**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](http://www.hchealth.org)Facebook: [www.facebook.com/hocohealth](https://www.facebook.com/hocohealth)

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

RECEIPT DATE: 3-14-16**ONSITE SEWAGE DISPOSAL SYSTEM**P 558028APPROVAL DATE: 4/20/16 (SEC)**PERMIT:****CONSTRUCTION**

A

PROPERTY ADDRESS: 18335 Chelsea Knolls DriveSUBDIVISION: Chelsea KnollsLOT: 5TAX ID: 04-594319CONTRACTOR: Hatfield's EquipmentEMAIL: ken@hatfieldsequipment.comCONTRACTOR ADDRESS: P.O. Box 519 Annapolis Junction, MD 20701PHONE: 301-490-4289

CONTRACTOR CERTIFIED FOR BAT INSTALLATION:



MDE



MANUFACTURER:

PROPERTY OWNER: Ryan HomesEMAIL: dsnyder@nvrinc.comOWNER ADDRESS: 9720 Patuxent Woods DrivePHONE: 410-796-0980BAT UNIT MODEL: Norweco TNTLP 500PUMP SIZE: 0.5HPPUMP TANK CAPACITY: 1500 GAL

OPERATION &amp; MAINTENANCE AGREEMENT

DATE SIGNED:

5/1/14

DATE RECORDED:

5/1/14

DISTRIBUTION SYSTEM:



GRAVITY



PRESSURE DOSED

BEDROOMS: 4

APPLICATION RATE:

0.8

TRENCHES:

LINEAR FEET REQUIRED: 250INLET DEPTH: 4TRENCH WIDTH: 3MAXIMUM BOTTOM DEPTH: 6

MINIMUM SPACE

BETWEEN TRENCHES: 10EFFECTIVE AREA BEGINNING DEPTH: 5.5

LOCATION:

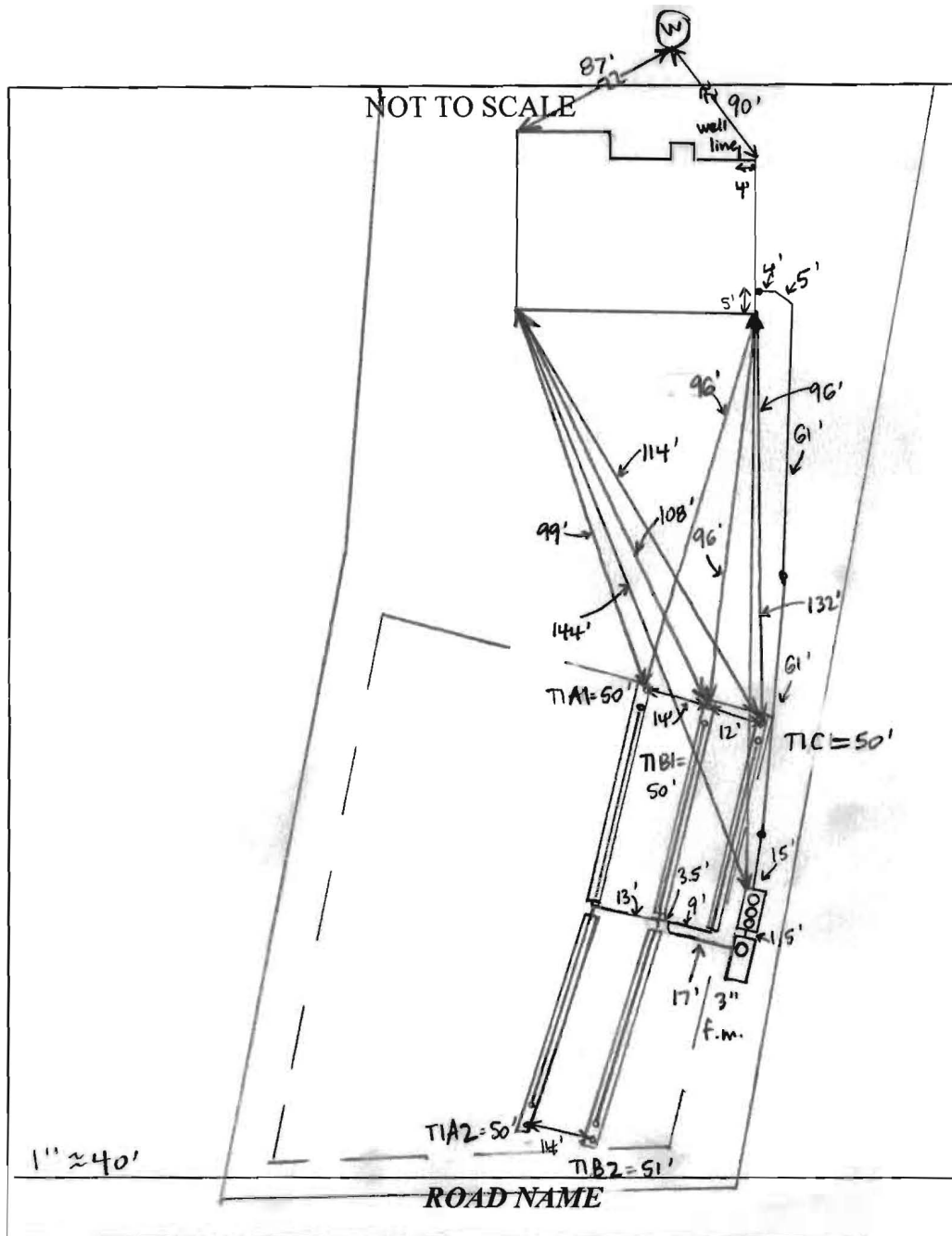
PER APPROVED SITE PLAN. SEWAGE DISPOSAL AREA AND BAT UNIT LOCATION MUST BE STAKED BY LICENSED SURVEYOR PRIOR TO PRE-CONSTRUCTION INSPECTION.

