307 Cornelius Harnett Blvd.
Lillington, NC 27546

Prepared for:
HHHunt Homes
1 Fenton Main Street
Suite 280
Cary, North Carolina 27511

Prepared by:
Adam Aycock, EI

DATE: January 23, 2025
PROJECT NO.: 1823

1501 Lakestone Village Lane, Suite 205
Fuquay-Varina, North Carolina 27526
919-669-0329

Harnett County GIS

PID: 050633 0112 63

PIN: 0633-03-7104.000

Account Number: 1500061907

Owner: HHHUNT LOT ACQUISTIONS LLC

Mailing Address: 11237 NUCKOLS RD GLEN ALLEN, VA 23059-5502

Physical Address: 306 WHITE MAGNOLIA LN FUQUAY-VARINA, NC 27526 ac

Description: LOT#41 MAGNOLIA ACRES S/D MAP#2023-591

Surveyed/Deeded Acreage: 0.74

Calculated Acreage: 0.74

Deed Date:

Deed Book/Page: 4223 - 0821

Plat(Survey) Book/Page: 2023 - 591

Last Sale: 2024 - 2

Sale Price: $3349500

Qualified Code: A

Vacant or Improved: V

Transfer of Split: T

Actual Year Built:

Heated Area : SqFt

Building Count : 0

Building Value: $0

Parcel Outbuilding Value: $0

Parcel Land Value: 30100

Market Value: $30100

Deferred Value: $0

Total Assessed Value: $30100

Zoning: RA-30 - 0.74 acres (100.0%)

Zoning Jurisdiction: Harnett County

Wetlands: No

FEMA Flood: Minimal Flood Risk

Within 1mi of Agriculture District: Yes

Elementary School: Northwest Harnett Elementary

Middle School: Harnett Central Middle

High School: Harnett Central High

Fire Department: Northwest Harnett

EMS Department: Medic 14

Law Enforcement: Harnett County Sheriff

Voter Precinct: Northwest Harnett

County Commissioner : Duncan Edward Jaggers

School Board Member: John Hairr

PRESSURE MANIFOLD DESIGN

Name: HHHunt Homes **P.I.N. #:** 0633-03-7104 **D #:** N/A

Address: 306 White Magnolia Lane **Subdiv:** Magnolia Acres **Lot#:** 41

# of BDR: 4 **Daily Flow:** 480 **gal/day** **L.T.A.R.:** 0.300 **gal/day/sq.ft**

Septic Tank: 1000 **gals (min.)** **Pump Tank:** 1200 **gals (min.)** **Sq. Foot:** 1980 **Stone Depth:** N/A (10" Large Diameter Pipe)

Number of Taps: 6 **Length of Trenches:** Varies **ft(See Tap Chart for Details)**

Depth of Trenches: see Harnett County permit **Manifold Length:** 54 **in**

Manifold Diameter: 4 in sch 80pvc (minimum) **Tap Configuration: 6 in spacing** 1 **side(s) of manifold**

Supply Line: length: 150 **ft** **Diameter:** 2 **in sch 40pvc**

Friction Loss + Fitting Loss: 7.61 **ft(supply line length + 70' for fittings in pump tank)**

Design Head: 2.0 **ft** **Elevation Head:** 14.64 **ft**

Vent Hole Size: 3/16 **in** **Orifice Coefficient of Discharge:** 0.60

Orifice Coefficient of Contraction: 0.62 **Orifice Coefficient of Velocity:** 0.97

Maximum Head Supplied by Selected Pump(s) at Total Design Flowrate: 34 **ft**

Orifice / Vent Hole Flowrate: 2.42 **gpm** **Head Loss at Orifice / Vent Hole:** 2.16 **ft**

Total Head: 26.40 **ft** **Pump to Deliver:** 41.82 **gals/min at** 26.40 **ft head**

Dosing Volume: 283.14 **gals.**

Drawdown: 283.14 **gals divided by** 19 **gals/in =** 14.90 **inches**

SJE Rhombus Installer Friendly Series simplex control panel, or equivalent, required
A septic tank filter, or equal is required.
Possible pumps: **Hydromatic:** **Goulds:** **Myers:**
Zoeller: 140 **Other:**

TAP CHART

Bench Mark	4.42	is = 100.00	set at	41/45 rear Corner			**Design Head:**	2.0	
Pump tank elev.		16	88.42	**Pump elev.**	83.42		**Manifold elev.**	98.06	
line	**color**	**rod read**	**Elevation**	**length**	**hole size**	**flow/tap**	**gal/day**	**trench area**	**LINE LTAR**
5	B + 3'	7.68	96.74	90	1/2in SCH 80	5.48	66.76	225	0.2967
6	B - 3'	7.36	97.06	90	1/2in SCH 80	5.48	66.76	225	0.2967
7 & 8	W & Pi +3'	8.36	96.06	120	1/2in SCH 40	7.11	86.62	300	0.2887
9 & 10	Pi - 3' & Y	9.36	95.06	120	1/2in SCH 40	7.11	86.62	300	0.2887
11 & 12	Pu + 3' & Pu - 3'	12.92	91.50	120	1/2in SCH 40	7.11	86.62	300	0.2887
13 & 14 & 15	O & B+3' & B-3'	15.84	88.58	120	1/2in SCH 40	7.11	86.62	300	0.2887
		total	**feet =**	**660**	**gal/min =**	**39.4**		**LTAR =**	**0.3000**
% of Pipe Vol.		66		**Des. Flow**	480.00			**(ltar + 5%)**	0.3150
Dose Volume		283.14		**Pump Run=**	12.18				
Dose Pump Time		7.19		**Tank Gal/IN**	19				
Drawdown in Inches		14.90		**Elev. Head**	14.64				
Supply Line Length		150							

Comments:

PRESSURE MANIFOLD DESIGN

Name: HHHunt Homes **P.I.N. #:** 0633-03-7104 **D #:** N/A

Address: 306 White Magnolia Lane **Subdiv:** Magnolia Acres **Lot#:** 41

# of BDR: 4 **Daily Flow:** 480 **gal/day** **L.T.A.R.:** 0.300 **gal/day/sq.ft**

Septic Tank: 1000 **gals (min.)** **Pump Tank:** 1200 **gals (min.)** **Sq. Foot:** 810 **Stone Depth:** N/A (Horizontal Panel Block)

Number of Taps: 4 **Length of Trenches:** Varies **ft(See Tap Chart for Details)**

Depth of Trenches: see Harnett County permit **Manifold Length:** 42 **in**

Manifold Diameter: 4 in sch 80pvc (minimum) **Tap Configuration: 6 in spacing** 1 **side(s) of manifold**

Supply Line: length: 130 **ft** **Diameter:** 2 **in sch 40pvc**

Friction Loss + Fitting Loss: 3.39 **ft(supply line length + 70' for fittings in pump tank)**

Design Head: 2.0 **ft** **Elevation Head:** 20.38 **ft**

Vent Hole Size: 3/16 **in** **Orifice Coefficient of Discharge:** 0.60

Orifice Coefficient of Contraction: 0.62 **Orifice Coefficient of Velocity:** 0.97

Maximum Head Supplied by Selected Pump(s) at Total Design Flowrate: 40 **ft**

Orifice / Vent Hole Flowrate: 2.62 **gpm** **Head Loss at Orifice / Vent Hole:** 2.54 **ft**

Total Head: 28.31 **ft** **Pump to Deliver:** 29.43 **gals/min at** 28.31 **ft head**

Dosing Volume: 254.48 **gals.**

Drawdown: 254.48 **gals divided by** 19 **gals/in =** 13.39 **inches**

SJE Rhombus Installer Friendly Series simplex control panel, or equivalent, required
A septic tank filter, or equal is required.
Possible pumps: **Hydromatic:** **Goulds:** **Myers:**
Zoeller: 140 **Other:**

TAP CHART

Bench Mark	4.42	is = 100.00	set at	41/45 rear Corner			**Design Head:**	2.0	
Pump tank elev.		16	88.42	**Pump elev.**	83.42		**Manifold elev.**	103.80	
line	**color**	**rod read**	**Elevation**	**length**	**hole size**	**flow/tap**	**gal/day**	**trench area**	**LINE LTAR**
1	nf	1.62	102.80	54	1/2in SCH 80	5.48	98.11	162	0.6056
2	nf	3.10	101.32	72	1/2in SCH 40	7.11	127.30	216	0.5893
3	Pink	4.59	99.83	72	1/2in SCH 40	7.11	127.30	216	0.5893
4	Red	6.07	98.35	72	1/2in SCH 40	7.11	127.30	216	0.5893
		total	**feet =**	**270**	**gal/min =**	**26.8**		**LTAR =**	**0.3000**
% of Pipe Vol.		145		**Des. Flow**	480.00			**(ltar + 5%)**	0.3150
Dose Volume		254.48		**Pump Run=**	17.90			**(ltar W/ HPB)**	0.6000
Dose Pump Time		9.49		**Tank Gal/IN**	19			**(ltar + 5%)**	0.6300
Drawdown in Inches		13.39		**Elev. Head**	20.38				
Supply Line Length		130							

Comments: Line 1 requires 12 panels, Lines 2, 3 & 4 require 17 panels each , totaling 63 panels for the system.

STB - 345 - Top Seam

Approval Date: 12 - 09 - 99

Liquid Capacity 1007 Gallons

Non Traffic Rated

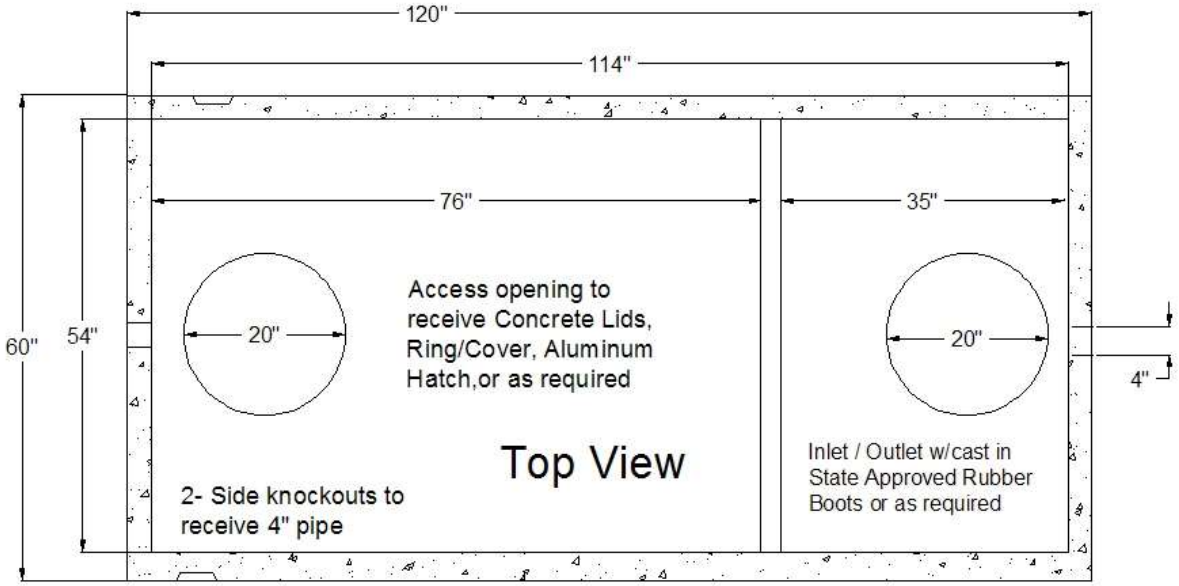
Reinforcing Schedule: # 3 Grade 60 Rebar

