

**GENERAL NOTES**

1. THE LOT SHOWN HEREON WAS RECORDED ON THE PLAT FOR CLARKSVILLE CROSSING PROPERTY, PLAT NUMBER 25134-25137 REFER TO THE PLAT FOR LOT DIMENSIONS, LOT AREA, ALL EASEMENTS AND CONDITIONS.
2. THE EXISTING WELL SHOWN ON THIS PLAN (HO-17-0380) HAS BEEN FIELD LOCATED BY BENCHMARK ENGINEERING, INC. AND IS ACCURATELY SHOWN.
3. THERE ARE NO EXISTING WELLS OR SEPTIC SYSTEMS WITHIN 100' OF THIS PROJECT'S BOUNDARY EXCEPT AS NOTED.
4. TOPOGRAPHY SHOWN WAS PREPARED BY BENCHMARK ENGINEERING, INC. DATED AUGUST, 2013.
5. SEDIMENT AND EROSION CONTROLS WILL BE SUBMITTED BY HOWARD SOILS CONSERVATION DISTRICT AS A CUSTOM GRADING PLAN.
6. ALL DRAINAGE AND STORMWATER MANAGEMENT FEATURES USED ON THIS SITE MUST COMPLY WITH THE APPROVED BUILDING PERMIT AND CUSTOM GRADING PLANS. STORMWATER MANAGEMENT FOR THIS LOT IS PROVIDED BY TWO NON-ROOFTOP DISCONNECTIONS AND ONE MICRO-BIORETENTION FACILITY.
7. ANY CHANGES TO A PRIVATE SEWAGE DISPOSAL AREA OR WELL BOX SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
8. ANY CHANGES TO THE LOCATIONS OR DEPTHS TO ANY COMPONENTS MUST BE APPROVED BY THE ENGINEER AND THE HOWARD COUNTY HEALTH DEPARTMENT PRIOR TO INSTALLATION. A REVISED SITE PLAN MAY BE REQUIRED.
9. ANY ELECTRICAL WORK FOR THE INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
10. THE SEPTIC TANK WILL BE A 2000 GALLON TWO COMPARTMENT TANK. THE PUMP TANK IS TO BE A 2,000 GALLON ONE COMPARTMENT TANK.
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12. ALL WELLS AND SEPTIC SYSTEMS LOCATED WITHIN 100' OF THE PROPERTY BOUNDARIES AND 200' DOWN GRADIENT OF ANY WELLS/OR SEPTIC SYSTEM HAVE BEEN SHOWN.
13. ANY FUTURE WELLS SHALL BE 10' FROM DRIVEWAY.
14. MICRO-BIORETENTION SWM FACILITIES WITHIN 100' OF A WELL SITE OR WELL BOX WILL BE LINES. MICRO-BIORETENTION FACILITIES ARE NOT ALLOWED CLOSER THAN 50' TO A WELL SITE OR WELL BOX.

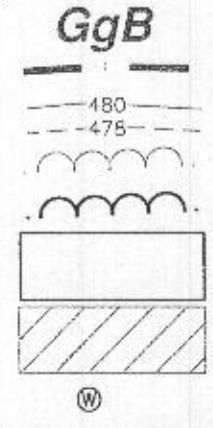
Approved Septic System Plan  
 Howard County Health Department  
 5-bedroom residence  
 w/ bath in finished basement area  
*Reichen*  
 Signature 11/8/21  
Date

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 45577, Expiration Date: 06/08/2022

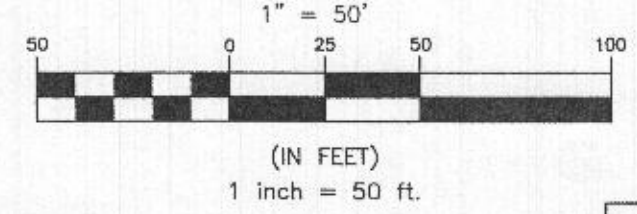


**LEGEND**

- SOILS CLASSIFICATION
- SOILS DELINEATION
- EXISTING CONTOURS
- EXISTING TREE LINE
- PROPOSED TREE LINE
- WELL BOX
- SEWAGE DISPOSAL AREA
- FIELD LOCATED WELL