NOTES:

ISSUED BY: Robert BrickerISSUE DATE: 3-14-16EXPIRATION DATE: 3-14-17**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 16001039**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.**



TRENCH/DRAINFIELD DATA		
WIDTH	INLET	BOTTOM
3'	4'	6'
NUMBER OF TRENCHES		5'
TOTAL LENGTH		251'
ABSORPTION AREA		753' + SIDEWALL
DISTRIBUTION BOX LEVEL		_____
DISTRIBUTION BOX BAFFLE		_____
DISTRIBUTION BOX PORT		_____

SEPTIC TANK DATA	
SEPTIC TANK I LEVEL	YES
MANUFACTURER	BACKRIVER/ NORWEGIAN
CAPACITY	1300 GAL
SEAM LOC	TOP
TANK LID DEPTH	3'
BAFFLES	NO
BAFFLE FILTER	NO
MANHOLE LOC	FRONT, MID, REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	1-24-16
PUMP/SEPTIC TANK LEVEL YES	
MANUFACTURER	BACKRIVER
CAPACITY	1500 GAL
SEAM LOC	TOP
TANK LID DEPTH	3'
BAFFLES	NO
BAFFLE FILTER	NO
MANHOLE LOC	FRONT
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	_____
Pump: 1/2 hp MESO-11	

#### PRE-CONSTRUCTION:

3/21/16 On site with Hatfield's for layout. Tank and SDA corner stakes present. NW corner of SDA is a few feet inside 100' well arc. Trench IC staked as 100' long. Adjusted IC to be 50' long and outside well arc slightly adjusted IB and IA so that center manifold corresponds with start of IC. Okay to move tanks closer to house, keeping 5' from edge of IC, outside well arc and on property (line marked). (SC)

#### INSTALLATION:

3/22/16 Tanks installed. House connection made. Hatfield's setting pump. (SC)  
 3/23/16 Hatfield's digging TIA1, all other trenches complete. 6' bottoms, 3' wide. Higher density of rock hit last 5' of TIA1, 5-6' deep. Possible rocky pockets at ends of IB1 + IC1 judging from spoil piles. Using laser to dig + add stone #57 stone used in trenches. Need pump + alarm and BAT startup certification (SC) 3/28/16 BAT startup received. (SC) 4/20/16 Met Hatfield's on site for pump + alarm. Alarm sounds, lateral head heights: IA1 = 28", IA2 = 32", IB1 = 46", IB2 = 46", IC = 57". Norweco aerator + alarm functional. (SC)

FINAL INSPECTOR Sarah Collins

DATE OF APPROVAL 4/20/16

## 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 18335 Chelsea Knolls Dr., MT. Airy, MD 21771 March 22, 2016 was installed according to the manufacture's specifications.