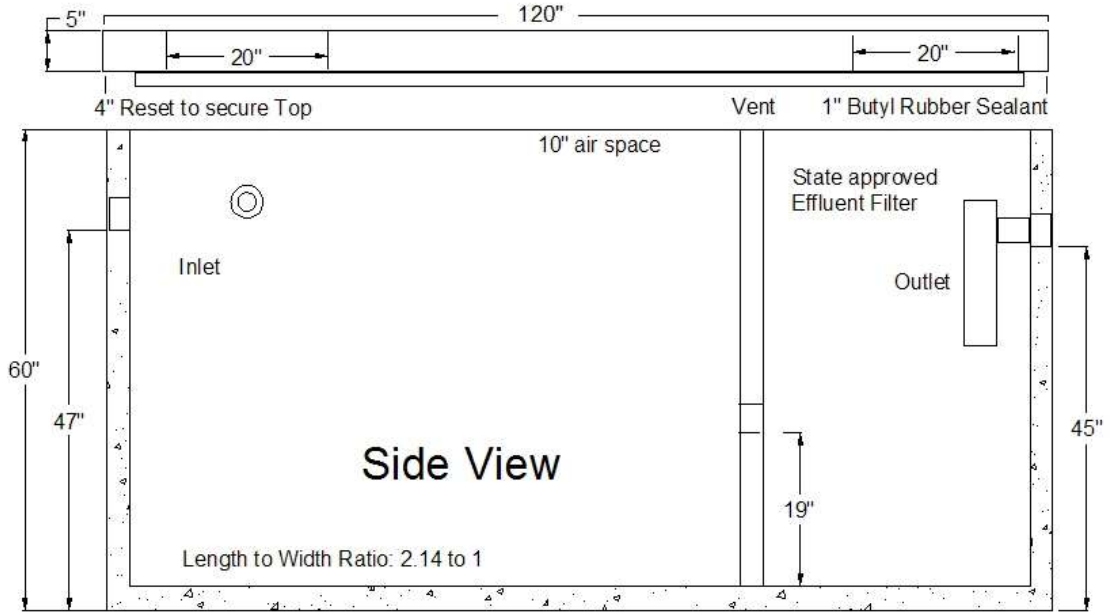
4500 PSI Concrete w/ State Approved Structural Fiber

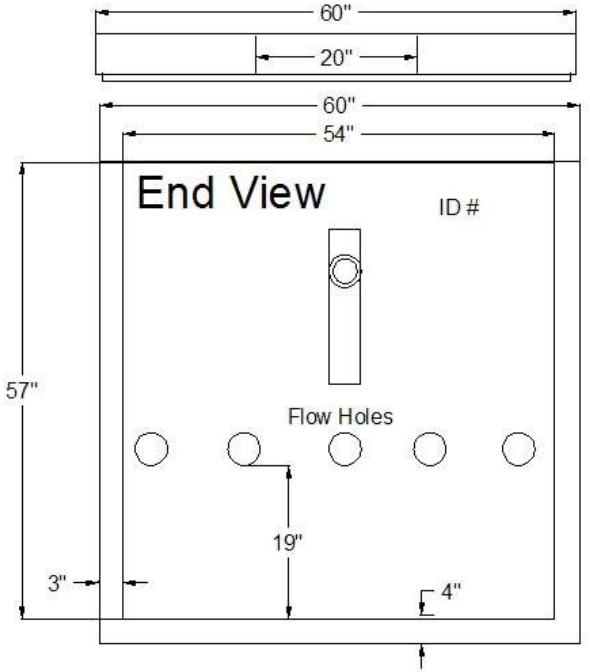
Est. Weight: 8,200 lbs.

Manufactured By:

GARNERS
Septic Tanks, Inc.
Eddie Garner, *President*
919-718-5181
121 Stanton Hill Road
Carthage, NC 28327
Fax 919-775-2229
Eddie@garnersseptictanks.com







POLYLOK™ Inc.
Innovations in Precast, Drainage & Wastewater Products
Zabel® A Division of Polylok Inc.

PL-68 Effluent Filter

PL-68 Filter and Tee

PL-68 is much more than just an effluent filter. The housing can also be used as an inlet baffle (tee) or an outlet baffle. The housing is designed to accept Polylok's snap in gas deflector to deflect gas bubbles away from the tee and to keep the solids in the tank.

Features:

- Offers 68 linear feet of 1/16" filter slots, which significantly extends time between cleaning.
- Accepts 3/4" PVC handle.
- Locks in any 360° position when used with PL-68 Tee.
- PL-68 Housing can be used as an inlet or outlet tee.
- Gasket prevents bypass.

PL-68 Installation:

Ideal for residential waste flows up to 800 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-68 filter into tee.
5. Replace and secure the septic tank cover.

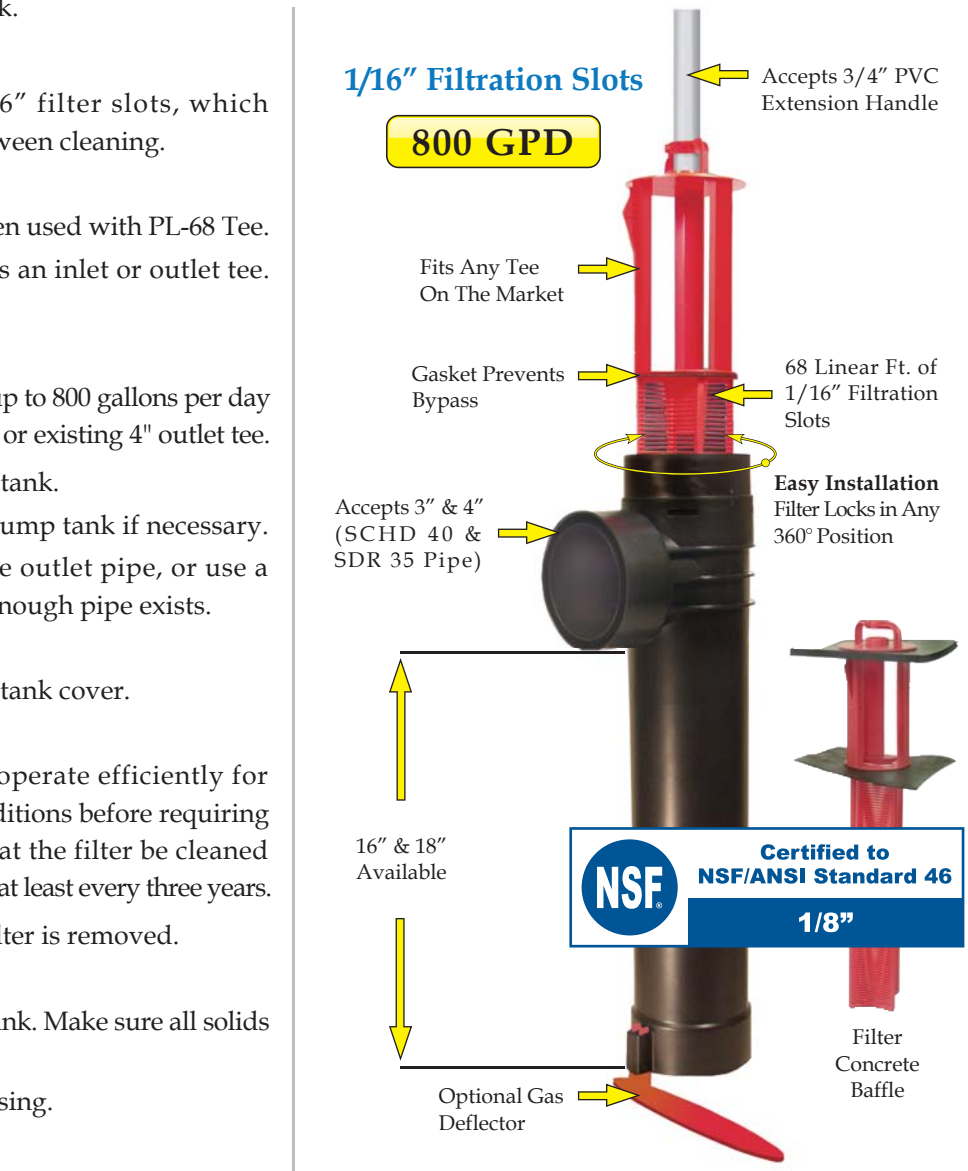
PL-68 Maintenance:

The PL-68 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-68 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.

Related Products:

PL-68 Filter Concrete Baffle
Extend & Lok™

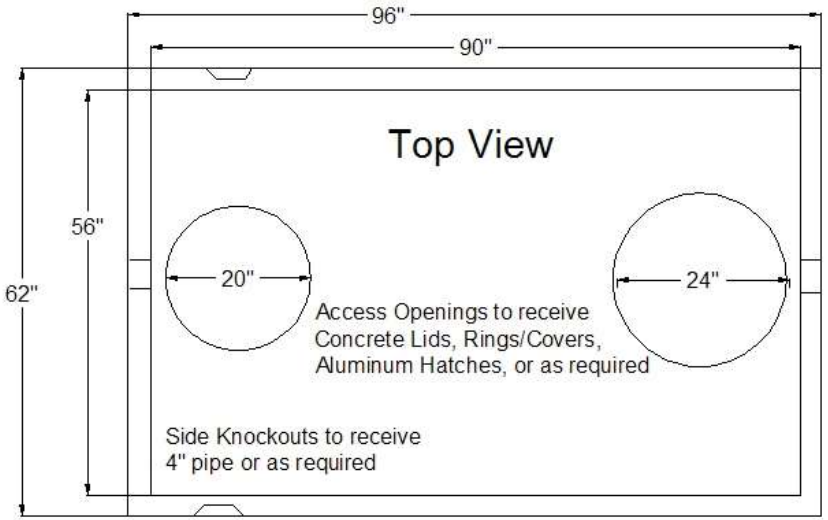


Extend & Lok™
Easily installs into existing tanks.

Spacer Bushing 4" SCHD 40 to SDR 35

Spacer Bushing 4" SCHD 40 to 110mm Pipe

2" Extender



PT - 213 Top seam

Date: 08-18-93

Non Traffic Rated

Liquid Capacity 1,211 Gallons

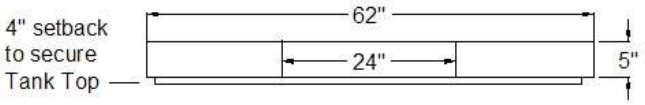
Reinforcing Schedule: # 3 Grade 60 Rebar

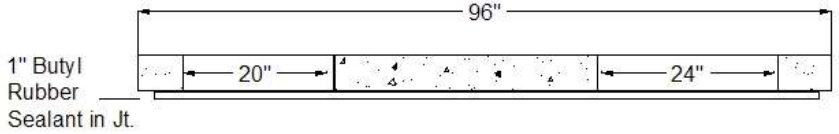
4500 PSI Concrete w/ State Approved Structural Fiber

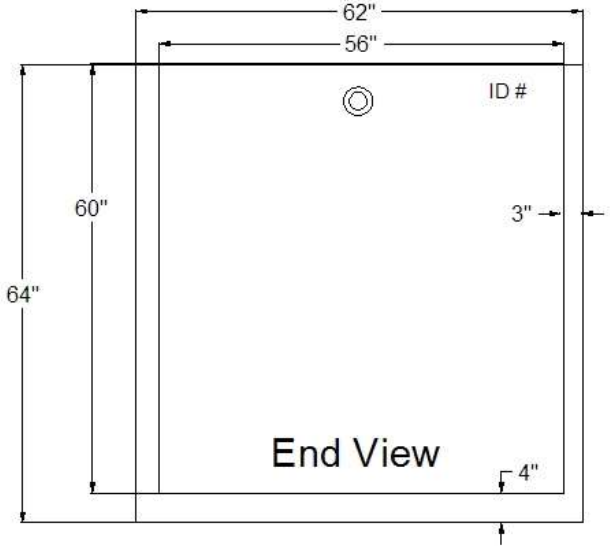
2.5 yds. Est. Weight 8,900 lbs. 19 gals. per in.

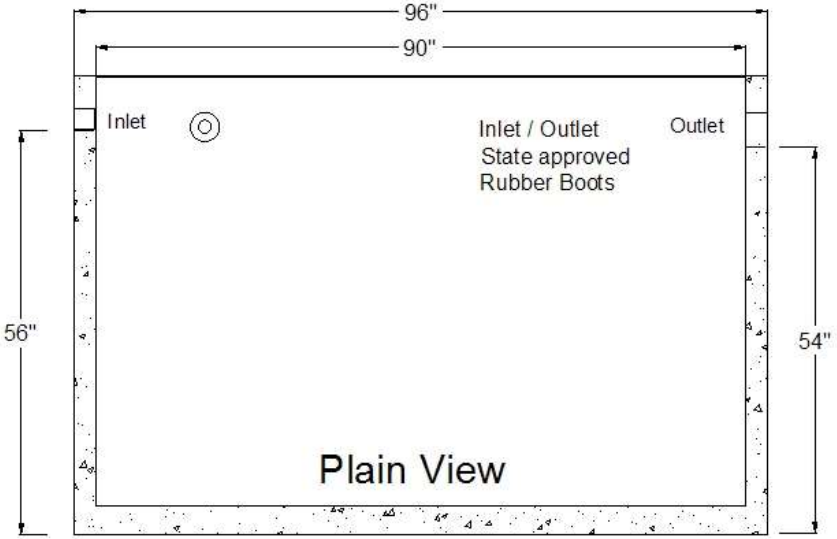
Manufactured By:

GARNERS
Septic Tanks, Inc.
Eddie Garner, *President*
919-718-5181
121 Stanton Hill Road
Carthage, NC 28327 Fax 919-775-2229
Eddie@garnersseptictanks.com









INSTALLER FRIENDLY SERIES® - IFS Single Phase Simplex (Demand/TD)

Single phase, simplex demand dose or timed dose, float controlled system for pump control and system monitoring.

