



Howard County
Health Department

Bureau of Environmental Health
8930 Stanford Boulevard, Columbia, MD 21045
Main: 410-313-2640 | Fax: 410-313-2648
TDD 410-313-2323 | Toll Free 1-866-313-6300
www.hchealth.org
Facebook: www.facebook.com/hocohealth

Maura J. Rossman, M.D., Health Officer

RECEIPT DATE: 2/23/16

ONSITE SEWAGE DISPOSAL SYSTEM

P 558318

APPROVAL DATE: 5/5/16 *(SC)*

PERMIT: CONSTRUCTION

A

PROPERTY ADDRESS: 12330 Point Ridge Drive

SUBDIVISION: Regan Property

LOT: 2

TAX ID: 05-597435

CONTRACTOR: J. Maurice Carlisle

EMAIL: _____

CONTRACTOR ADDRESS: 19700 Barnesville Road, Dickerson, MD 20842

PHONE: 301-428-8599

CONTRACTOR CERTIFIED FOR BAT INSTALLATION: MDE MANUFACTURER:

PROPERTY OWNER: MB Highland Reserve

EMAIL: _____

OWNER ADDRESS: 1686 E. Gude Drive, Rockville, MD 20850

PHONE: _____

BAT UNIT MODEL: Norweco TNTLP-600 PUMP SIZE: 600GPD PUMP TANK CAPACITY: 2000GAL

OPERATION & MAINTENANCE AGREEMENT DATE SIGNED: 2/29/16

DATE RECORDED: 2/29/16

DISTRIBUTION SYSTEM: GRAVITY

PRESSURE DOSED

BEDROOMS: 5

APPLICATION RATE: 1.2

TRENCHES:	LINEAR FEET REQUIRED: <u>104</u>	INLET DEPTH: <u>3</u>
	TRENCH WIDTH: <u>3</u>	MAXIMUM BOTTOM DEPTH: <u>8</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>10</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>5</u>
LOCATION:	PER APPROVED SITE PLAN. SEWAGE DISPOSAL AREA AND BAT UNIT LOCATION MUST BE STAKED BY LICENSED SURVEYOR PRIOR TO PRE-CONSTRUCTION INSPECTION.	
NOTES:	<u>2x52' Trenches</u>	

ISSUED BY: Dana Bernard

ISSUE DATE: 3-4-16

EXPIRATION DATE: 3-4-17

- NOTE: CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION INSPECTION PRIOR TO BEGINNING ANY INSTALLATION
- NOTE: CONTRACTOR MUST SCHEDULE AN INSPECTION AND GAIN APPROVAL OF ALL COMPONENTS PRIOR TO COVERING
- NOTE: STONE MUST BE APPROVED BY HEALTH DEPARTMENT AND GRAVEL TICKET MUST BE AVAILABLE FOR REVIEW.
- NOTE: WATERTIGHT SEPTIC TANKS REQUIRED
- NOTE: ALL PARTS OF SEPTIC SYSTEM SHALL BE AT LEAST 100 FEET DOWNGRADIENT FROM ANY WATER WELL
- NOTE: MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS
- NOTE: AN ELECTRICAL PERMIT IS REQUIRED FOR INSTALLATION OF ANY ELECTRICAL COMPONENTS OF THE SYSTEM
 ELECTRICAL PERMIT ISSUED E 16000700
- NOTE: AN INDIVIDUAL CERTIFIED BY MDE AND THE MANUFACTURER FOR BAT INSTALLATION MUST BE PRESENT AT ALL TIMES DURING BAT INSTALLATION.
- NOTE: MDE RECOMMENDS SEPTIC TANKS, BAT, AND OTHER PRETREATMENT UNITS BE PUMPED AT A FREQUENCY ADEQUATE TO ENSURE THAT SOLIDS ARE NOT DISCHARGED TO THE DISPOSAL AREA

NEITHER THE HOWARD COUNTY COUNCIL NOR THE HEALTH DEPARTMENT IS RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF ANY SYSTEM.

PERMITTEE RESPONSIBLE FOR OBTAINING FINAL APPROVAL ON THIS PERMIT.

CALL 410-313-1771 TO SCHEDULE INSPECTIONS.

NOT TO SCALE

See As-Built Drawing
On Separate Sheet

ROAD NAME

TRENCH/DRAINFIELD DATA

WIDTH	INLET	BOTTOM
3'	3'	8'
NUMBER OF TRENCHES		2
TOTAL LENGTH		105'
ABSORPTION AREA		315' + SIDEWALL
DISTRIBUTION BOX LEVEL		Yes
DISTRIBUTION BOX BAFFLE		Yes
DISTRIBUTION BOX PORT		Yes

SEPTIC TANK DATA

SEPTIC TANK 1 LEVEL	YES
MANUFACTURER	BACKRIVER/NORWECO
CAPACITY	1300 GAL
SEAM LOC	TOP
TANK LID DEPTH	0.5-1.5'
BAFFLES	NO
BAFFLE FILTER	NO
MANHOLE LOC	FRONT, MID REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	2-4-16

PUMP/SEPTIC TANK LEVEL

SEPTIC TANK 2 LEVEL	YES
MANUFACTURER	BACKRIVER
CAPACITY	2000 GAL
SEAM LOC	TOP
TANK LID DEPTH	1-2.5'
BAFFLES	Front
BAFFLE FILTER	NONE
MANHOLE LOC	FRONT + REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	12-18-15

PRE-CONSTRUCTION:

3/23/2016 Trenches laid out, O.K. to set pump tank in bottom corner of easement so that swale can be cut between tanks. (BB) 3/30/16 JM Carlisle called. Septic area staked by surveyor - didn't match unlabeled stakes thought to be SDA at layout. Proposed trenches are in middle of SDA. Shot contour and moved trenches to top of SDA. (SC)

INSTALLATION: 4/6/16 T1 complete + left open. 2.5' to stone, 3' wide and wider in some areas due to shallow rocks. T1 obs. pipe is 5' from trench end. (SC) 4/7/2016 No one on site, No work done. (BB) 4/18/16 Tanks installed. Carlisle adding stone + pipe to T2. Using laser transit to check inlet depth. 3' wide, 2.5' to stone. Hit some bigger rocks ~ inlet depth while digging. (SC) 4/21/2016 House connection made. Tank plumbing installed, Working on pump line. (BB) 4/22/2016 System finished except for pump and alarm test. Need BAT certification from Back River Precast. (BB) 4/25/2016 Received BAT certification. (BB)

FINAL INSPECTOR Sarah Collins DATE OF APPROVAL 5/5/16

5/5/16 On site for pump + alarm. Pump pumps effluent to D-box, alarm sounds. Norweco alarm + generator both functional. (SC)

HO-95-2694

40'

40.5'

12330
Point Ridge
Drive

127'

C1

B

25'

17.5'

21.5'

8.5'

10.0'

28.5'

57'

10.5'

9.5'

39'

~48'

~71'

~78'

118'

13.5'

12'

13.5'

13'

150' to B

162' to A

153' to B

201' to C

T2-S3'