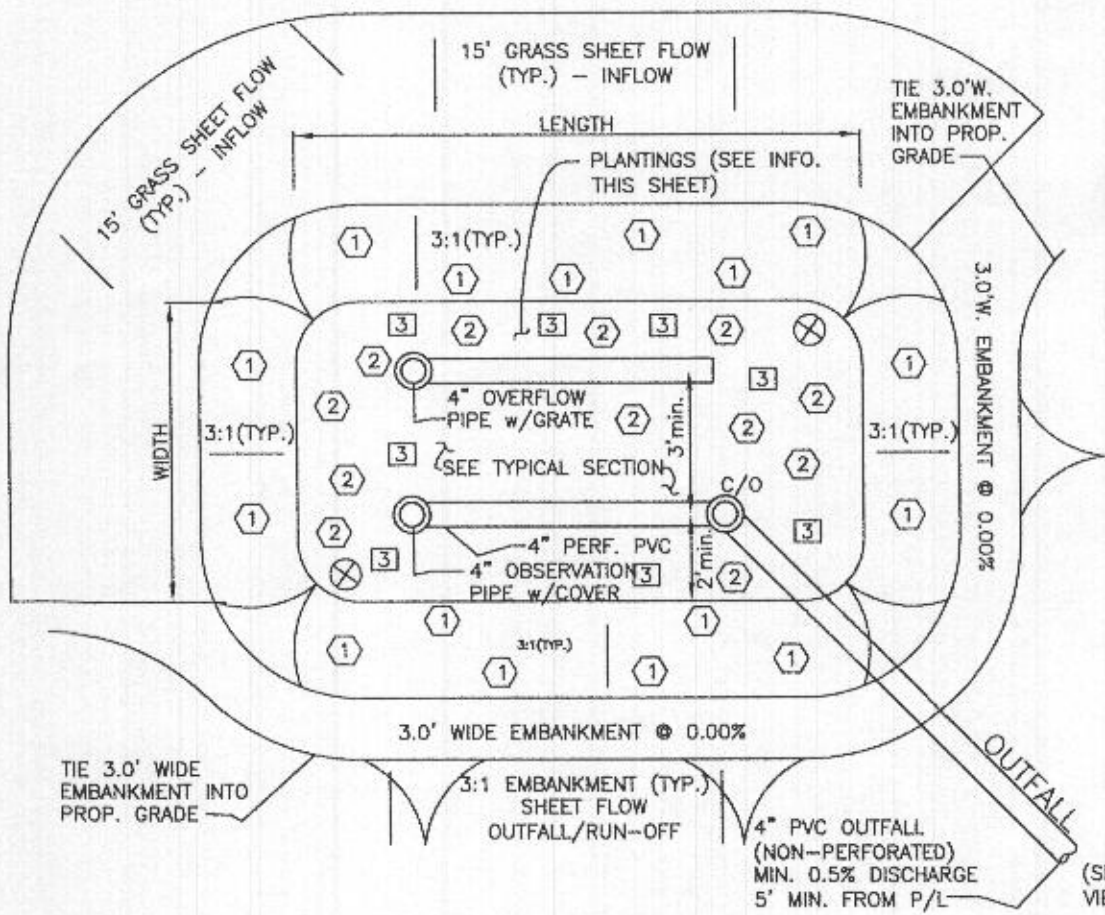
**PLAN VIEW**



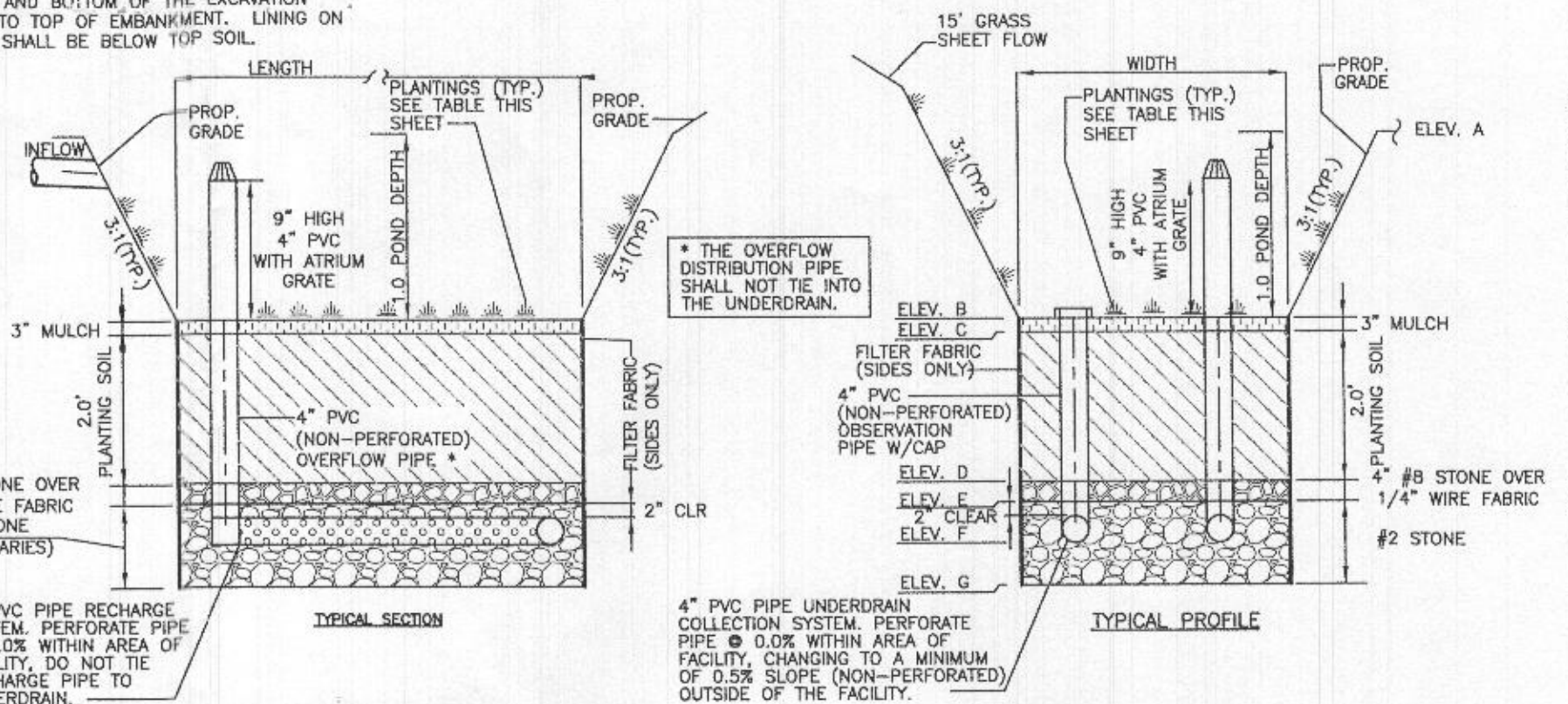
**BUILDER:**  
 WILLIAMSBURG HOMES  
 5485 HARPERS FARM ROAD  
 COLUMBIA, MARYLAND 21044  
 410-997-8800

**BENCHMARK**  
 ENGINEERS & LAND SURVEYORS & PLANNERS  
**ENGINEERING, INC.**  
 8480 BALTIMORE NATIONAL PIKE & SUITE 315  
 ELLICOTT CITY, MARYLAND 21043  
 (P) 410-485-6105 & (F) 410-485-6644  
 WWW.BEI-CMLENGINEERING.COM

PROJECT:		CLARKSVILLE CROSSING LOT 1	
LOCATION:		TAX MAP: 34, GRID: 23, PARCEL: 301 6505 OLD HILLTOP CT., TAX ID: 05-602003 ELECTION DISTRICT NO. 5, HOWARD COUNTY, MARYLAND	
TITLE:		BUILDING PERMIT PLAN	
HOUSE TYPE:		RUTLEDGE	
DATE:	SEPTEMBER, 2021	PROJECT NO.	2525
SCALE:	AS SHOWN	DRAWING	1 OF 2



NOTE: FACILITIES MUST BE CONSTRUCTED WITH IMPERMEABLE LINER WHEN INSTALLED WITHIN THE 100' WELL RADIUS. THIS LINING SHOULD INCLUDE ENTIRE SIDES AND BOTTOM OF THE EXCAVATION AND EXTEND TO TOP OF EMBANKMENT. LINING ON SIDE SLOPES SHALL BE BELOW TOP SOIL.



- MICROBIORETENTION PLANTING DATA**
1. PLANTINGS WITHIN THE PONDING AREA OF THE MICRO-BIORETENTION FACILITY ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE
  2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE MICRO-BIORETENTION FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE
  3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO-BIORETENTION FACILITY NEAR O.B. PIPE AND UNDERDRAIN.
- MICROBIORETENTION PLANTING SCHEDULE**  
(SPECIFIC NUMBER OF PLANTINGS SHALL BE DETERMINED WITH FINAL DESIGN AT PLOT PLAN PHASE)
- ① VINCA MINOR (COMMON PERIWINKLE)
  - ② AJUSTA REPTAS (CREEPING BUNGLEWEED)
  - ③ IRIS VERSICOLOR (IRIS)
  - ⊗ CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)

- OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)**
- A. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.
  - B. THE OWNER SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
  - C. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
  - D. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

**BIO-RETENTION DIMENSION LEGEND**

FACILITY	NAME
A	TOP OF EMBANKMENT
B	TOP OF MULCH
C	TOP OF SOIL
D	TOP OF STONE FILTER
E	TOP OF STONE STORAGE
F	UNDERDRAIN INVERT
G	BOTTOM OF STONE
H	OUTFALL ELEVATION