The IFS simplex control panel is designed to control one 120, 208, 240 VAC single phase pump in water and sewage installations.

The IFS control panel features an easy-to-use touch pad with display on the inner door for programming and system monitoring.

The panel configuration can be easily converted in the field to either a timed dose or demand dose.

TOUCH PAD FEATURES

A. **Float Indicators** illuminate when floats are activated. Alarm will activate if a float operates out of sequence.

B. **HOA (Hand-Off-Automatic) Buttons** control pump mode with indication. Hand mode defaults to Automatic when stop level or redundant off level is reached.

C. **Pump Run Indicator** illuminates when pump is called to run.

D. **LED Display** shows system information including: mode, pump elapsed time (hh:mm), events (cycles), alarm counter, float error count, timed dose override counter (timed dose only), and ON/OFF times (timed dose only).

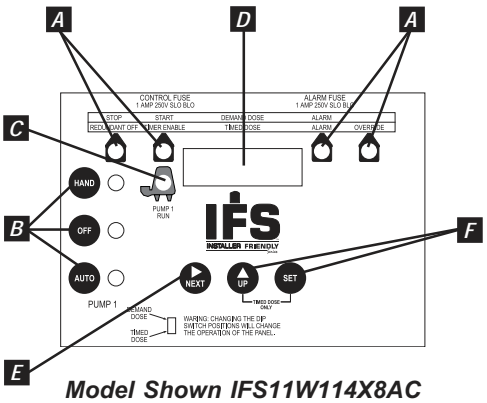
E. **NEXT Push Button** toggles display.

F. **UP and SET Push Buttons** set pump ON/OFF times (timed dose only).

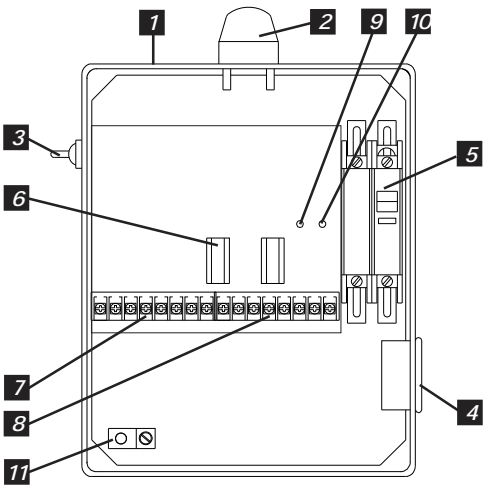
PANEL COMPONENTS

1. **Enclosure** base measures 10 X 8 X 4 inches (25.4 X 20.32 X 10.16 cm). NEMA 4X (ultraviolet stabilized thermoplastic with removable mounting feet for outdoor or indoor use). **Note:** Options, voltage, and amp range selected may change enclosure size and component layout.
2. **Red Alarm Beacon** provides 360° visual check of alarm condition.
3. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition is cleared.
4. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
5. **Circuit Breaker** (optional) provides pump disconnect and branch circuit protection.
6. **Power Relay** controls pump by switching electrical lines. Definate purpose contactor used when pump full load amps are above 15.
7. **Float Connection Terminal Block**
8. **Incoming Control/Alarm Power & Pump Terminal Block**
9. **Control Power Indicator/Fuse** indicator light illuminates if control power is present in panel. Alarm will activate if control fuse is blown.
10. **Alarm Power Indicator/Fuse** indicator light illuminates if alarm power is present in panel.
11. **Ground Lug**

NOTE: Schematic/Wiring Diagram and Pump Specification Label are located inside the panel on enclosure cover



Model Shown IFS11W114X8AC (Inner door view)



Model Shown IFS11W114X8AC (Inside view)

Reg. Cdn Pat. & TM Off

FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes: **Demand Dose** - three 20' SJE MilliAmpMaster™ control switches **Timed Dose** - two 20' SJE MilliAmpMaster™ control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty

c UL us LISTED

SJE Rhombus®
PO Box 1708, Detroit Lakes, MN 56502
1-888-DIAL-SJE • 1-218-847-1317
1-218-847-4617 Fax
email: sje@sjerhombus.com
www.sjerhombus.com

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.

IFS	2	1	W	Note	Note	4	H	8AC, 10E, 10F	15A

MODEL IFS

MODEL TYPE
- [ ] 1 = SPLX TIMED DOSE (includes option 8AC standard)
- [X] 2 = SPLX DEMAND DOSE (includes option 8AC standard)

ALARM PACKAGE
- [✔] 1 = alarm package (includes test/normal/silence switch, fuse, red light & horn)

ENCLOSURE RATING
- [✔] W = NEMA 4X

STARTING DEVICE
- [ ] 1 = 120/208/240 VAC
- [ ] 9 = 120 VAC

PUMP FULL LOAD AMPS
- [ ] 0 = 0-7 FLA
- [ ] 1 = 7-15 FLA
- [ ] 2 = 15-20 FLA

PUMP DISCONNECTS
- [ ] 0 = no pump disconnect
- [X] 4 = circuit breaker
  - 120 VAC (must select starting device option 9)
  - 120/208/240 VAC (must select starting device option 1)

SWITCH APPLICATIONS
- [X] H = floats (Timed dose = low level and alarm / Demand dose = stop, start, and alarm) (select 17 option)
- [ ] X = no float
  - timed dose
  - demand Dose

Note: Pump down applications only.

OPTIONS *Listed below*

Note: Starting device, pump full load amps, cord length, and float type to be selected by installer and their electrician upon selection of pump.

If additional features are required, call the factory for a quote on an Engineered Custom control panel.

	CODE	DESCRIPTION
[ ]	1J	Duo alarm inputs
[ ]	3A	Alarm flasher
[ ]	3B	Manual reset alarm
[ ]	4A	Redundant off *(select option 4D if floats are required)* Demand Dose Timed Dose
[ ]	4D	Redundant off float
[ ]	6A	Auxiliary alarm contacts, form C
[✔]	8AC	Display board includes: ETM counter, events (cycles) counter, alarm counter, and override counter (timed dose only). ***(Included as standard.)***
[X]	10E	Lockable latch - NEMA 4X
[X]	10F	Lightning arrestor *(must select pump circuit breaker, control and alarm power combined)*
[ ]	10K	Anti-condensation heater
[ ]	11C	NEMA 1 remote alarm panel *(must select option 6A)*

	CODE	DESCRIPTION
[ ]	11D	NEMA 4X remote alarm panel *(must select option 6A)*
[X]	15A	Control / Alarm circuit breaker
[ ]	16A	10' cord in lieu of 20' *(per float)*
[ ]	16B	15' cord in lieu of 20' *(per float)*
[ ]	16C	30' cord in lieu of 20' *(per float)*
[ ]	16D	40' cord in lieu of 20' *(per float)*
[ ]	17C	Sensor Float® / internally weighted ▲ *(per float)*
[ ]	17D	Sensor Float® / externally weighted ▲ *(per float)*
[ ]	17G	MilliAmpMaster™ / pipe clamp ● *(per float)*
[ ]	17H	MilliAmpMaster™ / externally weighted ● *(per float)*
[ ]	17J	Sensor Float® / pipe clamp ▲ *(per float)*
[ ]	18A	Timer override option with float (timed dose only)

● Mechanically-activated ▲ Mercury-activated

SAMPLE

MODEL IFS | 1 | 1 | W | 9 | 1 | 4 | H | 8AC 10E17G

- **Model Type** — IFS
- **Alarm Package** — 1
- **Enclosure Rating** — W
- **Starting Device** — 9
- **Pump Full Load Amps** — 1
- **Pump Disconnects** — 4
- **Switch Application** — H
- **Options: Display, Lockable Latch, SJE MilliAmpMaster™/pipe clamp** — 8AC 10E17G

Your Peace of Mind is Our Top Priority®

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER® PUMP COMPANY

SECTION: 2.15.070
FM2783
0617
Supersedes
0417

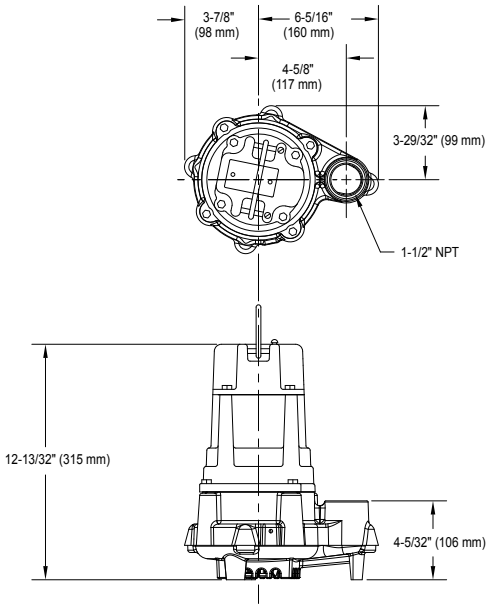
TECHNICAL DATA SHEET
FLOW-MATE SERIES
Models 140/4140, 145/4145 Effluent / Dewatering Pumps

PRODUCT SPECIFICATIONS

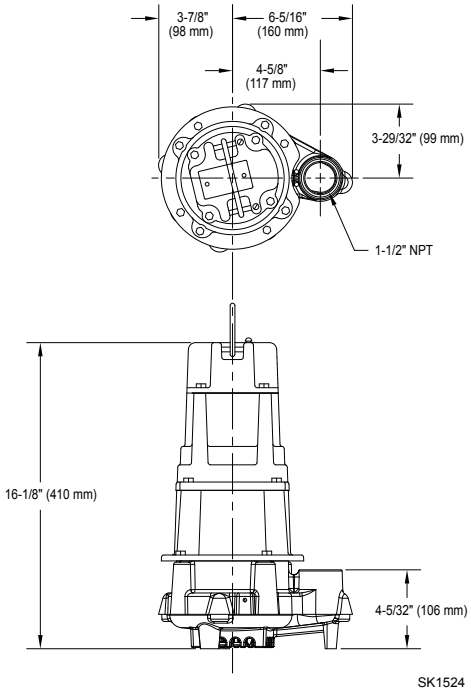
MOTOR	Horse Power	3/4 - 1
	Voltage	115 or 230
	Phase	1 Ph
	Hertz	60 Hz
	RPM	3450
	Type	Permanent split capacitor
	Insulation	Class B
	Amps	6.0 - 13.0
PUMP	Operation	Automatic or nonautomatic
	Discharge Size	1-1/2" NPT
	Solids Handling	1/2" (12 mm), 3/4" (19 mm) spherical solids
	Cord Length	20' (6 m)
	Cord Type	UL listed, neoprene cord
	Max. Head	50' (15.2 m) or 74' (22.6 m)
	Max. Flow Rate	86 GPM (326 LPM) or 61 GPM (232 LPM)
	Max. Operating Temp.	130 °F (54 °C)
	Cooling	Oil filled
	Motor Protection	Auto reset thermal overload
MATERIALS	Cap	Cast iron
	Motor Housing	Cast iron
	Pump Housing	Cast iron
	Base	Cast iron
	Upper Bearing	Sleeve bearing
	Lower Bearing	Ball bearing
	Mechanical Seals	Carbon and ceramic
	Impeller Type	Single vane (145) or non-clogging vortex (140)
	Impeller	Engineered thermoplastic
	Hardware	Stainless steel
	Motor Shaft	JIS S45C steel
	Gasket	Neoprene

NOTE: See model comparison chart for specific details.

