

**BUILDING PERMIT PLAN NOTES:**

1. THE LOT SHOWN HEREON WAS RECORDED IN LIBER 14121 AT FOLIO 176. REFER TO THE TITLE FOR LOT DIMENSIONS, LOT AREAS, ALL EASEMENTS AND CONDITIONS.
2. SEDIMENT AND EROSION CONTROLS WERE APPROVED BY HOWARD SOIL CONSERVATION DISTRICT UNDER A GRADING PLAN AND MODIFIED FOR THIS SPECIFIC HOUSE.
3. TOPOGRAPHY SHOWN HEREON IS TAKEN FROM THE APPROVED ROAD CONSTRUCTION PLANS AND TOPOGRAPHIC INFORMATION PROVIDED BY BENCHMARK ENGINEERING, INC., ON OR ABOUT AUGUST, 2017.
4. ALL SEDIMENT AND EROSION CONTROL FEATURES USED ON THIS SITE SHALL COMPLY WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
5. ALL DRAINAGE AND STORMWATER MANAGEMENT FEATURES USED ON THIS SITE MUST COMPLY WITH THE APPROVED ROAD CONSTRUCTION PLANS EXCEPT AS WAIVED.
6. THERE ARE NO EXISTING WELLS OR SEPTIC SYSTEMS WITHIN 100' OF THIS PROJECT'S BOUNDARY EXCEPT AS NOTED.
7. ANY CHANGES TO A PRIVATE SEWAGE EASEMENT OR WELL BOX SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
8. STORMWATER MANAGEMENT FOR THIS LOT WAS DESIGNED TO BE PROVIDED BY MICRO-BIORETENTION FACILITIES (MDE M-6).
9. MICRO-BIORETENTION FACILITIES SHOULD HAVE EITHER 4" OR 6" ROOF LEADERS DEPENDING ON THE SIZE OF THE ROOFTOP AREA.
10. THE SEPTIC TANK WILL BE A 2000 GALLON TWO COMPARTMENT TANK AND THE PUMP TANK WILL HAVE A 2000 GALLON ONE COMPARTMENT TANK.

**Required BAT Site Plan Notes**

1. Any change 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 sit plan may be required.
2. The maximum depth of the BAT shall be per the manufacturer's specification, 3.0'.
3. The blower may not be located further from the tank than the manufacturer's specifications, 75'.
4. The BAT system shall be maintained and operated for the life of the system.
5. The BAT shall be operated by and maintained by a certified service provider.
6. Within one month of installation, a person installing the BAT system shall report to the Maryland Department of the Environment (MDE) in a manner acceptable to MDE, the address and date of completion of the BAT installation and the type of BAT installed.
7. Electrical work for the BAT installation must be performed by a licensed electrician.
8. An agreement and Easement must be completed and signed by all applicable parties, and recorded in Land Records of Howard County.
9. The Health Department requires documentation for the start-up certification from the manufacturer prior to final approval of the installation.

**BENCHMARK INFORMATION NAD83**

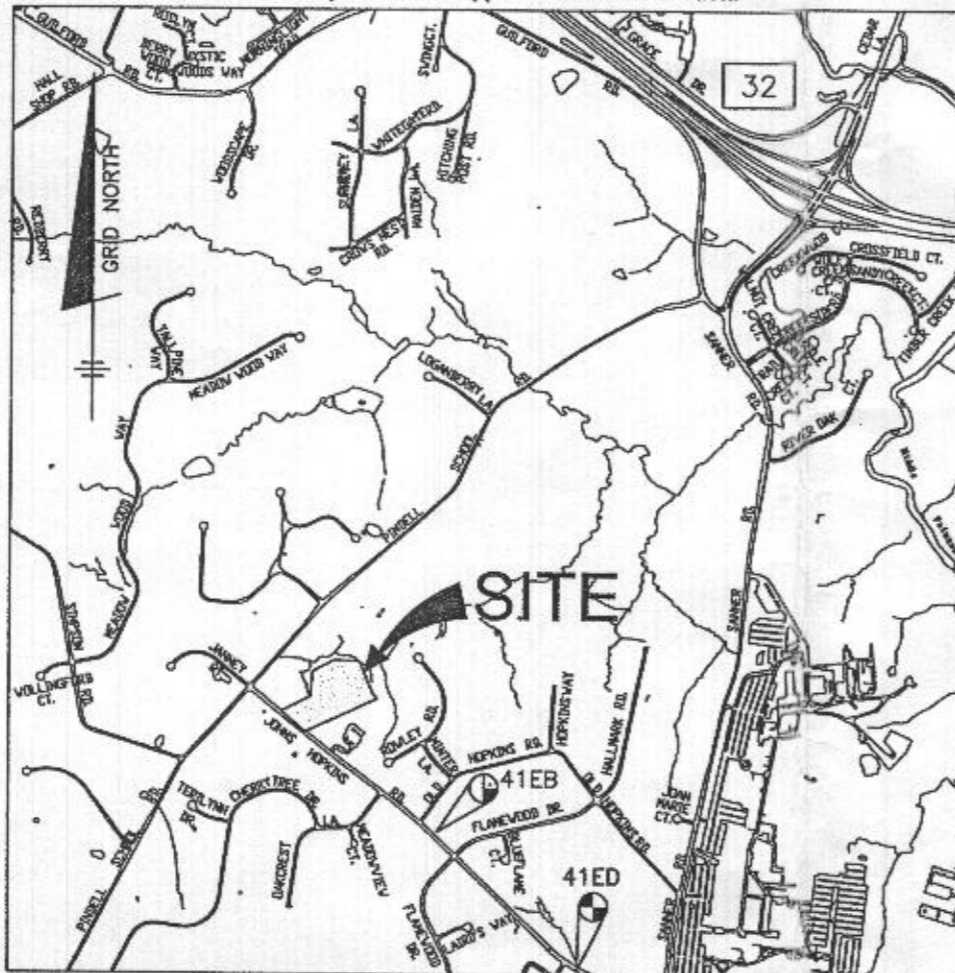
Ho. Co. STATION 41EB	Ho. Co. STATION 41ED
NORTHING: 546,222.22'	NORTHING: 544,800.61'
EASTING: 1,337,778.22'	EASTING: 1,339,251.13'
ELEVATION: 463.78'	ELEVATION: 405.70'

**Spec Sheet information**

System	Application Rate	Effective Depth	Bottom Depth
Initial	1.2	4.0	8.0
1st Replacement	1.2	4.0	8.0
2nd Replacement	0.8	5.0	8.0

**ONSITE SEWAGE DISPOSAL SYSTEM NOTES:**

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ADC MAP 5052 GRID E4

**VICINITY MAP**  
SCALE: 1" = 2000'

Approved Septic System Plan  
Howard County Health Department

Signature

Date

**TRENCH DATA**

INITIAL SYSTEM		FIRST REPLACEMENT		SECOND REPLACEMENT	
TRENCH 1-1	TRENCH 2-1	TRENCH 3-1	TRENCH 3-5		
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft	LENGTH 40.2 ft		
GROUND ELEVATION 467.8	GROUND ELEVATION 465.1	GROUND ELEVATION 462.4	GROUND ELEVATION 460.0		
INVERT ELEVATION 464.2	INVERT ELEVATION 462.1	INVERT ELEVATION 459.4	INVERT ELEVATION 458.0		
MAX BOTTOM ELEVATION 459.8	MAX BOTTOM ELEVATION 457.1	MAX BOTTOM ELEVATION 454.4	MAX BOTTOM ELEVATION 452.0		
TRENCH 1-2	TRENCH 2-2	TRENCH 3-2	TRENCH 3-6		
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft	LENGTH 40.2 ft		
GROUND ELEVATION 467.5	GROUND ELEVATION 464.8	GROUND ELEVATION 462.1	GROUND ELEVATION 459.7		
INVERT ELEVATION 464.2	INVERT ELEVATION 462.1	INVERT ELEVATION 459.4	INVERT ELEVATION 457.7		
MAX BOTTOM ELEVATION 459.5	MAX BOTTOM ELEVATION 456.8	MAX BOTTOM ELEVATION 454.1	MAX BOTTOM ELEVATION 451.7		
TRENCH 1-3	TRENCH 2-3	TRENCH 3-3	TRENCH 3-7		
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft	LENGTH 40.2 ft		
GROUND ELEVATION 466.5	GROUND ELEVATION 463.7	GROUND ELEVATION 461.2	GROUND ELEVATION 458.5		
INVERT ELEVATION 464.2	INVERT ELEVATION 461.7	INVERT ELEVATION 459.2	INVERT ELEVATION 456.5		
MAX BOTTOM ELEVATION 458.5	MAX BOTTOM ELEVATION 455.7	MAX BOTTOM ELEVATION 453.2	MAX BOTTOM ELEVATION 450.5		
TRENCH 1-4	TRENCH 2-4	TRENCH 3-4			
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft			
GROUND ELEVATION 466.2	GROUND ELEVATION 463.4	GROUND ELEVATION 460.9			
INVERT ELEVATION 464.2	INVERT ELEVATION 461.4	INVERT ELEVATION 458.9			
MAX BOTTOM ELEVATION 458.2	MAX BOTTOM ELEVATION 455.4	MAX BOTTOM ELEVATION 452.9			

PROJECT: **AJ GILL PROPERTY**  
**JOHNS HOPKINS ROAD**

LOCATION: TAX MAP: 41, GRID: 9, PARCEL: 259  
ZONED: RR-DEO  
5TH ELECTION DISTRICT  
HOWARD COUNTY, MD, TAX ID #05-351731

TITLE: **BAT SITE PLAN**

HOUSE TYPE: **CUSTOM**

DATE: **DECEMBER, 2019** PROJECT NO. **2473**

SCALE: **AS SHOWN** DRAWING **1** OF **7**

**BUILDER:**  
COMPETENT BUILDERS, INC.  
HARI RAJ SINGH  
FULTON, MD 20759  
443-839-1930

**OWNER:**  
HAJEET S. GILL  
RAJDEEP K. GILL  
8111 CHAPEL MANOR LANE  
ELLCOTT CITY, MD 21043  
PHONE: 443-509-4019

**BENCHMARK**  
ENGINEERS • LAND SURVEYORS • PLANNERS

**ENGINEERING, INC.**

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ELLCOTT CITY, MARYLAND 21043  
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WWW.BE-CIVILENGINEERING.COM

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: 06-08-2020.