Installer: Jeff Reiter

Property Owner: NVR

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.**



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MATTHEW GECKLE  
Vice-President

13038-3201

Clerk of the Circuit Court for  
Howard County  
Land Records/Licensing  
14 BAT AGREEMENTS  
The Thomas Dorsey Building  
9250 Bendix Road  
Columbia, MD 21045  
410-313-5850

~~FOR CHECK~~  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 82

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 83

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 84

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 85

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 86

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 87

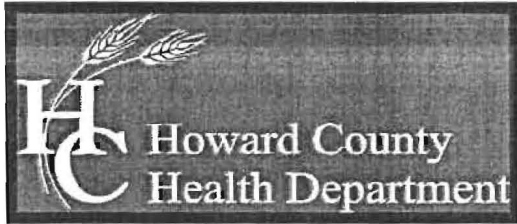
LR - Agreement Surcharge  
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LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 88

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 89

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC  
Reference/Control #: 90

LR - Agreement Surcharge  
1x 40.00 40.00  
LR - Agreement Recording Fee  
1x 20.00 20.00  
Grantor/Grantee Name: Chelsea Knolls LC





Bureau of Environmental Health

7178 Columbia Gateway Drive, Columbia, MD 21046-2147

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Facebook: www.facebook.com/hocohealth

Twitter: HowardCoHealthDep

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

Lot 5

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

THIS AGREEMENT is made this 15<sup>th</sup> day of May 2014, among Chelsea Knolls, LC, 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 18335 Chelsea Knolls Drive, Mt Airy, Maryland 21771, in the 4<sup>th</sup> Election District of Howard County, Maryland, and the deed to same is recorded or shall be recorded among the Land Records of Howard County, Maryland in Liber 8717 Folio 579.

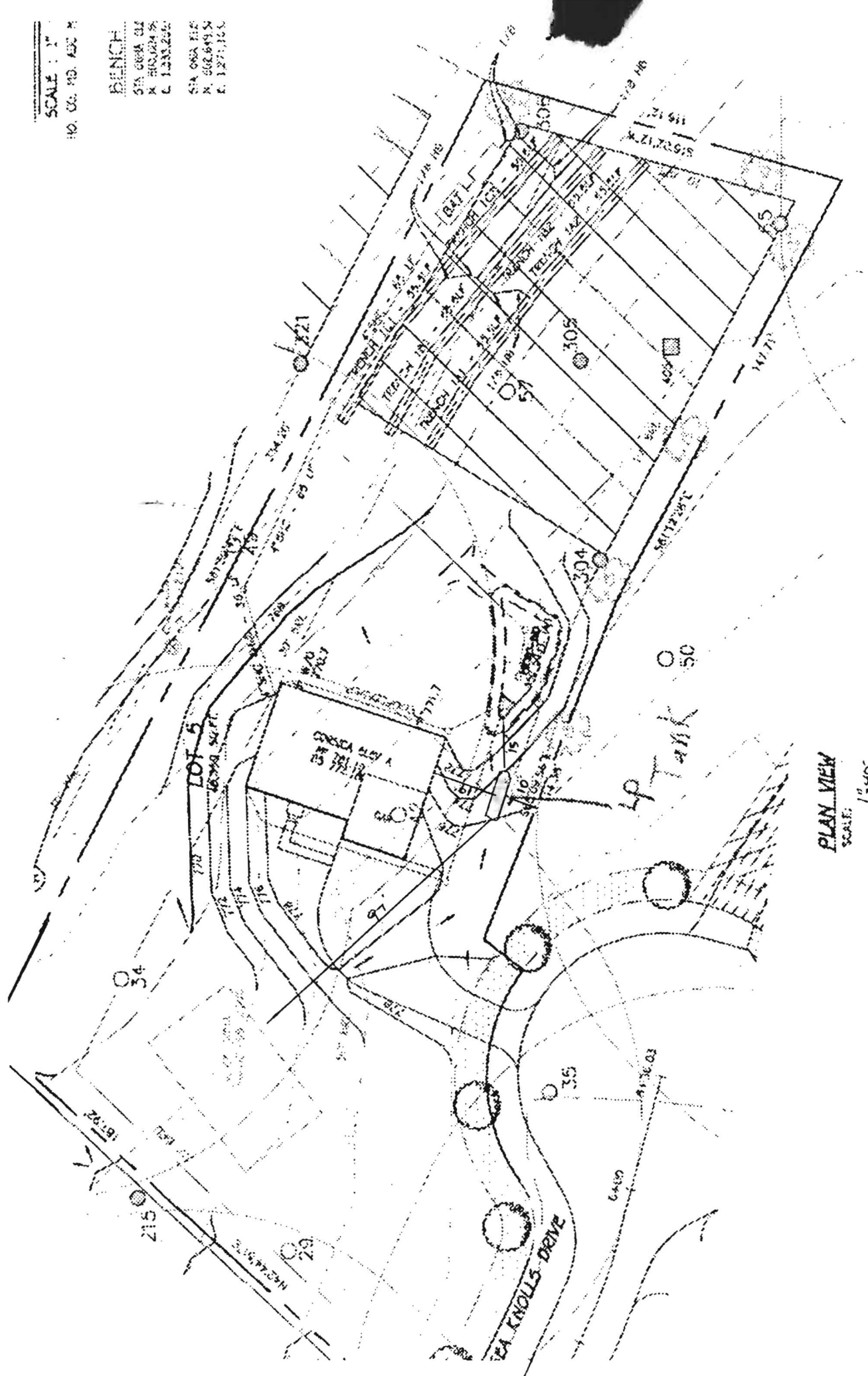
WHEREAS, The Lot is suitable for the installation of a conventional on-site sewage disposal system with an advanced pre-treatment system, utilizing best available technology to perform nitrogen reduction, in accordance with the Code of Maryland Regulations 26.04.02.07, effective January 1, 2013.