SINGLE SEAL



DOUBLE SEAL



SK1524

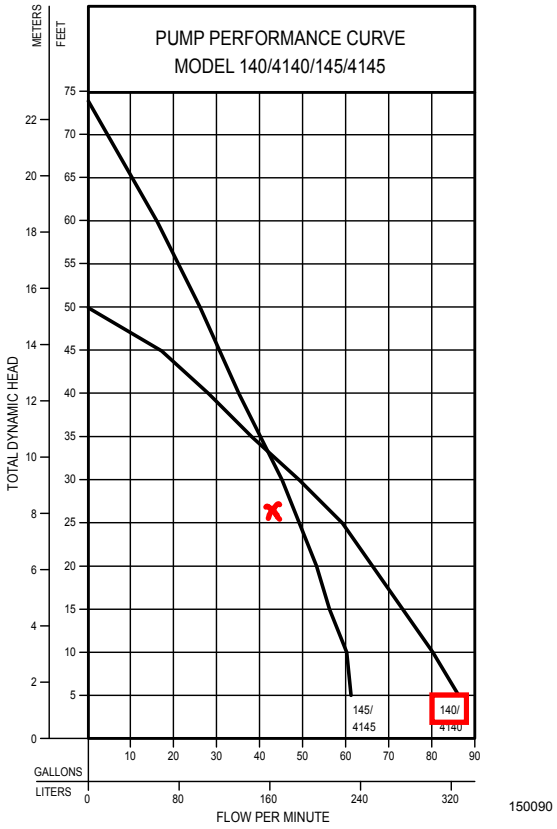
C US Certified to CSA Standard 227875

SSPMA

502-778-2731 | 800-928-7867 | 3649 Cane Run Road | Louisville, KY 40211-1961 | www.zoeller.com

TOTAL DYNAMIC HEAD FLOW PER MINUTE

MODEL		140/4140		145/4145	
Feet	Meters	Gal.	Liters	Gal.	Liters
5	1.5	86	326	61	232
10	3.0	80	303	60	228
15	4.6	73	276	56	213
20	6.1	66	250	53	201
25	7.6	59	223	49	186
30	9.1	49	185	45	171
40	12.2	28	106	35	133
50	15.2	--	--	26	99
60	18.3	--	--	16	61
Shut-off Head:		50 ft.(15.2m)		74 ft.(22.6m)	



Model	MODEL COMPARISON										
	Seal	Mode	Volts	Ph	Amps	HP	Hz	Lbs	Kg	Simplex	Duplex
N140	Single	Non	115	1	12.0	1	60	46	21	1 or 2	3
E140	Single	Non	230	1	6.0	1	60	46	21	1 or 2	3
BN140	Single	Auto	115	1	12.0	1	60	47	21	*	---
BE140	Single	Auto	230	1	6.0	1	60	47	21	*	---
E145	Single	Non	230	1	6.0	3/4	60	46	21	1 or 2	3
N145	Single	Non	115	1	13.0	3/4	60	46	21	1 or 2	3
BN145	Single	Auto	115	1	13.0	3/4	60	48	22	*	---
N4140	Double	Non	115	1	12.0	1	60	65	29	*	---
E4140	Double	Non	230	1	6.0	1	60	65	29	1 or 2	3
BN4140	Double	Auto	115	1	12.0	1	60	66	30	*	---
BE4140	Double	Auto	230	1	6.0	1	60	66	30	*	---
N4145	Double	Non	115	1	13.0	3/4	60	64	29	1 or 2	3
BN4145	Double	Auto	115	1	13.0	3/4	60	64	29	*	---

* Single piggyback switch included.
BN and BE models include a 20' (6 m) piggyback variable level pump switch. Additional cord lengths are available in 15' (5 m), 25' (8 m), 35' (11 m) and 50' (15 m).
50' (15 m) cord length is for 230 V only.

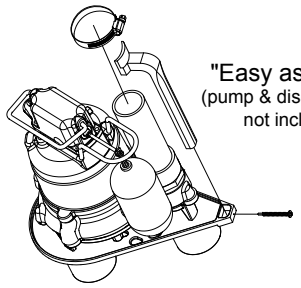
SELECTION GUIDE

1. For automatic, use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
2. See FM1228 for correct model of simplex control panel.
3. See FM0712 for correct model of duplex control panel.

OPTIONAL PUMP STAND P/N 10-2421

- Reduces potential clogging by debris
- Replaces rocks or bricks under the pump
- Made of durable, noncorrosive ABS
- Raises pump 2" (5 cm) off bottom of basin
- Provides the ability to raise intake by adding sections of 1-1/2" or 2" (DN40 or DN50) PVC piping
- Attaches securely to pump
- Accommodates sump, dewatering and effluent applications

NOTE: Make sure float is free from obstruction.

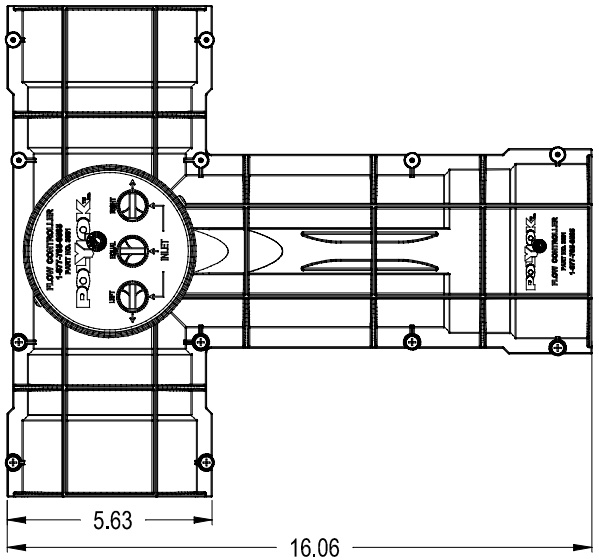


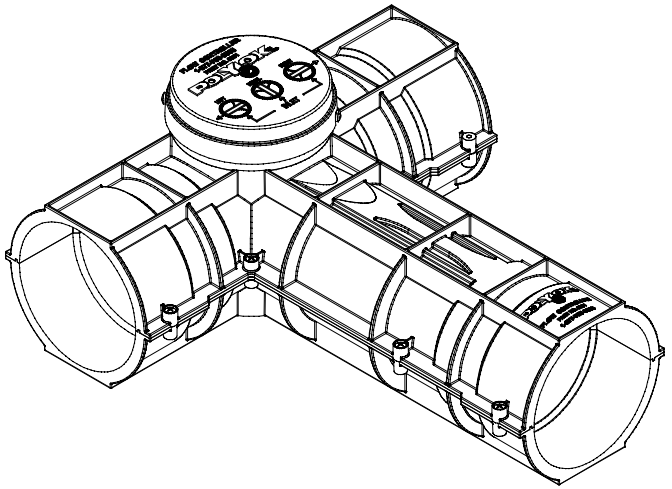
"Easy assembly"
(pump & discharge pipe not included.)

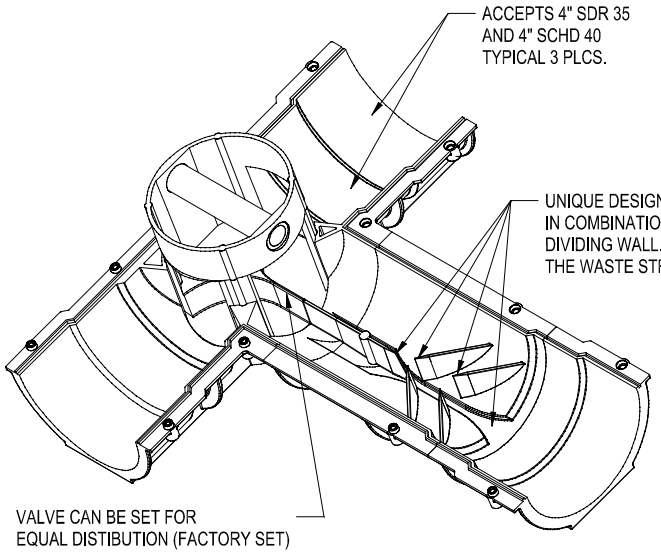
⚠ CAUTION All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

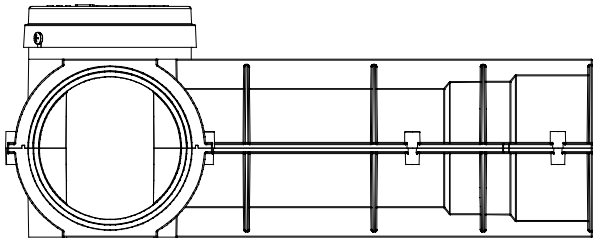
502-778-2731 | 800-928-7867 | 3649 Cane Run Road | Louisville, KY 40211-1961 | www.zoeller.com

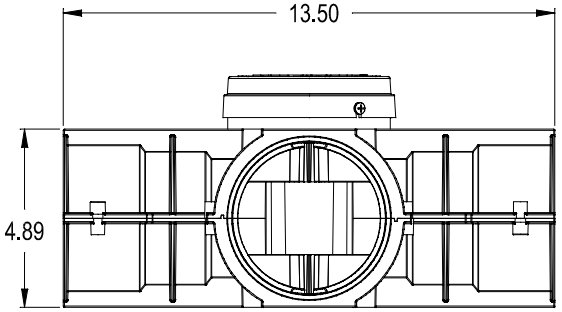
POLYLOK FLOW CONTROLLER
PART NO. 3051
MATERIAL - ABS











Crumpler's No-Rock™ Fabric Wrapped Large Diameter (LDP) Septic Pipe

Crumpler Plastic Pipe, Inc.

Manufacturers of Corrugated Plastic Drainage Pipe

Phone 910-525-4046 / (800) 334-5071

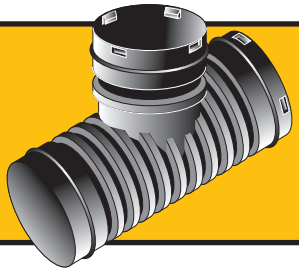
Post Office Box 2068
Roseboro, North Carolina 28382

Web Site: www.cpp-pipe.com

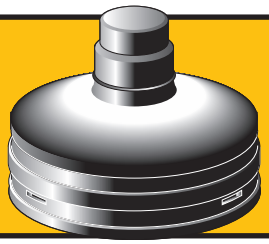
CPP-NR Rev. 9/18

Crumpler's No-Rock™ Fabric Wrapped Large Diameter (LDP) Septic Pipe

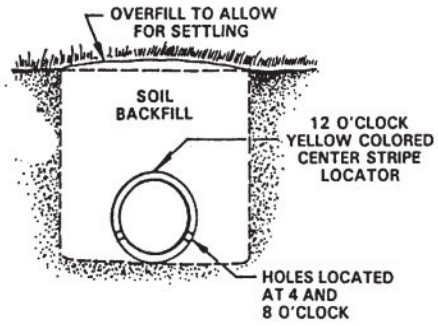
Blind Tee's

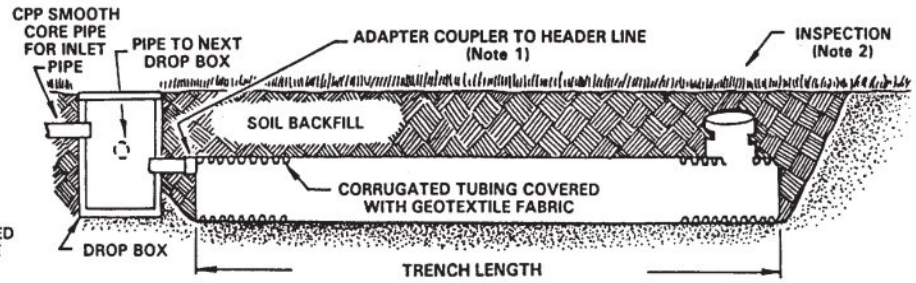


Snap Combo End Cap/4" Reducer/Adapter



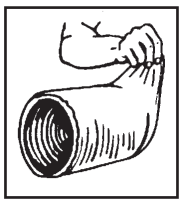
CPP Gravelless LDP Trench Construction Details





Notes:

1. CPP ADAPTER TO 4" COUPLER USED TO CONNECT TO SOLID HEADERS. THE 4" ADAPTER IS ROTATED TO TOP OF PIPE.
2. CPP BLIND TEE USED FOR END-CAP. SNOUT PORT CAN BE CUT OUT FOR INSTALLING A CLEAN OUT ADAPTER THAT ALLOWS FOR POST INSTALLATION INSPECTION.