**ON-LOT BIORETENTION CONCEPTUAL DIMENSIONS\***

FACILITY	LENGTH (FT)	WIDTH (FT)	A	B	C	D	E	F	G	H	FILTER (A)	PLANTINGS		
MB-2	18.2	26.6	448.00	447.00	446.83	444.83	444.50	443.83	442.90	443.80	478	46	40	22

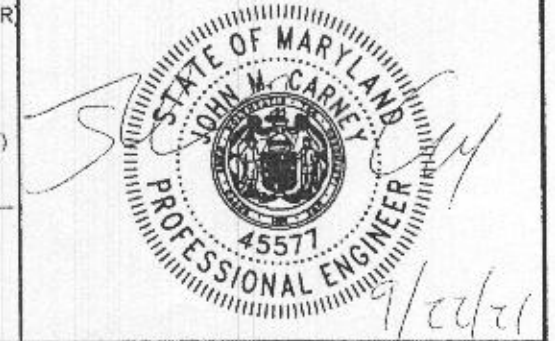
PLUS 2 CALLUNA VULGARIS (HEATHER) PER FACILITY

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DISCONNECTION OF ROOFTOP RUNOFF (N-1), DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)**

MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA. IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

Designation	Area (SF)	Area (SF)	Runoff	Required (CF)	Length (ft)	Length (ft)	Length (ft)	Ratio	Pe Treated (inches)	Volume Provided (CF)
NR-2	393	728	0.54	38.94	2	11	12	1.0	1.0	32.51
NR-4	1361	2320	0.58	133.84	2	16	18	1.0	1.0	111.74

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 45577, Expiration Date: 06/08/2022



**PROJECT:** CLARKSVILLE CROSSING LOT 1

**LOCATION:** TAX MAP: 34, GRID: 23, PARCEL: 301  
6505 OLD HILLTOP CT., TAX ID: 05-602003  
ELECTION DISTRICT NO. 5, HOWARD COUNTY, MARYLAND

**TITLE:** BUILDING PERMIT PLAN

**HOUSE TYPE:** RUTLEDGE

**DATE:** SEPTEMBER, 2021 **PROJECT NO.:** 2525

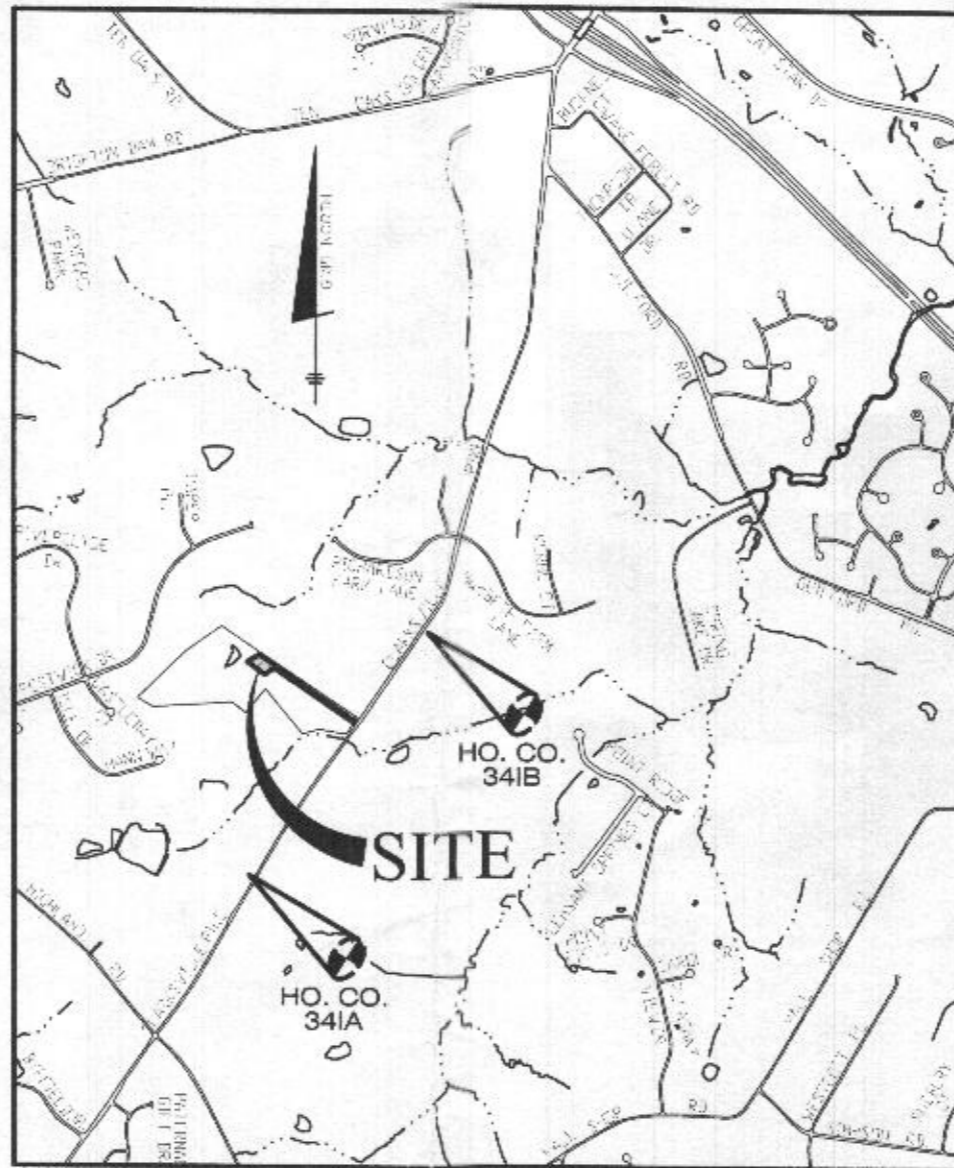
**SCALE:** AS SHOWN **DRAWING:** 2 OF 2

**BUILDER:**  
WILLIAMSBURG HOMES  
5485 HARPERS FARM ROAD  
COLUMBIA, MARYLAND 21044  
410-997-8800

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SCALE: 1" = 2000'  
ADC MAP 31; GRID C4

Approved Septic System Plan  
Howard County Health Department  
2000-gallon Septic Tank  
w/ 2000-gallon Pump Tank  
\* Zoeller-BN151 pump or equiv.  
Krieger 11/8/2021  
Date  
to Gravity Distribution  
for 5-bedroom residence

