GENERAL NOTES

1. THE LOT SHOWN HEREON COMPLIES WITH THE MINIMUM OWNERSHIP WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT.
2. THIS AREA DESIGNATES A PRIVATE SEWAGE DISPOSAL AREA OF AT LEAST 10,000 S.F. AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWERAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWER IS AVAILABLE. THIS EASEMENT SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWER SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWERAGE EASEMENT. RECORDATION OF A MODIFIED SEWERAGE EASEMENT PLAT SHALL NOT BE REQUIRED.
3. TOPOGRAPHY SHOWN WITHIN THE LIMIT OF DISTURBANCE IS BASED ON HOWARD COUNTY GIS, 2 FOOT CONTOURS, AND VERIFIED WITH FIELD RUN TOPOGRAPHY BY BENCHMARK ENGINEERING, INC., IN JULY, 2017.
4. TO THE BEST OF OUR KNOWLEDGE, ALL WELLS AND SEPTIC SYSTEMS LOCATED WITHIN 100' OF THE PROPERTY BOUNDARIES AND 200' DOWN GRADIENT OF ANY WELL AND/OR SEPTIC HAVE BEEN SHOWN.
5. ANY CHANGES TO A PRIVATE SEWAGE EASEMENT SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
6. STORMWATER MANAGEMENT FOR THIS LOT COMPLIES WITH THE "MARYLAND DEPARTMENT OF THE ENVIRONMENT STORMWATER MANAGEMENT ACT OF 2007" AND THE "HOWARD COUNTY DESIGN MANUAL VOLUME I, CHAPTER 5". STORMWATER MANAGEMENT IS PROVIDED BY NON-ROOFTOP DISCONNECTION (N-2), TWO (M-6) MICRO BIO-RETENTIONS AND TWO (M-5) DRY WELLS. THEY ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.
7. A DECLARATION OF INTENT FOR SINGLE FAMILY RESIDENTIAL LOT EXEMPTION (CLEARING LESS THAN 20,000 SQUARE FEET OF FOREST) SHALL BE FILED WITH DPZ.
8. PROPERTY ACREAGE: (LOT 3) 3.59 AC., ZONED RR-DEO.
9. PROPOSED LIMIT OF DISTURBANCE: 3.0 AC.
10. FOREST STAND DELINEATION HAS BEEN PERFORMED BY BENCHMARK ENGINEERING, INC. IN FEBRUARY, 2017, AND IS PROVIDED AS PART OF THE SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN SUBMISSION.
11. SPECIMEN TREES HAVE BEEN FIELD LOCATED BY BENCHMARK ENGINEERING, INC. AND ARE DEPICTED ON THIS PLAN.
12. THE EXISTING WELL SHOWN (TAG #HO-17-0196) SHOWN ON THIS PLAN HAS BEEN FIELD LOCATED BY BENCHMARK ENGINEERING, INC. DECEMBER, 2017 AND IS ACCURATELY SHOWN.
13. EXACT LENGTH OF SEPTIC TRENCHES IS TO BE DETERMINED BY THE HEALTH DEPARTMENT AT THE TIME OF TRENCH LAYOUT AND INSPECTION.
14. ANY CHANGES TO THE LOCATION 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.
15. THE MAXIMUM EARTH COVER OVER THE SEPTIC TANK IS 3 FEET. GREATER EARTH COVER WILL REQUIRE A HEAVY LOAD BEARING TANK.

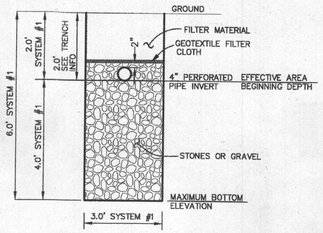
REQUIRED BAT SITE PLAN NOTES

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. THE BLOWER MAY NOT BE LOCATED FURTHER FROM THE TANK THAN THE MANUFACTURER'S SPECIFICATIONS.
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.

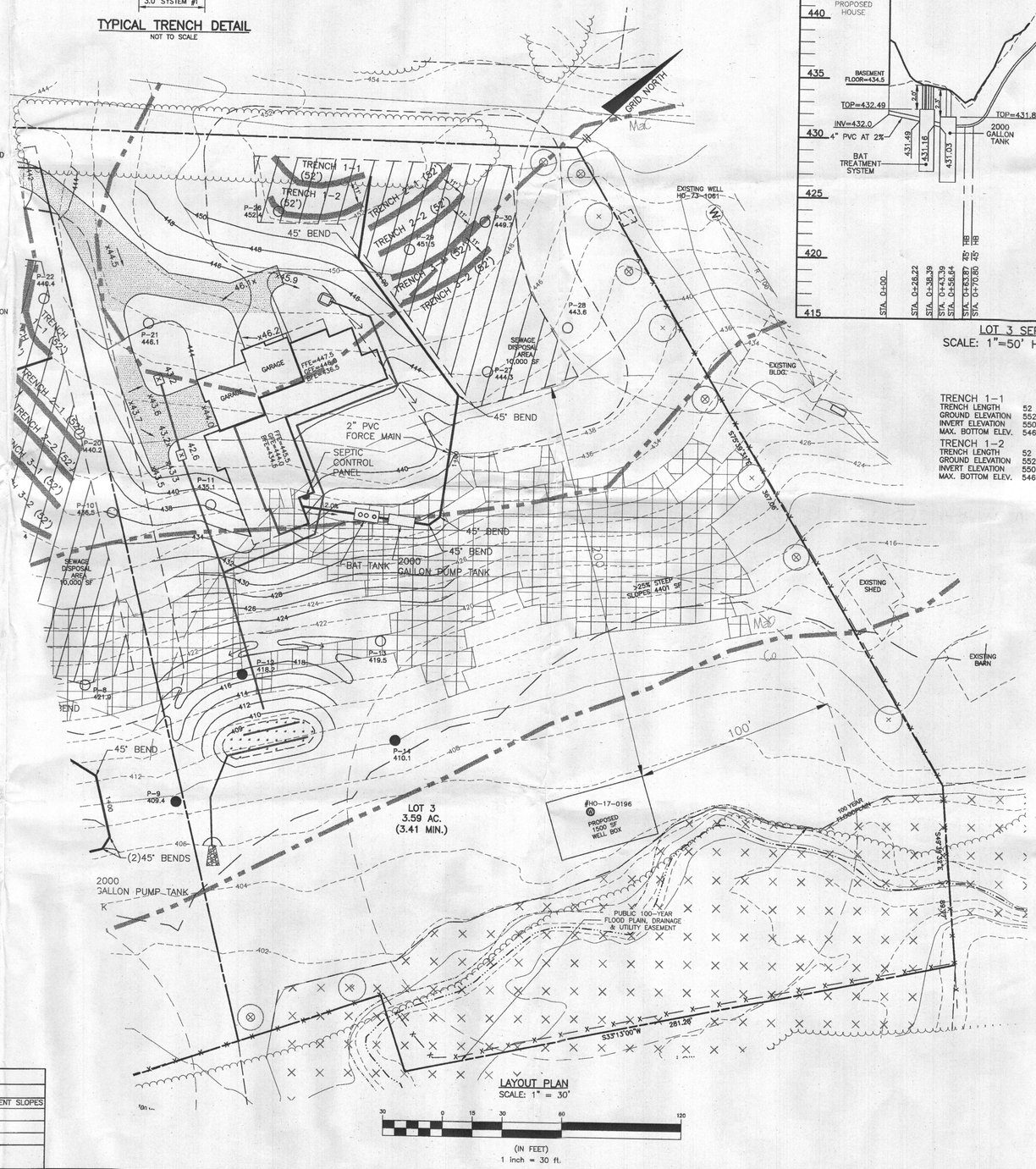
INITIAL SYSTEM		
Number of Bedrooms	6	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	2	ft
Bottom Max Depth	6	ft
Design Flow	900	gpd
Drainage Field square footage	750	sf
Sidewall reduction credit	0.417	
Trench width	3	
Effective Area Depth	4	
Linear Length of trench Required	**104**	lf

