Mitchell Environmental, P.A.

SEPTIC SYSTEM DESIGN

for

HOLLIES PINES- LOT 4

Broadway, 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: March 22, 2024
PROJECT NO.: 1922

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

Harnett County GIS

PID: 139692 0014 92

PIN: 9692-70-1192.000

Account Number: 1500051599

Owner: HHHUNT HOMES RALEIGH-DURHAM LLC

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

Physical Address: 996 HOLLIES PINES RD BROADWAY, NC 27505 ac

Description: LOT#4 PINEDAROSA 1 MAP#2020-109

Surveyed/Deeded Acreage: 0.57

Calculated Acreage: 0.58

Deed Date: 1662008400000

Deed Book/Page: 4165 - 0651

Plat(Survey) Book/Page: 2020 - 109

Last Sale: 2022 - 9

Sale Price: $240000

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: 20460

Market Value: $20460

Deferred Value: $0

Total Assessed Value: $20460

Zoning: RA-30 - 0.58 acres (100.0%)

Zoning Jurisdiction: Harnett County

Wetlands: No

FEMA Flood: Minimal Flood Risk

Within 1mi of Agriculture District: Yes

Elementary School: Boone Trail Elementary

Middle School: Western Harnett Middle

High School: Western Harnett High

Fire Department: Boone Trail

EMS Department: Medic 12, D12 EMS

Law Enforcement: Harnett County Sheriff

Voter Precinct: Boone Trail

County Commissioner : Lewis Weatherspoon

School Board Member: Duncan Jaggers

STB - 345 - Top Seam

Approval Date: 12 - 09 - 99

Liquid Capacity 1007 Gallons

Non Traffic Rated

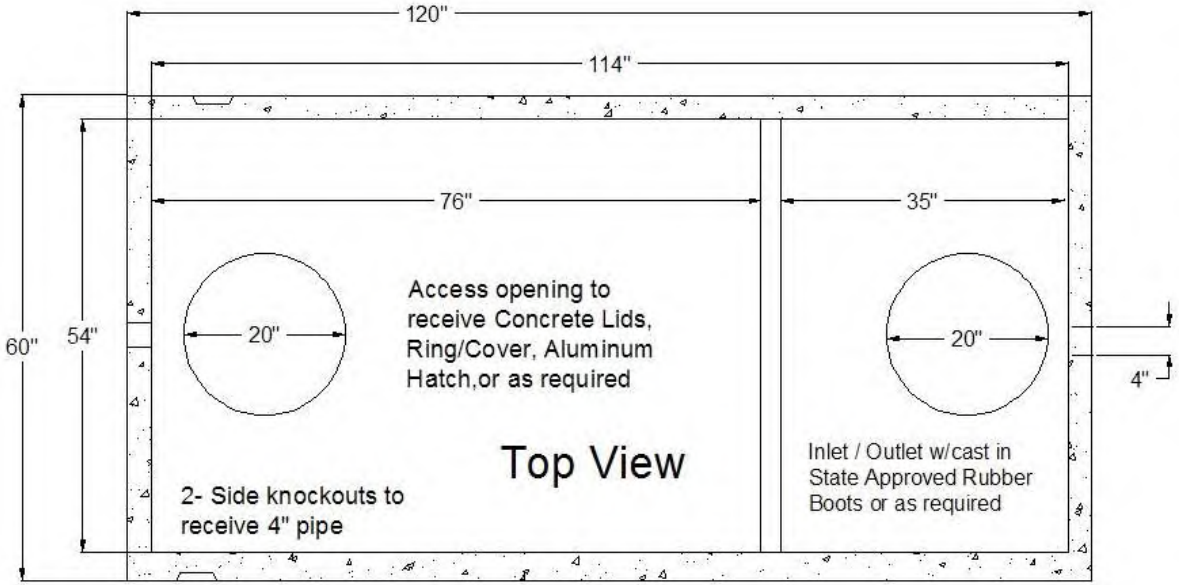
Reinforcing Schedule: # 3 Grade 60 Rebar

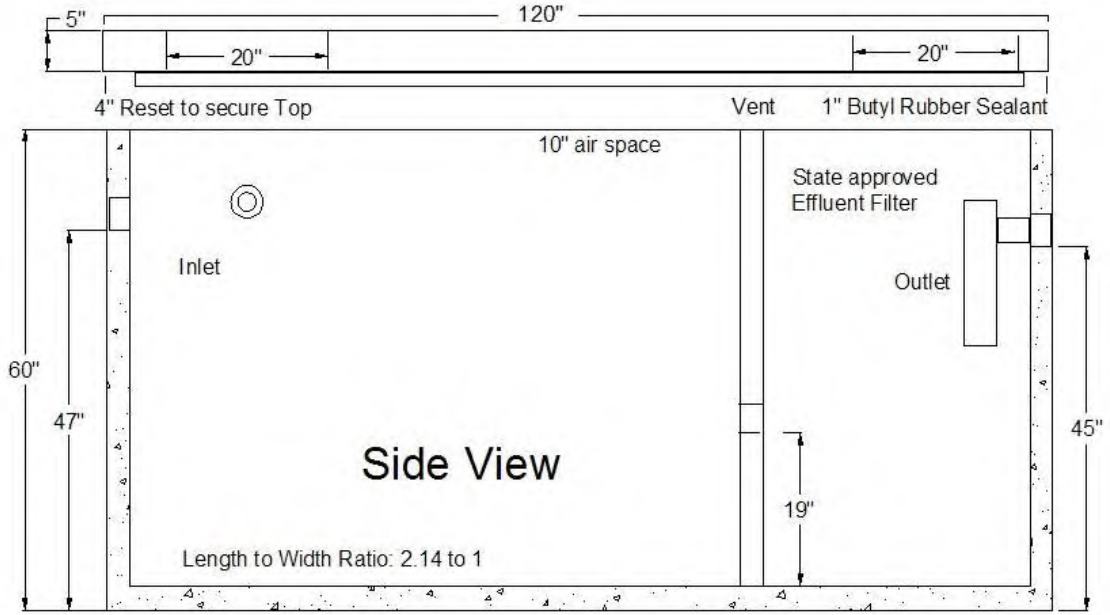
4500 PSI Concrete w/ State Approved Structural Fiber