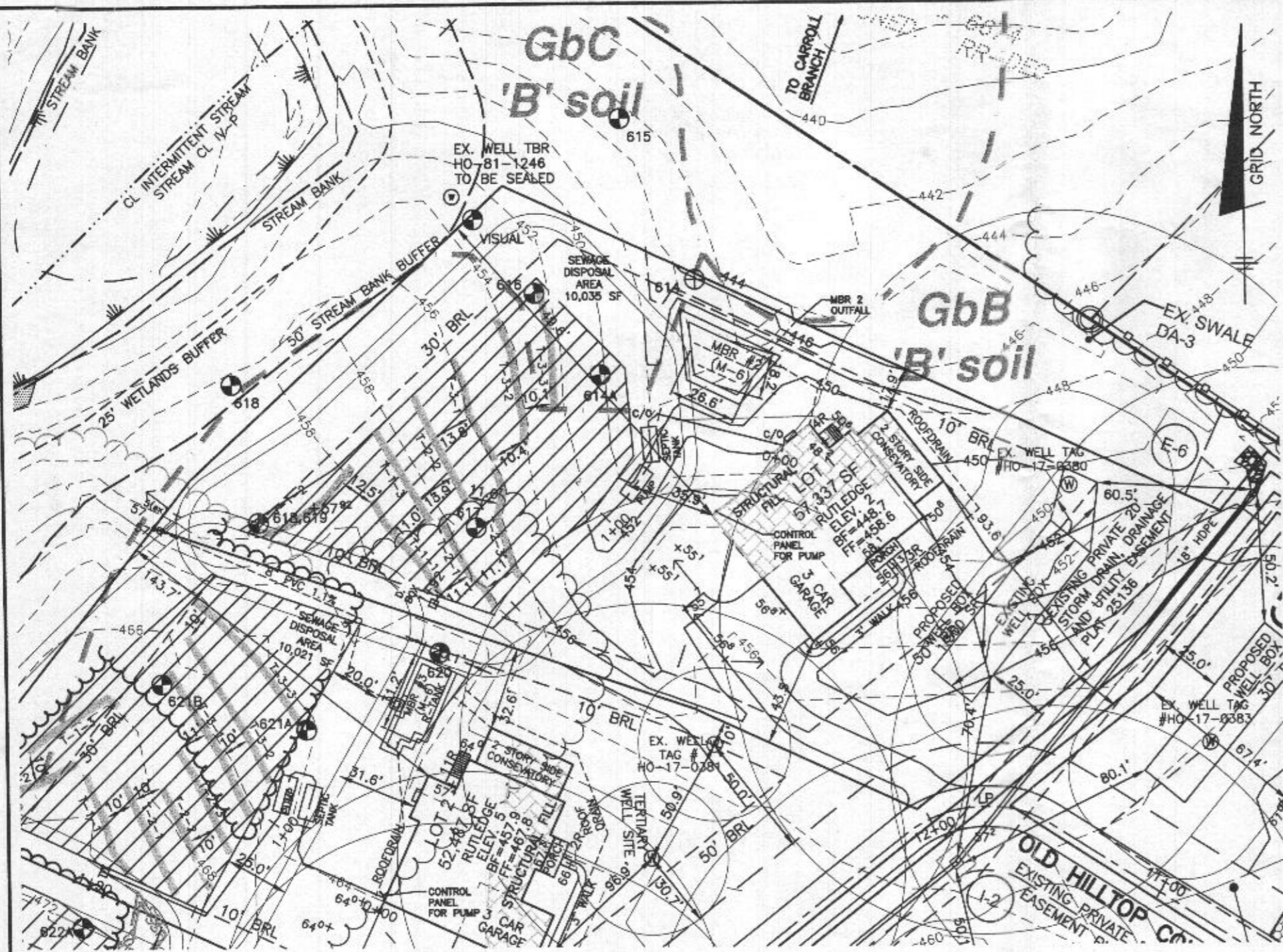
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PROJECT:		CLARKSVILLE CROSSING LOT 1	
LOCATION:		TAX MAP: 34, GRID: 23, PARCEL: 301 6505 OLD HILLTOP CT., TAX ID: 05-602003 ELECTION DISTRICT NO. 5, HOWARD COUNTY, MARYLAND	
TITLE:		ONSITE SEWAGE DISPOSAL SYSTEM PLAN	
HOUSE TYPE:		RUTLEDGE	
DATE:	SEPTEMBER, 2021	PROJECT NO.	2525
SCALE:	AS SHOWN	DRAWING	1 OF 4



INITIAL SYSTEM		
Number of Bedrooms	5	
Application Rate	0.8	gpd/sf
Effective Area Beginning Depth	4.0	ft
Bottom Max Depth	8.0	ft
Design Flow	750	gpd
Drainage Field square footage	937.5	sf
Sidewall Reduction Credit	0.42	
Trench width	3	ft
Effective Area Depth	4	ft
Trench Spacing	11	ft
Linear Length of trench Required	130	lf

1st REPLACEMENT SYSTEM		
Number of Bedrooms	5	
Application Rate	0.8	gpd/sf
Effective Area Beginning Depth	4.0	ft
Bottom Max Depth	8.0	ft
Design Flow	750	gpd
Drainage Field square footage	937.5	sf
Sidewall Reduction Credit	0.42	
Trench width	3	ft
Effective Area Depth	4	ft
Trench Spacing	11	ft
Linear Length of trench Required	130	lf

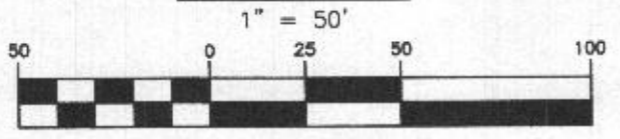
2nd REPLACEMENT SYSTEM		
Number of Bedrooms	5	
Application Rate	0.8	gpd/sf
Effective Area Beginning Depth	3.5	ft
Bottom Max Depth	7.0	ft
Design Flow	750	gpd
Drainage Field square footage	938	sf
Sidewall Reduction Credit	0.45	
Trench width	3	ft
Effective Area Depth	3.5	ft
Trench Spacing	10	ft
Linear Length of trench Required	142	lf

SEPTIC INVERT CHART - LOT 1	
INV @ HOUSE	448.1
GROUND @ HOUSE	451.6
INV IN TANK	446.9
INV OUT TANK	446.6
TOP OF TANK	447.7
GROUND OVER TANK	449.2
INV IN PUMP TANK	446.5
INV OUT PUMP TANK	446.3
TOP OF PUMP TANK	447.4
GROUND OVER TANK	450.4
INV IN DIST BOX	457.1
INV OUT DIST BOX	457.0
GROUND AT DIST BOX	460.0

**LEGEND**

- SOILS CLASSIFICATION **GgB**
- SOILS DELINEATION
- EXISTING CONTOURS
- EXISTING TREE LINE
- PROPOSED TREE LINE
- WELL BOX
- SEWAGE DISPOSAL AREA
- FIELD LOCATED WELL
- PERCOLATION TEST, PASSING
- PERCOLATION TEST, FAILING

**PLAN VIEW**



Approved Septic System Plan  
Howard County Health Department

*Khader*  
Signature  
11/8/2021  
Date

SPEC SHEET INFORMATION - LOT 1			
System	Application Rate	Effective Depth	Bottom Depth
Initial	0.8	4.0	8.0
1st Replacement	0.8	4.0	8.0
2nd Replacement	0.8	3.5	7.0