NOW, THEREFORE, the parties hereto agree as follows:

- A. Owner hereby grants to the County the right to enter upon the Lot at any reasonable time 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 to develop accurate and thorough test results.
- 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 Lot shall bind the Owner, their heirs, successors, and assigns to the provisions of the agreement as

SCALE : 1" = 100.00' H.D. A.D.C. N.

BENCH  
 574.000 011  
 N. 510.024 95  
 E. 1.233 256  
 574.000 011  
 N. 510.024 95  
 E. 1.233 256



PLAN VIEW  
 SCALE: 1"=40'

GENERAL NOTES

1. SURVEY PROPERTY LINES: NO-100
2. TOTAL AREA OF PROPERTY: 40.000 SQ. FT.
3. SURVEY DOCUMENT SUBJECT TO 100-100

18335

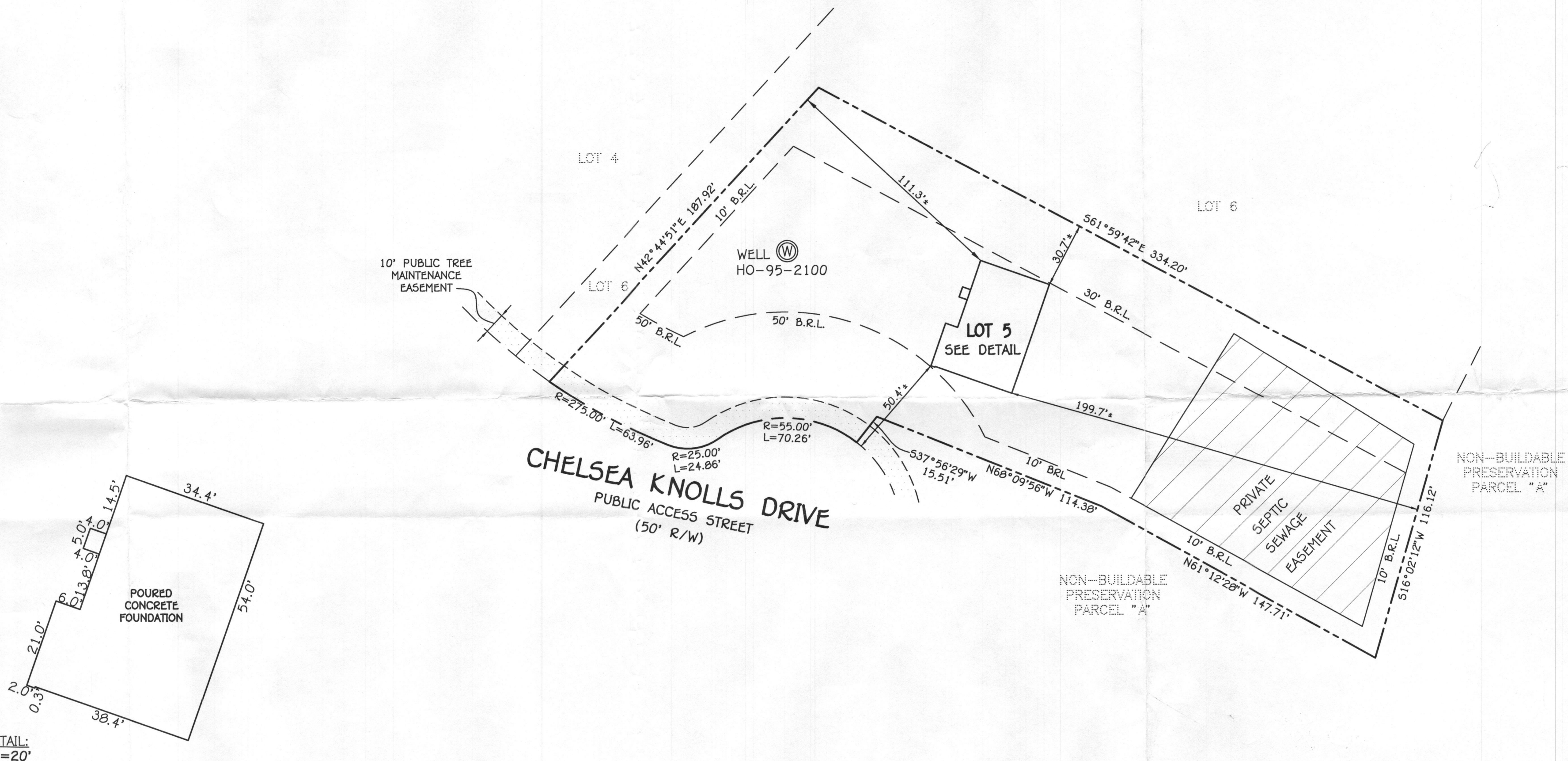
432.5 Chelsea Knolls Dr.