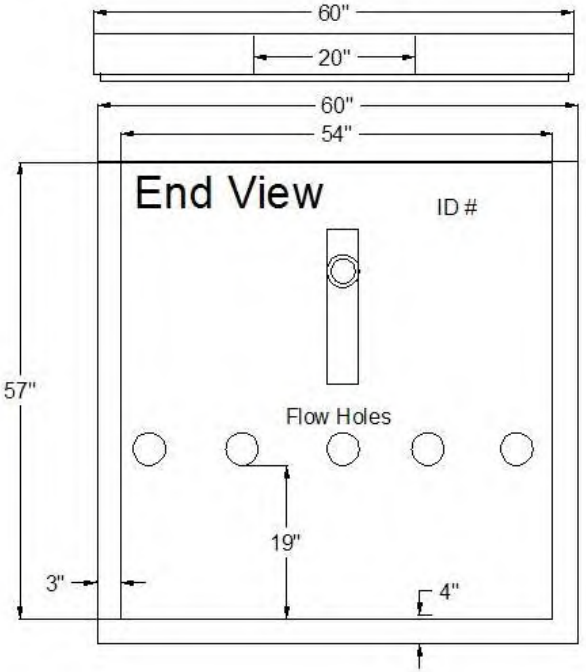
Est. Weight: 8,200 lbs.

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:

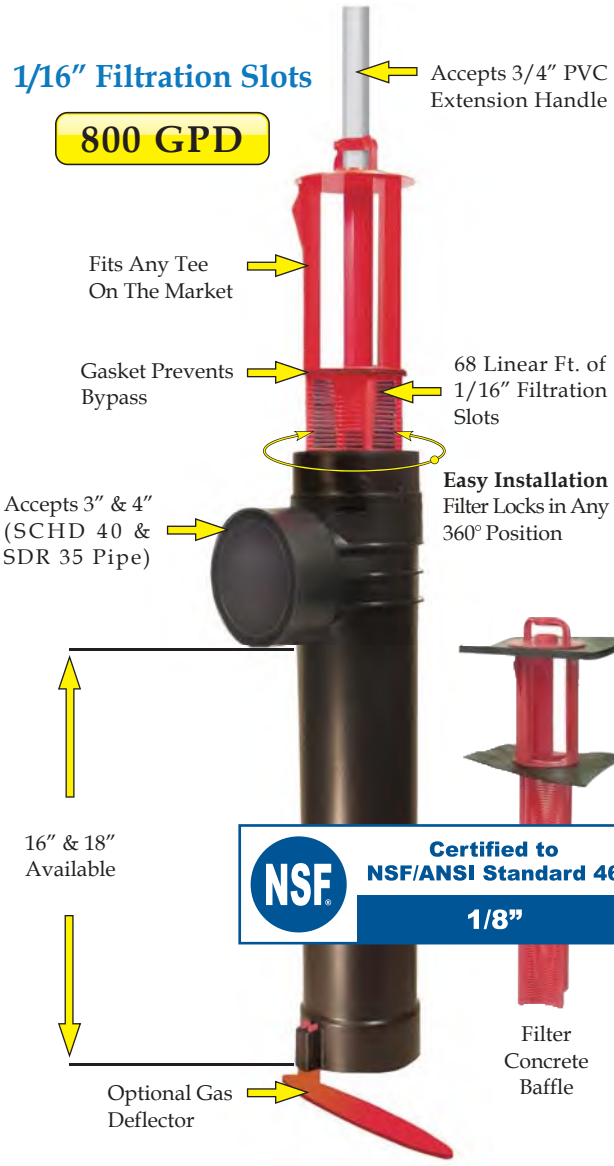
The PL-68 Effluent Filter will operate efficiently for several years under normal conditions before requiring cleaning. It is recommended that the filter be cleaned every time the tank is pumped, or at least every three years.

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.