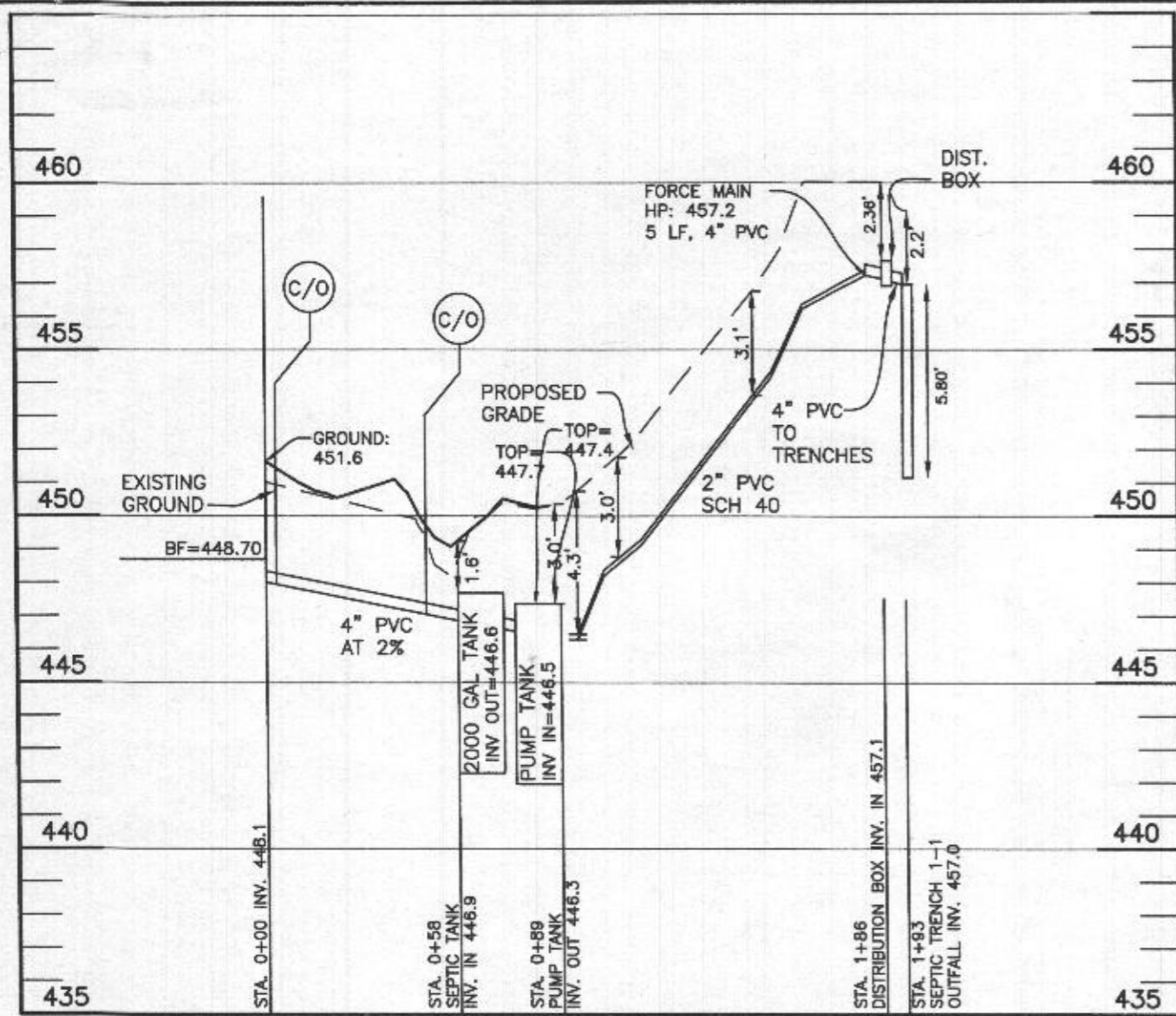
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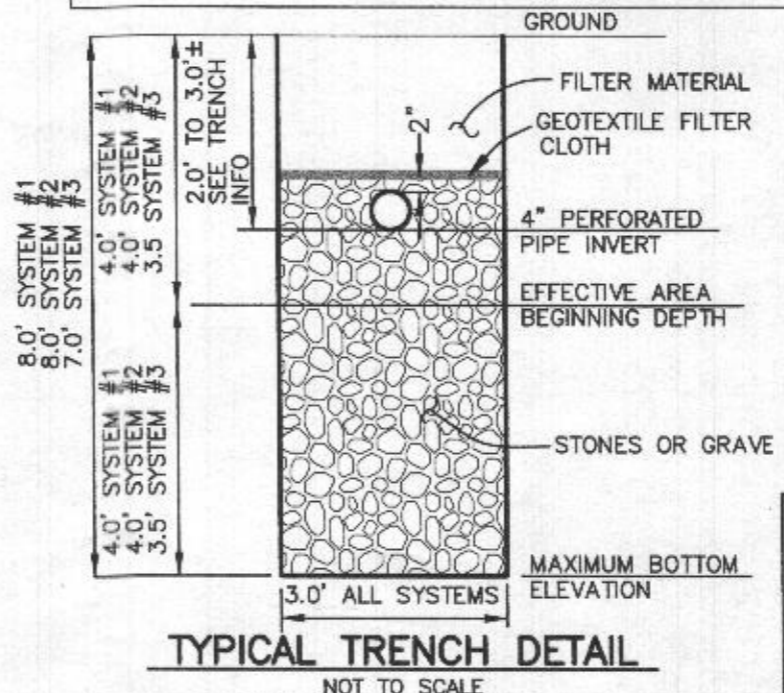


PROJECT:	CLARKSVILLE CROSSING LOT 1		
LOCATION:	TAX MAP: 34, GRID: 23, PARCEL: 301 6505 OLD HILLTOP CT., TAX ID: 05-602003 ELECTION DISTRICT NO. 5, HOWARD COUNTY, MARYLAND		
TITLE:	ONSITE SEWAGE DISPOSAL SYSTEM PLAN		
HOUSE TYPE:	RUTLEDGE		
DATE:	SEPTEMBER, 2021	PROJECT NO.	2525
SCALE:	AS SHOWN	DRAWING	2 OF 4



Septic Profile Lot 1  
Horizontal Scale 1" = 50'  
Vertical Scale 1" = 5'