T1-S2'

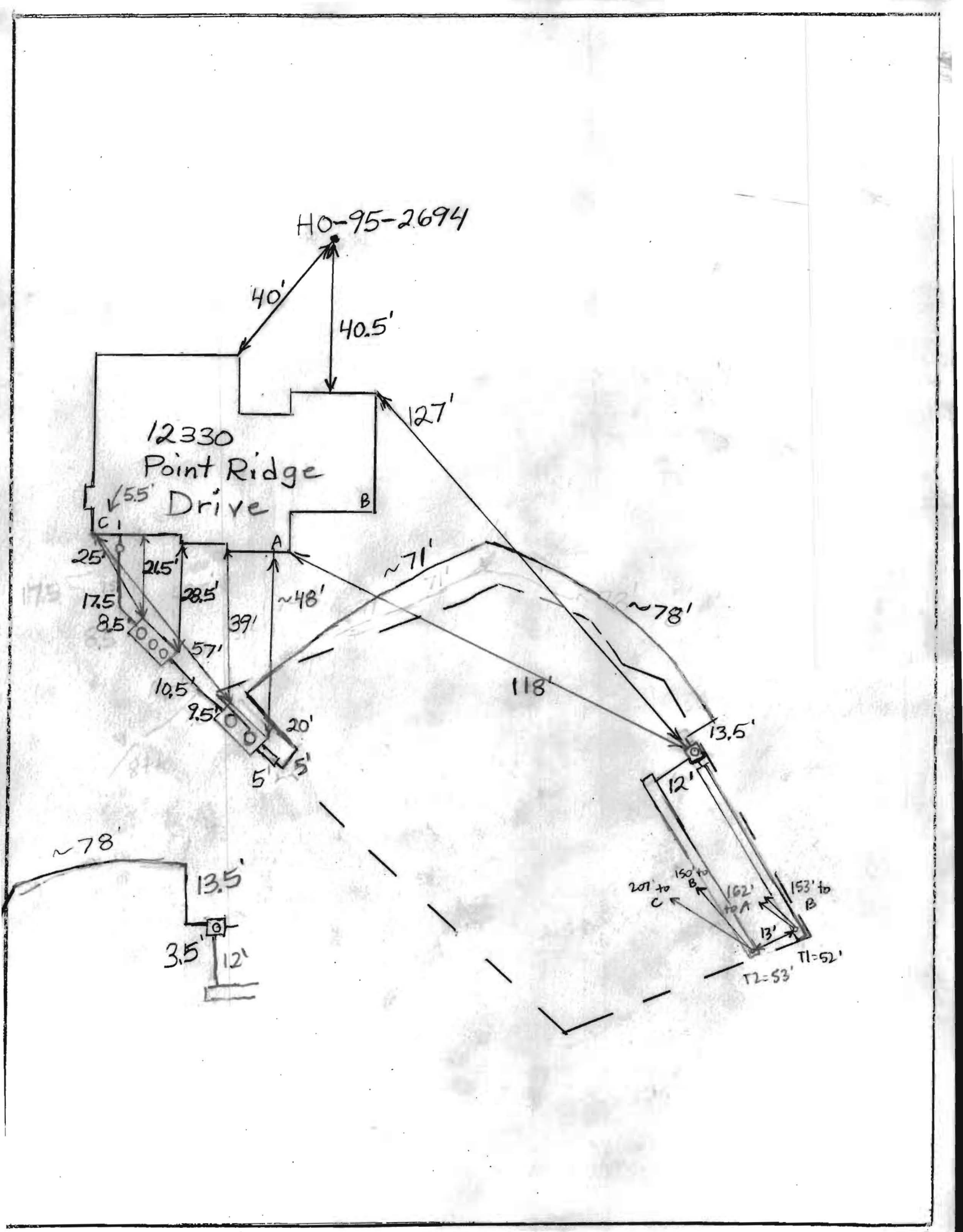
~78'

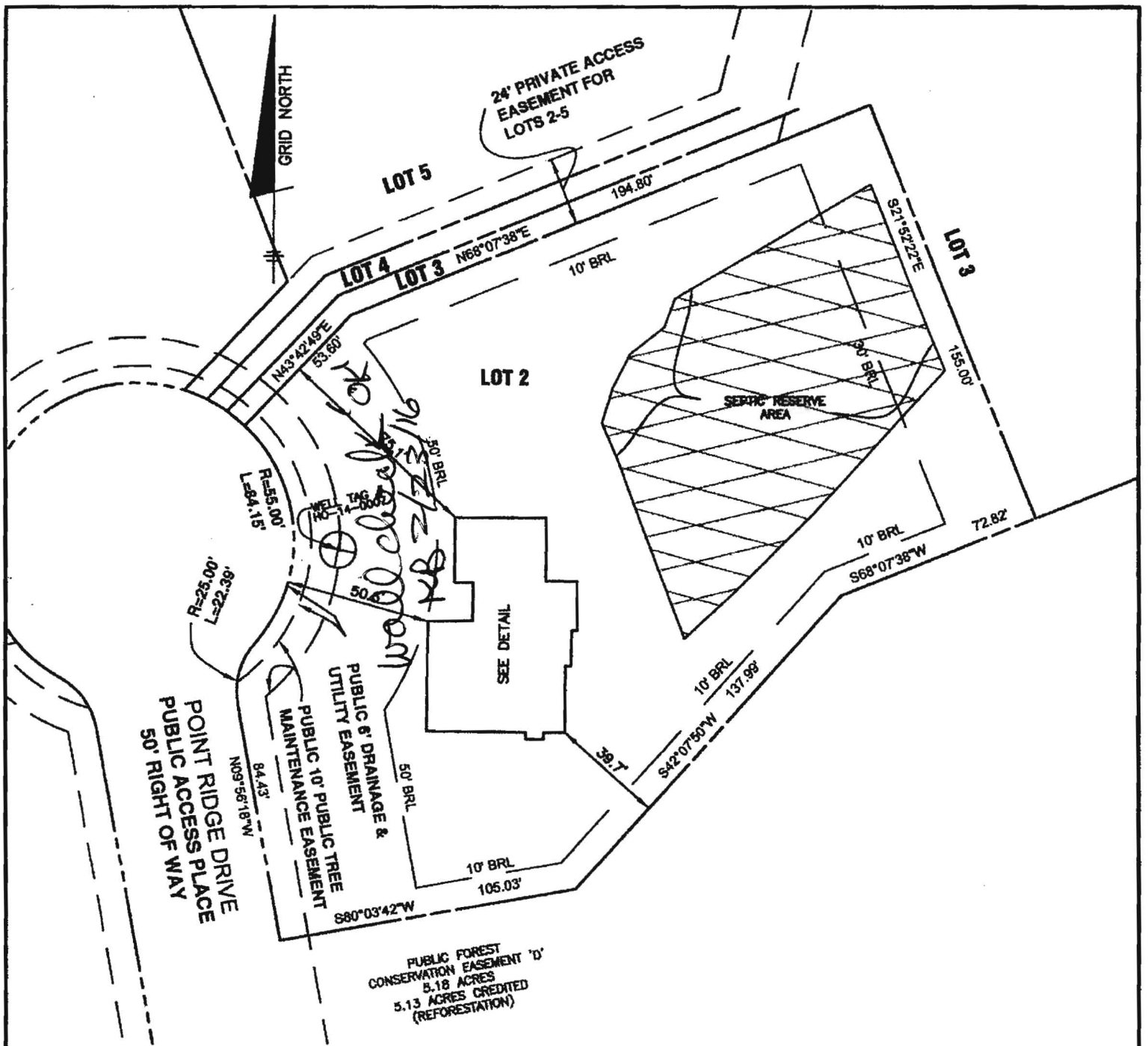
3.5'