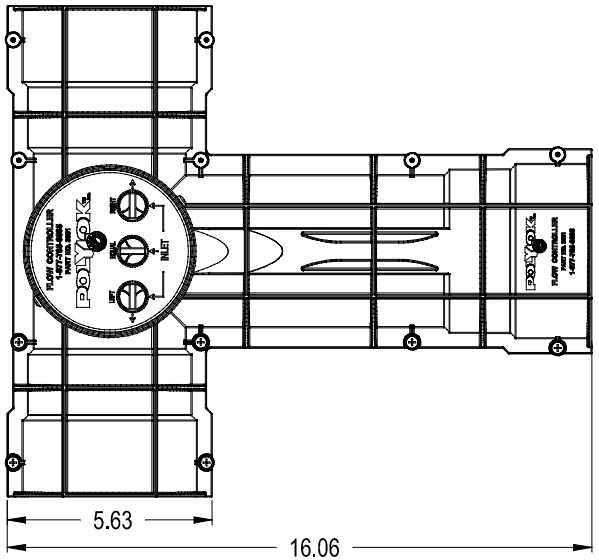


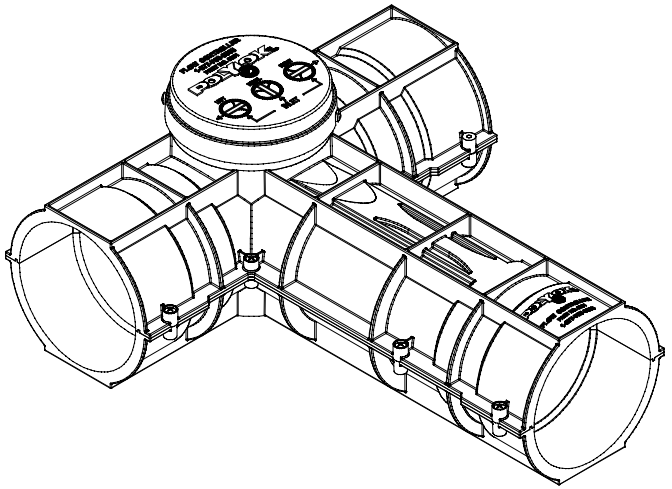
Spacer Bushing 4" SCHD 40 to SDR 35

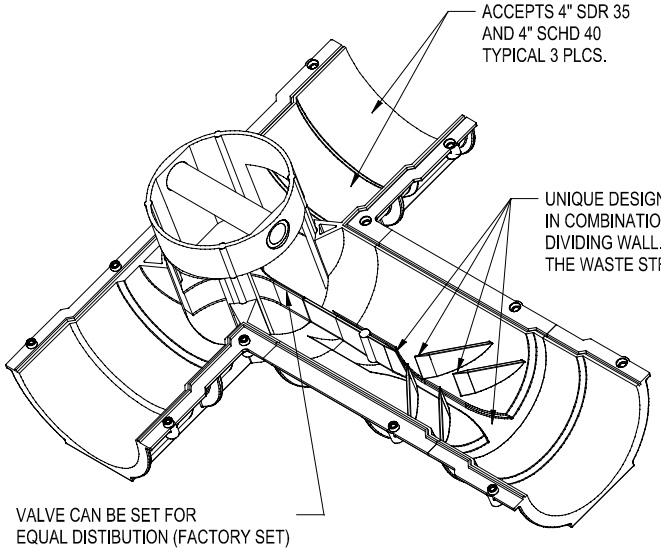
Spacer Bushing 4" SCHD 40 to 110mm Pipe

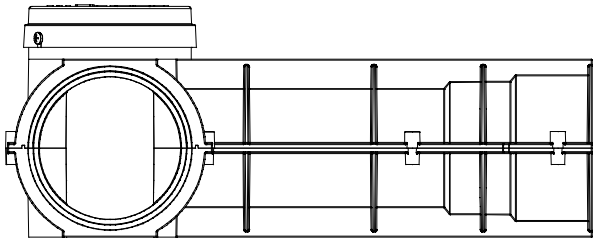
2" Extender

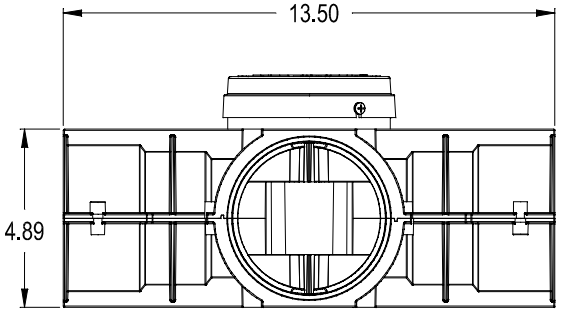
POLYLOK FLOW CONTROLLER
PART NO. 3051
MATERIAL - ABS











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

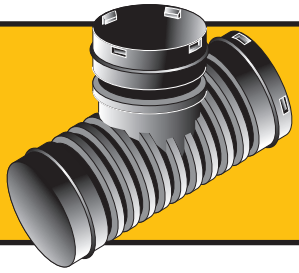
Post Office Box 2068
Roseboro, North Carolina 28382

Web Site: www.cpp-pipe.com

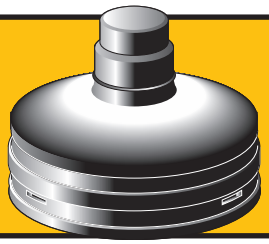
CPP-NR Rev. 9/18

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

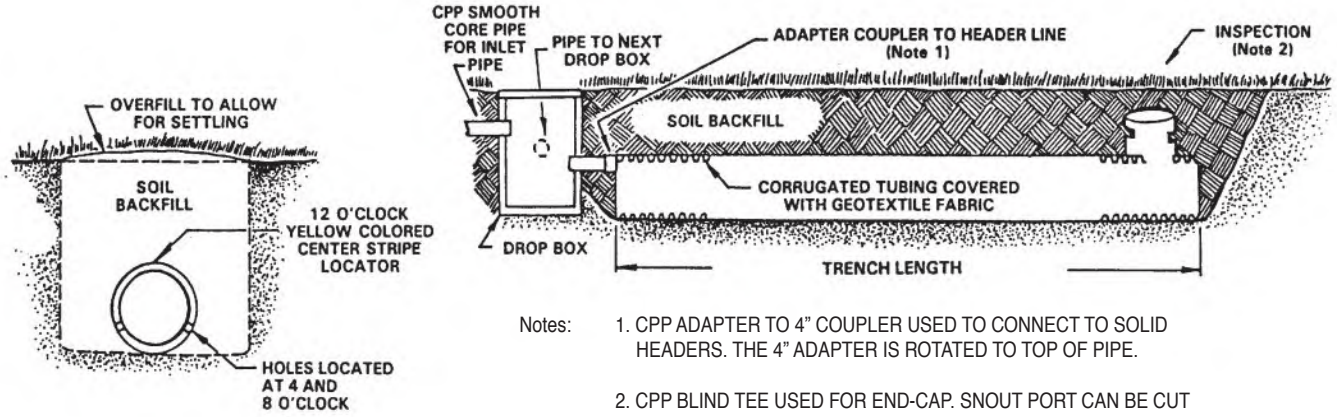
Blind Tee's



Snap Combo End Cap/4" Reducer/Adapter

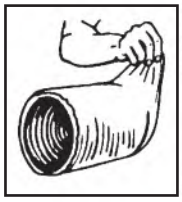


CPP Gravelless LDP Trench Construction Details



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.