**LEGEND**

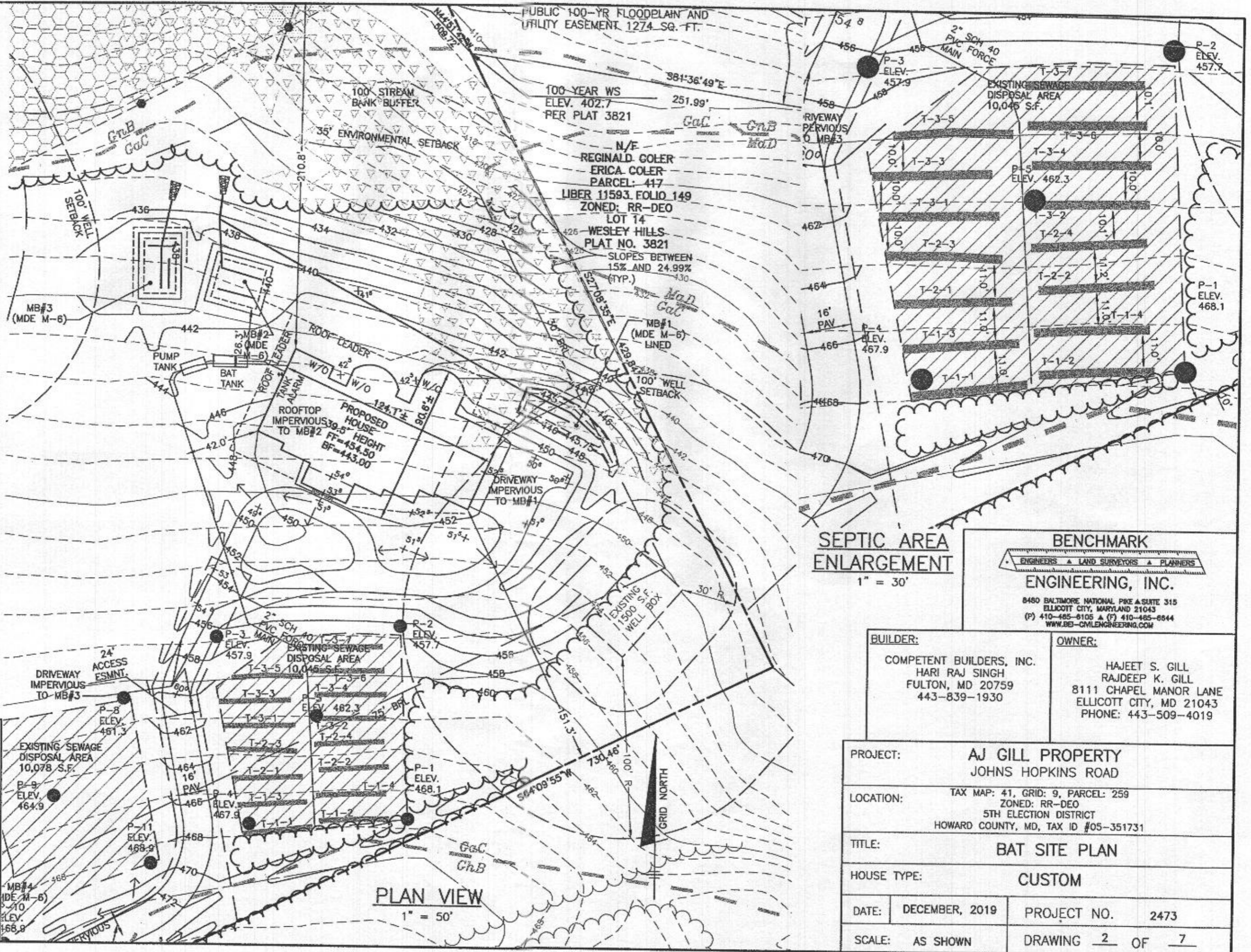
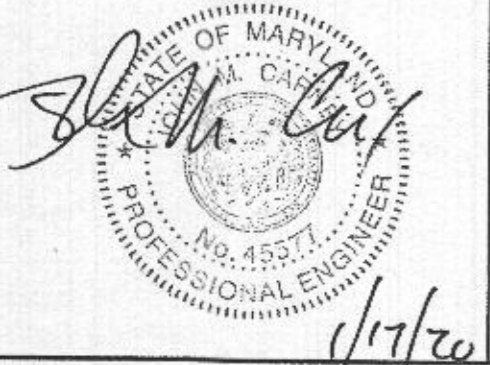
- EXISTING STRUCTURE
- PERCOLATION TEST PASSED
- EXISTING SEPTIC FIELD
- EXISTING WELL EX. WELL
- EXISTING WELL BOX EXISTING 1,500 S.F. WELL BOX

INITIAL SYSTEM		
Number of Bedrooms	9	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	4.0	ft
Bottom Max Depth	8.0	ft
Design Flow	1350	gpd
Drainage Field square footage	1125	sf
Sidewall Reduction Credit	0.42	
Trench width	3	ft
Effective Area Depth	4	ft
Trench Spacing	11	ft
Linear Length of trench Required	156	lf

1st REPLACEMENT SYSTEM		
Number of Bedrooms	9	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	4.0	ft
Bottom Max Depth	8.0	ft
Design Flow	1350	gpd
Drainage Field square footage	1125	sf
Sidewall Reduction Credit	0.42	
Trench width	3	ft
Effective Area Depth	4	ft
Trench Spacing	11	ft
Linear Length of trench Required	156	lf

2nd REPLACEMENT SYSTEM		
Number of Bedrooms	9	
Application Rate	0.8	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	8.0	ft
Design Flow	1350	gpd
Drainage Field square footage	1688	sf
Sidewall Reduction Credit	0.50	
Trench width	3	ft
Effective Area Depth	3	ft
Trench Spacing	10	ft
Linear Length of trench Required	281	lf

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: 06-08-2020.



**SEPTIC AREA ENLARGEMENT**  
1" = 30'

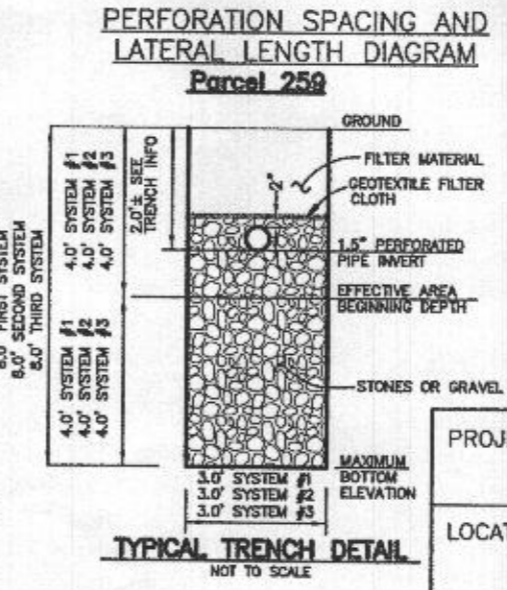
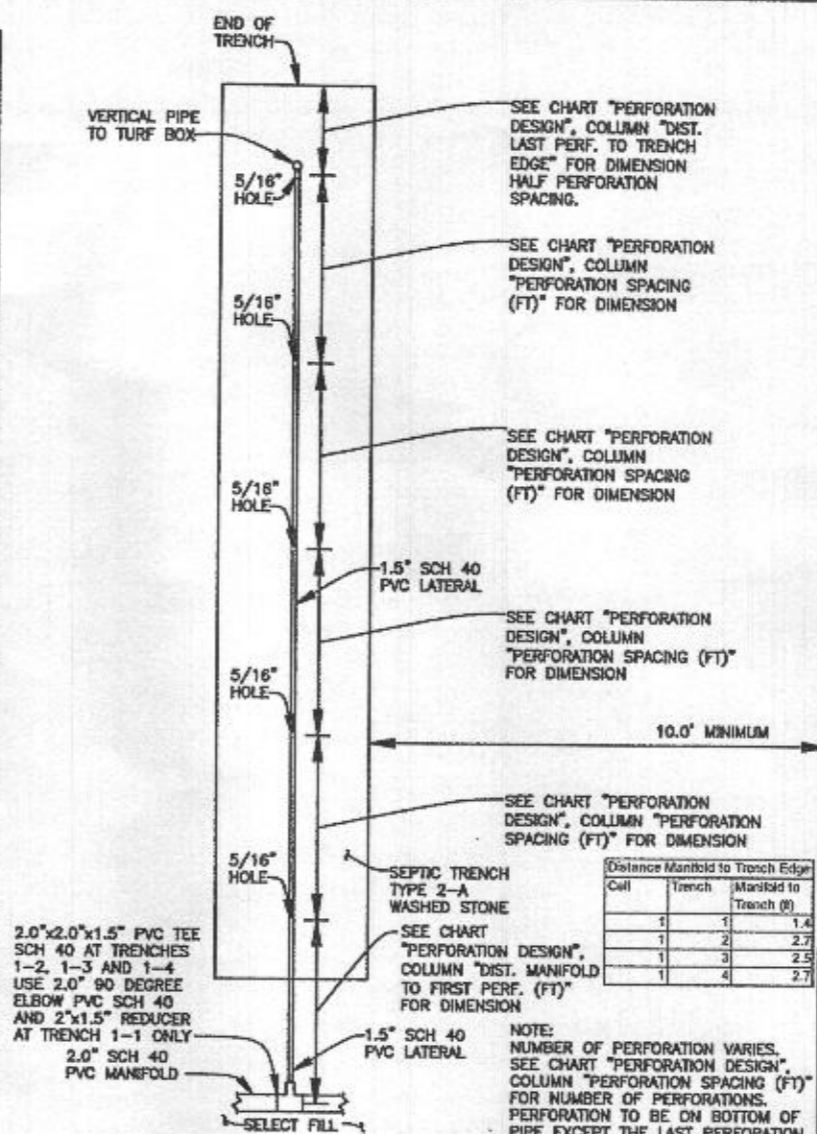
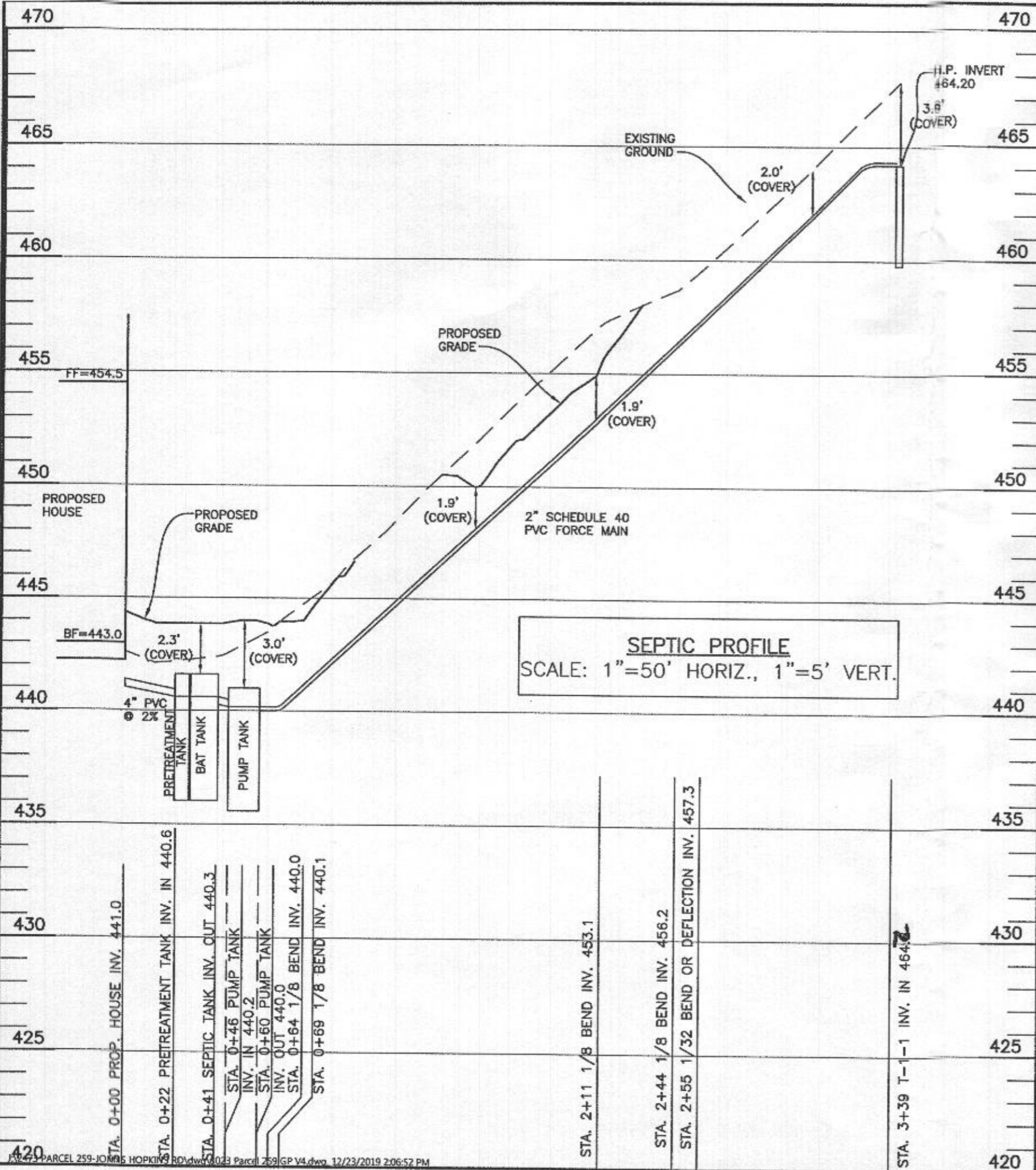
**BENCHMARK ENGINEERING, INC.**  
ENGINEERS • LAND SURVEYORS • PLANNERS  
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WWW.BE-CMLENGINEERING.COM