TRENCH DATA					
INITIAL SYSTEM	FIRST REPLACEMENT		SECOND REPLACEMENT		
<b>TRENCH 1-1</b>	<b>TRENCH 2-1</b>		<b>TRENCH 3-1</b>		
LENGTH 45 ft	LENGTH 41 ft	LENGTH 43 ft	LENGTH 43 ft	LENGTH 43 ft	LENGTH 43 ft
GROUND ELEVATION 459.2	GROUND ELEVATION 458.0	GROUND ELEVATION 456.0	GROUND ELEVATION 456.0	GROUND ELEVATION 454.0	GROUND ELEVATION 454.0
INVERT ELEVATION 457.0	INVERT ELEVATION 456.0	INVERT ELEVATION 454.0	INVERT ELEVATION 454.0	INVERT ELEVATION 452.0	INVERT ELEVATION 452.0
MAX BOTTOM ELEVATION 451.2	MAX BOTTOM ELEVATION 450.0	MAX BOTTOM ELEVATION 449.0	MAX BOTTOM ELEVATION 449.0	MAX BOTTOM ELEVATION 447.2	MAX BOTTOM ELEVATION 447.2
<b>TRENCH 1-2</b>	<b>TRENCH 2-2</b>		<b>TRENCH 3-2</b>		
LENGTH 45 ft	LENGTH 45 ft	LENGTH 50 ft	LENGTH 50 ft	LENGTH 50 ft	LENGTH 50 ft
GROUND ELEVATION 458.0	GROUND ELEVATION 457.3	GROUND ELEVATION 454.2	GROUND ELEVATION 454.2	GROUND ELEVATION 452.2	GROUND ELEVATION 452.2
INVERT ELEVATION 456.0	INVERT ELEVATION 455.3	INVERT ELEVATION 452.2	INVERT ELEVATION 452.2	INVERT ELEVATION 450.4	INVERT ELEVATION 450.4
MAX BOTTOM ELEVATION 450.0	MAX BOTTOM ELEVATION 449.3	MAX BOTTOM ELEVATION 447.2	MAX BOTTOM ELEVATION 447.2	MAX BOTTOM ELEVATION 445.4	MAX BOTTOM ELEVATION 445.4
<b>TRENCH 1-3</b>	<b>TRENCH 2-3</b>		<b>TRENCH 3-3</b>		
LENGTH 41 ft	LENGTH 45 ft	LENGTH 50 ft	LENGTH 50 ft	LENGTH 50 ft	LENGTH 50 ft
GROUND ELEVATION 458.6	GROUND ELEVATION 456.2	GROUND ELEVATION 452.4	GROUND ELEVATION 452.4	GROUND ELEVATION 450.4	GROUND ELEVATION 450.4
INVERT ELEVATION 456.6	INVERT ELEVATION 454.2	INVERT ELEVATION 450.4	INVERT ELEVATION 450.4	INVERT ELEVATION 448.2	INVERT ELEVATION 448.2
MAX BOTTOM ELEVATION 450.6	MAX BOTTOM ELEVATION 448.2	MAX BOTTOM ELEVATION 445.4	MAX BOTTOM ELEVATION 445.4	MAX BOTTOM ELEVATION 443.2	MAX BOTTOM ELEVATION 443.2



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Approved Septic System Plan  
Howard County Health Department

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**STATE OF MARYLAND**  
**JOHN M. CARNEY**  
**PROFESSIONAL ENGINEER**  
45577

Signature: *[Handwritten Signature]* 11/8/21

PROJECT: **CLARKSVILLE CROSSING LOT 1**

LOCATION: TAX MAP: 34, GRID: 23, PARCEL: 301  
6505 OLD HILLTOP CT., TAX ID: 05-602003  
ELECTION DISTRICT NO. 5, HOWARD COUNTY, MARYLAND

TITLE: **ONSITE SEWAGE DISPOSAL SYSTEM PLAN**

HOUSE TYPE: **RUTLEDGE**

DATE: SEPTEMBER, 2021 PROJECT NO. 2525

SCALE: AS SHOWN DRAWING 3 OF 4

Trusted. Tested. Tough.™

**ZOELLER PUMP COMPANY**

SECTION: 2 16.000  
FM2704  
1017  
Supersedes 0016

**TECHNICAL DATA SHEET DOSE-MATE SERIES**  
Models 151, 152, 153 Effluent Pumps

**PRODUCT SPECIFICATIONS**

<b>MOTOR</b>	Motor Power: 1/2 (151), 3/4 (152), 1 (153)
Voltage: 115 or 230	
Phase: 1 Ph.	
Warranty: 60 mo.	
WPM: 3450	
Type: Thermally-protected capacitor	
Insulation: Class F	
Amperage: 2.0 (151), 2.5 (152)	
Operation: Automatic or non-automatic	
Discharge Size: 1-1/2" NPT	
Swirl Handling: 10" (151), 12" (152), 15" (153) from vertical upflow	
Cord Length: 20' (151)	
Cord Type: UL listed power cord	
Max. Head: 44' (151), 4 m	
Max. Flow Rate: 17 GPM (151) (1.0)	
Min. Operating Temp: 100°F (38°C)	
Locking: Oil-filled	
Motor Protection: Auto reset thermal overload	
Cap: Cast iron	
Motor Housing: Cast iron	
Pump Housing: Cast iron	
Flow: Plastic or cast iron	
Upper Bearing: Slalom bearing	
Lower Bearing: Ball bearing	
Mechanical Seal: Carbon and ceramic	
Impeller Type: Non-clogging vortex	
Impeller: Engineered thermoplastic	
Hardware: Stainless steel	
Motor Shaft: AISI 316L steel	
Options: None	

**MODEL 151**

**MODELS 152 & 153**

**RECOMMENDED PUMP: BN151**

Model	Seal	Motor	Watts	Ph.	Amperage	HP	Flow	Lbs.	Kg.	Impeller	Options
BN151	Single	Non	115	1	2.0	1.5	30	15	7	1	2 or 2
BN151	Single	Non	230	1	3.0	1.5	30	15	7	1	2 or 2
BN151	Single	Auto	115	1	4.0	1.5	30	15	7	1	2 or 2
BN151	Single	Auto	230	1	6.0	1.5	30	15	7	1	2 or 2
BN152	Single	Non	115	1	2.5	1.5	30	15	7	1	2 or 2
BN152	Single	Non	230	1	4.0	1.5	30	15	7	1	2 or 2
BN153	Single	Auto	115	1	3.5	1.5	30	15	7	1	2 or 2
BN153	Single	Auto	230	1	5.5	1.5	30	15	7	1	2 or 2
BN152	Single	Non	115	1	2.5	1.5	30	15	7	1	2 or 2
BN152	Single	Non	230	1	4.0	1.5	30	15	7	1	2 or 2
BN153	Single	Auto	115	1	3.5	1.5	30	15	7	1	2 or 2
BN153	Single	Auto	230	1	5.5	1.5	30	15	7	1	2 or 2

**SELECTION GUIDE**

- For automatic, use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM2477.
- See FM1228 for correct model of simplex control panel.
- See FM2712 for correct model of duplex control panel.