12'

12330

Point Ridge Drive





POINT RIDGE DRIVE
PUBLIC ACCESS PLACE
50' RIGHT OF WAY

PUBLIC FOREST
CONSERVATION EASEMENT 'D'
5.18 ACRES
5.13 ACRES CREDITED
(REFORESTATION)

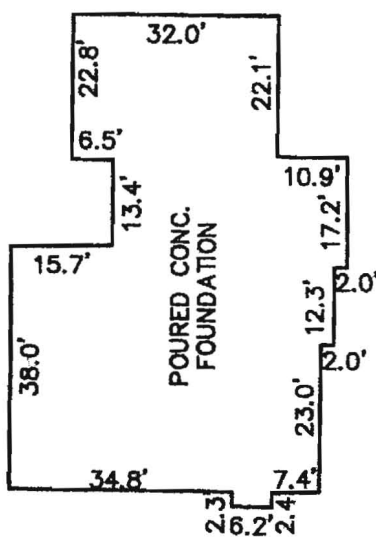
TOP OF FOUNDATION WALL = 409.9
OFFSET DIMENSIONS TO PROPERTY LINES ARE ± 0.1'

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS, WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21320, EXPIRATION DATE 1-7-2017 AND TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION AND BELIEF THAT THE DIMENSIONS OF THE BUILDING WALLS SHOWN HEREON ARE CORRECT; THAT THEY ARE BASED ON A FIELD RUN SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. ON 12/29/15.

Donald A. Mason
DONALD A. MASON
PROFESSIONAL LAND SURVEYOR
MD REG. No. 21320
FOR BENCHMARK ENGINEERING, INC.
MD REG. No. 351
FEMA FIRM No. 24027C0130D
ZONE: X
DATED: NOV. 6, 2013

BENCHMARK
ENGINEERING, INC.
8460 BALTIMORE NATIONAL PIKE ▲ SUITE 315
ELLCOTT CITY, MARYLAND 21043
phone: 410-485-8105 ▲ fax: 410-485-6644
www.bei-civilengineering.com



FOUNDATION DETAIL
SCALE: 1" = 30'

WALL CHECK
REGAN PROPERTY
PLAT No. 23070
LOT No. 2
12330 POINT RIDGE DRIVE

5TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
FIELD OBS. BY AS
COMP. BY DAM
DRAWN BY DAM
SCALE: 1" = 50' DATE: 12-30-15



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Twitter: HowardCoHealthDep

Lot 2

Maura J. Rossman, M.D., Health Officer

OPERATION AND MAINTENANCE AGREEMENT FOR AN ON-SITE SEWAGE DISPOSAL SYSTEM HAVING AN ADVANCED PRE-TREATMENT SYSTEM

THIS AGREEMENT is made this 25th day of February, 2016, among MB Highland Reserve LLC, hereinafter collectively referred to as "Owner", and the Howard County Health Department hereinafter referred to as the "County".

WHEREAS, Owner is the owner or contract owner of a parcel of land located at 12330 Point Ridge Drive, in the 5th Election District of Howard County, Maryland, and the deed and subdivision plat of the property is recorded among the Land Records of Howard County, Maryland, Tax Map # 34, Block # -, Parcel # 200, Deed Reference # Liber 15918 Folio 00156 and Tax Account # 05-597446 ("the Property").

WHEREAS, The Property is suitable for the installation of a conventional on-site sewage disposal system with an advanced pre-treatment system, utilizing best available technology to perform nitrogen reduction, in accordance with the Code of Maryland Regulations 26.04.02.07, effective January 1, 2013. The pre-treatment device being installed is Norweco Model #TNTLP-600GPD

NOW, THEREFORE, the parties hereto agree as follows:

A. Owner hereby grants to the County the right to enter upon the Property at any reasonable time with prior notice for access to the system to make periodic inspections and the Owner agrees to provide any information and data in Owner's possession reasonably requested and needed by the County.

B. Owner acknowledges and agrees that neither the County nor any of its agents or employees, either officially or individually, underwrites the operation of any system approved by them.

C. The Owner will devote reasonable care and effort to the operation and maintenance of the system in perpetuity or until a public sewer connection is made so that a system malfunction is not the result of poor maintenance, faulty operation, or neglect.

D. The Owner agrees to enter into a contract reasonably acceptable to the Owner and the County with a private entity to operate and maintain on a regularly scheduled basis an approved advanced pre-treatment system. The owner shall supply a copy of the contract to the County when it is renewed or altered.

E. This agreement shall run with the land and upon Owner's taking title to the Property shall bind the Owner, their heirs, successors, and assigns to the provisions of the agreement as long as the property is in existence and after installation of the system. Owner further agrees that they shall inform in writing any subsequent purchaser or lessee of the Property that the system shall require maintenance or other attention. Upon taking title to the Property, the Owner agrees to cause this agreement to be recorded in the Land Records of Howard County and assure that it becomes part of the Deed for the subject property in order that prospective buyers may be aware of the special conditions affecting this property.

F. This agreement shall not be construed to limit any authority of the County to protect the public health, safety or comfort or to issue any other orders to take any other action which is now or may hereafter be within its authority.

G. This agreement may be voided at any time at the discretion of the County.

H. This agreement contains the entire agreement and understanding between the County and the Owner. There are no additional terms other than as contained in this agreement. This agreement may not be modified, except in writing signed by each of the parties or by their authorized representatives.

I. The laws of the State of Maryland govern the provisions of all transactions pursuant to this agreement.

J. Owner acknowledges and agrees that interior renovations to increase the number of bedrooms or an increase in living space shall not be permitted without approval from the County.

IN WITNESS WHEREOF, the parties have signed and sealed this agreement on the date indicated above.


Howard County Health Department

Owner #1 Signature Date

Martin J. Mitchell

Owner #1 Print Name

Buyer #1 Signature Date

Buyer #1 Print Name

Owner#2 Signature Date

Owner #2 Print Name

Buyer #2 Signature Date

Buyer #2 Print Name

Back River Pre-Cast, LLC

PO BOX 329
Glyndon, MD 21071
Phone # 410-833-3394
Fax # 410-833-4116

Letter of Certification

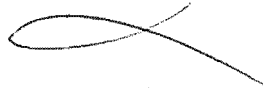
This is to certify that the Norweco Singlair TNT 600 GPD Septic Tank installed at 12330 Point Ridge Dr., Highland, MD 20777 on April 18, 2016 was installed according to the manufacture's specifications.