1st REPLACEMENT SYSTEM		
Number of Bedrooms	6	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	2	ft
Bottom Max Depth	6	ft
Design Flow	900	gpd
Drainage Field square footage	750	sf
Sidewall reduction credit	0.417	
Trench width	3	
Effective Area Depth	4	
Linear Length of trench Required	**104**	lf

2nd REPLACEMENT SYSTEM		
Number of Bedrooms	6	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	2	ft
Bottom Max Depth	6	ft
Design Flow	900	gpd
Drainage Field square footage	750	sf
Sidewall reduction credit	0.417	
Trench width	3	
Effective Area Depth	4	
Linear Length of trench Required	**104**	lf

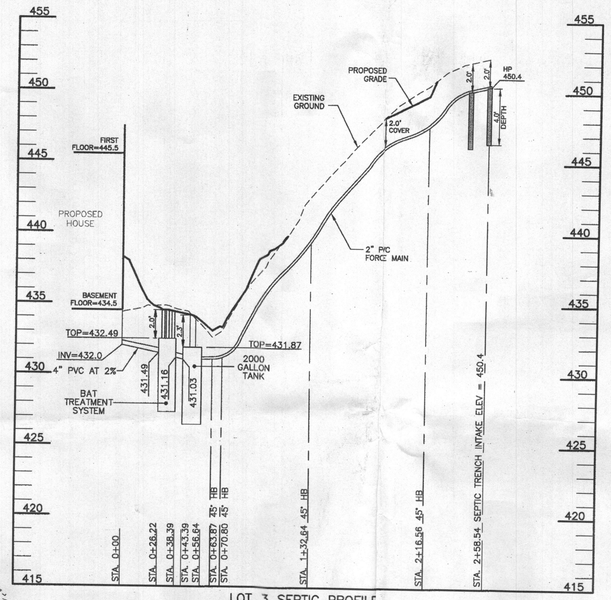


TYPICAL TRENCH DETAIL
NOT TO SCALE

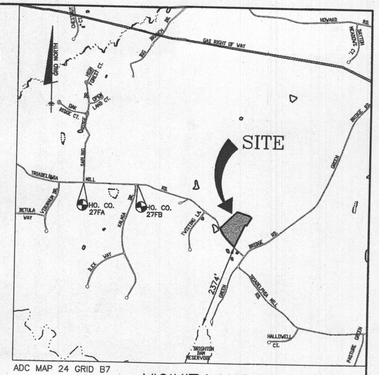


LAYOUT PLAN
SCALE: 1" = 30'

(IN FEET)
1 inch = 30 ft.



LOT 3 SEPTIC PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



ADC MAP 24 GRID B7

VICINITY MAP
SCALE : 1"=2000'

BENCHMARKS (NAD83)

HO. CO. No. 27FA ELEV. 496.35
18.2' SOUTH OF THE CENTERLINE OF TRIADELPHIA MILL RD AT THE INTERSECTION OF SAPLING RIDGE DR.
N 569002.176 E 1306892.586

HO. CO. No. 27FB ELEV. 512.22
3.2' SOUTH OF THE EDGE OF PAVING OF TRIADELPHIA MILL RD 61' EAST OF THE CENTERLINE OF KALMIA DR.
N 568975.151 E 1308421.369

TRENCH INFORMATION

TRENCH 1-1	
TRENCH LENGTH	52 LF
GROUND ELEVATION	552.4
INVERT ELEVATION	550.4
MAX. BOTTOM ELEV.	546.4

TRENCH 1-2	
TRENCH LENGTH	52 LF
GROUND ELEVATION	552.1
INVERT ELEVATION	550.1
MAX. BOTTOM ELEV.	546.1

TRENCH 2-1	
TRENCH LENGTH	52 LF
GROUND ELEVATION	551.5
INVERT ELEVATION	549.5
MAX. BOTTOM ELEV.	545.5

TRENCH 2-2	
TRENCH LENGTH	52 LF
GROUND ELEVATION	551.0
INVERT ELEVATION	549.0
MAX. BOTTOM ELEV.	545.0

TRENCH 3-1	
TRENCH LENGTH	52 LF
GROUND ELEVATION	550.1
INVERT ELEVATION	548.1
MAX. BOTTOM ELEV.	544.1

TRENCH 3-2	
TRENCH LENGTH	52 LF
GROUND ELEVATION	548.8
INVERT ELEVATION	546.8
MAX. BOTTOM ELEV.	542.8

LEGEND

- SOILS CLASSIFICATION — GnB
- SOILS DELINEATION
- EXISTING CONTOURS — 480 / 478
- EXISTING WOODS LINE
- EXISTING WELL — W
- PROPOSED WELL — PROPOSED WELL BOX
- PASSING PERCOLATION TEST
- FAILING PERCOLATION TEST
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- PROPOSED SEWAGE DISPOSAL AREA
- BETWEEN 20% AND 24.99% SLOPES
- EX. 100 YEAR FLOODPLAIN

Approved Septic System Plan
Howard County Health Department
NORWECO TNT 960 LP
w/ Mayer Bros. 2000-gal Pump Tank
& Zoeller BN Well (0.5 hp) Pump
R Bradley 1/12/2018
Signature Date
BAT-LPD system

THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF ANY WORK.

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.

SOILS LEGEND			
SYMBOL	TYPE	K* FACTOR	NAME
Co*	C	.37**	CODORUS AND HATBORO SILT LOAM, 0 TO 3 PERCENT SLOPES
GgC	B	.28	GLENELG LOAM, 3 TO 8 PERCENT SLOPES
MoC	B	.32	MANOR LOAM, 8 TO 15 PERCENT SLOPES
MoD	B	.32**	MANOR LOAM, 15 TO 25 PERCENT SLOPES

* INDICATES HYDRIC SOILS
** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY, APRIL 2016. PAGE 15

BENCHMARK
ENGINEERS LAND SURVEYORS PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE, SUITE 315 A ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-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: 06-08-2018.