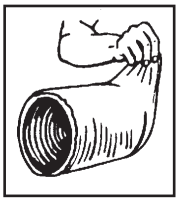


TYPE	SIZE	PART NO.	PACKAGE DESCRIPTION	PRICE
	8"	0830020B	CRUMPLER'S NO-ROCK™ SEPTIC - 20 ft. with filter wrap	
	10"	1030020B	CRUMPLER"S NO-ROCK™ SEPTIC - 20 ft. with filter wrap	

Large diameter (LDP) CPP GRAVELLESS septic tank trench systems use a filter wrap that allows for the installation of septic treatment pipes without gravel. The advantage in using CPP NO-ROCK is evident in areas where there is a shortage of inexpensive quality rock or where the shape and topography of a lot hinder the access of heavy construction equipment. Less equipment use means more trees can be saved, less lot grading is needed, and thus fuel and labor are saved. Additionally, narrow trenches for 8" and 10" CPP pipes create a reduced OC (On-Center) Spacing between parallel septic trenches. An 8" CPP pipe can fit in a 10" wide trench and a 10" CPP pipe in a 12" wide trench. Thus Lot space is saved for other uses.

- **Eliminates Rock**
- **Saves On Lot Grading**
- **Saves Trees On Lot**
- **Saves on Installation Labor**
- **Saves Fuel**
- **Increases Lot Value**

Crumpler's No-Rock™ Fabric Wrapped Large Diameter (LDP) Septic Pipe



TYPE	SIZE	PART NO.	PACKAGE DESCRIPTION	PRICE
	8"	0830020B	CRUMPLER'S NO-ROCK™ SEPTIC - 20 ft. with filter wrap	
	10"	1030020B	CRUMPLER"S NO-ROCK™ SEPTIC - 20 ft. with filter wrap	

Large diameter GRAVELLESS septic tank trench systems were developed as an alternative to 4" pipe systems in gravel-filled trenches for use in soils that most conventional 4" gravel would be allowed in. Organic Iron Ochre soils, however, are unsuitable For Filter Enclosed Gravelless Septic Pipes. The advantage in using the large diameter systems is evident in areas where there is a shortage of inexpensive quality rock, or where the shape and topography of a lot hinder the access of heavy construction equipment. The use of small trenchers for digging narrow trenches means more trees can be saved, less grading is needed, and thus fuel and labor are saved.

Crumpler's NO-ROCK™ septic systems include using either an 8" or a 10" corrugated HDPE pipe enclosed in a polypropylene filter wrap. ASTM-F-481 septic installation specification should be reviewed prior to installation. **Most states allow GRAVELLESS large diameter systems to be substituted for conventional systems in ANY SOIL TYPE deemed acceptable for a conventional system.** One should check with local septic inspectors for locally approved soils.

Crumpler's NO-ROCK™ septic system may be substituted for any conventional 4" pipe gravel trench system utilizing distribution devices, serial distribution, hillside or stepdowns. However, it should not be substituted for bed systems. It should also be limited to domestic sewage, and not used where there will be large amounts of grease or oil such as in restaurants unless designed by an engineer.

The 8" size pipe will equal to 2-foot wide conventional trench; and the 10" size will equal a 2.5 foot wide trench. To determine the required linear footage of either pipe size, first determine the square footage by dividing the design sewage flow by the appropriate soil's long term application rate. Then divide this total square footage area figure by either 2 feet (for 8") or 2.5 feet (for 10") to establish the linear footage amount. Per chart below, on center **(oc)** spacing will be determined by actual trench width.

Example: A 3-bedroom house on a loam soil
0.6 gpd/ft^2 = loam soil's long term application rate.

3BR x 120 gpd = 360 gpd
360 gpd ÷ 0.6 gpd/ft^2 = 600 ft.

600 ft^2 ÷ 2ft = 300 linear ft of 8" or
600 ft^2 ÷ 2.5 ft = 240 linear ft of 10"
600 ft^2 ÷ 3 ft = 200 ft for conventional 4" gravel

SUGGESTED INSTALLATION OF STANDARDS

Nitrification trench bottom minimum width for 8"..... 10"
Nitrification trench bottom minimum width for 10" ..... 12"
Nitrification line center spacing on 8" ..... 5' oc
Nitrification line center spacing on 10" ..... 6' oc
Nitrification trench bottom minimum depth ..... 18"
Nitrification trench bottom maximum depth (24" preferred) ..... 36"
Nitrification trench bottom slope.....level to 1" per 100 ft
Nitrification line minimum cover ..... 6"
Nitrification line maximum cover (12" preferred) ..... 24"

To eliminate voids and clods under pipes 15" - 18" trenches is recommended unless sand backfill is used.

The corrugated pipe used shall comply with ASTM-F-667. Also the installer should be careful to note that the filter wrap is light sensitive, and should not be exposed to sunlight for extended periods of time. The installer should also take care during installation to avoid tearing of the filter material. The protective plastic wrap that protects the filter should be disposed of off site.

Slope Correction Table

NOTE: Add the inches from Slope Table to the MSD[1] to determine the RSD[2]

PERCENT SLOPE	10" Trench	12" Trench	18" Trench	24" Trench	36" Trench
6	0.6	0.7	1.1	1.4	2.2
12	1.2	1.4	2.2	2.9	4.3
18	1.8	2.2	3.2	4.3	6.5
24	2.4	2.9	4.3	5.8	8.6
30	3	3.6	5.4	7.2	10.8
36	3.6	4.3	6.5	8.6	13.0
42	4.2	5.0	7.6	10.1	15.1
48	4.8	5.8	8.6	11.5	17.3
54	5.4	6.5	9.7	13.0	19.4
60	6	7.2	10.8	14.4	21.6

NOTE: For sloping sites a calcuation of the additional required soil depth is necessary using the table above or the following formula: RSD = MSD + (TW x .S)
Where; RSD = Required Soil Depth (inches),
MSD - Min. Soil Depth (Min. Soil Cover + Ht. of Sys. + Min. Separation) (in)
TW = Trench Width (inches), &
.S = Percent Slope (.00)

Example: Assume site for septic system dispersal field has a slope of 28% and the trench bottom is required to be 12 inches above a site limitation, such as, weathered rock or perched water table. Also, assume that the proposed site has a usable or acceptable soil depth of 38 inches. Further, a minimum soil cover of 6 inches is required over the dispersal system.

Trial 1: Conventional trench (36 inches wide, 12 inches gravel, 6 inches over) would require a usable soil depth of 40 inches. [40 inches RSD - 30 inches MSD + (36 inches TW x .28 S)] Thus, a conventional or 36 inch wide trench is unsuitable at this site.

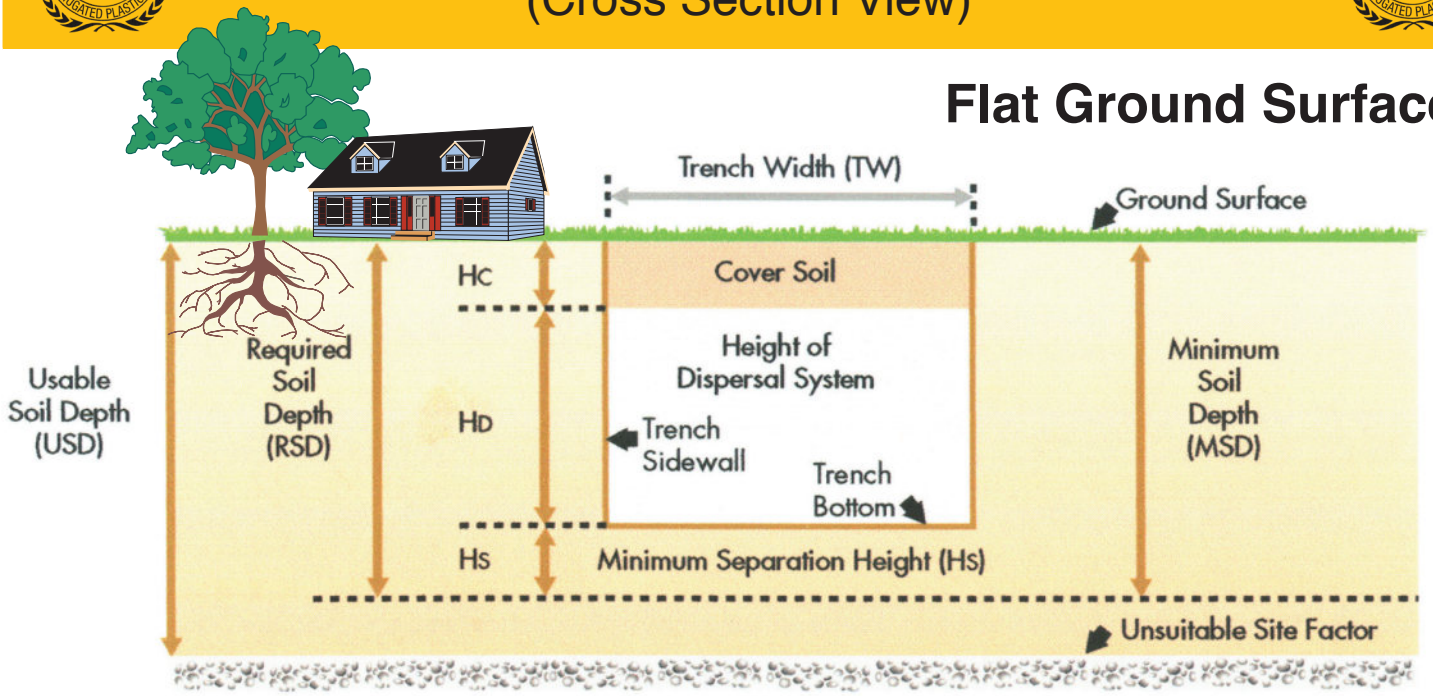
Trial 2: Crumpler NO ROCK™ 8 inch ID (10 in. OD) installed in a 12 inch wide trench would require a usable soil depth of 31.4 inches. [31.4 RSD = 28 inches MSD + (12 inches TW x .28 S)] Therefore, site is acceptable for Crumpler 8 in. NO ROCK™.

Trial 3: Crumpler NO ROCK™ 10 inch ID (12 in. OD) installed in an 18 inch wide trench would require a usable soil depth of 35 inches. [35 inches RSD = 30 inches MSD + (18 inches TW x .28 S)] Therefore, site is acceptable for Crumpler 10 inch NO ROCK™.

[1] **MSD** is the minimum soil depth at 0% slope and is the sum of the min. separation distance between trench bottom and limiting horizon (typ. 12 in), plus the system height, plus the min. soil cover (typ. 6 in.).
[2] **RSD** is the required soil depth to install a trench on a sloping site with the added inches to meet the minimum separation distance on the uphill side of the trench.

Septic Effluent Disposal Trenches on Sloping Sites
(Cross Section View)