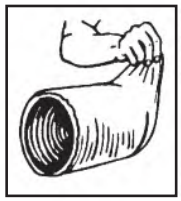


TYPE	SIZE	PART NO.	PACKAGE DESCRIPTION	PRICE
	8"	0830020B	CRUMPLER'S NO-ROCK™ SEPTIC - 20 ft. with filter wrap	
	10"	1030020B	CRUMPLER"S NO-ROCK™ SEPTIC - 20 ft. with filter wrap	

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.

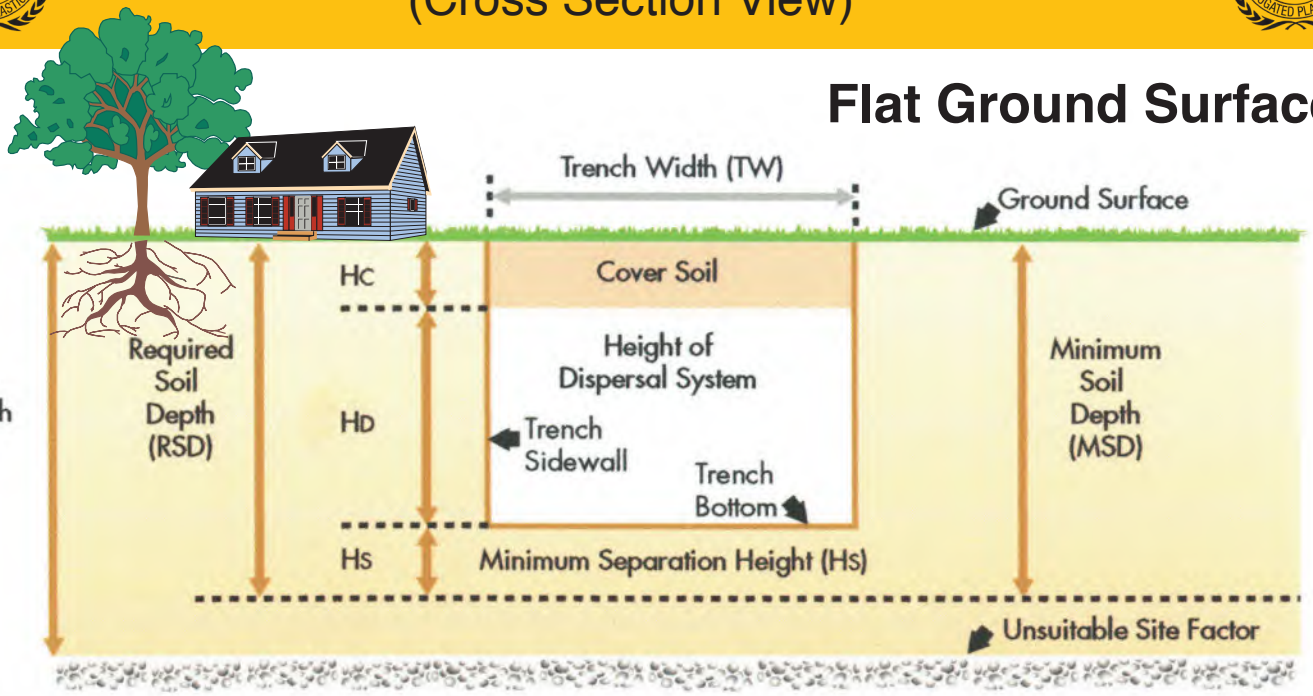
Trial 2: Crumpler NO ROCK™ 8 inch ID (10 in. OD) installed in a 12 inch wide trench would require a usable soil depth of 31.4 inches. [31.4 RSD = 28 inches MSD + (12 inches TW x .28 S)] Therefore, site is acceptable for Crumpler 8 in. NO ROCK™.

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



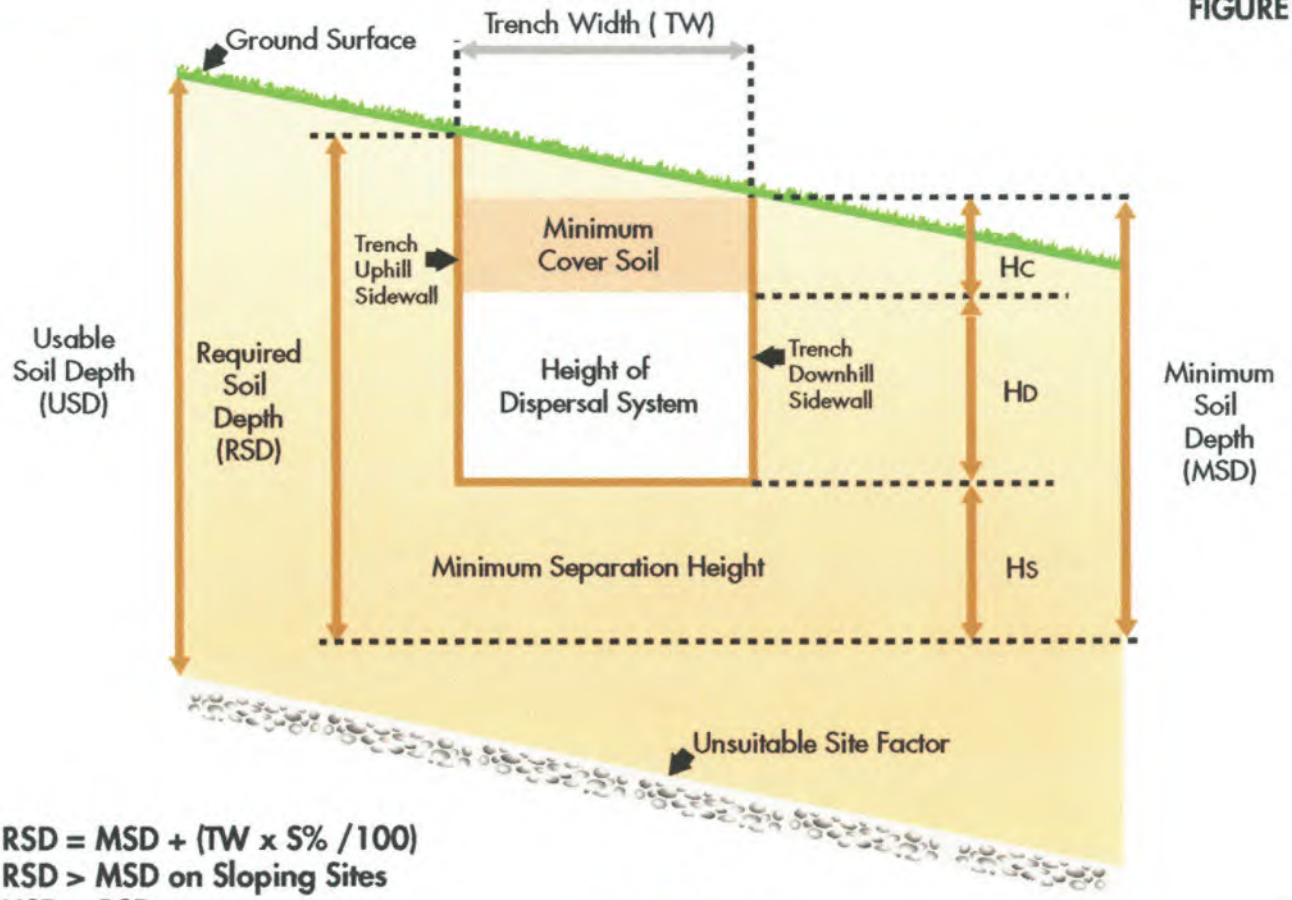
MSD = Hc + HD + Hs
MSD = RSD on Flat Sites