STATE OF MARYLAND — JOHN M. CARNEY — No. 45577 — PROFESSIONAL ENGINEER
12/20/17

OWNER/DEVELOPERS:
ELLEN M. VAWTER,
MICHAEL A. VAWTER,
NANCY J. VAWTER,
LAURA J. LEONARD,
DREW B. LEONARD
14170 TRIADELPHIA MILL ROAD
DAYTON, MARYLAND 21036
301-706-6044

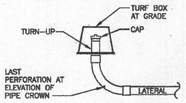
PROJECT:
VAWTER PROPERTY
LOT 3

LOCATION: 14176 TRIADELPHIA MILL ROAD
TAX MAP: 27 - GRID: 24 - PARCEL: 68
ZONED: RR-DEO RURAL RESIDENTIAL
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

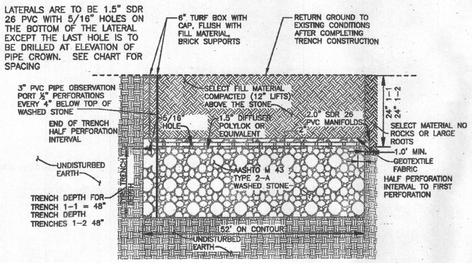
TITLE: SEPTIC SYSTEM DESIGN PLAN

DESIGN: LDD	DRAFT: LDD	CHECK: AAM	DATE: DECEMBER, 2017	PROJECT NO. 2766
			SCALE: AS SHOWN	SHEET 1 OF 3

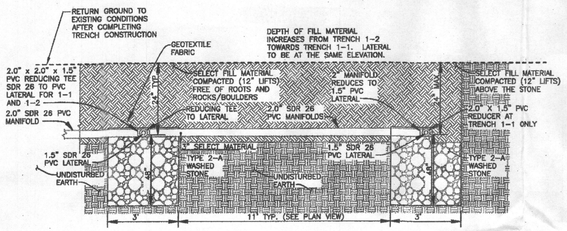
J:\2766 VAWTER PROPERTY\dwg\8026 GP.dwg, SEPTIC lot 3, 12/20/2017 9:44:15 AM, mfgmr



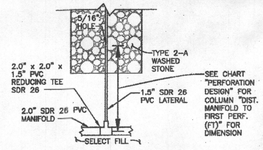
END PERFORATION AND TURN-UP DETAIL



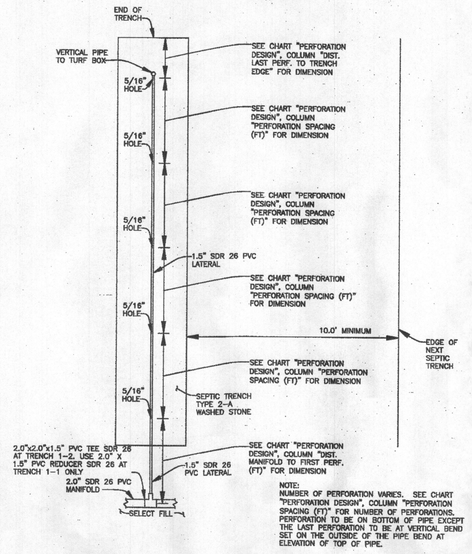
LATERAL AND TRENCH DESIGN



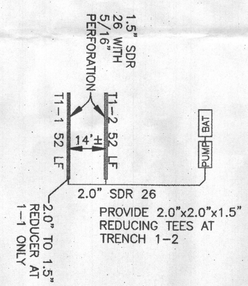
TRENCH AND MANIFOLD SECTION



OVERHEAD VIEW OF MANIFOLD AND LATERAL CONNECTION SECTION



PERFORATION SPACING AND LATERAL LENGTH DIAGRAM



TRENCH SCHEMATIC

NOT TO SCALE

Trench and Lateral Design												
Cell	Trench	Pipe Inv.	Trench	Highest	Lowest	Total Design	Approx. Lateral	Number of	Flow per	Flow per	Flow
		Elev	Bottom Elev.	Ground Over	Ground Over	Head (ft)	Length (ft)	Perforations	Perforation (gpm)	Lateral (gpm)	Differential
1	1	450.4	446.4	452.4	452.4	28.2	50.5	11	1.63	17.91	0.0%
	2	450.1	446.1	452.1	452.1	27.8	55.0	10	1.78	17.78	0.7%

Perforation Diameter = 5/16 inches Target Flow = 17.91 gpm

Cell	Flow Rate
1	35.69

	Depth To Effective Sidewall	Deep Trench Depth	Depth to Inlet
Trench 1	5 ft	4 ft	2 ft
Trench 2	5 ft	4 ft	2 ft

Perforation Design								
Cell	Trench	Number of	Manifold to	Trench Length	Perforation	Dist. Manifold	Dist. Last Perf.	Lateral Length
		Perforations	Trench (ft)	(ft)	Spacing (ft)	to First Perf. (ft)	to Trench Edge	(ft)
1	1	11	3.2	52	4.73	5.56	2.36	52.84
	2	10	2.5	52	5.20	5.10	2.60	51.90

Lateral Pressure Calculations																		
Cell	Trench	Pipe	Beginning	Gate	Manifold	Manifold	Manifold	Manifold Thru	Delta Loss	Total Manifold	Lateral 90 degree	Sudden Reduction	Lateral Bends	Lateral Length	Lateral Loss	Total Loss to	Total Design	Flow per
		Elev.	Manifold Loss	Valve	Bends 45D	Length	velocity	Tees	Manifold	Loss	side tee loss	Loss	45 deg. Loss	to first perf. Loss	Summation	First Perf.	Head (ft)	Lateral (gpm)
1	2	450.1	0.00	0	4	188	35.8	0	4.19	4.19	0.06	0.01	0.00	0.10	0.16	4.35	27.77	17.78
1	1	450.4	4.19			14	17.9	1	0.09	4.28	0.06	0.01	0.00	0.09	0.16	4.44	28.16	17.91

Perforation Diameter = 5/16 inches Distal Head 2 feet

Friction Head

main

Friction Head = Head loss due to pipe friction

2" pipe = 202 feet

45° bends	4	loss for manifold bend	16.0 feet	per table 4.3
Str. Coupling	1	loss for straight tee	2.0 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	1	loss for lateral bend	3.0 feet	per table 4.3
Gate Valve	0	loss for valve	0.0 feet	per table 4.3