Flat Ground Surface



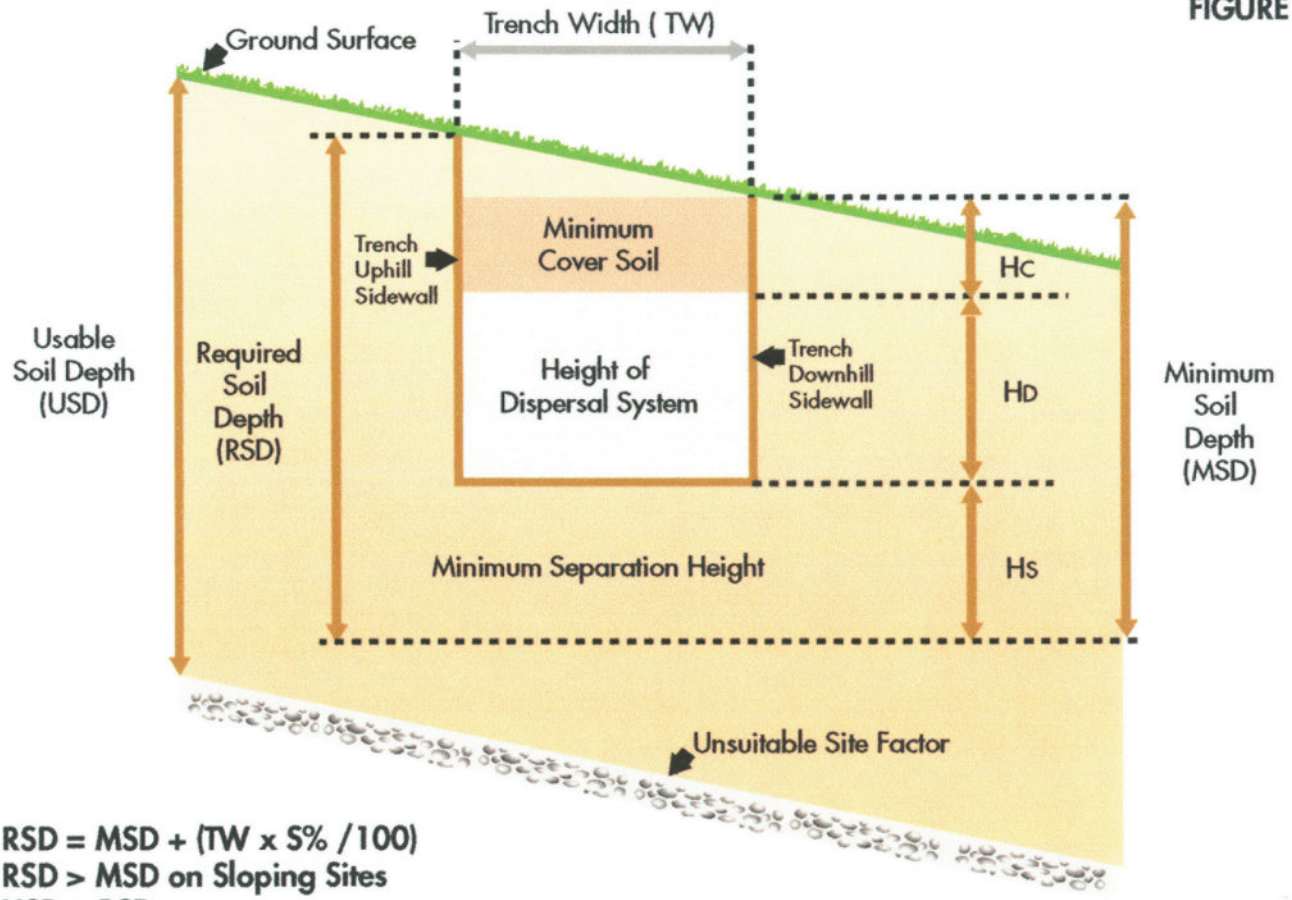
MSD = Hc + HD + Hs
MSD = RSD on Flat Sites

Not To Scale

FIGURE 1

Sloping ground Surface

FIGURE 2

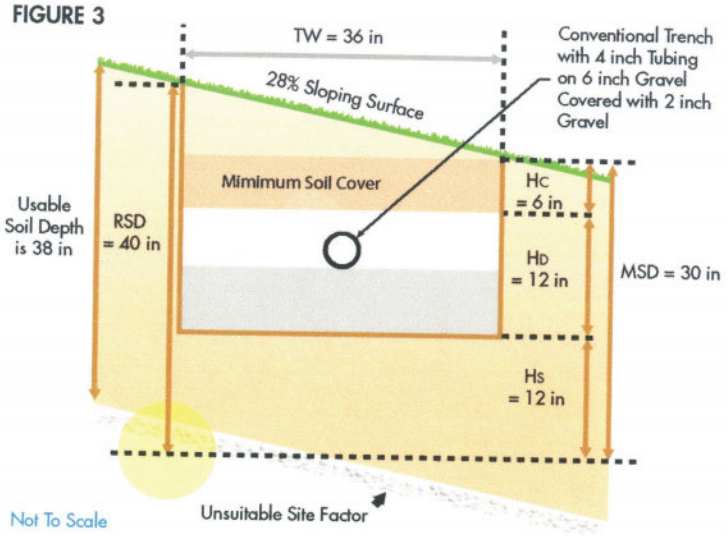


RSD = MSD + (TW x S% /100)
RSD > MSD on Sloping Sites
USD ≥ RSD

Not To Scale

Septic Effluent Disposal Trenches on Sloping Sites (Cross Section View)

FIGURE 3



Septic Effluent Disposal Trenches on Sloping Sites *(Cross Section)* Trial No. 1

Site has 28% slope and soil is 38 inches deep

Trial No. 1: Use 36 inch wide conventional trench system

MSD = 6 in + 12 in + 12 in = 30 inches

RSD = 30 in (36 in x 28%/100) = 40 inches

RSD (40 in) > USD (38 in)

Proposed System **Unsuitable** for Slope

Septic Effluent Disposal Trenches on Sloping Sites *(Cross Section)* Trial No. 2

Site has 28% slope and soil is 38 inches deep

Trial No. 2: Use CPP 8 inch NO-ROCK™ with 12 inch wide trench.

MSD = 6 in + 10 in + 12 in = 28 inches

RSD = 30 in (12 in x 28%/100) = 31.4 inches

USD (38 in) > RSD (31.4 in)

Proposed **CPP 8 inch NO-ROCK™ Suitable** for Slope

FIGURE 4

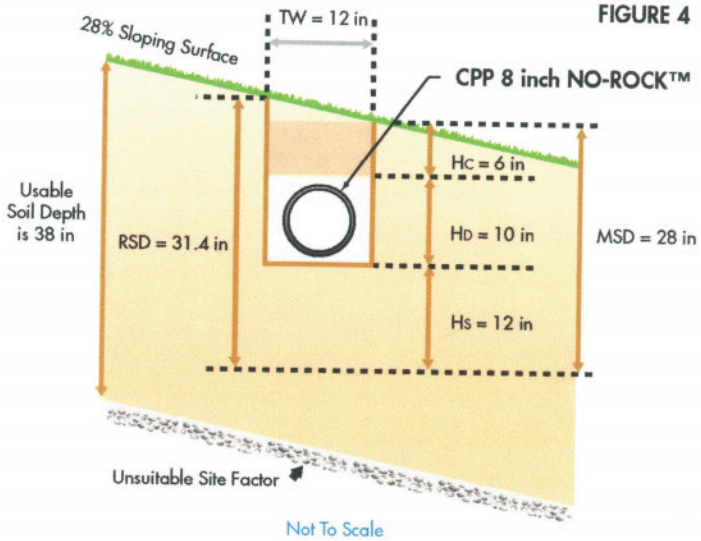
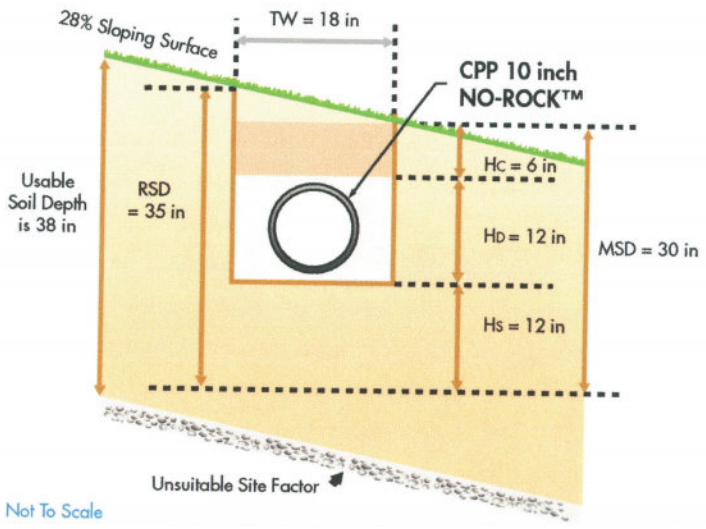


FIGURE 5



Septic Effluent Disposal Trenches on Sloping Sites *(Cross Section)* Trial No. 3

Site has 28% slope and soil is 38 inches deep

Trial No. 3: Use CPP 10 inch NO-ROCK™ with 18 inch wide trench.

MSD = 6 in + 12 in + 12 in = 30 inches

RSD = 30 in (18 in x 28%/100) = 35 inches

USD (38 in) > RSD (35 in)

Proposed **CPP 10 inch NO-ROCK™ Suitable** for Slope

Crumpler's No-Rock™ Fabric Wrapped Large Diameter (LDP) Septic Pipe

NC State University layout of CPP No-Rock Septic at the Ed Booth field Learning Lab.

Laser Level adjustment setting prior to trenching sequence.

Laser Level check of trench depth grade and bag encased protected pipe moved onto trench site. The plastic bags protect the filter wrap from extended storage UV deterioration and natural handling abuses.

Protective plastic bags removed just prior to trench placement.

Protective plastic bags removed from the site for disposal elsewhere.

Trenching complete, and ready for Side-Wall rake prep sequence.

CPP No-Rock Septic pipes allow for narrow trenches that offer a closer OC spacing, which requires a reduced land area foot print compared to conventional 3-foot wide trenches.

A Blind Tee with a screw off Clean Out Plug is placed at the end of each individual line. This allows for a line inspection.

Final cover sequence begins.

Narrow trenches allow for faster, less cumbersome of equipment about the site during the final cover phase, and this saves equipment time on the job.

To Spec (HDPE) Corrugated Plastic Pipe Spec as:

ASTM General Construction

CPP-ASTM-F-677 (3” - 24”)
CPP-ASTM-F-2306 (12” - 60”)
CPP-ASTM-F-2648 (2”-60”)

AASHTO Highway Construction

CPP-AASHTO-M-252 (3” - 10”)
CPP-AASHTO-M-294 (12” - 60”

CRUMPLER PLASTIC PIPE, Inc.
CPP
CORRUGATED PLASTIC PIPE

MADE IN USA

PHONE 910-525-4046 / (800) 334-5071
24 HR. FAX SERVICE (800) CPP-PIPE
WEB SITE: www.cpp-pipe.com

The East Coast’s Largest Producer Under One Roof

4-Bedroom
LTAR: 0.3 gpd/ft^2
Initial: Pump-to-Innovative 25% Reduction Status Product utilizing lines 4-9 (410')
Repair: Pump-to-PPBPS utilizing lines 1-3,10-11 (270')

40

41

45

42

43

SITE BOUNDARY

217.85'

147.52'

145.13'

148.22'

31.78'

WHITE MAGNOLIA LANE

15: B-3': 40'
14: B+3': 40'
13: O: 40'
12: Pu-3': 60'
11: Pu+3': 60'
10: Y: 60'
9: Pi-3': 60'
8: Pi+3': 60'
7: W: 60'
6: B-3': 90'
5: B+3': 90'

4: R: 72'
3: Pi: 72'
2: nf: 72'
1: nf: 54'

Initial septic drainfield

Repair septic drainfield

NAD 83

GRAPHIC SCALE
0 30 60
1 inch = 30 ft.

Notes:
-No soil cuts within 20 feet of septic trenches.
-No swales within 30 feet of septic trenches unless approved, in writing, by Engineer.

SHEET NUMBER
1 of 7

Magnolia Acres
Lot 41
Overall Septic

REVISION NO.	DATE
Original Submittal	January 23, 2025
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