Not To Scale

FIGURE 1

Sloping ground Surface

FIGURE 2

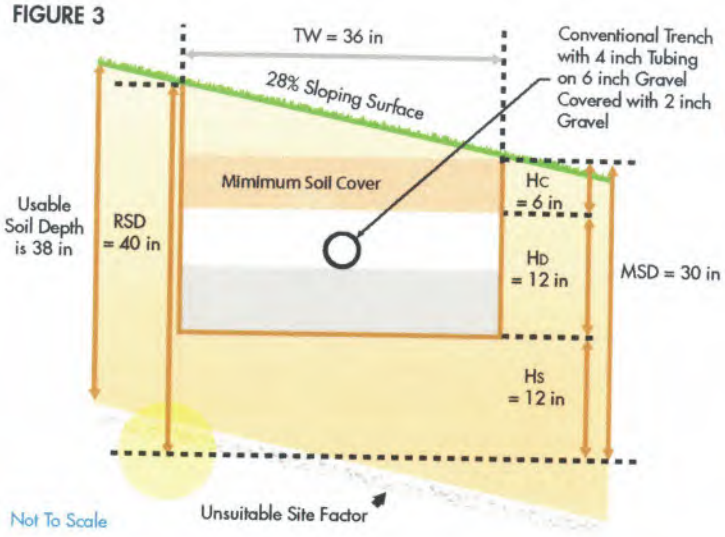


RSD = MSD + (TW x S% /100)
RSD > MSD on Sloping Sites
USD ≥ RSD

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

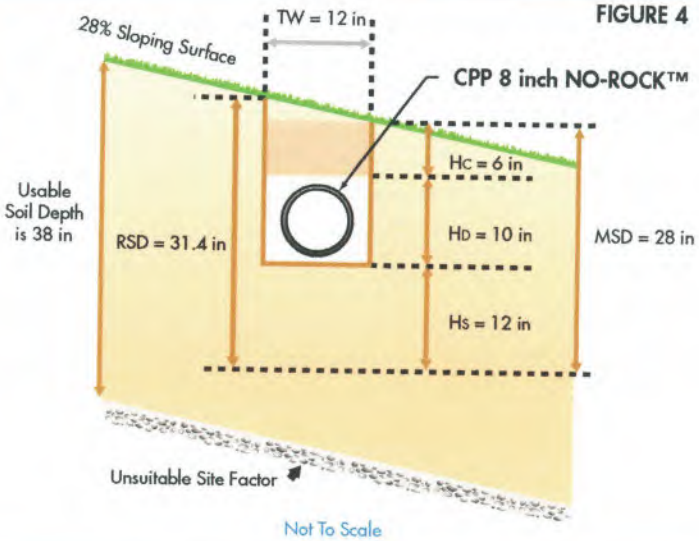
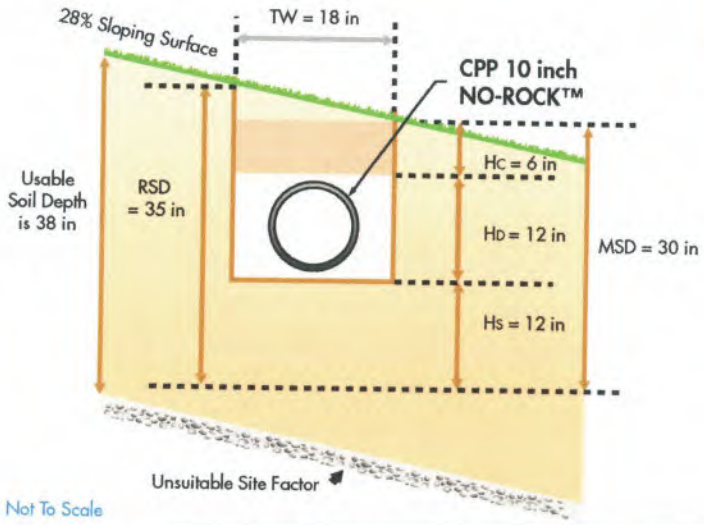


FIGURE 5



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

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

Existing water meter
(*Typical*)

5

SITE
BOUNDARY

100.83'

248.32'

Existing water main

4

STOOP

10' minimum

10' minimum

1: B+4': 67'
2: B-4': 67'
3: W: 110'
4: nf: 110'
5: G: 110'
6: nf: 110'
7: Pi: 110'
8: nf: 110'
9: Y-4': 67'
10: R: 67'

Repair septic drainfield

100.64'

248.92'

3

Initial septic drainfield

4-Bedroom
LTAR: 0.3 gpd/ft^2
Initial: Gravity-to-10" large diameter pipe utilizing lines 3-8 (660')
Repair: Gravity-to-Horizontal Panel Block utilizing lines 1-2, 9-10 (268')

NAD 83

GRAPHIC SCALE
0 30 60
1 inch = 30 ft.