Equivalent Manifold Length = 220.0 Friction loss = 4.52 feet

1.5" lateral 62.00 feet Friction loss = 1.12 feet

Total Friction Head = 5.63

Design Calculations Lot 3

Design Input:			Calculations:	
Capacity requirements				
number of lots	1		Max. Daily Flow	900 gpd
bedrooms per lot	6		Average Daily Flow	450 gpd
use rate per bedroom	150 gpd		Maximum Daily Flow	0.63 gpm
			Average Daily Flow	0.31 gpm
Drainfield Requirements				
Application Rate	1.2 gpd/sq ft		Standard Trench Length	250 ft
Trench width	3 ft		Deep Trench Conversion Factor	41.67 %
trench gravel depth	4 ft		Deep Trench Length for MDF	104.16 ft
number of trenches	2		total trench length for 100% capacity	104.16 ft
trench spacing center-center	13 ft		individual trench length	52 ft
			Approx. Lateral Length	48.00 ft
Tanks and Capacities				
			minimum req. area	1,250 sf
BAT tank	2,000	gallons	req. capacity (1125+(0.75*MDF))	1,800 gal.
2nd settling tank	NA	gallons	design settling capacity	2,000 gal.
Equalization Tank	NA	gallons		
pump tank size	2,000	gallons	min. pump tank capacity (ADF)	600 gal.
Distribution system				
number of cells	1			
			Total Number of Pumps	1
trenches first system	2		laterals served by pump	2
lateral length per pump	104 ft		Vol./100 ft 1.5" SDR 26	12.6 gal.
ID 1.5" SDR 26 PVC	1.75 inches		Vol. of laterals served	13.1 gal.
Max. Forcemain length	202 ft		Vol./100 ft 2" SDR 26	19.6 gal.
ID 2" SDR 26 PVC	2.17 inches		Max. Main volume	39.6 gal.
Static Hydraulic Profile				
Ground Elev. At BAT tank	434.49 ft		Tank #1 effulent elev	431.16 ft
Tank #1 invert in	431.49 ft			
Cover	2.00 ft			
Tank #1 top	432.49 ft	okay		
Fall in tanks	0.33 ft		Pump Tank effulent elev	431.03 ft
Fall between tanks	0.13 ft		Invert of pump tank	426.78 ft
Ground Elev. at pump tank	434.14 ft			
Pump Tank invert in	431.03 ft			
inv. into pump tank to top	0.84 ft		Pump Elevation	427.28 ft
Pump Tank top	431.87 ft	okay	pump intake elev.	426.07 ft
Pump Block Height	0.50 ft			
Height of Intake	0.79 ft			
Highest lateral	450.00 ft	Cell 1		
Perforation Design:				
			Distal Pressure =	2.0 ft
Size of Perforation	5/16 inches		Flow	1.63 gpm
Design Separation	4.73 ft		Perforations per Lateral	11.00
Use Perforations	11		Perforation Actual Spacing	4.73 ft
Perforations per field	22		Flow rate	35.82 gpm
Dosing volume, flow rates and Pressures				
lateral flow rate per pump	35.82 gpm		Static Head	21.32 ft Cell 1
Friction (C) for PVC	150		Friction Head	5.63 ft Cell 1
Miscellaneous Losses	0 ft		Distal Head	2 ft
Estimated Run Time	2.00 Min.		Max. Total Dynamic Head	28.95 ft
Cells in simultaneous use	1		Minimum Dose Vol.	150.00 gal.
Pump tank Volume	45.49 Gal/in		Min. Runtime	4.19 min.
			Selected Runtime	5.19
			Selected Dose Volume	150.00 gal.
			Average Dose	3.00 per day
Tank and Float Design:				
Ground over Tank =	434.14 ft		Inside Tank Dimenions	
Top of Tank =	431.87 ft		Height =	4.67 ft
Invert of Tank =	426.78 ft		Width =	5.58 ft
Pump Block=	0.50 ft		Length =	13.08 ft
Water End and Motor =	1.34 ft		Number of Tanks =	1
per Mayer Brothers Precast				
minimum Pump off =	428.62 ft			
Pump Off Float =	428.68 ft			
Dose =	20.05 cf			
Area of Pit	72.99 sf		Use one 2,000 gallon pump tank	
Pump on dist. =	0.27 ft			
Pump on Elev. =	428.95 ft			
Distance between Pump on and Highwater Alarm =				0.5 ft
Highwater Alarm Elevation =				429.45 ft
High Water Alarm to Inlet =	1.58			
Volume Above Alarm Float to Inlet =	114.97 cf or			859.99 gallons
One Day Flow =	900.00 gallons			not okay
90% One Day Flow =	810.00 gallons			okay
Pump Requirements:				
Performance =	35.82 gpm			
Head of Water =	28.85 feet of head			
Pump Selection:	Zoeller Pump BN161			
	1/2 horse power	115 Volts	Single Phase	

Approved Septic System Plan
Howard County Health Department
NORNECO TNT 8100 LP
w/ 2000-gal Mayer Bros. pump tank
& Zoeller BN161 (@SNP) pump
1/12/2018
Signature Date
3AT-13D System

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.BENCHMARKENGINEERING.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: 06-08-2018.

STATE OF MARYLAND JOHN M. GARNER No. 45577 PROFESSIONAL ENGINEER
12/20/17

OWNER/DEVELOPERS:

ELLEN M. VAWTER,
MICHAEL A. VAWTER,
NANCY J. VAWTER,
LAURA J. LEONARD,
DREW B. LEONARD
14170 TRIADELPHIA MILL ROAD
DAYTON, MARYLAND 21036
301-706-6044

PROJECT:

VAWTER PROPERTY

LOT 3

LOCATION: 14176 TRIADELPHIA MILL ROAD
TAX MAP: 27 – GRID: 24 – PARCEL: 68
ZONED: RR-DEO RURAL RESIDENTIAL
ELECTION DISTRICT NO. 5 – HOWARD COUNTY, MARYLAND

TITLE: SEPTIC SYSTEM DESIGN DETAILS

DESIGN: LDD	DRAFT: LDD	CHECK: AAM	DATE: DECEMBER, 2017	PROJECT NO. 2766
			SCALE: NONE	SHEET 3 OF 3

J:\2766 VAWTER PROPERTY\dwg\80326 GP.dwg, TRENCH details and calcs lot 3, 12/20/2017 9:45:14 AM, ntigner

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
Zoeller Family of Water Solutions®

SECTION: 2.15.000
FM2785
0317
Supersedes
0515

TECHNICAL DATA SHEET
HIGH HEAD FLOW-MATE SERIES
Models 161/4161, 163/4163, 165/4165 Submersible Effluent Pumps

PRODUCT SPECIFICATIONS

MOTOR	Horse Power	1/2 (161/4161, 163/4163) or 1 (165/4165)
	Voltage	115 - 575
	Phase	1 or 3 Ph
	Hertz	60 Hz
	RPM	3450
	Type	Permanent split capacitor or 3 Ph
	Insulation	Class B
	Amps	2.4 - 15.5
PUMP	Operation	Automatic or nonautomatic
	Auto On/Off Points	15-3/4" (400 mm) / 5-1/4" (133 mm)
	Discharge Size	1-1/2" NPT (optional 2" or 3" flange)
	Solids Handling	3/4" (19 mm) spherical solids
	Cord Length	20' (6 m) standard
	Cord Type	1 Ph: UL listed 3-wire neoprene cord and plug or 3 Ph: 4-wire with no plug
	Max. Head	86.5' (26 m)
	Max. Flow Rate	100 GPM (379 LPM)
	Max. Operating Temp.	130 °F (54 °C)
	Cooling	Oil filled
	Motor Protection	Auto reset thermal overload (1 Ph)
MATERIALS	Upper Bearing	Ball bearing
	Lower Bearing	Ball bearing
	Mechanical Seals	Carbon and ceramic
	Impeller Type	Non-clogging vortex
	Impeller	Bronze
	Hardware	Stainless steel
	Motor Shaft	SAE 1117 carbon steel or 416 stainless steel*
	Gasket	Neoprene square ring and gasket

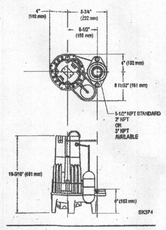
*Single seal models are built with a carbon steel motor shaft, and double seal models are built with a stainless steel motor shaft.

All Class 30 cast iron construction.

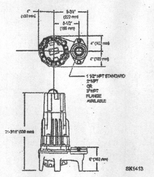
NOTE: Tweaking of effluent systems normally requires variable level float(s) controls and properly sized basins to achieve required pumping cycles or dosing timers with nonautomatic pumps.

NOTE: See model comparison chart for specific details.