**BUILDER:**  
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HARI RAJ SINGH  
FULTON, MD 20759  
443-839-1930

**OWNER:**  
HAJEET S. GILL  
RAJDEEP K. GILL  
8111 CHAPEL MANOR LANE  
ELLCOTT CITY, MD 21043  
PHONE: 443-509-4019

<b>PROJECT:</b> AJ GILL PROPERTY JOHNS HOPKINS ROAD	
<b>LOCATION:</b> TAX MAP: 41, GRID: 9, PARCEL: 259 ZONED: RR-DEO 5TH ELECTION DISTRICT HOWARD COUNTY, MD, TAX ID #05-351731	
<b>TITLE:</b> BAT SITE PLAN	
<b>HOUSE TYPE:</b> CUSTOM	
<b>DATE:</b> DECEMBER, 2019	<b>PROJECT NO.</b> 2473
<b>SCALE:</b> AS SHOWN	<b>DRAWING</b> 2 OF 7

**PLAN VIEW**  
1" = 50'



THIS PLAN IS FOR SEPTIC DESIGN ONLY.

SIGNATURE AND SEAL ARE FOR SEPTIC PROFILE AND CALCULATIONS ONLY, TANK AND DETAILS WERE NOT DESIGNED OR REVIEWED BY THE ENGINEER.

SEE MANUFACTURES SPECIFICATIONS FOR DETAILS. WWW.MAYERPRECAST.COM EQUIVALENT FROM OTHER MANUFACTURERS CAN BE SUBSTITUTED.

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*[Signature]*  
12/29/19  
STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
No. 45577

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HOUSE TYPE:	CUSTOM		
DATE:	DECEMBER, 2019	PROJECT NO.	2473
SCALE:	AS SHOWN	DRAWING	3 OF 7

**Design Calculations**

**Design Input:**

**Capacity requirements**

number of lots	1
bedrooms per lot	9
use rate per bedroom	150 gpd

**Drainfield Requirements**

Application Rate	1.2 gpd/sq ft
Trench width	3 ft
trench gravel depth	4 ft
number of trenches	4
trench spacing center-center	14 ft

**Tanks and Capacities**

BAT tank	1,000	gallons
2nd settling tank	NA	gallons
Equalization Tank	500	gallons
pump tank size	2,000	gallons

**Distribution system**

number of cells	1
trenches first system	4
lateral length per pump	164.4 ft
ID 1.5" SCH 40 PVC	1.59 inches
Max. Manifold length	280 ft
ID 2.0" SCH 40 PVC	2.047 inches

**Static Hydraulic Profile**

Ground Elev. At BAT tank	443.90 ft
Tank #1 invert in	440.60 ft
Cover	2.30 ft
Tank #1 top	441.60 ft
Fall in tanks	0.33 ft
Fall between tanks	0.10 ft
Ground Elev. at pump tank	444.00 ft
Pump Tank invert in	440.17 ft
inv. into pump tank to top	0.84 ft
Pump Tank top	441.01 ft
Pump Block Height	0.16 ft
Height of Intake	0.35 ft
Highest lateral	464.20 ft

**Perforation Design:**

Size of Perforation	5/16 inches
Design Separation	6.50 ft
Use Perforations	5
Perforations per field	20

**Dosing volume, flow rates and Pressures**

lateral flow rate per pump	32.57 gpm
Friction (C) for PVC	150
Miscellaneous Losses	0 ft
Estimated Run Time	4.00 Min.
Cells in simultaneous use	1
Pump tank Volume	58.08 Gal/in

**Calculations:**

Max. Daily Flow	1350 gpd
Average Daily Flow	675 gpd
Maximum Daily Flow	0.94 gpm
Average Daily Flow	0.47 gpm

Standard Trench Length	375.00 ft
Deep Trench Conversion Factor	41.67 %
Deep Trench Length for MDF	156.2625 ft
total trench length for 100% capacity	156.2625 ft
individual trench length	39.1 ft
Lateral Length	35.10 ft

minimum req. area	1875.15 sf
req. capacity (1125+(0.75*MDF))	2137.5 gal.
design settling capacity NA	gal.
min. pump tank capacity (ADF)	811 gal.

Total Number of Pumps	1
laterals served by pump	4
Vol./100 ft 1.5" SCH 40	10.6 gal.
Vol. of laterals served	17.4 gal.
Vol./100 ft 2.0" SCH 40	17.4 gal.
Max. Main volume	48.7 gal.

Tank #1 effluent elev	440.27 ft
Pump Tank effluent elev	440.17 ft
invert of pump tank	435.92 ft
Inside Top of Tank	440.59
Pump Elevation	436.08 ft
pump intake elev.	436.43 ft

Distal Pressure =	2.0 ft
Flow	1.63 gpm
Perforations per Lateral	6.02
Perforation Actual Spacing	7.82 ft
Flow rate	32.57 gpm
Manifold Velocity	3.17 fps
Lateral Velocity	1.32 fps

Static Head	27.08 ft Cell 1
Friction Head	5.79 ft Cell 1
Distal Head	2 ft
Max. Total Dynamic Head	34.87 ft
Estimated Dose (5xLateral+1xMain) Vol.	135.85 gal.
Min. Runtime	6.91 min.
Minimum Dose Volume	225.00 gal.
Average Doses	3.00 per day

**Tank and Float Design:**

Ground over Tank =	444.00 ft
Top of Tank =	441.01 ft
Invert of Tank =	435.92 ft
Pump Block =	0.16 ft
Water End and Motor =	1.03 ft
Inside Tank Dimensions	
Height =	4.67 ft
Width =	5.58 ft
Length =	13.08 ft
Number of Tanks =	1

minimum Pump off =	437.12 ft
Pump Off Float =	437.12 ft

Dose =	30.08 @
Area of Pit	72.99 sf

Pump on dist. =	0.41 ft
Pump on Elev. =	437.53 ft

Distance between Pump on and Highwater Alarm =	0.5 ft
Highwater Alarm Elevation =	438.03 ft

High Alarm to Tank Inside top =	2.56
Area of Pump & Eq. tanks =	72.99
Volume Above Alarm Float to Inlet =	186.93 cf or
One Day Flow =	1350.00 gallons

**Pump Requirements:**

Performance =	32.57 gpm
Head of Water =	34.87 feet of head

**Pump Selection:**

Zoeller Pump BN140	115 Volts	Single Phase
1 horse power		

**Trench and Lateral Design**

Cell	Trench	Pipe Inv. Elev.	Trench Bottom Elev.	Highest Ground Over	Lowest Ground Over	Lateral Pressure Head (ft)	Trench Length (ft)	Number of Perforations	Flow per Perforation (gpm)	Flow per Lateral (gpm)	Flow Differential
1	1	464.2	459.8	467.8	467.8	2.00	39.1	5	1.63	8.14	0.0%
	2	464.2	459.8	467.6	467.6	2.00	39.1	5	1.63	8.14	0.0%
	3	464.2	458.5	468.5	468.5	2.00	39.1	5	1.63	8.14	0.0%
	4	464.2	458.2	466.2	466.2	2.00	39.1	5	1.63	8.14	0.0%

Perforation Diameter = 5/16 inches Target Flow = 8.14 gpm Cell 1 Flow Rate 32.57

Depth To Effective Sidewall	4.0 ft	Deep Trench Depth	8.0 ft	Depth to Inlet	3.6 ft
Trench 1	4.0 ft		8.0 ft		3.4 ft
Trench 2	4.0 ft		8.0 ft		2.3 ft
Trench 3	4.0 ft		8.0 ft		2.0 ft
Trench 4	4.0 ft		8.0 ft		

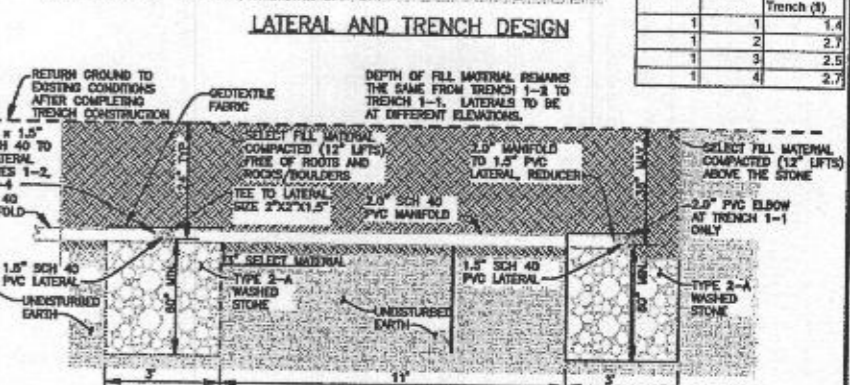
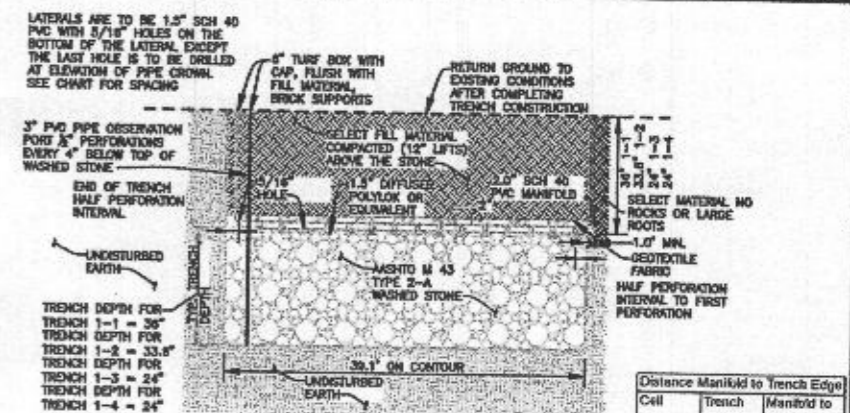
Cell	Trench	Number of Perforations	Manifold to Trench (ft)	Trench Length (ft)	Perforation Spacing (ft)	Dist. Manifold to First Perf. (ft)	Dist. Last Perf. to Trench Edge	Lateral Length (ft)
1	1	5	1.4	39.1	7.82	5.31	3.91	36.59
	2	5	2.7	39.1	7.82	6.61	3.91	37.69
	3	5	2.5	39.1	7.82	6.41	3.91	37.69
	4	5	2.7	39.1	7.82	6.61	3.91	37.69