SHEET NUMBER
1 of 5

Hollies Pines
Lot 4
Overall Septic

REVISION NO.	DATE
Original Submittal	March 22, 2024
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

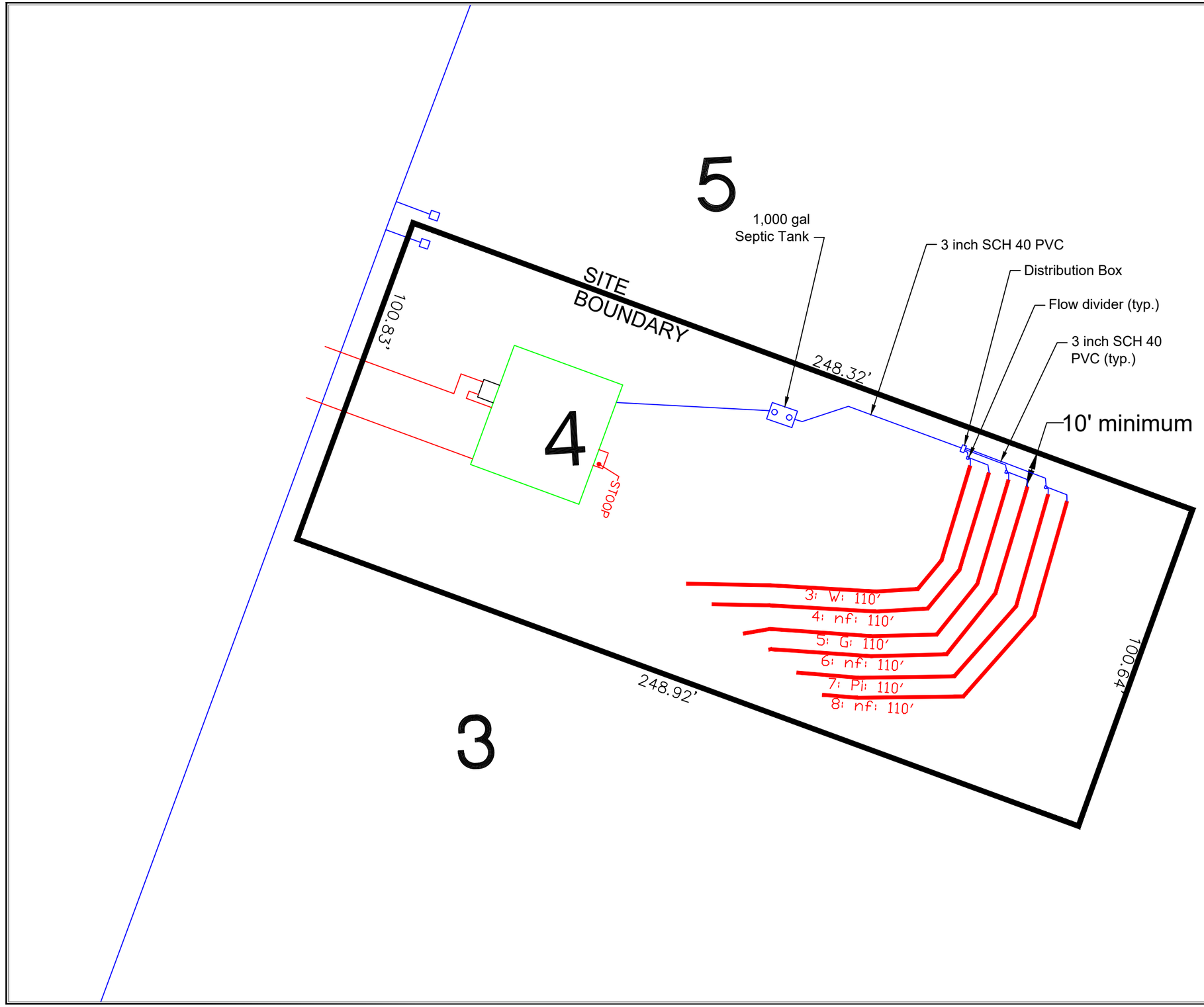
PREPARED FOR : HHHunt Homes of Raleigh
1401 Sunday Drive, Suite 109
Raleigh, NC 27607

DATE : March 22, 2024

DESIGNER CONTACT: EI
ADAM AYCOCK,

DRAWN BY: EI
ADAM AYCOCK,

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



SHEET NUMBER	2 of 5	Hollies Pines Lot 4 Initial Nitrification Field

REVISION NO.	DATE
Original Submittal	March 22, 2024
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