SINGLE SEAL



DOUBLE SEAL



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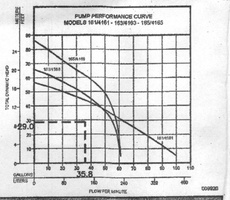
TOTAL DYNAMIC HEAD FLOW PER MINUTE

MODELS		161/4161		163/4163		165/4165	
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	100	379	61	231	61	231
10	3.0	93	352	60	227	60.5	229
15	4.6	86	326	60	227	60.3	228
20	6.1	79	298	59	223	60	227
25	7.6	71	267	57	216	59	223
30	9.1	62	235	55	208	58	220
40	12.2	45	170	46	174	55	208
50	15.2	20	76	33	125	50	189
60	18.3	--	--	15	57	39	148
70	21.3	--	--	--	--	22.5	85
80	24.4	--	--	--	--	10	38
Shut-off Head:		56 ft. (17.1 m)		66 ft. (20.1 m)		86.5 ft. (26.4 m)	



**USE D165 OR EQUIVALENT

Model	Type	Motor	Volts	Ph	Amps	HP	Hz	RPM	Impeller	Cord Plug	Duplex	Certifications
					MODEL COMPARISON							
M161	Single	Auto	115	1	15.0	1/2	60	80	36	1	---	UL and cCSAus [2]
B161	Single	Non	115	1	15.0	1/2	60	80	36	2 or 3 & 5	4 & 5	CSA [1]
N161	Double	Non	115	1	18.5	1/2	60	87	39	3 & 5	4 & 5	UL and cCSAus [2]
** BN161	Single	Auto	115	1	15.0	1/2	60	84	38	---	---	CSA
D161	Single	Auto	230	1	7.5	1/2	60	80	36	1	---	UL and cCSAus
E161 / E4161	Single / Double	Non	230	1	7.5	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	UL and cCSAus
* H161	Single	Auto	200	1	8.8	1/2	60	80	36	1	---	cCSAus
* I161 / I4161	Single / Double	Non	200	1	8.8	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* J161 / J4161	Single / Double	Non	200	3	6.4	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* F161 / F4161	Single / Double	Non	230	3	5.2	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* G161 / G4161	Single / Double	Non	460	3	2.9	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* BA161/BA4161	Single / Double	Non	575	3	2.4	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
BE161	Single	Auto	230	1	7.5	1/2	60	84	38	---	---	UL and cCSAus
M163	Single	Auto	115	1	15.0	1/2	60	80	36	1	---	UL and cCSAus [2]
N163 / N4163	Single / Double	Non	115	1	15.0	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	CSA [1]
BN163	Single	Auto	115	1	15.0	1/2	60	84	38	---	---	CSA
D163	Single	Auto	230	1	7.5	1/2	60	80	36	1	---	UL and cCSAus
E163 / E4163	Single / Double	Non	230	1	7.5	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	UL and cCSAus
* H163	Single	Auto	200	1	8.5	1/2	60	80	36	1	---	cCSAus
* I163 / I4163	Single / Double	Non	200	1	8.5	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* J163 / J4163	Single / Double	Non	200	3	6.0	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* F163 / F4163	Single / Double	Non	230	3	4.8	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* G163 / G4163	Single / Double	Non	460	3	2.8	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* BA163/BA4163	Single / Double	Non	575	3	2.4	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
BE163	Single	Auto	230	1	7.5	1/2	60	84	38	---	---	UL and cCSAus
D165	Single	Auto	230	1	10.2	1	60	80	36	1	---	UL and cCSAus
E165 / E4165	Single / Double	Non	230	1	10.2	1	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	UL and cCSAus
* H165	Single	Auto	200	1	12.6	1	60	80	36	1	---	cCSAus
* I165 / I4165	Single / Double	Non	200	1	12.6	1	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* J165 / J4165	Single / Double	Non	200	3	7.5	1	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* F165 / F4165	Single / Double	Non	230	3	7.4	1	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* G165 / G4165	Single / Double	Non	460	3	3.7	1	60	80 / 87	36 / 39	3 & 5	4 & 5	UL and cCSAus
* BA165/BA4165	Single / Double	Non	575	3	3.0	1	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
BE165	Single	Auto	230	1	10.2	1	60	84	38	---	---	UL and cCSAus

* no molded plug (1) UL listed unit available with 20 Amp plug. (2) 20 Amp duplex receptacle, P/N 10-0060 available.
Additional cords lengths are available in 25' (8 m), 35' (11 m), and 50' (15 m).

SELECTION GUIDE

1. Integral float operated mechanical switch, no external control required.
2. For automatic use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
3. See FM1228 for correct model of simplex control panel.
4. See FM0712 for correct model of duplex control panel.
5. Variable level control switch 19-0743 used as a control activator, specify simplex (3) float or duplex (4) float system. Refer to FM0526.

⚠ 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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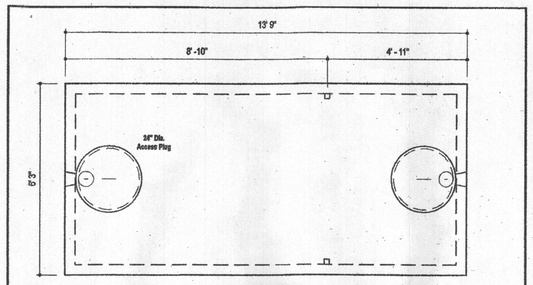
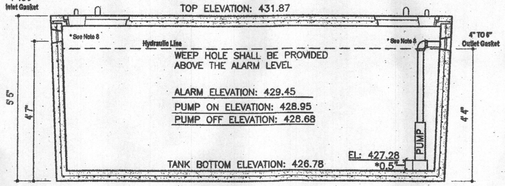


PLAN VIEW



SECTION A-A

*USE BLOCK OR SUPPORT TO RAISE PUMP INLET A MINIMUM OF 0.5" OFF BOTTOM OF TANK

DESIGN DATA & GENERAL NOTES

[1] Concrete strength f'c=4,000 p.s.i. @ 28 days. Density = 150 pcf
[2] Cement - Portland Type III per ASTM C 150-92.
[3] Admixtures & plasticizers per ASTM C 260-88 & C 494-92.
[4] Reinforcing per ASTM A615. Min. 1-1/2" cover.
[5] Top slab sealed with butyl rope mastic.
[6] 4" wall, 4" base, & 6" top thickness.
[7] Size 2" of cover
[8] Depending on use of tank, Inlet & Outlet baffle may be required by code.

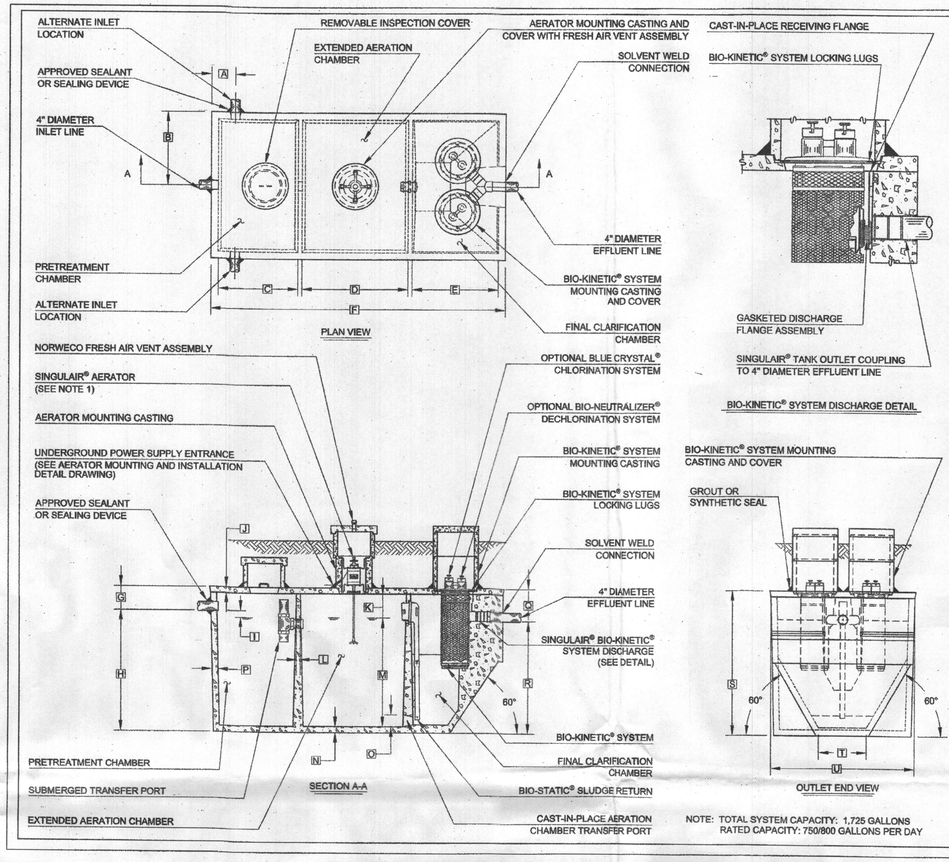
FLOAT TREE:	ELEV.	RELATIVE TO BOTTOM
BOTTOM OF TANK	426.78	
TOP OF PUMP	428.62	1'-10 1/16"
PUMP OFF	428.68	1'-10 3/16"
PUMP ON	428.95	2'-2 3/64"
HIGH ALARM	429.45	2'-8 3/64"