# GENERAL NOTES:

- 1) THIS LOCATION DRAWING IS PREPARED FOR THE BENEFIT OF THE CLIENT SIGNING THE HOUSE LOCATION SURVEY APPROVAL FORM INsofar AS IT IS REQUIRED BY A LENDER OR TITLE INSURANCE COMPANY OR ITS AGENTS IN CONNECTION WITH THE CONTEMPLATED TRANSFER, FINANCING, OR REFINANCING OF THE PROPERTY SHOWN HEREON. UNLESS INDICATED AS BEING A BOUNDARY SURVEY, THIS LOCATION DRAWING IS NOT INTENDED FOR USE IN THE ESTABLISHMENT OF PROPERTY LINES AND IS NOT TO BE RELIED UPON FOR THE ESTABLISHMENT OR LOCATIONS OF FENCES, GARAGES, BUILDINGS OR OTHER EXISTING OR FUTURE IMPROVEMENTS. AS A RESULT, THIS LOCATION DRAWING DOES NOT PROVIDE FOR ACCURATE IDENTIFICATION OF PROPERTY LINES, BUT SUCH IDENTIFICATION MAY NOT BE REQUIRED FOR THE TRANSFER OF TITLE OR SECURING FINANCING FOR RE-FINANCING.
- 2) SUBJECT PROPERTY IS SHOWN IN ZONE X ON THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP OF HOWARD COUNTY, MARYLAND, COMMUNITY PANEL No. 24027C00100 EFFECTIVE 11/06/2013
- 3) THE OFFSETS FROM BUILDING LINE TO PROPERTY LINE AS SHOWN ON THE PLAT HEREON ARE TO AN ACCURACY OF PLUS OR MINUS 0.5'.
- 4) NO TITLE REPORT FURNISHED. SUBJECT TO ALL EASEMENTS, RIGHTS OF WAY AND CONDITIONS OF RECORD.
- 5) THE EXISTING WELL(S) SHOWN ON THIS PLAN (IDENTIFIED WITH THE ATTACHED WELL TAG NUMBER HO-95-2100 HAS BEEN FIELD LOCATED BY FISHER, COLLINS AND CARTER, INC. PROFESSIONAL LAND SURVEYORS AND IS ACCURATELY SHOWN.
- 6) PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED PROPERTY LINE SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 339, EXPIRATION DATE 10/04/2016.
- 7) BUILDING PERMIT #B-15005251