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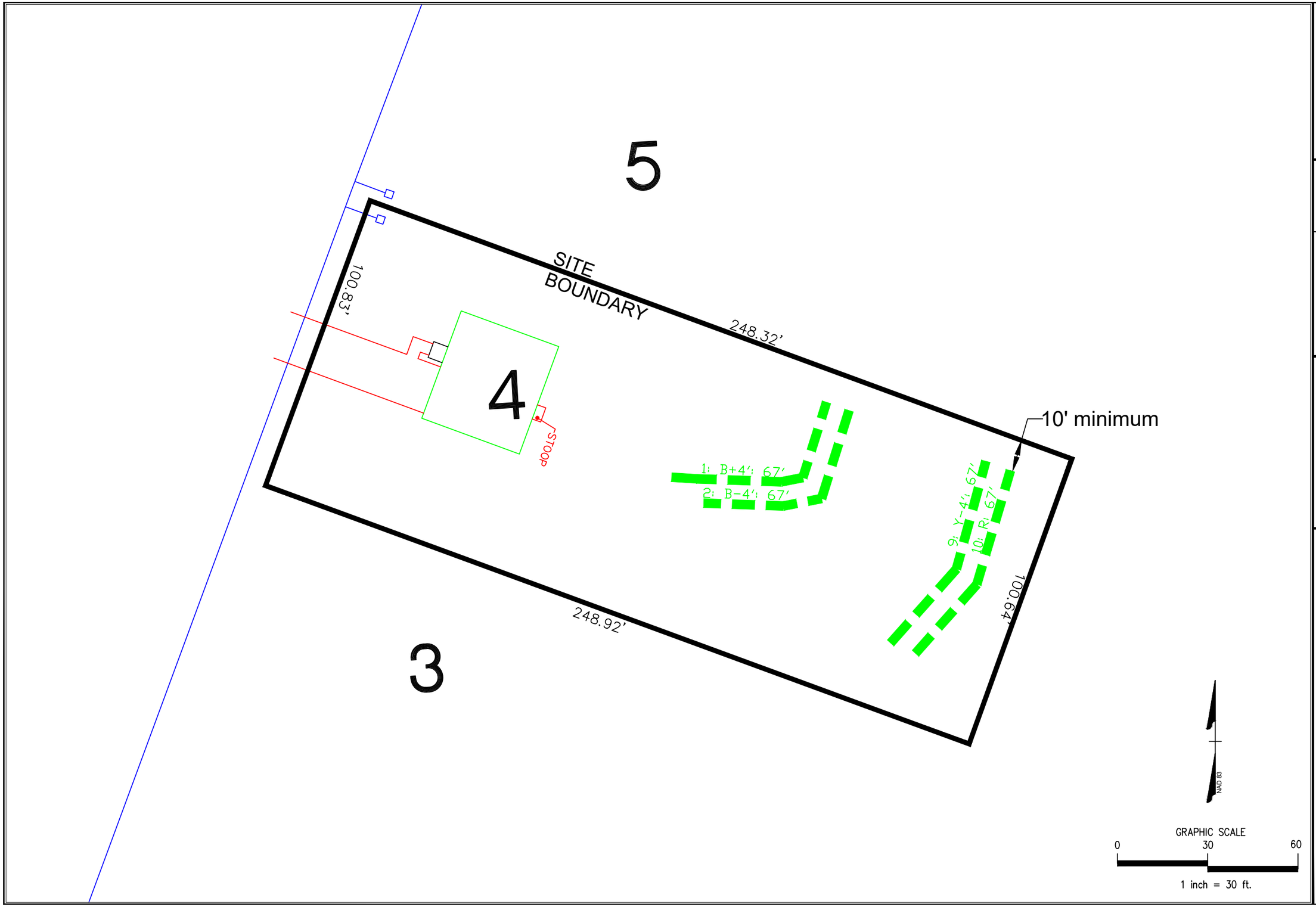

SHEET NUMBER	3 of 5

Hollies Pines
Lot 4
Repair Nitrification Field

REVISION NO.	DATE
Original Submittal	March 22, 2024
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

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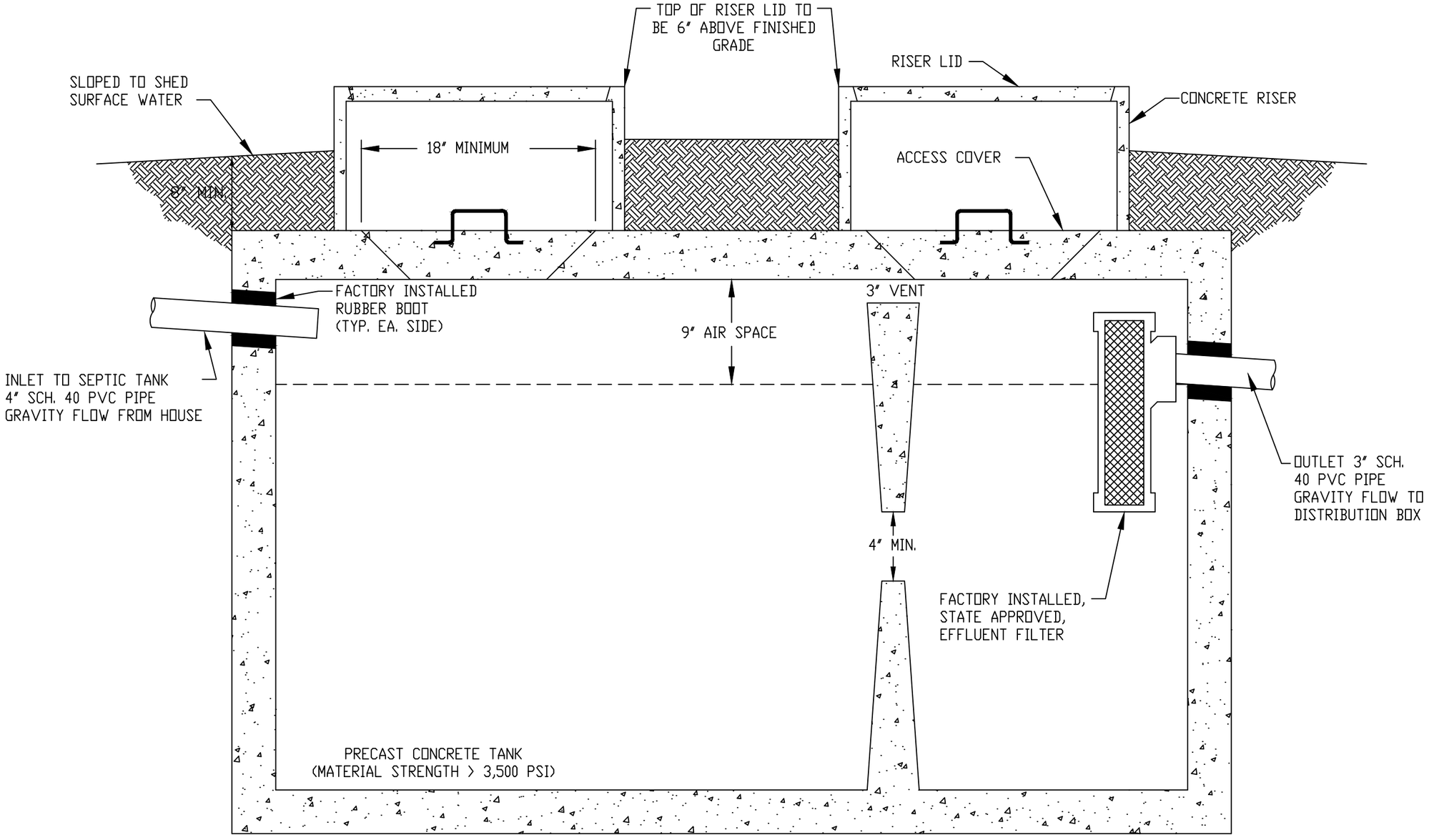
DATE : March 22, 2024