**OPTIONAL PUMP STAND P/N 10-2421**

- Reduces potential clogging by debris
- Replaces inside or below under the pump
- Made of durable, non-corrosive ABS
- Replaces 2" (51 mm) of bottom of tank
- Provides the ability to raise water by adding sections of 12" or 24" (305 or 610 mm) PVC piping
- Adjustable to pump
- Accommodates simple, overflow and effluent applications

**CAUTION:** All treatment of sewage, injection devices and wiring should be done by a qualified licensed electrician. All electrical work shall conform to applicable National Electrical Code (NEC) and the Department Safety and Health Act (OSHA).

© Copyright 2017 Zoeller Co. All rights reserved. 800-776-2721 | 800-928-7827 | 3642 Care Run Road | Louisville, KY 40215-1861 | zoellerpumps.com

**Pumping Station**  
 Diameter of Force Main and Manifold = 2" PVC SCH. 40  
 Length of Force Main = 97 feet SCH.40 gallons/100 feet = 17.4 Table 4.2  
 Volume of Main = 16.9 gallons  
 Total Volume = 16.9 gallons  
 Minimum Dose must be greater than 1/6 of the design flow 125 gallons  
 Minimum Dose must be greater than the volume of the main 17 gallons  
 Use minimum dose of 130 gallons okay Doses per Day = 5.769231

**Size Pump Chamber**  
 Pump chamber must be able to hold one dose and one days design flow

One day Capacity = 750 gallons  
 Dose = 130 gallons  
 Totals = 880 gallons

Use 2,000 gallon pump tank  
 Tank Dimensions:  
 Exterior Length: 13.75 feet Interior Length: 13.08 feet Walls: 0.33 feet  
 Width: 6.25 feet Interior Width: 5.58 feet Bottom: 0.33 feet  
 Height: 5.42 feet Interior Height: 4.67 feet Top: 0.42 feet  
 Area: 73.05 sf Bottom to Inlet: 4.58 feet  
 Volume: 340.89 cf

**Sizing the Pump**  
 Flow: runtime = 4.000 minutes  
 rate = 32.50 gallons/minute

**Design Head:**  
 Design Head = Static Head + Friction Head  
 Static Head = highest elevation of main - pump off elevation  
 Highest component of system = 457.20 Main 1-P  
 Pump off elevation = 444.00  
 Static Head = 13.20 feet  
 Friction Head = head loss due to pipe friction  
 2.0" pipe = 97 feet  
 45° bends 0 loss for bend 0 feet per table 4.3  
 90° bends 4 loss for bend 20 feet per table 4.3  
 Gate Valve 0 loss for tee 0 feet per table 4.3  
 Friction loss per table 4.4 = 1.80 (ft/100 ft)  
 Equivalent Length = 117 Friction loss 2.10 feet  
 Total Friction Head = 2.10  
 Design Head = 15.30 feet

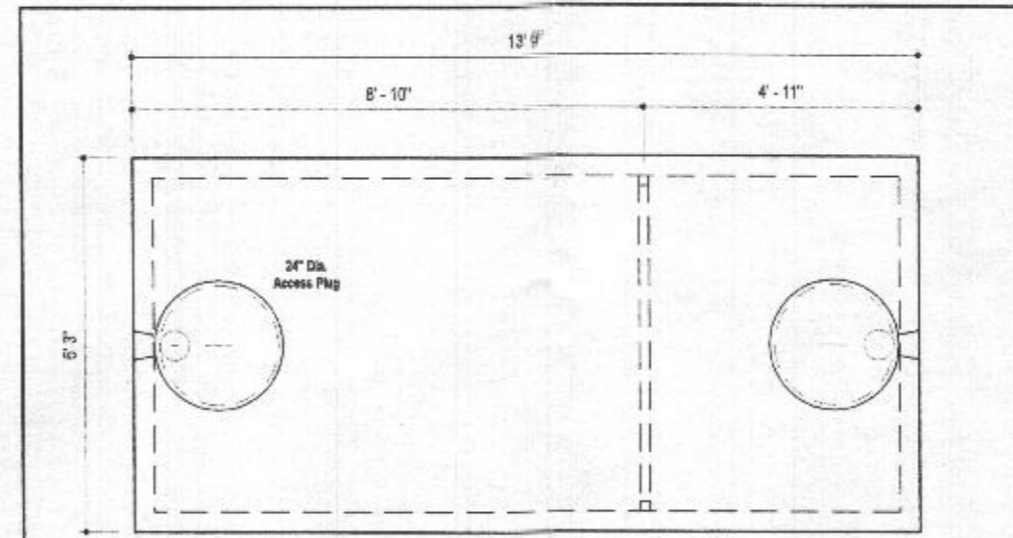
**Pump Requirements:**  
 Performance = 32.50 gpm  
 Head of Water = 15.30 feet of head  
 Pump Selection: Zoeller Pump Company, Model 151  
 1/3 horse power

Pump Flow Rate = 37.40 gallons/minute per rating curve. Run time: 3.48 Minutes  
 TDH analysis 15.92 ft.  
 Between design and curve? Yes

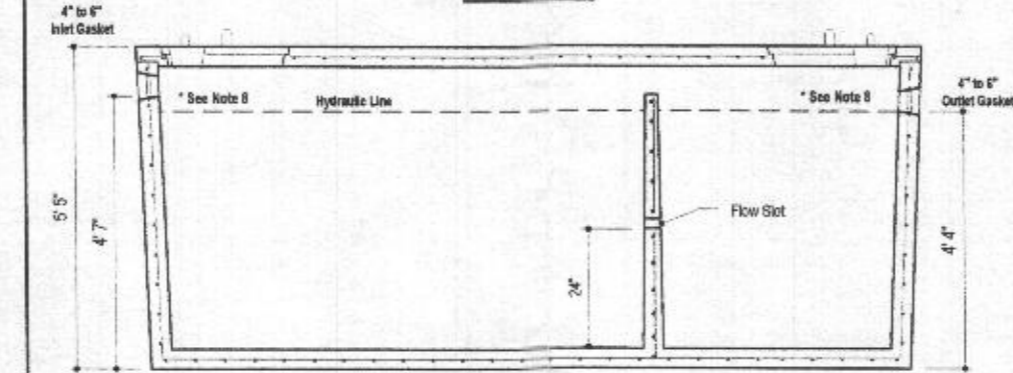
**Design Pump Chamber**  
 Ground over Tank = 450.40 Cover = 3.00 ft  
 Top of Tank = 447.40  
 Invert of Tank = 442.31  
 6" Riser = 0.50 feet  
 Pump Height = 0.98 feet  
 Min. Pump off = 443.79  
 Selected Pump off = 444.00  
 Dose = 17.4 of  
 Area of Pit = 73.05 sf  
 Pump on dist. = 0.24  
 Pump on Elev. = 444.24

Distance between Pump on and Highwater Alarm = 0.5 feet  
 Highwater Alarm Elevation = 444.74  
 Dist. for day stored above alarm 1.37  
 Minimum Inlet Elev. = 446.11  
 Tank Inlet = 446.56 Okay  
 Dist. Alarm to Inlet = 1.82 Okay