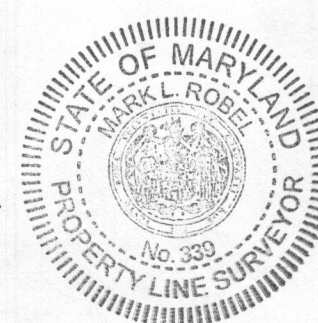
Wall Check  
OK 3-14-16  
JH



## HOUSE LOCATION DRAWING

FOUNDATION LOCATION: 2/18/16  
FINAL LOCATION:  
BOUNDARY SURVEY:

SCALE: 1"=40'  
DATE: 2/19/16  
DRAWN BY: GAD  
CHECKED BY: MLR  
PROJECT No.: 13030-3001



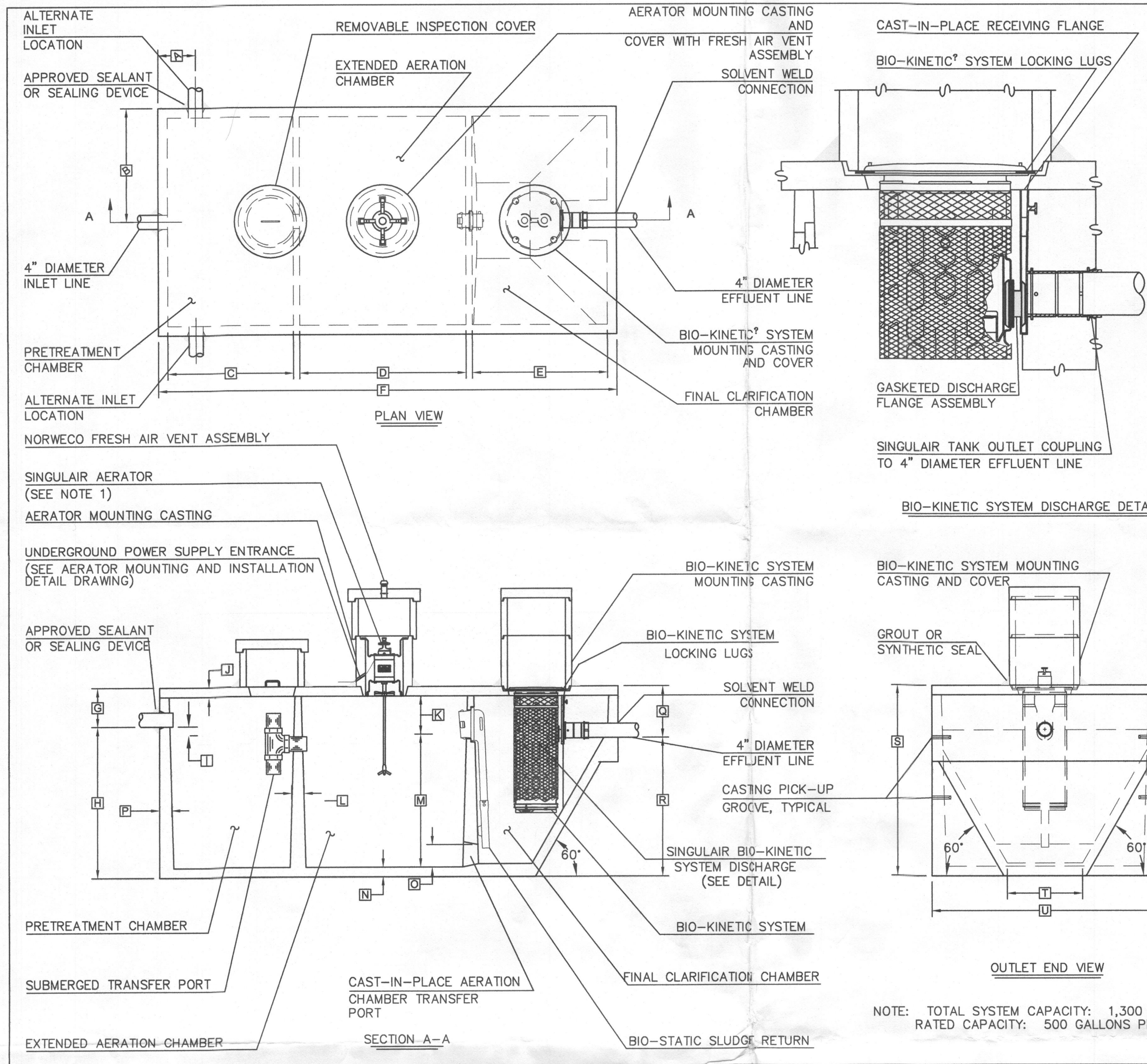
Mark L. Robel  
PROPERTY LINE SURVEYOR  
REG. #339  
DATE: 2/19/16