Installer: Ralph Beall

Property Owner: MB Highland Reserve LLC

Permit #

THIS CERTIFICATION IS FOR INSTALLATION ONLY. THE 5-YEAR OPERATIONS & MAINTENANCE AGREEMENT FROM DATE OF INSTALLATION WILL ONLY GO INTO EFFECT AFTER BACK RIVER PRE-CAST, LLC RECEIVES FINAL AND FULL PAYMENT FOR THE SYSTEM.

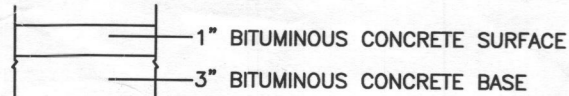


MATTHEW GECKLE

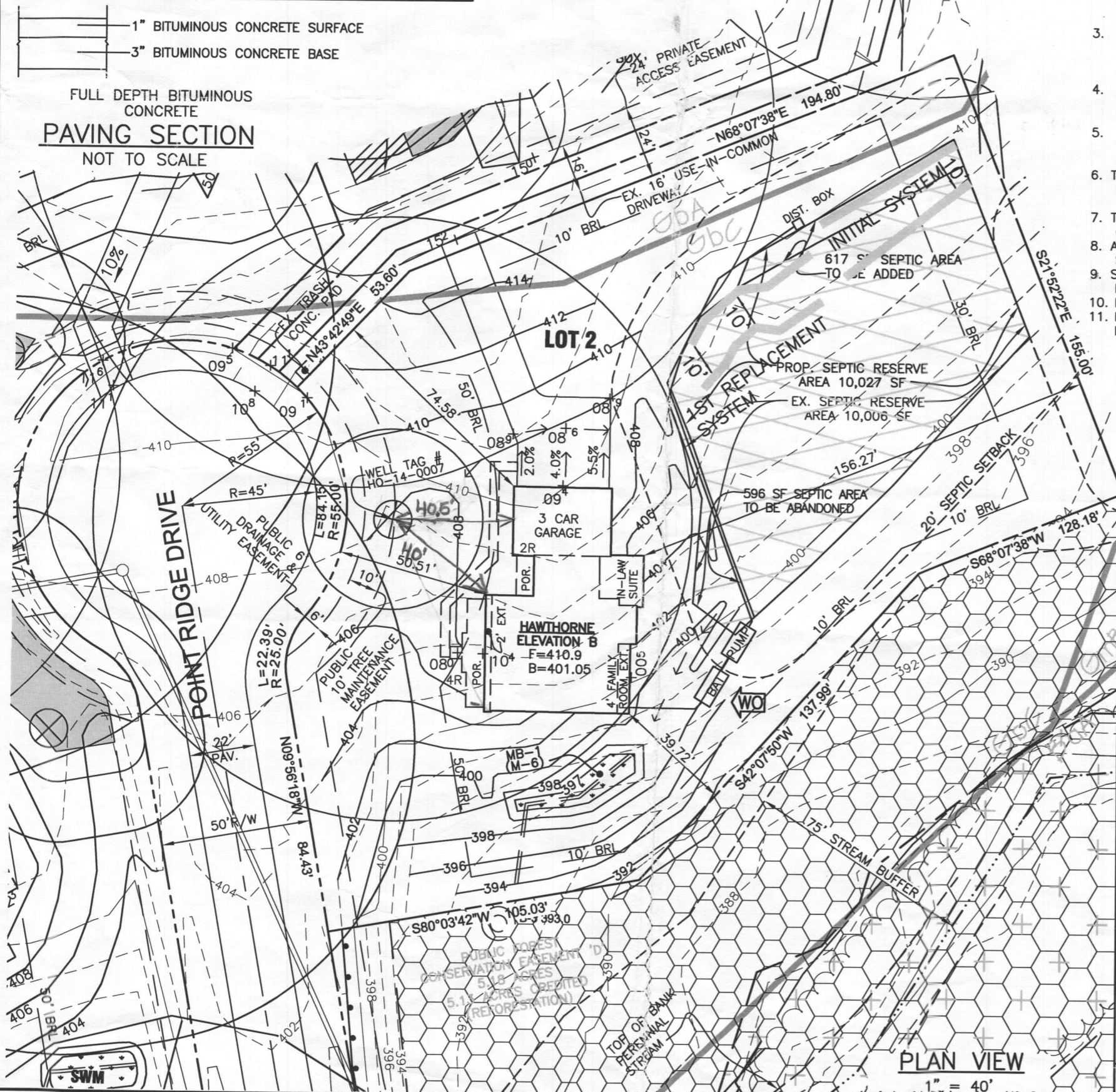
Vice-President

SOILS LEGEND		
MAP SYMBOL	SOIL GROUP	SOIL TYPE
GbB	B	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES
GbC	B	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES
MdD	B	MANOR LOAM, 15 TO 25 PERCENT SLOPES

FROM NRCS WEB SOIL SURVEY 2.0, PAGE 16, CLARKSVILLE NW



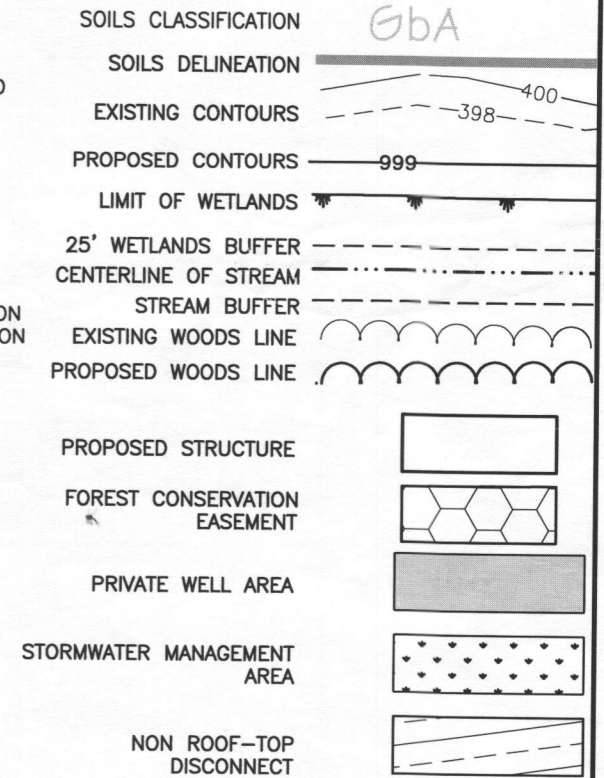
FULL DEPTH BITUMINOUS CONCRETE
PAVING SECTION
NOT TO SCALE



BUILDING PERMIT PLAN NOTES

1. THE LOT SHOWN HEREON WAS RECORDED ON THE PLAT FOR REGAN PROPERTY, PLAT Nos. 23053-23074. REFER TO THE PLATS 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 JANUARY, 2012.
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. THE EXISTING WELL SHOWN ON THIS PLAN, HO-95-2694, HAS BEEN FIELD LOCATED BY BENCHMARK ENGINEERING, INC., AND IS ACCURATELY SHOWN.
7. THERE ARE NO EXISTING WELLS OR SEPTIC SYSTEMS WITHIN 100' OF THIS PROJECT'S BOUNDARY EXCEPT AS NOTED.
8. ANY CHANGES TO A PRIVATE SEWAGE EASEMENT OR WELL BOX SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
9. STORMWATER MANAGEMENT FOR THIS LOT WAS DESIGNED TO BE PROVIDED BY MICRO-BIORETENTION FACILITY (MDE M-6).
10. NO DRIVEWAY CULVERT IS REQUIRED FOR THIS LOT
11. MICRO-BIORETENTION FACILITIES SHOULD HAVE EITHER 4" OR 6" ROOF LEADERS DEPENDING ON THE SIZE OF THE ROOFTOP AREA.