PREPARED FOR :
HHHunt Homes
1 Fenton Main Street
Suite 280
Cary, NC 27511

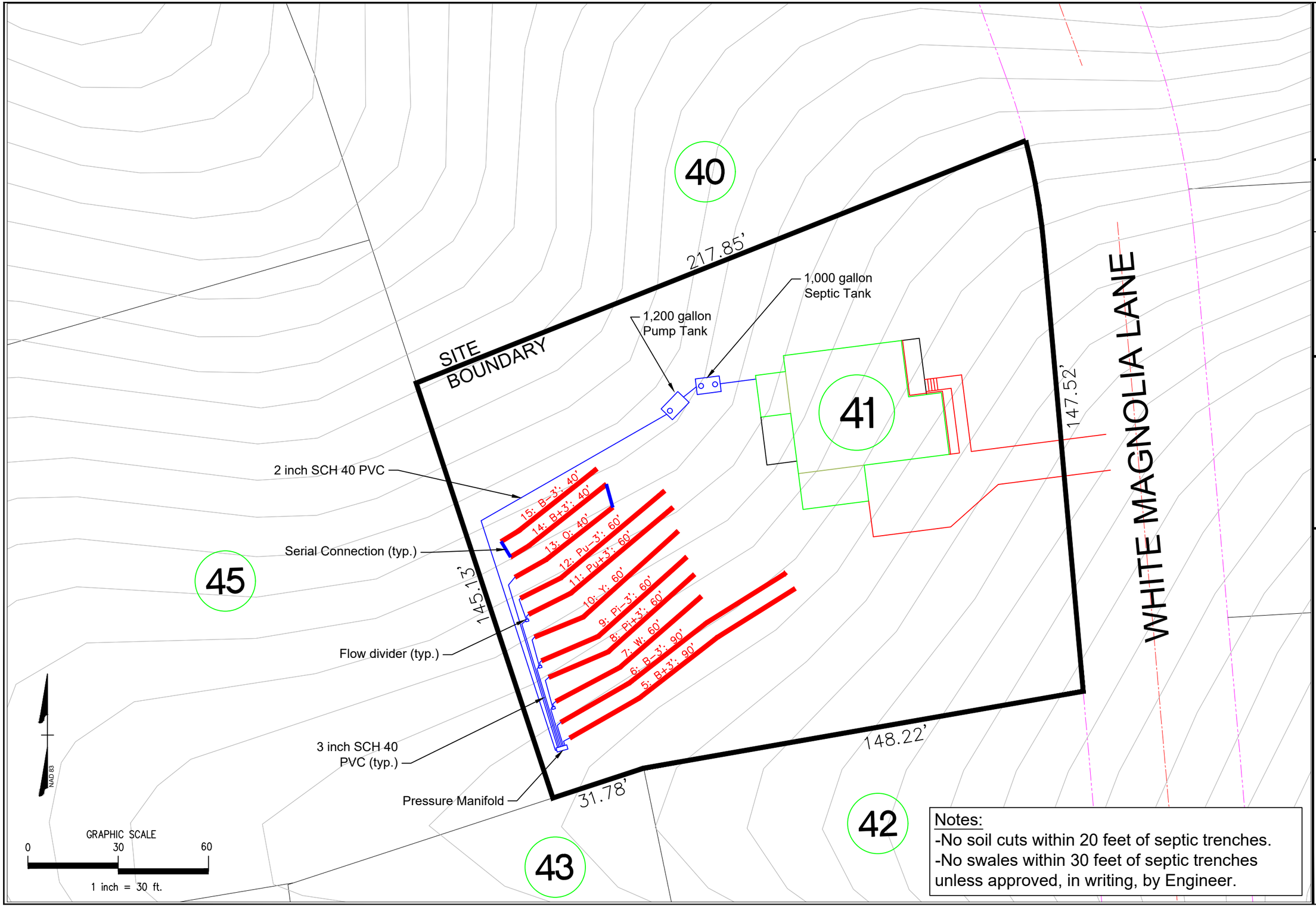
DATE : January 23, 2025

DESIGNER CONTACT:
ADAM AYCOCK, EI

DRAWN BY:
ADAM AYCOCK, EI

MITCHELL ENVIRONMENTAL, PA
C-2911

1501 LAKESTONE VILLAGE LANE
SUITE 205
FUQUAY VARINA, NC 27526



Notes:
-No soil cuts within 20 feet of septic trenches.
-No swales within 30 feet of septic trenches unless approved, in writing, by Engineer.

SHEET NUMBER
2 of 7

Magnolia Acres
Lot 41
Initial Nitrification Field

REVISION NO.	DATE
Original Submittal	January 23, 2025
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

PREPARED FOR : HHHunt Homes
1 Fenton Main Street
Suite 280
Cary, NC 27511

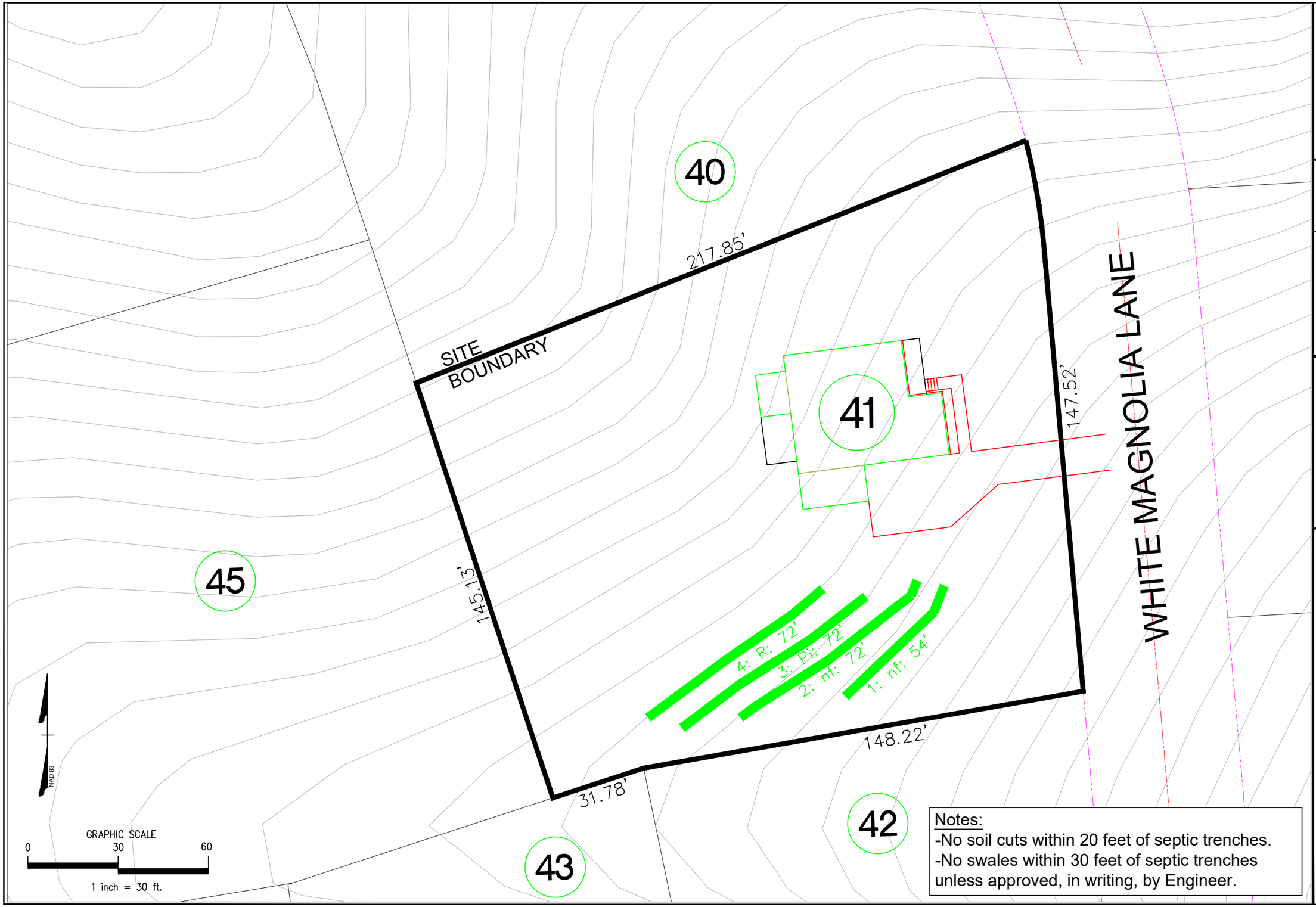
DATE : January 23, 2025

DESIGNER CONTACT:
ADAM AYCOCK, EI

DRAWN BY:
ADAM AYCOCK, EI

MITCHELL ENVIRONMENTAL, PA
C-2911

1501 LAKESTONE VILLAGE LANE
SUITE 205
FUQUAY VARINA, NC 27526



Notes:
-No soil cuts within 20 feet of septic trenches.
-No swales within 30 feet of septic trenches unless approved, in writing, by Engineer.

SHEET NUMBER
3 of 7

Magnolia Acres
Lot 41
Repair Nitrification Field

REVISION NO.	DATE
Original Submittal	January 23, 2025
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

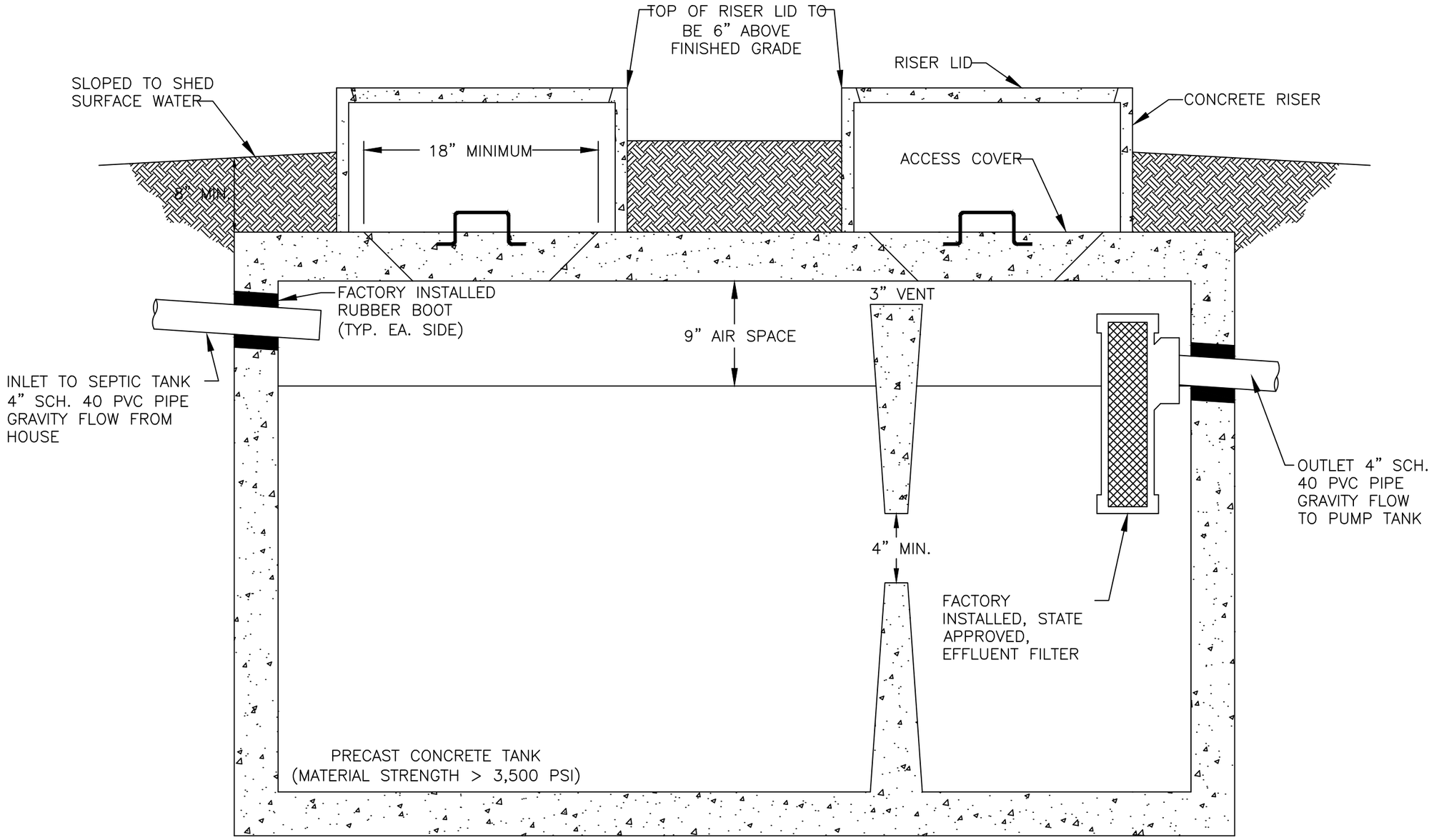
PREPARED FOR : HHHunt Homes
1 Fenton Main Street
Suite 280
Cary, NC 27511

DATE : January 23, 2025

DESIGNER CONTACT:
ADAM AYCOCK, EI

DRAWN BY:
ADAM AYCOCK, EI

MITCHELL ENVIRONMENTAL, PA
C-2911
1501 LAKESTONE VILLAGE LANE
SUITE 205
FUQUAY VARINA, NC 27526



1,000 GALLON SEPTIC TANK

SEPTIC TANK DETAIL

N.T.S.