WEIGHT = 19,000 lbs.

MBI Mayer Bros., Inc.
6364 Race Road
Elkridge, Maryland 21075
Tel. 410.796.1434
Fax. 410.796.1438
www.mayerbrospreca st.com

2,000 GALLON SEPTIC TANK
1-Compartment
Stock Item [Approx. 19,000 lbs]

Dwg. No. 2000-1C	No Scale	Aug. 11, 2008



GENERAL NOTES:

① SINGULAIR® AERATOR, AS TESTED AND ACCEPTED BY NSF.

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.

PROJECT ENGINEER'S APPROVAL:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.
DATE:
NAME:

CONTRACTOR'S CERTIFICATION:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.
DATE:
NAME:

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	4'- 8"
F	12'-2"	S	6'- 0"
G	1'- 0"	T	2'- 0"
H	5'- 0"	U	6'- 0"
I	0'- 3"	V	
J	0'- 3"	W	
K	1'- 0"	X	
L	0'- 2"	Y	
M	4'- 6"	Z	

U.S. AND FOREIGN PATENTS PENDING
© MMXVI

norweco®
LOW PROFILE SINGULAIR® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM MODEL 960LP-750GPD

DRAWN BY	MT
CHECKED BY	JMM
DATE	4-25-2016
SCALE	NTS
DRAWING NUMBER	PC-6-7157

THIS DRAWING IS THE PROPERTY OF NORWECO INC. THE INFORMATION HEREIN IS TO BE KEPT CONFIDENTIAL AND NOT DISCLOSED TO OTHERS WITHOUT WRITTEN CONSENT OF NORWECO, INC.

BAT TREATMENT SYSTEM TANK AND PUMP TANK (LOT 3)

N.T.S.

NOTE: RATED CAPACITY: 750 GALLONS PER DAY PER MANUFACTURER.

SEE MANUFACTURES SPECIFICATIONS FOR DETAILS. WWW.NORWECO.COM

Approved Septic System Plan
Howard County Health Department
NORWECO TNT 960 LP
w/ Mayer Bros. 2000-gal Pump Tank
& Zoeller PN161 (0.5 hp) Pump
Signature 1/12/2018 Date
BAT-LPD system

THE DETAILS SHOWN HEREON ARE BASED ON TYPICAL MANUFACTURES MANUFACTURES PROVIDED BY NORWECO, ACTUAL MANUFACTURER MAY DIFFER. CONTRACTOR TO VERIFY THAT ALL DIMENSION ARE IN COMPLIANCE WITH THE HEALTH DEPARTMENT REQUIREMENTS.

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

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: 06-08-2018.

MARYLAND LICENSED PROFESSIONAL ENGINEER No. 45577

12/20/17

OWNER/DEVELOPERS:
ELLEN M. VAWTER,
MICHAEL A. VAWTER,
NANCY J. VAWTER,
LAURA J. LEONARD,
DREW B. LEONARD
14170 TRIADELPHIA MILL ROAD
DAYTON, MARYLAND 21036
301-706-6044

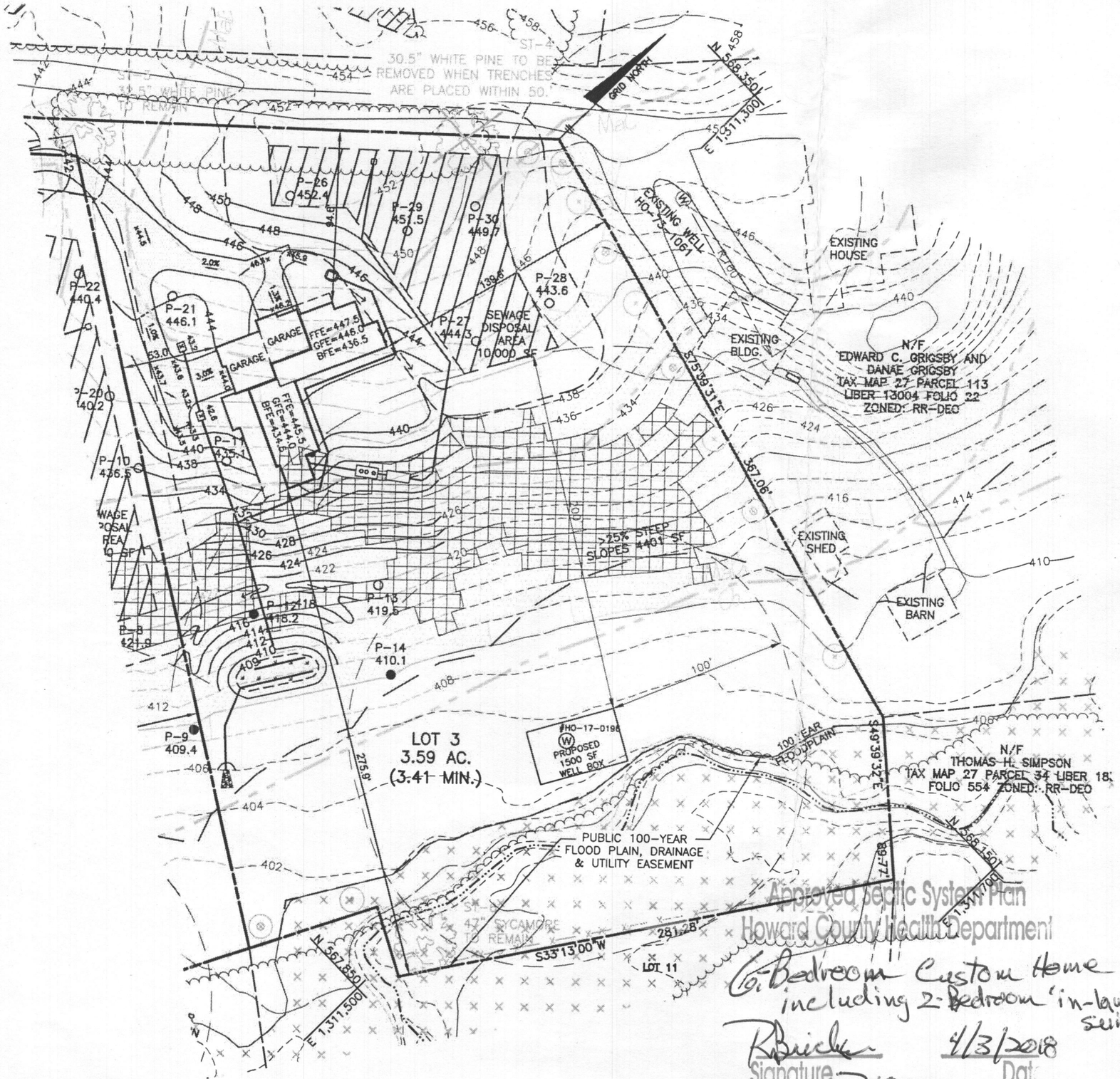
PROJECT:
VAWTER PROPERTY
LOT 3

LOCATION: 14176 TRIADELPHIA MILL ROAD
TAX MAP: 27 -- GRID: 24 -- PARCEL: 68
ZONED: RR-DEO RURAL RESIDENTIAL
ELECTION DISTRICT NO. 5 -- HOWARD COUNTY, MARYLAND