LEGEND

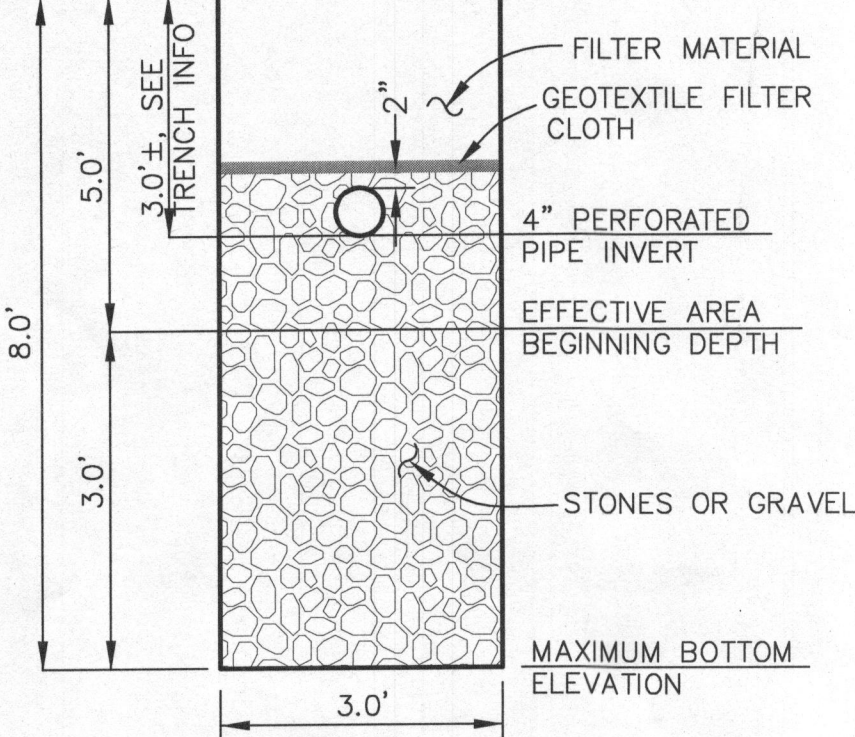


BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 ▲ FAX: 410-465-6644
BEI@BEI-CIVILENGINEERING.COM

OWNER/BUILDER:	PROJECT:	
MB HIGHLAND RESERVE, LLC 1686 EAST GUDE DRIVE ROCKVILLE, MD 20850 301-762-9511	REGAN PROPERTY LOT 2	
LOCATION:	12330 POINT RIDGE DRIVE HIGHLAND, MD 20777 TAX MAP No. 34 - BLOCK No. 24 - PARCEL No. 200 5TH ELECTION DISTRICT, HOWARD COUNTY, MARYLAND	
TITLE:	BAT SITE PLAN	
HOUSE TYPE:	HAWTHORNE	
DATE:	SEPTEMBER, 2015	PROJECT NO. 2171
DESIGN: JMC	DRAFT: JMC	SCALE: 1" = 40'
		DRAWING 1 OF 3

TRENCH INFORMATION

TRENCH 1-1	52 LF	TRENCH 2-1	52 LF	INV. OUT OF HOUSE	396.7
TRENCH LENGTH	409.8	TRENCH LENGTH	409.1	INV. IN TANK	395.5
GROUND ELEVATION	406.8	INVERT ELEVATION	406.1	INV. OUT SEPTIC TANK	395.1
MAX. BOTTOM ELEV.	401.8	MAX. BOTTOM ELEV.	401.1	TOP OF SEPTIC TANK	396.5
TRENCH 1-2	52 LF	TRENCH 2-2	52 LF	GROUND OVER SEPTIC TANK	398.0
TRENCH LENGTH	407.9	TRENCH LENGTH	407.6	INV. IN PUMP TANK	395.0
GROUND ELEVATION	404.9	INVERT ELEVATION	404.6	TOP OF PUMP TANK	395.8
MAX. BOTTOM ELEV.	399.9	MAX. BOTTOM ELEV.	399.6	GROUND OVER PUMP TANK	398.6
				INV. INTO BOX	407.3
				INV. OUT OF BOX	407.2
				GROUND AT BOX	410.2