**Lateral Pressure Calculations**

Cell	Trench	Pipe Elev.	Beginning Manifold Loss	Manifold Bend 90D	Manifold Bends 45D	Manifold Length	Manifold velocity	Manifold Thru Tees	Delta Loss Manifold	Total Manifold Loss	Lateral 90 degree side tee loss	Sudden Reduction Loss	Lateral Bends 45 deg. Loss	Lateral Length to first perf. Loss	Lateral Loss Summation	Total Loss to First Perf.	Total Design Head (ft)	Lateral Pressure Head (ft)	Flow per Lateral (gpm)
1	4	464.2	0.00	1	4	263	32.6	0	5.16	5.16	0.01	0.00	0.00	0.03	0.05	5.21	34.29	2.00	8.14
	3	464.2	5.16	0	0	3	24.4	1	0.05	5.21	0.01	0.00	0.00	0.03	0.05	5.25	34.33	2.00	8.14
	2	464.2	5.21	0	0	11	16.3	1	0.07	5.28	0.01	0.00	0.00	0.03	0.05	5.32	34.40	2.00	8.14
	1	464.2	5.28	0	0	3	8.1	1	0.00	5.28	0.01	0.00	0.00	0.03	0.04	5.32	34.40	2.00	8.14

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Cell	Trench	Manifold to Trench (ft)
1	1	1.4
1	2	2.7
1	3	2.5
1	4	2.7

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, 06-08-2020.

*[Signature]*  
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JOHNS HOPKINS ROAD

LOCATION: TAX MAP: 41, GRID: 9, PARCEL: 259  
ZONED: RR-DEO  
5TH ELECTION DISTRICT  
HOWARD COUNTY, MD, TAX ID #05-351731

TITLE: BAT SITE PLAN

HOUSE TYPE: CUSTOM

DATE: DECEMBER, 2019 PROJECT NO. 2627

SCALE: AS SHOWN DRAWING 4 OF 7

**Lateral Pressure Calculations**

Cell	Trench	Pipe Elev.	Beginning Manifold Loss	Manifold Bend 90D	Manifold Bends 45D	Manifold Length	Manifold velocity	Manifold Thru Tees	Delta Loss Manifold	Total Manifold Loss	Lateral 90 degree side tee loss	Sudden Reduction Loss	Lateral Bends 45 deg. Loss	Lateral Length to first perf. Loss	Lateral Loss Summation	Total Loss to First Perf.	Total Design Head (ft)	Lateral Pressure Head (ft)	Flow per Lateral (gpm)
1	4	464.2	0.00	1	4	263	32.6	0	5.16	5.16	0.01	0.00	0.00	0.03	0.05	5.21	34.29	2.00	8.14
	3	464.2	5.16	0	0	3	24.4	1	0.05	5.21	0.01	0.00	0.00	0.03	0.05	5.25	34.33	2.00	8.14
	2	464.2	5.21	0	0	11	16.3	1	0.07	5.28	0.01	0.00	0.00	0.03	0.05	5.32	34.40	2.00	8.14
	1	464.2	5.28	0	0	3	8.1	1	0.00	5.28	0.01	0.00	0.00	0.03	0.04	5.32	34.40	2.00	8.14

Perforation Diameter = 5/16 inches Distal Head 2 feet

Trusted. Tested. Tough.™

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



SECTION: 2.15.070  
FM2783  
0419  
Supersedes  
0617

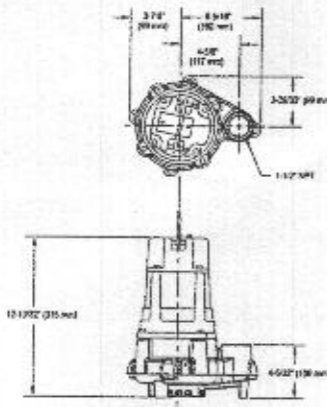
**TECHNICAL DATA SHEET  
FLOW-MATE SERIES**

Models 140/4140, 145/4145 Effluent / Dewatering Pumps

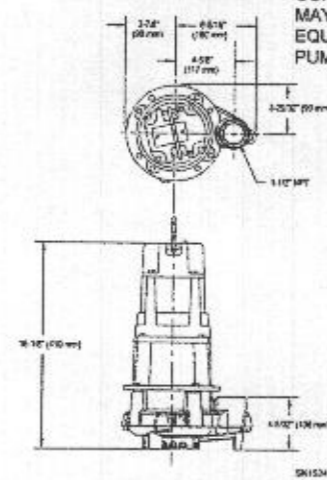
**PRODUCT SPECIFICATIONS**

<b>MOTOR</b>	Horse Power	3/4 - 1
	Voltage	115 or 230
	Phase	1 Ph
	Hertz	60 Hz
	RPM	3450
<b>PUMP</b>	Type	Permanent split capacitor
	Insulation	Class B
	Amps	6.0 - 13.0
	Operation	Automatic or nonautomatic
	Discharge Size	1-1/2" NPT
<b>MATERIALS</b>	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	88 GPM (328 LPM) or 61 GPM (232 LPM)
	Max. Operating Temp.	130 °F (54 °C)
	Cooling	Oil filled
	Motor Protection	Auto reset thermal overload
	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	

**SINGLE SEAL**



**DOUBLE SEAL**



USE BN140, CONTRACTOR MAY USE EQUIVALENT PUMP.

**TOTAL DYNAMIC HEAD  
FLOW PER MINUTE**

MODEL		140/4140		145/4145	
Feet	Meters	Gal.	Liters	Gal.	Liters
5	1.5	86	326	56	212
10	3.0	80	303	55	208
15	4.6	73	276	53	200
20	6.1	66	250	51	193
25	7.6	59	223	48	182
30	9.1	49	185	45	170
40	12.2	28	106	35	132
50	15.2	-	-	26	99
60	18.3	-	-	16	61

USE BN140, CONTRACTOR MAY USE EQUIVALENT PUMP

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**

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



**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).

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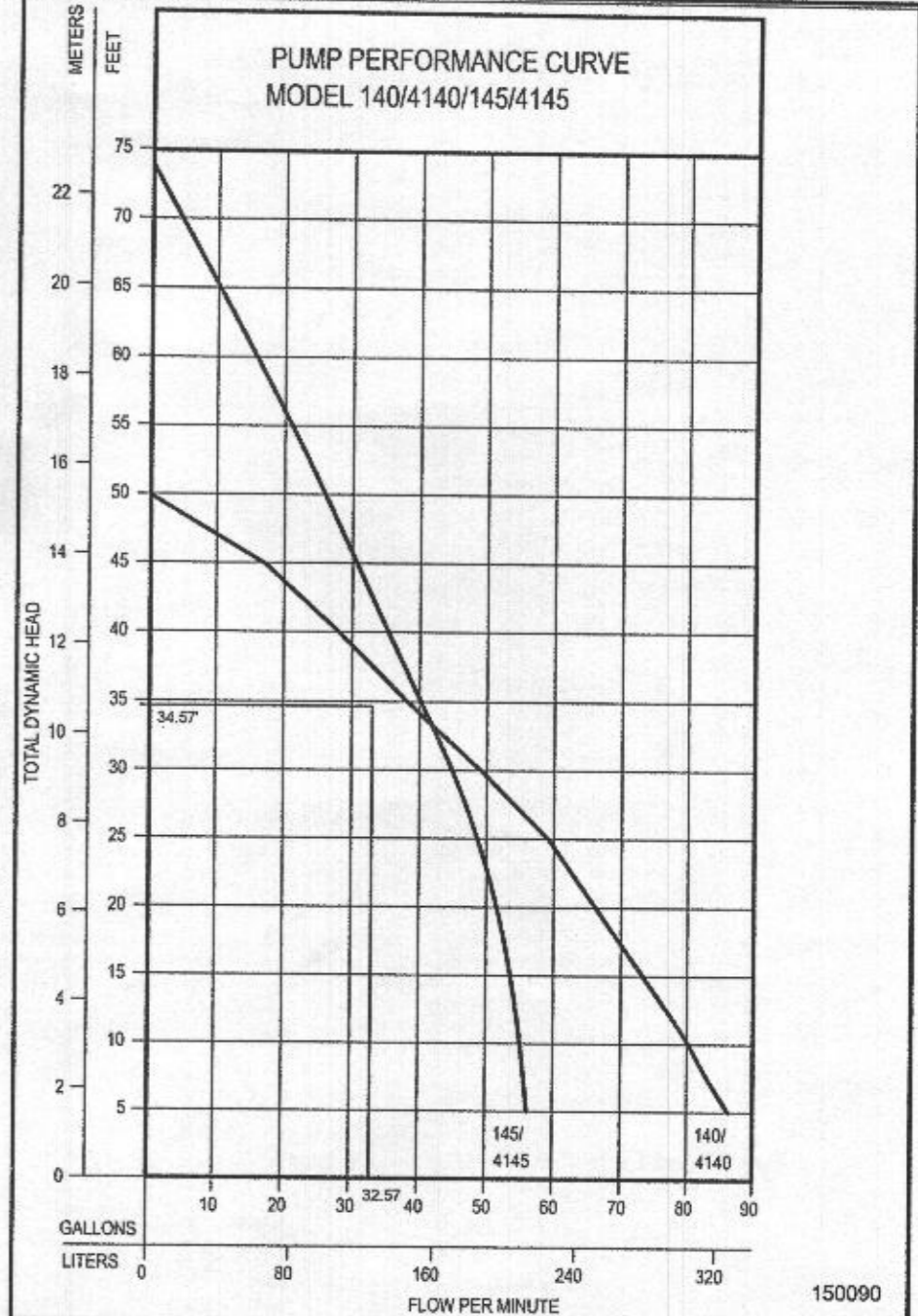
502-778-2731 | 800-928-7867 | 3649 Cane Run Road | Louisville, KY 40211-1961 | zoellerpump.com

THIS PLAN IS FOR SEPTIC DESIGN ONLY. SEE MANUFACTURERS SPECIFICATIONS FOR DETAILS. WWW.MAYERPRECAST.COM. EQUIVALENT FROM OTHER MANUFACTURERS CAN BE SUBSTITUTED.