TITLE: SEPTIC SYSTEM DESIGN DETAILS

DESIGN: LDD	DRAFT: LDD	CHECK: AAM	DATE: DECEMBER, 2017	PROJECT NO. 2766
			SCALE: NONE	SHEET 2 OF 3

J:\2766 VAWTER PROPERTY\dwg\8026 OP.dwg, SEPTIC TANK AND PUMP details lot 3, 12/20/2017 7:53:08 AM, nfigner



LEGEND

EXISTING CONTOURS	480 / 478
EXISTING WOODS LINE	
EXISTING WELL	W
PROPOSED WELL	PROPOSED WELL BOX
EXISTING STRUCTURE	
25% OR GREATER SLOPES 10' OR GREATER VERTICAL ERODIBLE SOILS	
100-YR FLOODPLAIN	
BOUNDARY	
PROPOSED SEWAGE	
DISCONNECTION AREA	

14176 Triadelphia Mill Road

0 30 60 120 240

1 inch = 60 ft.

OWNER/BUILDER:
ELLEN M. VAWTER,
MICHAEL A. VAWTER,
NANCY J. VAWTER,
LAURA J. LEONARD,
DREW B. LEONARD
14170 TRIADELPHIA MILL ROAD
DAYTON, MARYLAND 21036
301-706-6044

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315
ELLICOTT CITY, MARYLAND 21043
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WWW.BEI-CIVILENGINEERING.COM

PROJECT: VAWTER PROPERTY

LOCATION: 14170 TRIADELPHIA MILL ROAD
TAX MAP: 27 – GRID: 24 – PARCEL: 68
ZONED: RR-DEO RURAL RESIDENTIAL
ELECTION DISTRICT NO. 5 – HOWARD COUNTY, MARYLAND

TITLE: BUILDING PERMIT PLAN
LOT 3

HOUSE TYPE:

DATE:	JANUARY, 2018	PROJECT NO.	2766
SCALE:	AS SHOWN	DRAWING 1 OF 1	

Approved Septic System Plan
Howard County Health Department

6-Bedroom Custom Home
including 2-Bedroom 'in-law suite'

R Bricker 4/3/2018
Signature Date

B18000818

GENERAL NOTES

1. THE LOT SHOWN HEREON COMPLIES WITH THE MINIMUM OWNERSHIP WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT.
2. THIS AREA DESIGNATES A PRIVATE SEWAGE DISPOSAL AREA OF AT LEAST 10,000 S.F. AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWERAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWER IS AVAILABLE. THIS EASEMENT SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWER SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWERAGE EASEMENT. RECORDATION OF A MODIFIED SEWERAGE EASEMENT PLAT SHALL NOT BE REQUIRED.
3. TOPOGRAPHY SHOWN WITHIN THE LIMIT OF DISTURBANCE IS BASED ON HOWARD COUNTY GIS, 2 FOOT CONTOURS, AND VERIFIED WITH FIELD RUN TOPOGRAPHY BY BENCHMARK ENGINEERING, INC., IN JULY, 2017.
4. TO THE BEST OF OUR KNOWLEDGE, ALL WELLS AND SEPTIC SYSTEMS LOCATED WITHIN 100' OF THE PROPERTY BOUNDARIES AND 200' DOWN GRADIENT OF ANY WELL AND/OR SEPTIC HAVE BEEN SHOWN.
5. ANY CHANGES TO A PRIVATE SEWAGE EASEMENT SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
6. STORMWATER MANAGEMENT FOR THIS LOT COMPLIES WITH THE "MARYLAND DEPARTMENT OF THE ENVIRONMENT STORMWATER MANAGEMENT ACT OF 2007" AND THE "HOWARD COUNTY DESIGN MANUAL VOLUME I, CHAPTER 5". STORMWATER MANAGEMENT IS PROVIDED BY NON-ROOFTOP DISCONNECTION (N-2), TWO (M-6) MICRO BIO-RETENTIONS AND TWO (M-5) DRY WELLS. THEY ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.
7. A DECLARATION OF INTENT FOR SINGLE FAMILY RESIDENTIAL LOT EXEMPTION (CLEARING LESS THAN 20,000 SQUARE FEET OF FOREST) SHALL BE FILED WITH DPZ.
8. PROPERTY ACREAGE: (LOT 3) 3.59 AC., ZONED RR-DEO.
9. PROPOSED LIMIT OF DISTURBANCE: 3.0 AC.
10. FOREST STAND DELINEATION HAS BEEN PERFORMED BY BENCHMARK ENGINEERING, INC. IN FEBRUARY, 2017, AND IS PROVIDED AS PART OF THE SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN SUBMISSION.
11. SPECIMEN TREES HAVE BEEN FIELD LOCATED BY BENCHMARK ENGINEERING, INC. AND ARE DEPICTED ON THIS PLAN.
12. THE EXISTING WELL SHOWN (TAG #HO-17-0196) SHOWN ON THIS PLAN HAS BEEN FIELD LOCATED BY BENCHMARK ENGINEERING, INC. DECEMBER, 2017 AND IS ACCURATELY SHOWN.
13. EXACT LENGTH OF SEPTIC TRENCHES IS TO BE DETERMINED BY THE HEALTH DEPARTMENT AT THE TIME OF TRENCH LAYOUT AND INSPECTION.
14. ANY CHANGES TO THE LOCATION 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.
15. THE MAXIMUM EARTH COVER OVER THE SEPTIC TANK IS 3 FEET. GREATER EARTH COVER WILL REQUIRE A HEAVY LOAD BEARING 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. THE BLOWER MAY NOT BE LOCATED FURTHER FROM THE TANK THAN THE MANUFACTURER'S SPECIFICATIONS.
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.