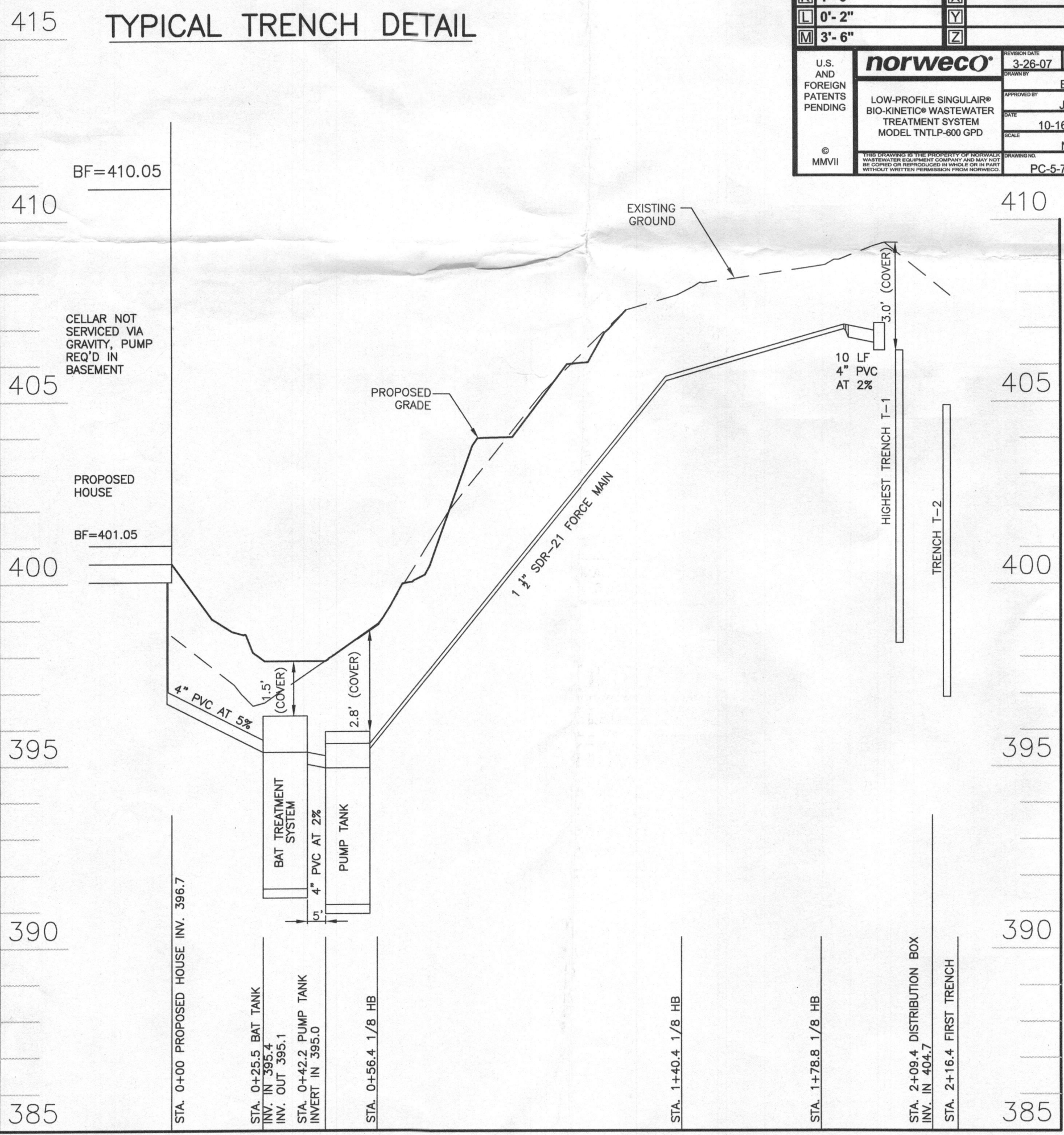


- GENERAL NOTES:**
- SINGLAIR® AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 60 MINUTES ON / 60 MINUTES OFF.
 - FALL THROUGH SINGLAIR® PLANT FROM INLET INVERT TO OUTLET INVERT IS FOUR INCHES. INLET INVERT IS TWELVE INCHES BELOW TANK TOP.
 - ON DEEPER INSTALLATIONS, PRECAST RISERS MUST BE USED TO EXTEND AERATOR MOUNTING CASTING AND BIO-KINETIC® SYSTEM MOUNTING CASTING TO GRADE.
 - TANK REINFORCED PER ACI STD. 318-05.
 - REMOVABLE COVERS ON RISERS WEIGH IN EXCESS OF SEVENTY-FIVE POUNDS EACH TO PREVENT UNAUTHORIZED ACCESS.
 - CONTACT THE LOCAL, LICENSED SINGLAIR® DISTRIBUTOR FOR ELECTRICAL REQUIREMENTS.

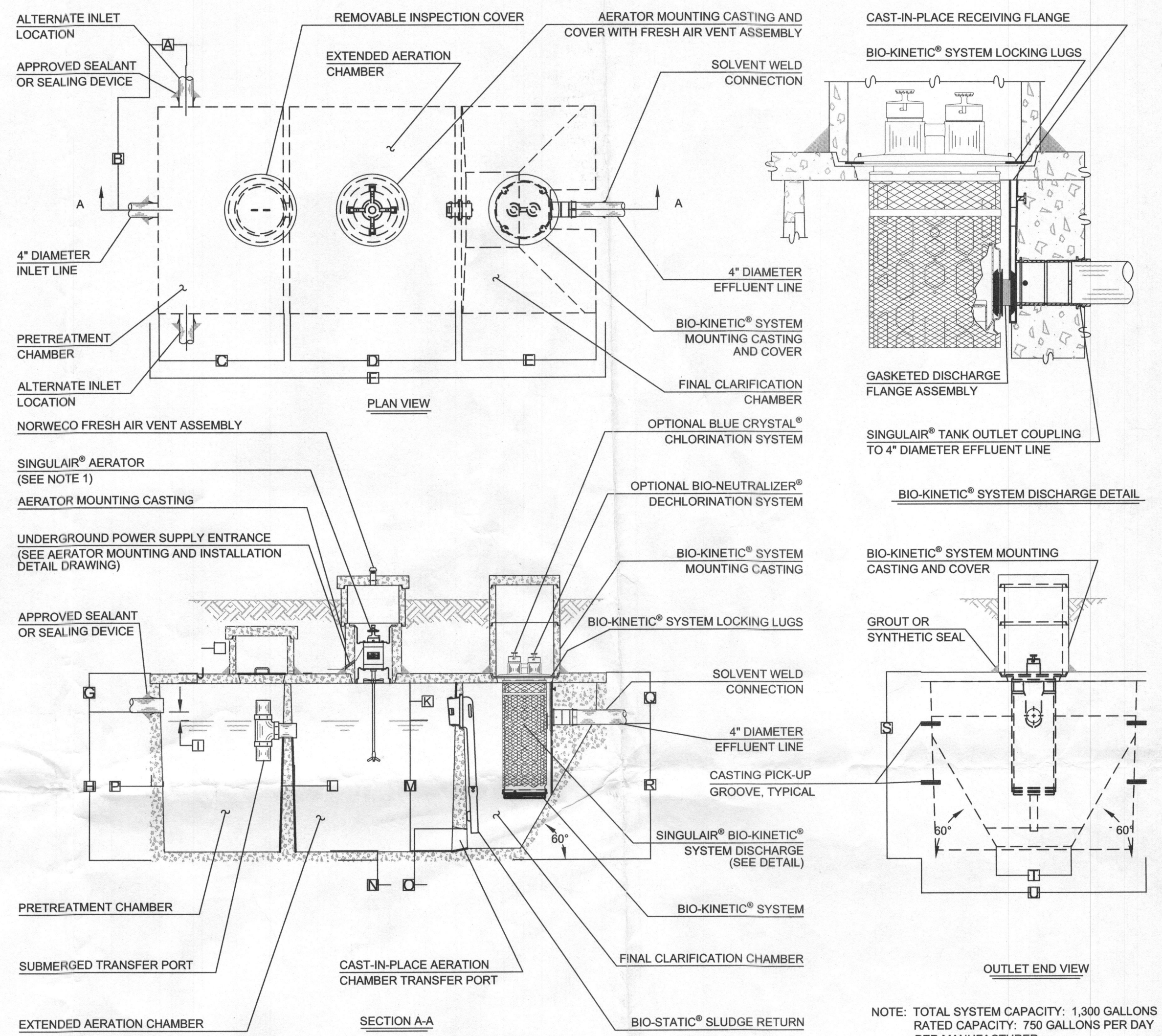
CRITICAL DIMENSIONS

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	4'-0"	U	6'-0"
I	0'-3"	V	
J	0'-3"	W	
K	1'-0"	X	
L	0'-2"	Y	
M	3'-6"	Z	

norweco
 U.S. AND FOREIGN PATENTS PENDING
 LOW-PROFILE SINGLAIR® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM MODEL TNL-600 GPD
 DATE: 10-16-06
 SCALE: NTS
 PC-5-7091



SEWER PROFILE - LOT 2
 SCALE: VERTICAL 1"=3', HORIZONTAL 1"=30'



- Required BAT Site Plan Notes**
- 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.
 - The maximum depth of the BAT shall be per the manufacturer's specification, 3.0'.
 - The blower may not be located further from the tank than the manufacturer's specifications, 75'.
 - The BAT system shall be maintained and operated for the life of the system.
 - The BAT shall be operated by and maintained by a certified service provider.
 - 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.
 - Electrical work for the BAT installation must be performed by a licensed electrician.
 - An agreement and Easement must be completed and signed by all applicable parties, and recorded in Land Records of Howard County.
 - The Health Department requires documentation for the start-up certification from the manufacturer prior to final approval of the installation.