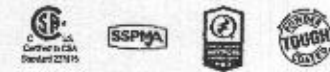
**BUILDER:**  
COMPETENT BUILDERS, INC.  
HARI RAJ SINGH  
FULTON, MD 20759  
443-839-1930

**OWNER:**  
HAJEET S. GILL  
RAJDEEP K. GILL  
8111 CHAPEL MANOR LANE  
ELLCOTT CITY, MD 21043  
PHONE: 443-509-4019

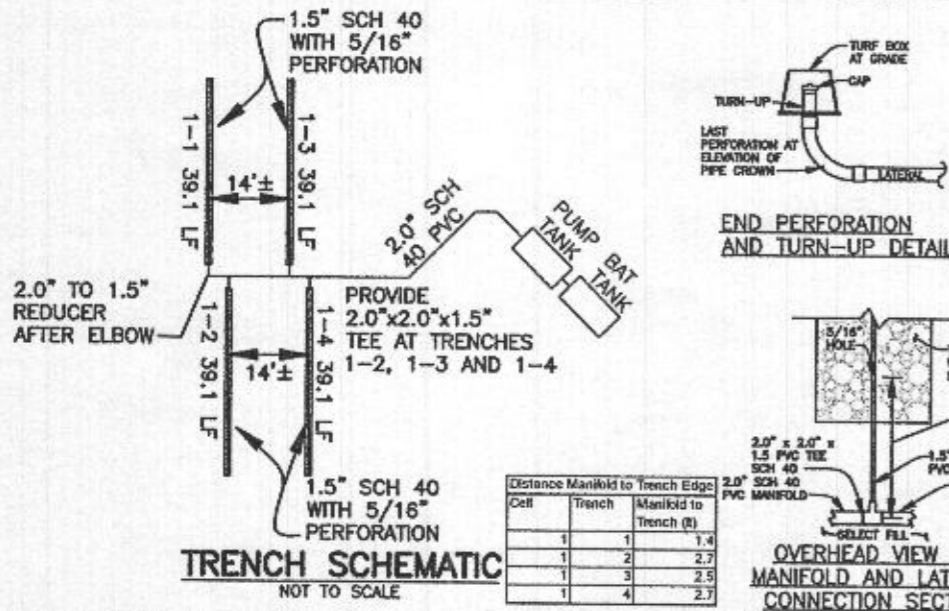
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 45571, Expiration Date: 06-08-2020.



NOTE: See model comparison chart for specific details.



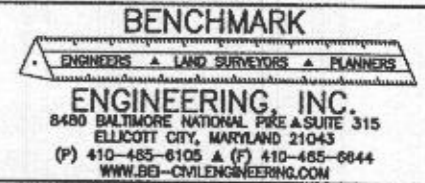
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502-778-2731 | 800-928-7867 | 3649 Cane Run Road | Louisville, KY 40211-1961 | zoellerpump.com



Cell	Trench	Manifold to Trench (ft)
1	1	1.4
1	2	2.7
1	3	2.5
1	4	2.7

OVERHEAD VIEW OF MANIFOLD AND LATERAL CONNECTION SECTION

SIGNATURE AND SEAL ARE FOR SEPTIC PROFILE AND CALCULATIONS ONLY, TANK AND DETAILS WERE NOT DESIGNED OR REVIEWED BY THE ENGINEER.



**PROJECT:** AJ GILL PROPERTY  
JOHNS HOPKINS ROAD

**LOCATION:** TAX MAP: 41, GRID: 9, PARCEL: 259  
ZONED: RR-DEO  
5TH ELECTION DISTRICT  
HOWARD COUNTY, MD, TAX ID #05-351731

**TITLE:** BAT SITE PLAN

**HOUSE TYPE:** CUSTOM

**DATE:** DECEMBER, 2019 **PROJECT NO.** 2627

**SCALE:** AS SHOWN **DRAWING** 5 **OF** 7

Friction Head  
main

Friction Head = Head loss due to pipe friction

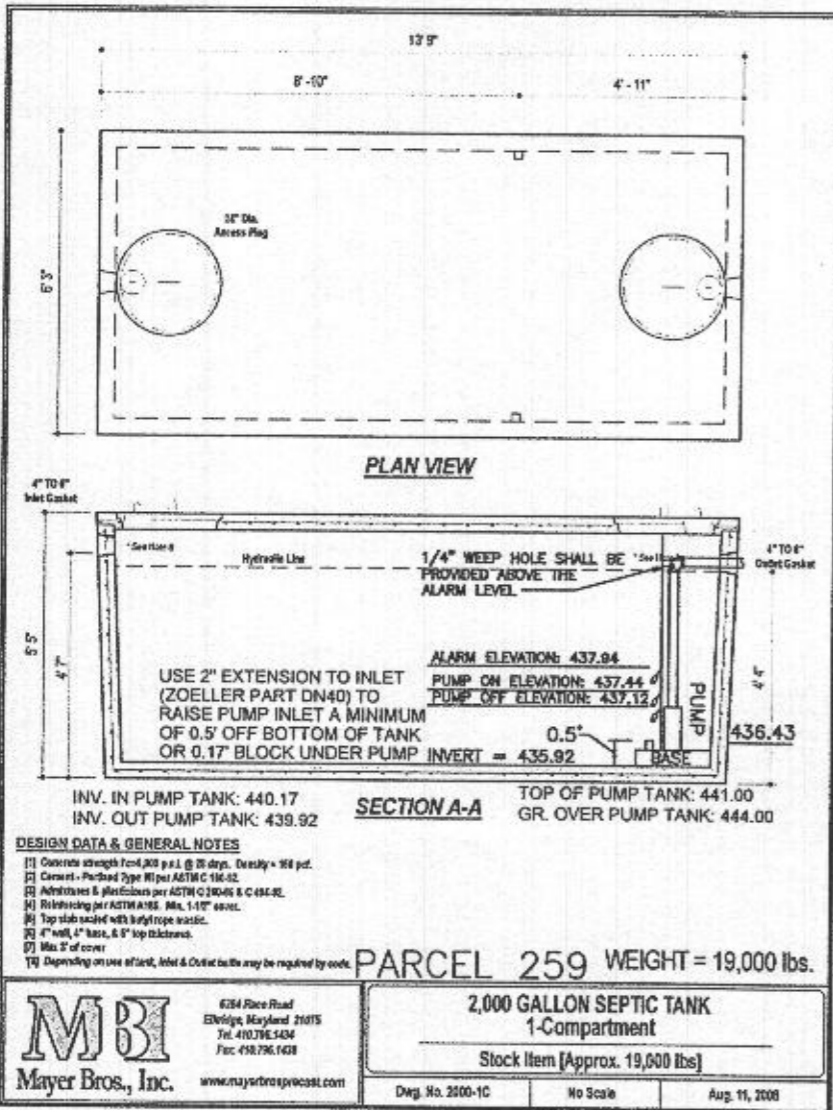
2.0" pipe = 280 feet

90° bends	1 loss for manifold bend	7.0 feet	per table 4.3
45° bends	4 loss for manifold bend	16.0 feet	per table 4.3
Str. Coupling	3 loss for straight tee	6.0 feet	per table 4.3
90 deg. Side tee	1 loss for tee bend	10.0 feet	per table 4.3 for smaller pipe
Sudden reduction	1 loss for reduction	1.0 feet	per Crane Co. technical paper
45° bends	0 loss for lateral bend	0.0 feet	per table 4.3
Gate Valve	0 loss for valve	0.0 feet	per table 4.3

Equivalent Manifold Length : 309.0 Friction loss = 5.57 feet

1.5" lateral 46.10 feet Friction loss = 0.22 feet

Total Friction Head = 5.79



Float Tree:	Elev.	Relative to Bottom
Bottom of Tank	435.92	
Top of Pump	437.12	1' 2 5/16"
Pump Off	437.12	1' 2 3/8"
Pump On	437.53	1' 7 5/16"
High Alarm	438.03	2' 1 5/16"

**BUILDER:**  
COMPETENT BUILDERS, INC.  
HARI RAJ SINGH  
FULTON, MD 20759  
443-839-1930

**OWNER:**  
HAJEET S. GILL  
RAJDEEP K. GILL  
8111 CHAPEL MANOR LANE  
ELLCOTT CITY, MD 21043  
PHONE: 443-509-4019

THIS PLAN IS  
FOR SEPTIC  
DESIGN ONLY

SEE MANUFACTURES  
SPECIFICATIONS FOR  
DETAILS.  
WWW.NORWECO.COM  
EQUIVALENT FROM OTHER  
MANUFACTURERS CAN BE  
SUBSTITUTED.

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THE ENGINEER.

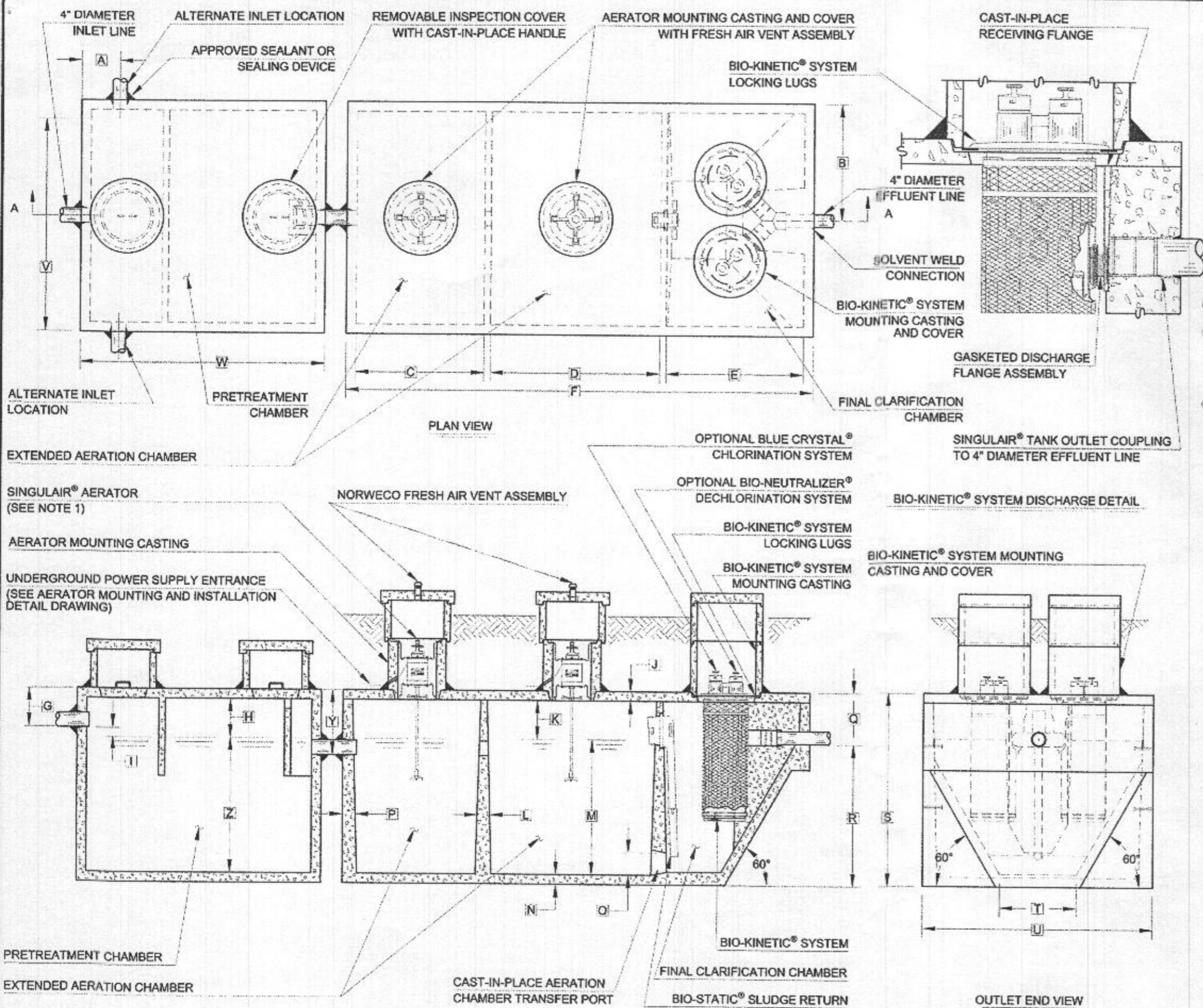
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 45577, Expiration Date: 06-08-2020.