INITIAL SYSTEM

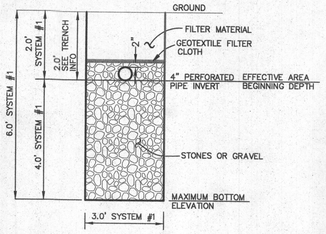
Number of Bedrooms	6	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	2	ft
Bottom Max Depth	6	ft
Design Flow	900	gpd
Drainage Field square footage	750	sf
Sidewall reduction credit	0.417	
Trench width	3	
Effective Area Depth	4	
Linear Length of trench Required	**104**	**lf**

1st REPLACEMENT SYSTEM

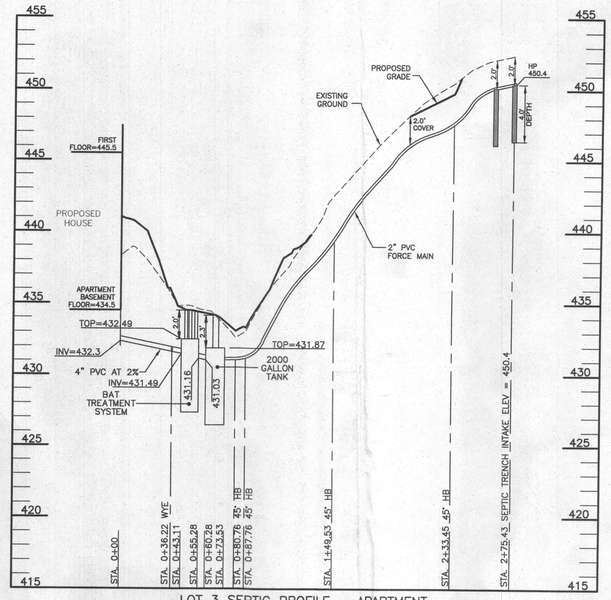
Number of Bedrooms	6	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	2	ft
Bottom Max Depth	6	ft
Design Flow	900	gpd
Drainage Field square footage	750	sf
Sidewall reduction credit	0.417	
Trench width	3	
Effective Area Depth	4	
Linear Length of trench Required	**104**	**lf**

2nd REPLACEMENT SYSTEM

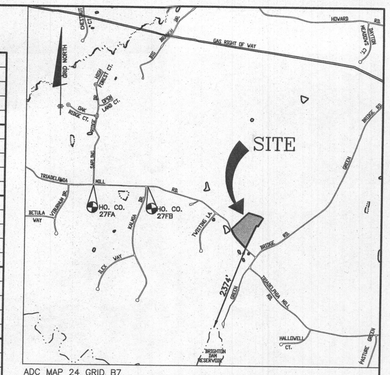
Number of Bedrooms	6	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	2	ft
Bottom Max Depth	6	ft
Design Flow	900	gpd
Drainage Field square footage	750	sf
Sidewall reduction credit	0.417	
Trench width	3	
Effective Area Depth	4	
Linear Length of trench Required	**104**	**lf**



TYPICAL TRENCH DETAIL
NOT TO SCALE



LOT 3 SEPTIC PROFILE - APARTMENT
SCALE: 1"=50' HORIZ., 1"=5' VERT.



VICINITY MAP
SCALE : 1"=2000'

BENCHMARKS (NAD83)

HO. CO. No. 27FA ELEV. 496.35
18.2' SOUTH OF THE CENTERLINE OF TRIADELPHIA MILL RD AT THE INTERSECTION OF SAPLING RIDGE DR.
N 569002.176 E 1306892.586

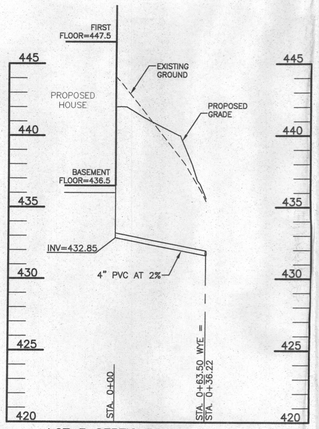
HO. CO. No. 27FB ELEV. 512.22
3.2' SOUTH OF THE EDGE OF PAVING OF TRIADELPHIA MILL RD 61' EAST OF THE CENTERLINE OF KALMIA DR.
N 568975.151 E 1308421.369

TRENCH INFORMATION

TRENCH 1-1		TRENCH 2-1		TRENCH 3-1	
TRENCH LENGTH	52 LF	TRENCH LENGTH	52 LF	TRENCH LENGTH	52 LF
GROUND ELEVATION	552.4	GROUND ELEVATION	551.5	GROUND ELEVATION	550.1
INVERT ELEVATION	550.4	INVERT ELEVATION	549.5	INVERT ELEVATION	548.1
MAX. BOTTOM ELEV.	546.4	MAX. BOTTOM ELEV.	545.5	MAX. BOTTOM ELEV.	544.1
TRENCH 1-2		**TRENCH 2-2**		**TRENCH 3-2**	
TRENCH LENGTH	52 LF	TRENCH LENGTH	52 LF	TRENCH LENGTH	52 LF
GROUND ELEVATION	552.1	GROUND ELEVATION	551.0	GROUND ELEVATION	548.8
INVERT ELEVATION	550.1	INVERT ELEVATION	549.0	INVERT ELEVATION	546.8
MAX. BOTTOM ELEV.	546.1	MAX. BOTTOM ELEV.	545.0	MAX. BOTTOM ELEV.	542.8

LAYOUT PLAN
SCALE: 1" = 30'

(IN FEET)
1 inch = 30 ft.



LOT 3 SEPTIC PROFILE - HOUSE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

LEGEND

- SOILS CLASSIFICATION — GnB
- SOILS DELINEATION
- EXISTING CONTOURS — 480 / 478
- EXISTING WOODS LINE
- EXISTING WELL
- PROPOSED WELL — PROPOSED WELL BOX
- PASSING PERCOLATION TEST
- FAILING PERCOLATION TEST
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- PROPOSED SEWAGE DISPOSAL AREA
- BETWEEN 20% AND 24.99% SLOPES
- EX. 100 YEAR FLOODPLAIN

THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF ANY WORK.

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.

REDLINE OK
12/17/2018

SOILS LEGEND

SYMBOL	TYPE	K* FACTOR	NAME
Co*	C	.37**	CODORUS AND HATBORO SILT LOAM, 0 TO 3 PERCENT SLOPES
GgC	B	.28	GLENELG LOAM, 3 TO 8 PERCENT SLOPES
MoC	B	.32	MANOR LOAM, 8 TO 15 PERCENT SLOPES
MoD	B	.32**	MANOR LOAM, 15 TO 25 PERCENT SLOPES

* INDICATES HYDRIC SOILS
** HIGHLY ERODIBLE, K>0.35, AND/OR 15% OR GREATER SLOPES
TAKEN FROM THE NRCS WEB SOIL SURVEY, APRIL 2016. PAGE 15

NO.	DATE	REVISION
1	11/29/18	REVISED TO DOCUMENT ADDITIONAL HOUSE CONNECTION AS-BUILT

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

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: 06-08-2018.

STATE OF MARYLAND — JOHN M. CARROLL — No. 45577 — PROFESSIONAL ENGINEER

11/29/18

OWNER/DEVELOPERS:

ELLEN M. VAWTER,
MICHAEL A. VAWTER,
NANCY J. VAWTER,
LAURA J. LEONARD,
DREW B. LEONARD
14170 TRIADELPHIA MILL ROAD
DAYTON, MARYLAND 21036
301-706-6044

PROJECT:

VAWTER PROPERTY

LOT 3

LOCATION: 14176 TRIADELPHIA MILL ROAD
TAX MAP: 27 - GRID: 24 - PARCEL: 68
ZONED: RR-DEO RURAL RESIDENTIAL
ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

TITLE: SEPTIC SYSTEM DESIGN PLAN

DESIGN: LDD	DRAFT: LDD	CHECK: AAM	DATE: DECEMBER, 2017	PROJECT NO. 2766
			SCALE: AS SHOWN	SHEET 1 OF 3

\2766 VAWTER PROPERTY\dwg\8026 GP redline 1.dwg, SEPTIC lot 3, 11/29/2018 11:21:42 AM