Approved Septic System Plan
 Howard County Health Department
Dana Beard 11-16-16
 Signature Date
 B 15004396

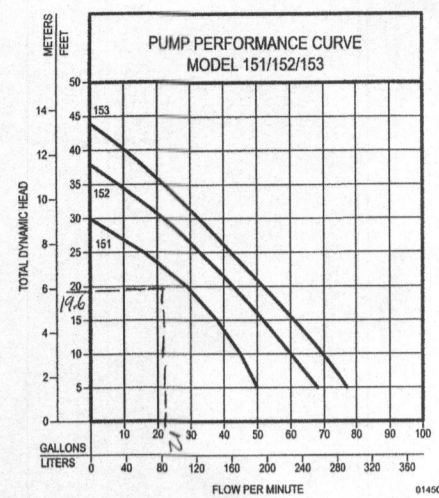
BENCHMARK ENGINEERING, INC.
 ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
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 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 ▲ FAX: 410-465-6644
 BEI@BEI-CIVILENGINEERING.COM

SIGNATURE AND SEAL ARE FOR PROFILE ONLY:
 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. 453791, Expiration Date: 06-08-2016.

OWNER/BUILDER: MB HIGHLAND RESERVE, LLC 1686 EAST GUDE DRIVE ROCKVILLE, MD 20850 301-762-9511	PROJECT: REGAN PROPERTY LOT 2
LOCATION: 12330 POINT RIDGE DRIVE HIGHLAND, MD 20777 TAX MAP No. 34 - BLOCK No. 24 - PARCEL No. 200 5TH ELECTION DISTRICT, HOWARD COUNTY, MARYLAND TAX ID NUMBER:	TITLE: BAT NOTES AND DETAILS
HOUSE TYPE: HAWTHORNE	DATE: OCTOBER, 2015
DESIGN: JMC	DRAFT: JMC
SCALE: AS NOTED	PROJECT NO. 2171 DRAWING 2 OF 3

**TOTAL DYNAMIC HEAD
FLOW PER MINUTE**

MODEL	151	152	153				
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	50	189	89	261	77	231
10	3.0	45	170	81	231	70	265
15	4.5	38	144	53	201	61	231
20	6.1	29	110	44	167	52	187
25	7.6	18	81	34	129	42	159
30	8.1	-	-	23	87	33	125
35	10.7	-	-	-	-	22	85
40	12.2	-	-	-	-	11	42
Shut-off Head:	30 ft. (9.1m)	38 ft. (11.6m)	44 ft. (13.4m)				



Model	Seal	Mode	Volts	Ph	Amps	HP	Hz	Lbs	Kg	Simplex	Duplex
N151	Single	Non	115	1	6.0	1/2	60	32	15	1	2 or 3
E151	Single	Non	230	1	3.2	1/2	60	32	15	1	2 or 3
BN151	Single	Auto	115	1	6.0	1/2	60	33	15	*	2 or 3
BE151	Single	Auto	230	1	3.2	1/2	60	33	15	*	2 or 3
N152	Single	Non	115	1	8.5	4/10	60	37	17	1	2 or 3
E152	Single	Non	230	1	4.3	4/10	60	37	17	1	2 or 3
BN152	Single	Auto	115	1	8.5	4/10	60	39	18	*	2 or 3
BE152	Single	Auto	230	1	4.3	4/10	60	39	18	*	2 or 3
N153	Single	Non	115	1	10.5	1/2	60	37	17	1	2 or 3
BN153	Single	Auto	115	1	10.5	1/2	60	39	18	*	2 or 3
E153	Single	Non	230	1	5.3	1/2	60	37	17	1	2 or 3
BE153	Single	Non	230	1	5.3	1/2	60	39	18	*	2 or 3

*N151 and BE151 models include a 20' (6 m) piggyback variable level pump switch. Additional cord lengths are available in 25' (8 m) and 30' (11 m). 50' (15 m) cords are available for 230 V units only.

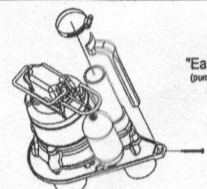
NOTE: Model 151 has a plastic base. Models 152 & 153 have a cast iron base.

SELECTION GUIDE

- For automatic, use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0472.
- 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



"Easy assembly"
pump & stand per
instructions

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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Your Peace of Mind is Our Top Priority™



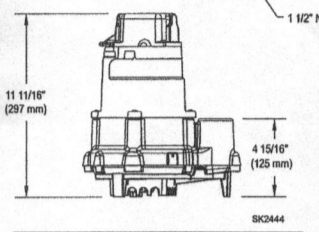
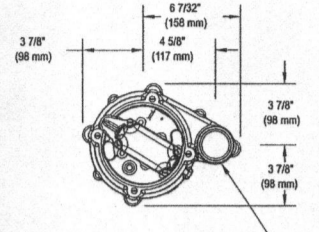
PUMP COMPANY
Zoeller Family of Water Solutions

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

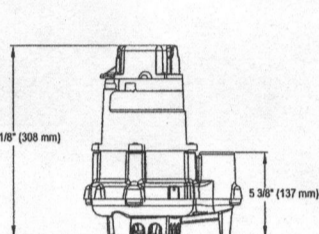
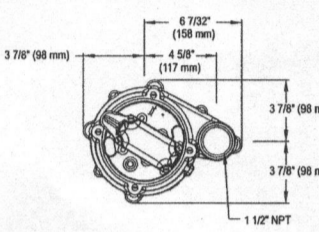
PRODUCT SPECIFICATIONS

MOTOR	MODEL 151
Horse Power	1/2 (151), 4/10 (152), 1/2 (153)
Voltage	115 or 230
Phase	1 Ph
Hz	60 Hz
NEMA	3450
Type	Permanent split capacitor
Insulation	Class B
Amps	3.2 - 10.5
Operation	Automatic or nonautomatic
Discharge Size	1-1/2" NPT
Solids Handling	1/2" (13 mm), 3/4" (19 mm) spherical solids
Cord Length	20' (6 m)
Cord Type	UL listed power cord
Max. Head	44' (13.4 m)
Max. Flow Rate	77 GPM (291 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	Plastic or cast iron
Upper Bearing	Sleeve bearing
Lower Bearing	Ball bearing
Mechanical Seals	Carbon and ceramic
Impeller Type	Non-clogging vortex
Impeller	Engineered thermoplastic
Hardware	Stainless steel
Motor Shaft	AISI 1215 steel
Gasket	Neoprene

MODEL 151



MODELS 152 & 153



NOTE: The sizing 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.