*John M. Carney*  
PROFESSIONAL ENGINEER  
No. 45577  
11/17/20

**BENCHMARK**  
ENGINEERS • LAND SURVEYORS • PLANNERS

**ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE SUITE 315  
ELLCOTT CITY, MARYLAND 21043  
(P) 410-485-8105 & (F) 410-485-6844  
WWW.BEJ-CVLENGINEERING.COM

PROJECT:	AJ GILL PROPERTY JOHNS HOPKINS ROAD		
LOCATION:	TAX MAP: 41, GRID: 9, PARCEL: 259 ZONED: RR-DEO 5TH ELECTION DISTRICT HOWARD COUNTY, MD, TAX ID #05-351731		
TITLE:	BAT SITE PLAN		
HOUSE TYPE:	CUSTOM		
DATE:	DECEMBER, 2019	PROJECT NO.	2627
SCALE:	AS SHOWN	DRAWING	6 OF 7



**GENERAL NOTES:**

- ① SINGULAIR® AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 60 MINUTES ON / 60 MINUTES OFF.
- ② FALL THROUGH SINGULAIR® PLANT FROM INLET INVERT TO OUTLET INVERT IS FOUR INCHES. INLET INVERT IS TWELVE INCHES BELOW TANK TOP.
- ③ ON DEEPER INSTALLATIONS, PRECAST RISERS MUST BE USED TO EXTEND AERATOR MOUNTING CASTING AND BIO-KINETIC® SYSTEM MOUNTING CASTING TO GRADE. INSPECTION COVER ON PRETREATMENT CHAMBER MUST BE DEVELOPED TO WITHIN TWELVE INCHES OF GRADE.
- ④ TANK REINFORCED PER ACI STD. 318.
- ⑤ REMOVABLE COVERS ON RISERS WEIGH IN EXCESS OF SEVENTY-FIVE POUNDS EACH TO PREVENT UNAUTHORIZED ACCESS.
- ⑥ CONTACT THE LOCAL, LICENSED SINGULAIR® DISTRIBUTOR FOR ELECTRICAL REQUIREMENTS.

CRITICAL DIMENSIONS			
A	1'-0"	N	0'-3"
B	3'-0"	O	0'-6"
C	3'-4"	P	0'-3"
D	4'-5"	Q	1'-4"
E	3'-7"	R	3'-8"
F	12'-2"	S	5'-0"
G	1'-0"	T	2'-0"
H	1'-0"	U	6'-0"
I	0'-3"	V	
J	0'-3"	W	
K	1'-0"	X	
L	0'-2"	Y	1'-8"
M	3'-6"	Z	

U.S. AND FOREIGN PATENTS PENDING

**norweco**

LOW PROFILE SINGULAIR® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM MODEL THTLP-1000 GPD

7-10-07

BDS

JMM

11-07-06

NTS

PC-5-7093

**BUILDER:**

COMPETENT BUILDERS, INC.  
HARI RAJ SINGH  
FULTON, MD 20759  
443-839-1930

**OWNER:**

HAJEET S. GILL  
RAJDEEP K. GILL  
8111 CHAPEL MANOR LANE  
ELLCOTT CITY, MD 21043  
PHONE: 443-509-4019

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. 43577, Expiration Date: 06-08-2020.

THIS PLAN IS FOR SEPTIC DESIGN ONLY

SEE MANUFACTURERS SPECIFICATIONS FOR DETAILS. WWW.NORWECO.COM EQUIVALENT FROM OTHER MANUFACTURERS CAN BE SUBSTITUTED.

SIGNATURE AND SEAL ARE FOR SEPTIC PROFILE AND CALCULATIONS ONLY, TANK AND DETAILS WERE NOT DESIGNED OR REVIEWED BY THE ENGINEER.

*[Signature]*

**BENCHMARK ENGINEERING, INC.**

ENGINEERS • LAND SURVEYORS • PLANNERS

8480 BALTIMORE NATIONAL PIKE SUITE 315  
ELLCOTT CITY, MARYLAND 21043  
(P) 410-465-6105 & (F) 410-465-6844  
WWW.BE-CIVILENGINEERING.COM

**PROJECT:** AJ GILL PROPERTY  
JOHNS HOPKINS ROAD

**LOCATION:** TAX MAP: 41, GRID: 9, PARCEL: 259  
ZONED: RR-DEO  
5TH ELECTION DISTRICT  
HOWARD COUNTY, MD, TAX ID #05-351731

**TITLE:** BAT SITE PLAN

**HOUSE TYPE:** CUSTOM

**DATE:** DECEMBER, 2019 **PROJECT NO.** 2627

**SCALE:** AS SHOWN **DRAWING** 7 **OF** 7

NOTE: PRETREATMENT CHAMBER MINIMUM REQUIREMENTS SHALL BE: 1,000 GALLONS CAPACITY, 15 GALLONS PER INCH OF LIQUID LEVEL AND 12 INCHES OF FREEBOARD.

SECTION A-A

NOTE: SOME CRITICAL DIMENSIONS ARE INTENTIONALLY LEFT BLANK TO BE FILLED IN PER INDIVIDUAL JOB SITE SPECIFICATIONS.

NOTE: TOTAL SYSTEM CAPACITY: 2,300 GALLONS RATED CAPACITY: 1,000 GALLONS PER DAY

**BUILDING PERMIT PLAN NOTES:**

1. THE LOT SHOWN HEREON WAS RECORDED IN LIBER 14121 AT FOLIO 176. REFER TO THE TITLE FOR LOT DIMENSIONS, LOT AREAS, ALL EASEMENTS AND CONDITIONS.
2. SEDIMENT AND EROSION CONTROLS WERE APPROVED BY HOWARD SOIL CONSERVATION DISTRICT UNDER A GRADING PLAN AND MODIFIED FOR THIS SPECIFIC HOUSE.
3. TOPOGRAPHY SHOWN HEREON IS TAKEN FROM THE APPROVED ROAD CONSTRUCTION PLANS AND TOPOGRAPHIC INFORMATION PROVIDED BY BENCHMARK ENGINEERING, INC., ON OR ABOUT AUGUST, 2017.
4. ALL SEDIMENT AND EROSION CONTROL FEATURES USED ON THIS SITE SHALL COMPLY WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
5. ALL DRAINAGE AND STORMWATER MANAGEMENT FEATURES USED ON THIS SITE MUST COMPLY WITH THE APPROVED ROAD CONSTRUCTION PLANS EXCEPT AS WAIVED.
6. THERE ARE NO EXISTING WELLS OR SEPTIC SYSTEMS WITHIN 100' OF THIS PROJECT'S BOUNDARY EXCEPT AS NOTED.
7. ANY CHANGES TO A PRIVATE SEWAGE EASEMENT OR WELL BOX SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
8. STORMWATER MANAGEMENT FOR THIS LOT WAS DESIGNED TO BE PROVIDED BY MICRO-BIORETENTION FACILITIES (MDE M-6).
9. MICRO-BIORETENTION FACILITIES SHOULD HAVE EITHER 4" OR 6" ROOF LEADERS DEPENDING ON THE SIZE OF THE ROOFTOP AREA.
10. THE SEPTIC TANK WILL BE A 2000 GALLON TWO COMPARTMENT TANK AND THE PUMP TANK WILL HAVE A 2000 GALLON ONE COMPARTMENT TANK.

**ONSITE SEWAGE DISPOSAL SYSTEM NOTES:**

1. THE LOT SHOWN HEREON WAS RECORDED IN LIBER 14121 AT FOLIO 176. REFER TO THE TITLE FOR LOT DIMENSIONS, LOT AREAS, ALL EASEMENTS AND CONDITIONS.
2. SEDIMENT AND EROSION CONTROLS WERE APPROVED BY HOWARD SOIL CONSERVATION DISTRICT UNDER A GRADING PLAN AND MODIFIED FOR THIS SPECIFIC HOUSE.
3. TOPOGRAPHY SHOWN HEREON IS TAKEN FROM THE APPROVED ROAD CONSTRUCTION PLANS AND TOPOGRAPHIC INFORMATION PROVIDED BY BENCHMARK ENGINEERING, INC., ON OR ABOUT AUGUST, 2017.
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10. THE SEPTIC TANK WILL BE A 2000 GALLON TWO COMPARTMENT TANK AND THE PUMP TANK WILL HAVE A 2000 GALLON ONE COMPARTMENT TANK.

**Required BAT Site Plan Notes**

1. Any change 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 sit plan may be required.
2. The maximum depth of the BAT shall be per the manufacturer's specification, 3.0'.
3. The blower may not be located further from the tank than the manufacturer's specifications, 75'.
4. The BAT system shall be maintained and operated for the life of the system.
5. The BAT shall be operated by and maintained by a certified service provider.
6. Within one month of installation, a person installing the BAT system shall report to the Maryland Department of the Environment (MDE) in a manner acceptable to MDE, the address and date of completion of the BAT installation and the type of BAT installed.
7. Electrical work for the BAT installation must be performed by a licensed electrician.
8. An agreement and Easement must be completed and signed by all applicable parties, and recorded in Land Records of Howard County.
9. The Health Department requires documentation for the start-up certification from the manufacturer prior to final approval of the installation.