*Approved Septic System Plan  
 Howard County Health Department  
 2000-gallon Septic Tank  
 w/ 2000-gallon Pump Tank  
 & Zoeller BN151 pump or equiv.  
 Rhinckes  
 Signature  
 11/8/2021  
 Date  
 To Gravity Distribution  
 for 5-bed room residence*



PLAN VIEW



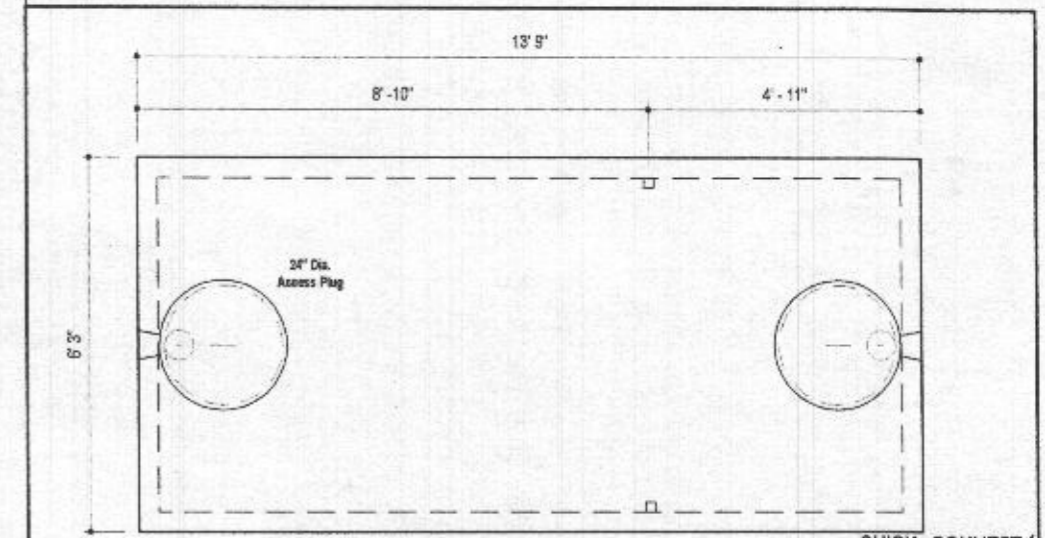
SECTION A-A

**DESIGN DATA & GENERAL NOTES**

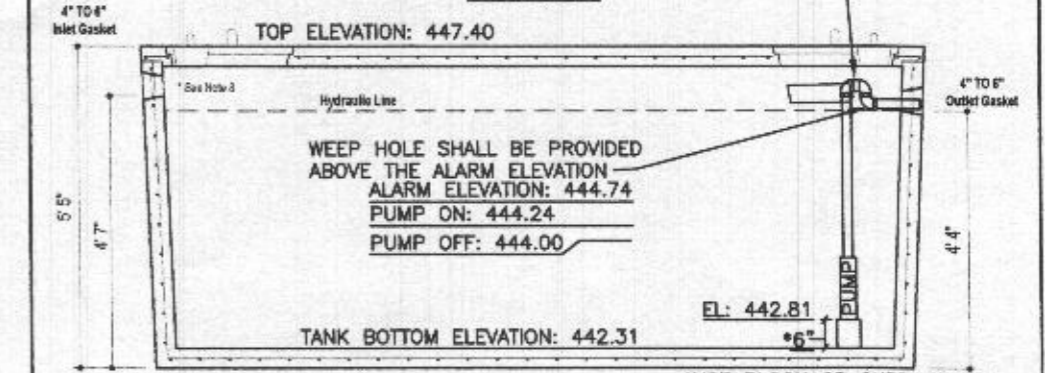
- (1) Concrete strength Fcm,800 p.s.i. @ 28 days. Density = 150 pcf.
- (2) Cement - Portland Type III per ASTM C 150-82.
- (3) Admixtures & plasticizers per ASTM C 266-86 & C 494-82.
- (4) Reinforcing per ASTM A185. Min. 1-1/2" cover.
- (5) Top slab sealed with butyl rope mastic.
- (6) 4" wall, 4" base, & 6" top thickness.
- (7) Max 3" of cover.
- (8) Depending on use of tank, Inlet & Outlet baffle may be required by code.

**MBI**  
 Mayer Bros., Inc.  
 6264 Race Road  
 Ellicott City, Maryland 21075  
 Tel. 410.796.1434  
 Fax. 410.796.1438  
 www.mayerbrosprecast.com

**2,000 GALLON SEPTIC TANK  
 2-Compartment**  
 Stock Item [Approx. 19,900 lbs]  
 Dwg. No. 2000-2C No Scale Aug 11, 2008



PLAN VIEW



SECTION A-A

**DESIGN DATA & GENERAL NOTES**

- (1) Concrete strength Fcm,800 p.s.i. @ 28 days. Density = 150 pcf.
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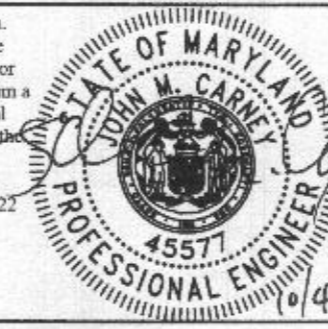
Item	Elev.	Relative to Bottom
Float Tree		
Bottom of Tank	442.31	
Top of Pump	443.79	1' 5 13/16"
Pump Off	444.00	1' 8 1/4"
Pump On	444.24	1' 11 1/8"
High Alarm	444.74	2' 5 1/8"

WEIGHT = 19,000 lbs.

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**2,000 GALLON SEPTIC TANK  
 1-Compartment**  
 Stock Item [Approx. 19,000 lbs]  
 Dwg. No. 2000-1C No Scale Aug 11, 2008

Professional Certification.  
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 45577.  
 Expiration Date: 06/08/2022



**BENCHMARK**  
 ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS  
**ENGINEERING, INC.**  
 8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315  
 ELLICOTT CITY, MARYLAND 21043  
 (P) 410-465-6105 ▲ (F) 410-465-6644  
 WWW.BEI-CIVILENGINEERING.COM

PROJECT:	CLARKSVILLE CROSSING LOT 1	
LOCATION:	TAX MAP: 34, GRID: 23, PARCEL: 301 6505 OLD HILLTOP CT., TAX ID: 05-602003 ELECTION DISTRICT NO. 5, HOWARD COUNTY, MARYLAND	
TITLE:	ONSITE SEWAGE DISPOSAL SYSTEM PLAN	
HOUSE TYPE:	RUTLEDGE	
DATE:	SEPTEMBER, 2021	PROJECT NO. 2525
SCALE:	AS SHOWN	DRAWING 4 OF 4

**BUILDER:**  
 WILLIAMSBURG HOMES  
 5485 HARPERS FARM ROAD  
 COLUMBIA, MARYLAND 21044  
 410-997-8800