SHEET NUMBER 4 of 7

Magnolia Acres
Lot 41
Septic Tank Detail

REVISION NO.	DATE
Original Submittal	January 23, 2025
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

PREPARED FOR : HHHunt Homes
1 Fenton Main Street
Suite 280
Cary, NC 27511

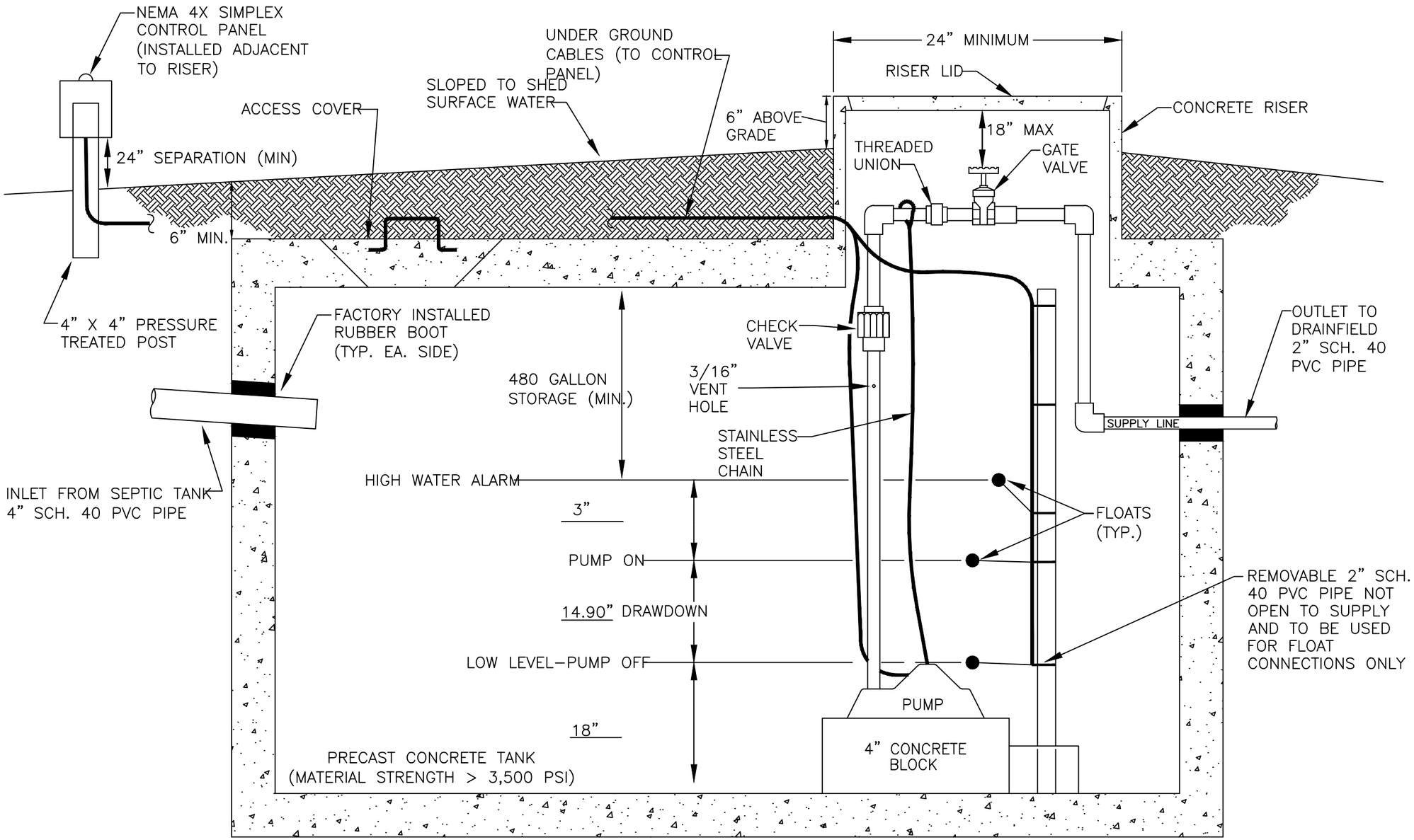
DATE : January 23, 2025

DESIGNER CONTACT:
ADAM AYCOCK, EI

DRAWN BY:
ADAM AYCOCK, EI

MITCHELL ENVIRONMENTAL, PA
C-2911
1501 LAKESTONE VILLAGE LANE
SUITE 205
FUQUAY VARINA, NC 27526

* DRAWDOWN SPECIFIED 19.0 GALLONS PER INCH



1,200 GALLON PUMP TANK

PUMP TANK DETAIL

N.T.S.

SHEET NUMBER 5 of 7

Magnolia Acres
Lot 41
Pump Tank Detail

REVISION NO.	DATE
Original Submittal	January 23, 2025
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

PREPARED FOR : HHHunt Homes
1 Fenton Main Street
Suite 280
Cary, NC 27511

DATE : January 23, 2025

DESIGNER CONTACT: ADAM AYCOCK, EI

DRAWN BY: ADAM AYCOCK, EI

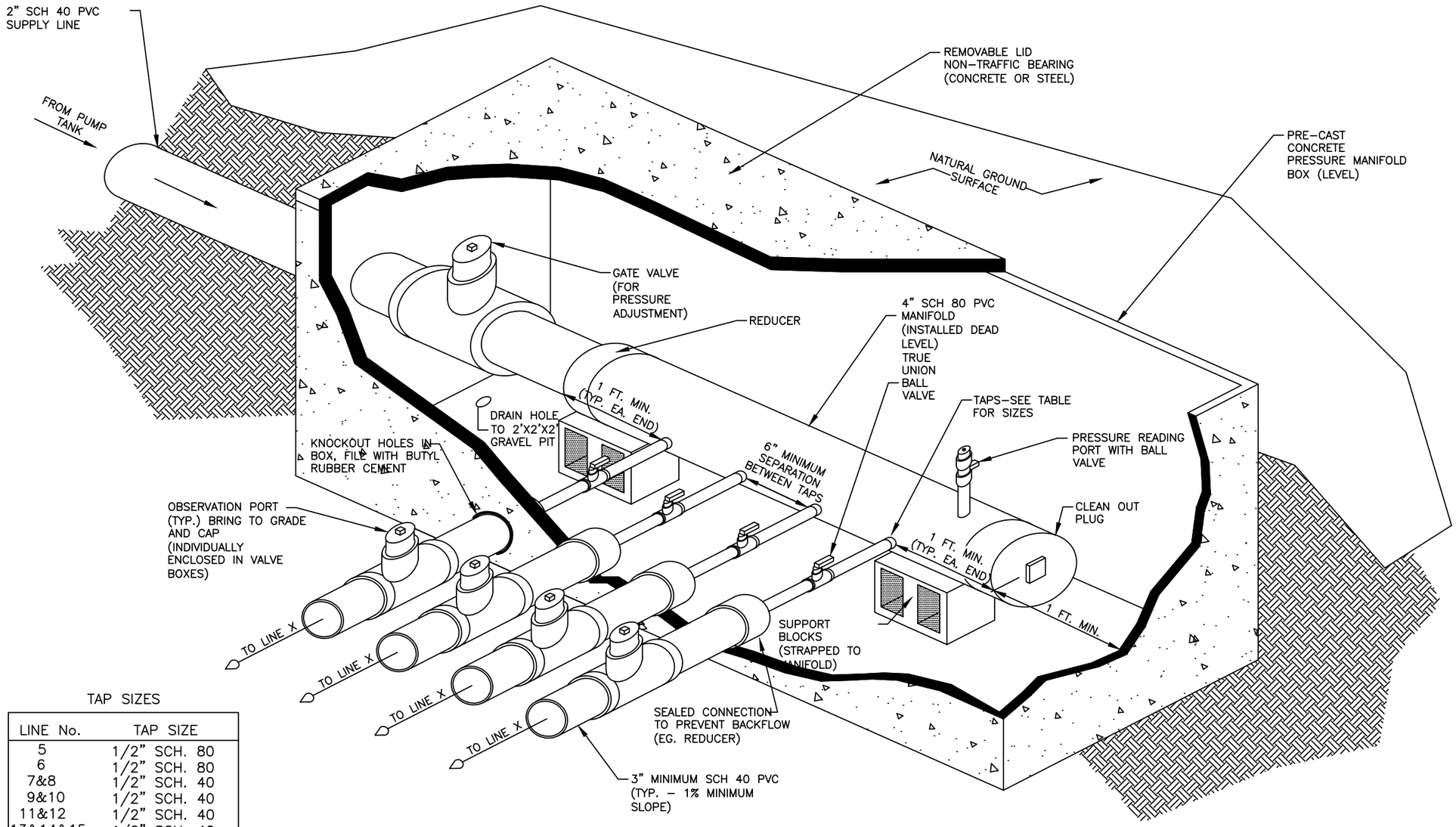
MITCHELL ENVIRONMENTAL, PA
C-2911
1501 LAKESTONE VILLAGE LANE
SUITE 205
FUQUAY VARINA, NC 27526

PRESSURE MANIFOLD DETAIL
FOR MAGNOLIA ACRES LOT 41 INITIAL SEPTIC SYSTEM

N.T.S.

NOTE: MANIFOLD MAY NEED TO BE FLIPPED SO THAT SUPPLY LINE ENTRANCE AND CLEANOUTS ARE REVERSED. SEE SITE PLAN.

NOTE: THE NUMBER OF TAPS MAY VARY FROM LOT TO LOT. SEE DESIGN SHEET FOR NUMBER OF TAPS.



TAP SIZES

LINE No.	TAP SIZE
5	1/2" SCH. 80
6	1/2" SCH. 80
7&8	1/2" SCH. 40
9&10	1/2" SCH. 40
11&12	1/2" SCH. 40
13&14&15	1/2" SCH. 40

6 TAPS TOTAL

SHEET NUMBER

6 of 7

Magnolia Acres
Lot 41
Pressure Manifold Detail

REVISION NO.	DATE
Original Submittal	January 23, 2025
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

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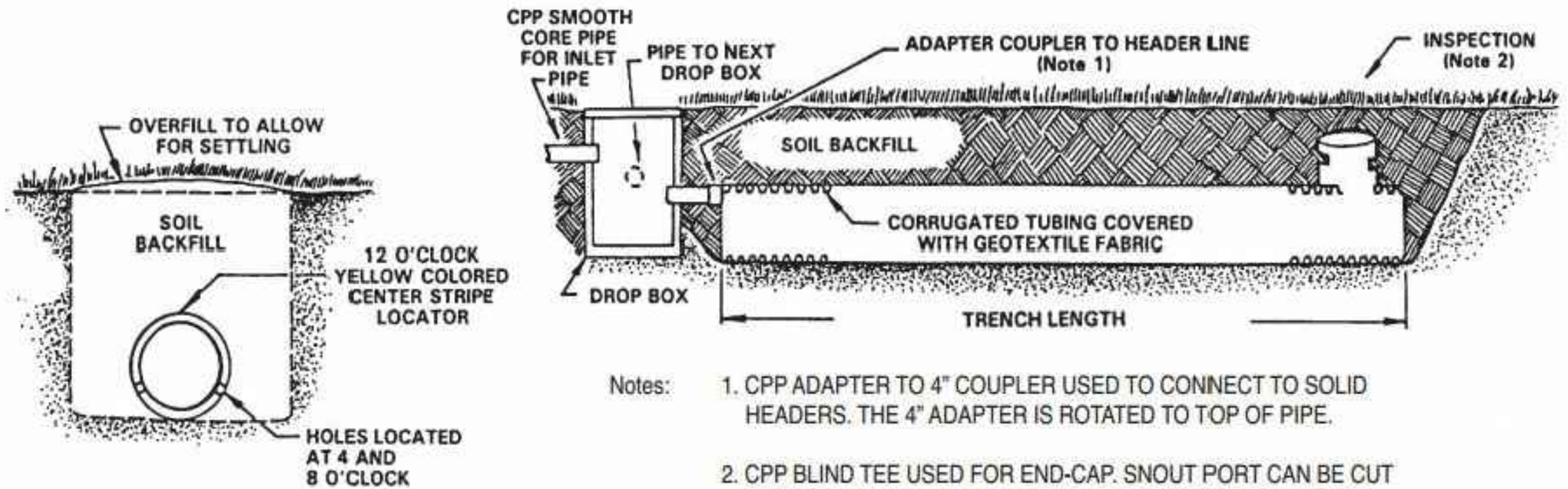
TRENCH DEPTH: SEE HARNETT COUNTY PERMIT
TRENCH WIDTH: 18" MAXIMUM
TRENCH SPACING: 6' o.c.

CPP Gravelless LDP Trench Construction Details



Notes:

1. CPP ADAPTER TO 4" COUPLER USED TO CONNECT TO SOLID HEADERS. THE 4" ADAPTER IS ROTATED TO TOP OF PIPE.

2. CPP BLIND TEE USED FOR END-CAP. SNOUT PORT CAN BE CUT OUT FOR INSTALLING A CLEAN OUT ADAPTER THAT ALLOWS FOR POST INSTALLATION INSPECTION.

SHEET NUMBER
7 of 7

Magnolia Acres
Lot 41
Trench Detail

REVISION NO.	DATE
Original Submittal	January 23, 2025
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

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1 Fenton Main Street
Suite 280
Cary, NC 27511

DATE : January 23, 2025

DESIGNER CONTACT:
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