**BENCHMARK INFORMATION NAD83**

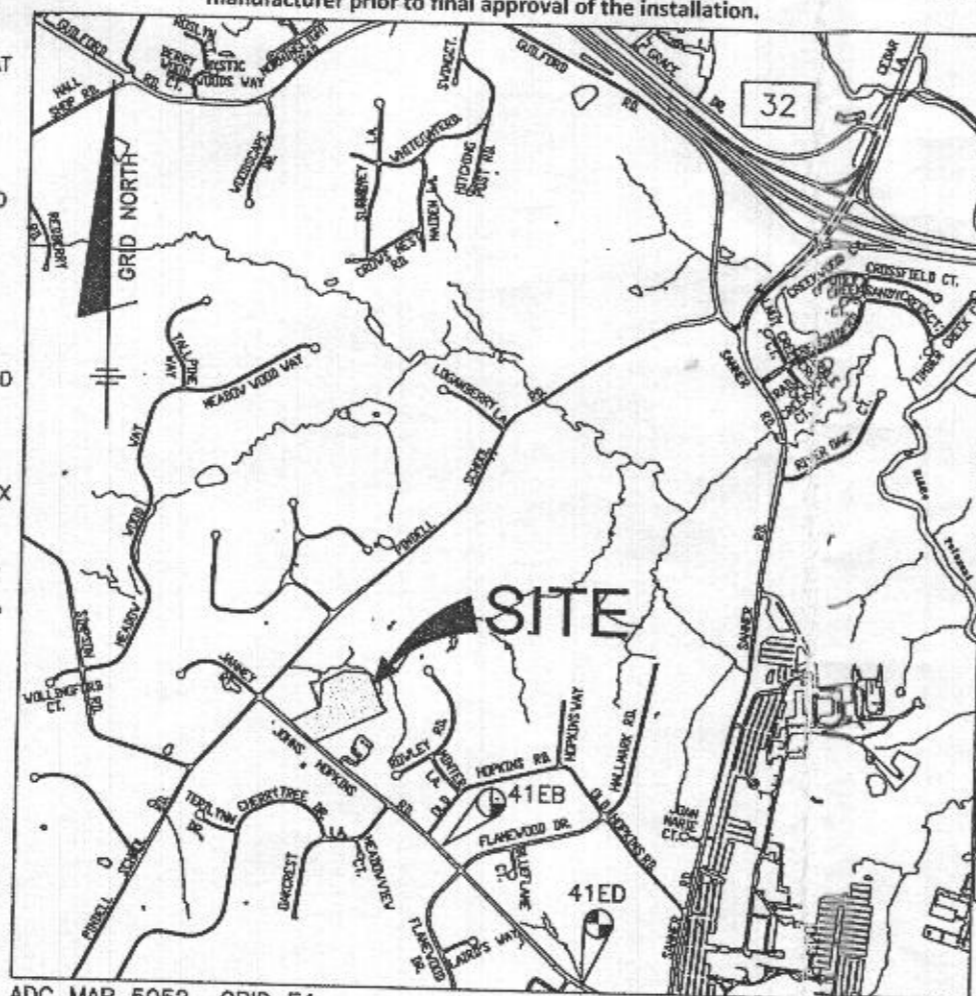
Ho. Co. STATION 41EB      Ho. Co. STATION 41ED  
 NORTHING: 546,222.22'      NORTHING: 544,800.61'  
 EASTING: 1,337,778.22'      EASTING: 1,339,251.13'  
 ELEVATION: 463.78'      ELEVATION: 405.70'

**Spec Sheet information**

System	Application Rate	Effective Depth	Bottom Depth
Initial	1.2	4.0	8.0
1st Replacement	1.2	4.0	8.0
2nd Replacement	0.8	5.0	8.0

Approved Septic System Plan  
 Howard County Health Department

Signature \_\_\_\_\_ Date \_\_\_\_\_



ADC MAP 5052 GRID E4

**VICINITY MAP**  
 SCALE: 1" = 2000'

TRENCH DATA			
INITIAL SYSTEM	FIRST REPLACEMENT	SECOND REPLACEMENT	
TRENCH 1-1	TRENCH 2-1	TRENCH 3-1	TRENCH 3-5
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft	LENGTH 40.2 ft
GROUND ELEVATION 467.8	GROUND ELEVATION 465.1	GROUND ELEVATION 462.4	GROUND ELEVATION 460.0
INVERT ELEVATION 464.2	INVERT ELEVATION 462.1	INVERT ELEVATION 459.4	INVERT ELEVATION 458.0
MAX BOTTOM ELEVATION 459.8	MAX BOTTOM ELEVATION 457.1	MAX BOTTOM ELEVATION 454.4	MAX BOTTOM ELEVATION 452.0
TRENCH 1-2	TRENCH 2-2	TRENCH 3-2	TRENCH 3-6
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft	LENGTH 40.2 ft
GROUND ELEVATION 467.5	GROUND ELEVATION 464.8	GROUND ELEVATION 462.1	GROUND ELEVATION 459.7
INVERT ELEVATION 464.2	INVERT ELEVATION 462.1	INVERT ELEVATION 459.4	INVERT ELEVATION 457.7
MAX BOTTOM ELEVATION 459.5	MAX BOTTOM ELEVATION 456.8	MAX BOTTOM ELEVATION 454.1	MAX BOTTOM ELEVATION 451.7
TRENCH 1-3	TRENCH 2-3	TRENCH 3-3	TRENCH 3-7
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft	LENGTH 40.2 ft
GROUND ELEVATION 466.5	GROUND ELEVATION 463.7	GROUND ELEVATION 461.2	GROUND ELEVATION 458.5
INVERT ELEVATION 464.2	INVERT ELEVATION 461.7	INVERT ELEVATION 459.2	INVERT ELEVATION 456.5
MAX BOTTOM ELEVATION 458.5	MAX BOTTOM ELEVATION 455.7	MAX BOTTOM ELEVATION 453.2	MAX BOTTOM ELEVATION 450.5
TRENCH 1-4	TRENCH 2-4	TRENCH 3-4	
LENGTH 39.1 ft	LENGTH 39.1 ft	LENGTH 40.2 ft	
GROUND ELEVATION 466.2	GROUND ELEVATION 463.4	GROUND ELEVATION 460.9	
INVERT ELEVATION 464.2	INVERT ELEVATION 461.4	INVERT ELEVATION 458.9	
MAX BOTTOM ELEVATION 458.2	MAX BOTTOM ELEVATION 455.4	MAX BOTTOM ELEVATION 452.9	

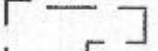

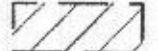

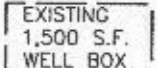
PROJECT:	AJ GILL PROPERTY JOHNS HOPKINS ROAD		
LOCATION:	TAX MAP: 41, GRID: 9, PARCEL: 259 ZONED: RR-DEO 5TH ELECTION DISTRICT HOWARD COUNTY, MD, TAX ID #05-351731		
TITLE:	BAT SITE PLAN		
HOUSE TYPE:	CUSTOM		
DATE:	DECEMBER, 2019	PROJECT NO.	2473
SCALE:	AS SHOWN	DRAWING	1 OF 7

<b>BUILDER:</b> COMPETENT BUILDERS, INC. HARI RAJ SINGH FULTON, MD 20759 443-839-1930	<b>OWNER:</b> HAJEET S. GILL RAJDEEP K. GILL 8111 CHAPEL MANOR LANE ELLICOTT CITY, MD 21043 PHONE: 443-509-4019	<b>BENCHMARK</b> ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS <b>ENGINEERING, INC.</b> 5480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-8105 ▲ (F) 410-465-8644 WWW.BEI-CVLENGINEERING.COM
---	--	---

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. 455771 Expiration Date: 06-08-2020.

12/29/19

**LEGEND**

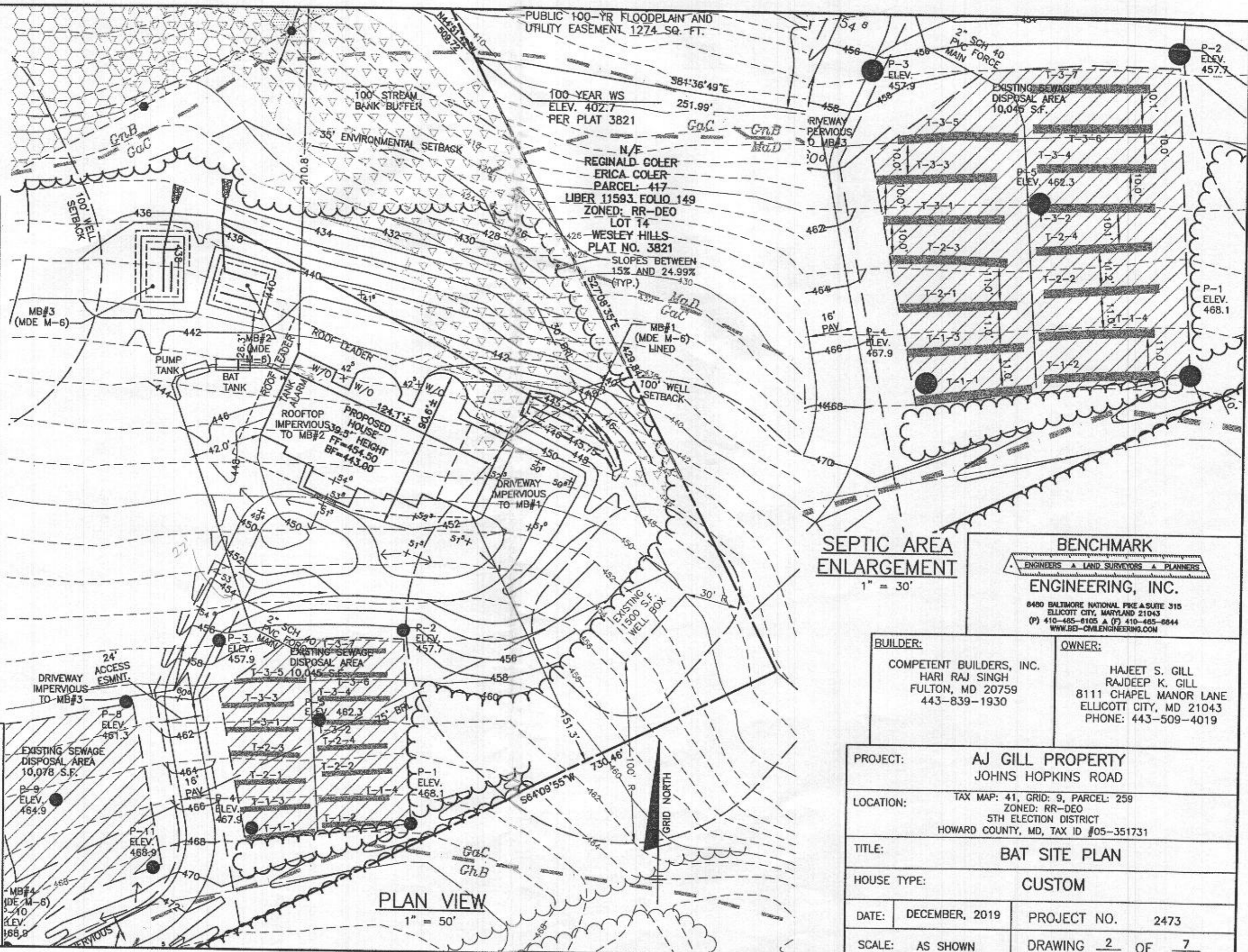
- EXISTING STRUCTURE 
- PERCOLATION TEST PASSED 
- EXISTING SEPTIC FIELD 
- EXISTING WELL  EX. WELL
- EXISTING WELL BOX 

INITIAL SYSTEM		
Number of Bedrooms	9	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	4.0	ft
Bottom Max Depth	8.0	ft
Design Flow	1350	gpd
Drainage Field square footage	1125	sf
Sidewall Reduction Credit	0.42	
Trench width	3	ft
Effective Area Depth	4	ft
Trench Spacing	11	ft
Linear Length of trench Required	156	lf

1st REPLACEMENT SYSTEM		
Number of Bedrooms	9	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	4.0	ft
Bottom Max Depth	8.0	ft
Design Flow	1350	gpd
Drainage Field square footage	1125	sf
Sidewall Reduction Credit	0.42	
Trench width	3	ft
Effective Area Depth	4	ft
Trench Spacing	11	ft
Linear Length of trench Required	156	lf

2nd REPLACEMENT SYSTEM		
Number of Bedrooms	9	
Application Rate	0.8	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	8.0	ft
Design Flow	1350	gpd
Drainage Field square footage	1688	sf
Sidewall Reduction Credit	0.50	
Trench width	3	ft
Effective Area Depth	3	ft
Trench Spacing	10	ft
Linear Length of trench Required	281	lf

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: 06-08-2020.