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 5

Hollies Pines
Lot 4
Septic Tank Detail

REVISION NO.	DATE
Original Submittal	March 22, 2024
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

PREPARED FOR : HHHunt Homes of Raleigh
1401 Sunday Drive, Suite 109
Raleigh, NC 27607

DATE : March 22, 2024

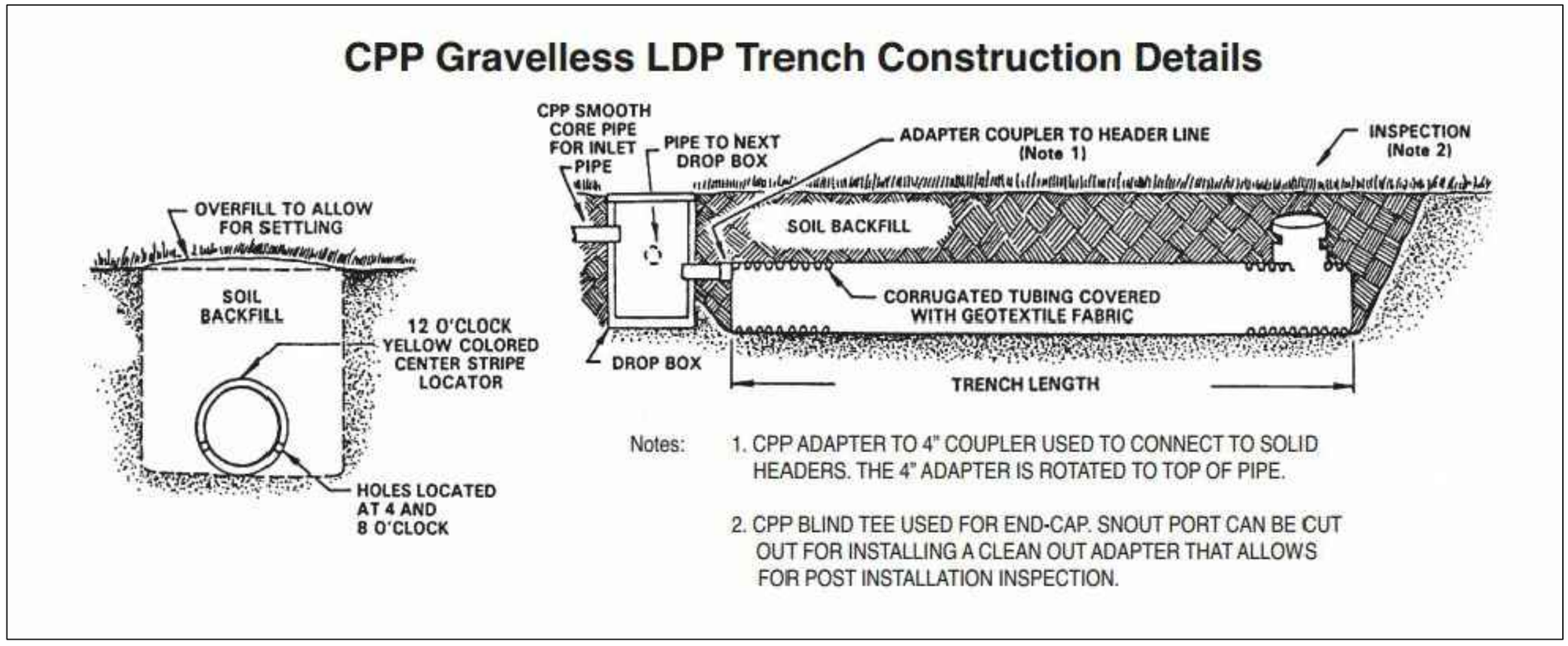
DESIGNER CONTACT:
ADAM AYCOCK, EI

DRAWN BY:
ADAM AYCOCK, EI

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

Trench Width = 12 Inches minimum
Trench Depth = see Harnett County permit

Trench Spacing = 6 Feet (Center-to-Center, Minimum)



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

5 of 5

Hollies Pines
Lot 4
Trench Detail

REVISION NO.	DATE
Original Submittal	March 22, 2024
Revision 1	-----
Revision 2	-----
Revision 3	-----
Master Set	-----

PREPARED FOR : HHHunt Homes of Raleigh
1401 Sunday Drive, Suite 109
Raleigh, NC 27607

DATE : March 22, 2024

MANUFACTURER CONTACT:
CRUMPLER PLASTIC PIPE

DRAWN BY:
CRUMPLER PLASTIC PIPE

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