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Design Calculations

Design Input:

Capacity requirements	number of lots	1
	bedrooms per lot	5
	use rate per bedroom	150 gpd

Calculations:

Max. Daily Flow	750 gpd
Average Daily Flow	375 gpd
Maximum Daily Flow	0.52 gpm
Average Daily Flow	0.26 gpm

Tanks and Capacities

first chamber	1,000 gallons	req. capacity (1125*(0.75*MDF))	1687.5 gal.
pump chamber	2,000 gallons	design capacity	2000 gal.
		min. pump chamber capacity (ADF+Dose)	505 gal.

Static Hydraulic Profile

Ground Elev. at tank	398.60 ft	Tank #1 effluent elev	394.72 ft
Tank invert in	394.97 ft		
Tank top	396.80 ft	okay	
Fall in tank	0.25 ft		
inv. tank to top	4.67 ft		
Tank invert in	391.13 ft		
Pump Block Height	0.50 ft		
Height of intake	0.45 ft		
Grinder invert	392.08 ft		

Dosing volume, flow rates and Pressures

flow rate	21.00 gpm	Static Head	0.55 ft
Friction (C) for PVC	150	Friction Head	4.19 ft
Miscellaneous Losses	0 ft	Distal Head	0 ft
Estimated Run Time	6.20 Min.	Max. Total Dynamic Head	4.74 ft
		min. Dose (1xMain) Vol.	130.00 gal.
		Min. Runtime	6.19 min.
		Total Dose Volume	130.00 gal.
		Average Doses	2.88 per day
Pump tank Volume	1687.50 Gal		

INITIAL SYSTEM

Number of Bedrooms	5
Application Rate	1.2 gpd/sf
Effective Area Beginning Depth	5 ft
Bottom Max Depth	8 ft
Design Flow	750 gpd
Drainage Field square footage	625 sf
Sidewall reduction credit	0.50
Trench width	3
Effective Area Depth	3
Linear Length of trench Required	104 lf

1st REPLACEMENT SYSTEM

Number of Bedrooms	5
Application Rate	1.2 gpd/sf
Effective Area Beginning Depth	5 ft
Bottom Max Depth	8 ft
Design Flow	750 gpd
Drainage Field square footage	625 sf
Sidewall reduction credit	0.50
Trench width	3
Effective Area Depth	3
Linear Length of trench Required	104 lf

Pumping Station

Diameter of Force Main and Manifold =	1.5 of SDR 21 pipe	9.2 Table 4.2
Length of Force Main =	194 feet	SDR 21 gallons/100 feet
Volume of Main =	17.8 gallons	ID = 1.5
Total Volume =	17.8 gallons	length = 100 gallon/sq ft 7.4'
		volume = 9.179978 gal/100 ft
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	18 gallons	
Use minimum dose of	130 gallons	okay
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
	Width: 6.25 feet	Width: 5.58 feet
	Height: 5.42 feet	Height: 4.75 feet
	Area: 73.05 sf	Area: 63.05 sf
	Volume: 347.22 cf	Volume: 312.22 cf
Walls:		
Bottom:		
Top:		
Bottom to Inlet:		

Sizing the Pump

Flow:	runtime = 6.2 minutes
rate =	20.96774 gallons/minute

Design Head:	Design Head = Static Head + Friction Head
	Static Head = highest elevation of main - pump off elevation
	Highest component of system = 407.5 Main HP BEGIN 4" PVC
	Pump off elevation = 392.08
	Static Head = 15.42 feet
	Friction Head = Head loss due to pipe friction
	1.5" pipe = 145 feet
	45' bends = 3 loss for bend
	90° Tee = 0 loss for tee
	9 feet per table 4.3
	0 feet per table 4.3
	Friction loss per table 4.4 = 2.72 (ft/100 ft)
	Equivalent Length = 154
	Fri loss = 4.19 feet
	Total Friction Head = 4.19
	Design Head = 19.61 feet

Pump Requirements:

Performance =	20.96774 gpm
Head of Water =	19.61 feet of head

Pump Selection: Zoeller Pump Company Effluent Series, Model 151
1/3 horse power

Pump Flow Rate = 21.00 gallons/minute per rating curve

Design Pump Chamber

Ground over Tank =	398.60
Top of Tank =	395.80
Invert of Tank =	390.71
6" Riser =	0.50 feet
12" Pump =	1.10 feet

Min. Pump off =	392.31
Selected Pump off =	392.65

Dose =	17.4 cf
Area of Pit =	73.05 sf

Pump on dist. =	0.24
Pump on Elev. =	392.89

Distance between Pump on and Highwater Alarm =	0.5 feet
Highwater Alarm Elevation =	393.39

Dist. for a dose above alarm =	1.37
Inlet Elev. =	394.76
Tank Inlet =	394.96 okay
Dist. Alarm to Inlet =	1.57

SEE MANUFACTURES SPECIFICATIONS FOR DETAILS. WWW.NORWECO.COM

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ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 ▲ FAX: 410-465-6644
BEI@BEI-CIVILENGINEERING.COM

SIGNATURE AND SEAL ARE FOR PROFILE ONLY:

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: 06-08-2016.

OWNER/BUILDER:

MB HIGHLAND RESERVE, LLC
1686 EAST GUDE DRIVE
ROCKVILLE, MD 20850
301-762-9511

PROJECT:

**REGAN PROPERTY
LOT 2**

LOCATION: 12330 POINT RIDGE DRIVE
HIGHLAND, MD 20777
TAX MAP No. 34 - BLOCK No. 24 - PARCEL No. 200
5TH ELECTION DISTRICT, HOWARD COUNTY, MARYLAND
TAX ID NUMBER:

TITLE: BAT NOTES AND DETAILS

HOUSE TYPE: HAWTHORNE

DATE: OCTOBER, 2015	PROJECT NO. 2171
SCALE: AS NOTED	DRAWING 3 OF 3

DESIGN: JMC

DRAFT: JMC

SCALE: AS NOTED

PLAN VIEW

SECTION A-A

DESIGN DATA & GENERAL NOTES

- Concrete strength f_c = 4,000 p.s.i. @ 28 days. Density = 150 pcf.
- Cement - Portland Type VII per ASTM C 150-92.
- Admixtures & plasticizers per ASTM C 390-95 & C 494-92.
- Reinforcing per ASTM A105. Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, 4" base, 8" top thickness.

6264 Race Road
Elkridge, Maryland 21075
Tel. 410.796.1434
Fax. 410.796.1438
www.mayerbrosprecast.com

**2,000 GALLON SEPTIC TANK
1-Compartment**

Stock Item [Approx. 19,000 lbs]

Dwg. No. 2000-1C No Scale Jan 1, 2000