**PLAN VIEW**  
1" = 50'

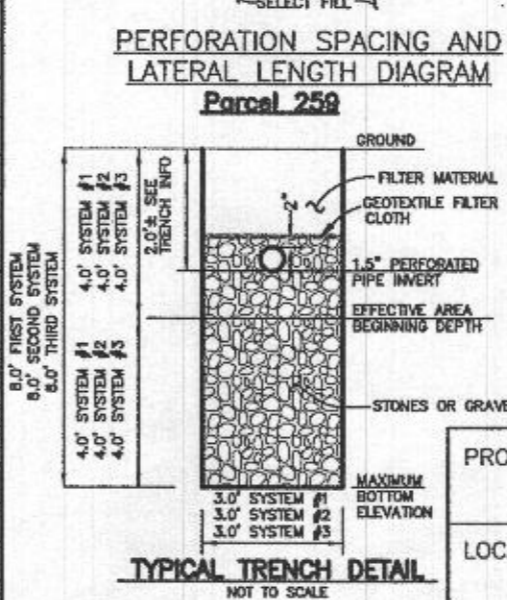
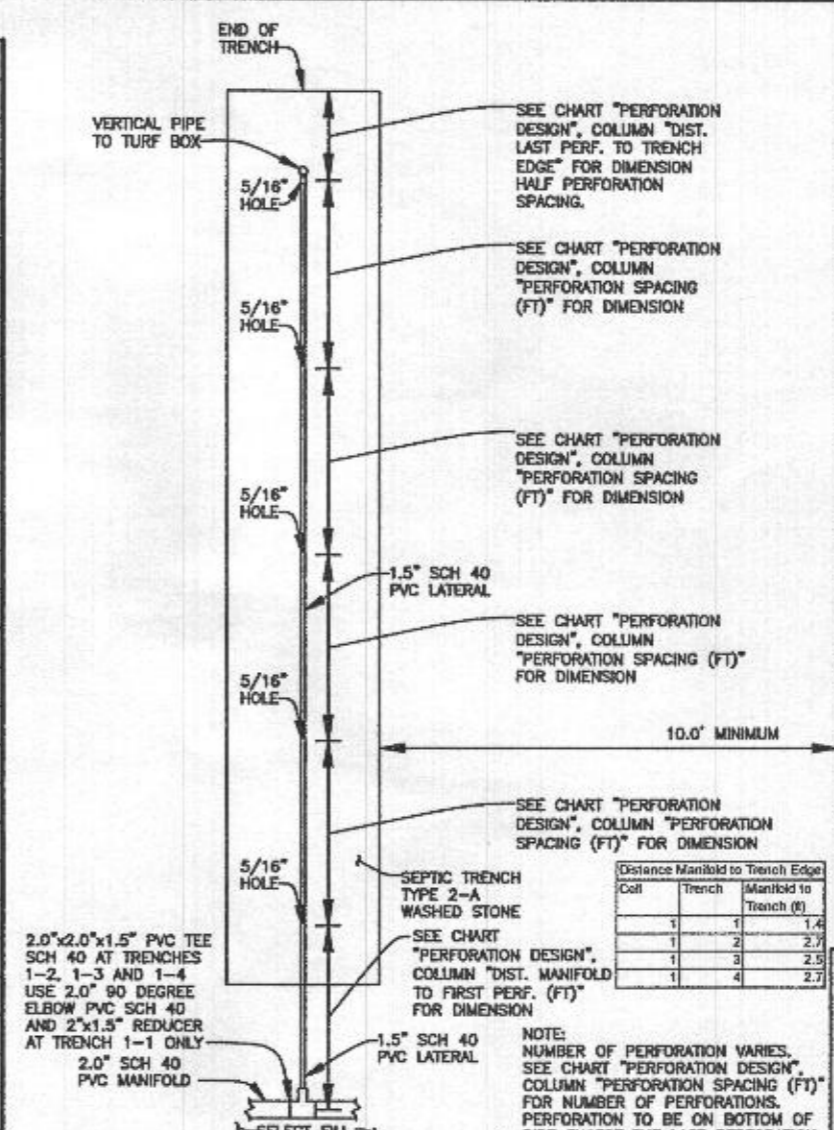
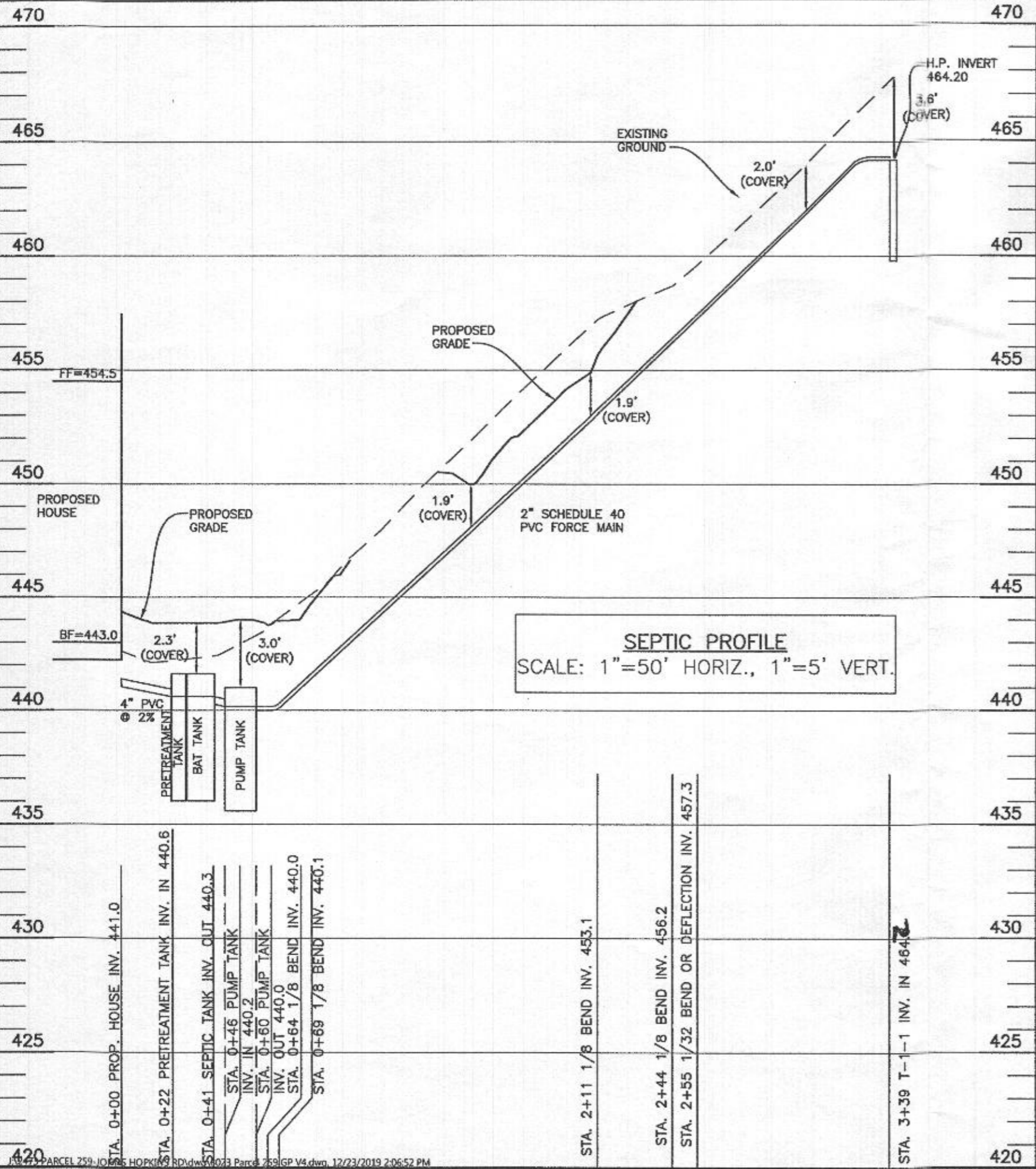
**SEPTIC AREA ENLARGEMENT**  
1" = 30'

**BENCHMARK ENGINEERING, INC.**  
ENGINEERS • LAND SURVEYORS • PLANNERS  
8480 BALTIMORE NATIONAL PIKE SUITE 315  
ELLICOTT CITY, MARYLAND 21043  
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**BUILDER:**  
COMPETENT BUILDERS, INC.  
HARI RAJ SINGH  
FULTON, MD 20759  
443-839-1930

**OWNER:**  
HAJEET S. GILL  
RAJDEEP K. GILL  
8111 CHAPEL MANOR LANE  
ELLICOTT CITY, MD 21043  
PHONE: 443-509-4019

<b>PROJECT:</b>	AJ GILL PROPERTY JOHNS HOPKINS ROAD		
<b>LOCATION:</b>	TAX MAP: 41, GRID: 9, PARCEL: 259 ZONED: RR-DEO 5TH ELECTION DISTRICT HOWARD COUNTY, MD, TAX ID #05-351731		
<b>TITLE:</b>	BAT SITE PLAN		
<b>HOUSE TYPE:</b>	CUSTOM		
<b>DATE:</b>	DECEMBER, 2019	<b>PROJECT NO.</b>	2473
<b>SCALE:</b>	AS SHOWN	<b>DRAWING</b>	2 OF 7



THIS PLAN IS FOR SEPTIC DESIGN ONLY.

SIGNATURE AND SEAL ARE FOR SEPTIC PROFILE AND CALCULATIONS ONLY, TANK AND DETAILS WERE NOT DESIGNED OR REVIEWED BY THE ENGINEER.

SEE MANUFACTURES SPECIFICATIONS FOR DETAILS. WWW.MAYERPRECAST.COM EQUIVALENT FROM OTHER MANUFACTURERS CAN BE SUBSTITUTED.

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SCALE:	AS SHOWN	DRAWING	3 OF 7