LOT 5  
CHELSEA KNOLLS  
LOTS 1 THRU 14,  
NON-BUILDABLE PRESERVATION  
PARCELS 'A' & 'B' AND  
NON-BUILDABLE BULK PARCEL 'C'  
PLAT NOS. 22016 THRU 22019  
FOURTH ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

FISHER, COLLINS & CARTER, INC.  
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE  
ELLICOTT CITY, MARYLAND 21042  
(410) 461 - 2895

#10335 CHELSEA KNOLLS DRIVE  
B.R.L. = BUILDING RESTRICTION LINE  
TOP OF FOUNDATION ELEVATION = 779.9'±





- GENERAL NOTES:**
- SINGULAIR AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 60 MINUTES ON / 60 MINUTES OFF.
  - FALL THROUGH SINGULAIR<sup>®</sup> 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 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.

**NAME:**  
**DATE:**

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

**NAME:**  
**DATE:**

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	

U.S. AND FOREIGN PATENTS PENDING	<b>norweco</b>	3-28-07	B
	LOW PROFILE SINGULAIR BIO-KINETIC WASTEWATER TREATMENT SYSTEM MODEL TWT-500 GPD		BDS
			JMM
		10-16-06	
			NTS
			PC-S-7091

NOTE: TOTAL SYSTEM CAPACITY: 1,300 GALLONS  
RATED CAPACITY: 500 GALLONS PER DAY

#### BAT 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 SITE PLAN MAY BE REQUIRED.
- THE MAXIMUM COVER OVER THE BAT SHALL BE 3 FEET.
- 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.
- ANY ELECTRICAL WORK FOR THE BAT INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
- AN AGREEMENT AND EASEMENT HAS BEEN COMPLETED AND SIGNED BY ALL APPLICABLE PARTIES, AND RECORDED IN THE LAND RECORDS OF HOWARD COUNTY, LIBER 15565, FOLIO 061.
- THE HEALTH DEPARTMENT REQUIRES DOCUMENTATION FOR THE START-UP CERTIFICATION FROM THE MANUFACTURER PRIOR TO FINAL APPROVAL OF THE INSTALLATION.
- SURFACE RUNOFF SHALL BE DIRECTED AROUND THE BAT TANK.

#### SEPTIC SYSTEM ELEVATIONS

FTE = 781.10  
BSE = 772.18  
INV. OUT OF HOUSE = 767.02  
PROP GROUND AT C/O = 766.8  
INV. INTO C/O = 764.86  
INV. OUT OF C/O = 764.26  
EX GROUND AT C/O = 764.7  
INV. INTO C/O = 762.96  
INV. OUT OF C/O = 762.86  
EX GROUND AT BAT TANK = 764.5  
TOP OF BAT TANK = 762.46  
COVER OVER BAT TANK = 2.04 FT  
INVERT INTO BAT TANK = 761.46  
INVERT OUT OF BAT TANK = 761.13  
EX GROUND AT PUMP TANK = 764.5  
TOP OF PUMP TANK = 761.8  
COVER OVER PUMP TANK = 2.7 FT  
INVERT INTO PUMP TANK = 761.05  
INVERT OUT OF PUMP TANK = 762.9

#### SEPTIC SYSTEM DESIGN

4 BEDROOM HOUSE  
LOADING RATE = 600 GPD  
APPLICATION RATE = 0.8  
EFFECTIVE SIDEWALL BEGINS AT 5.5 FEET  
TRENCH DEPTH = 6 FEET  
TRENCH WIDTH (W) = 3 FEET  
EFFECTIVE DEPTH (D) = 0.5 FEET  
SF OF DRAINFIELD = 600 GPD / 0.8 = 750 SF  
COEFFICIENT OF REDUCTION OF TRENCH LENGTH = (W+2)/(W+1+2D) = (3+2)/(3+1+(2x0.5)) = 1.0  
TRENCH LENGTH = 750 SF x 1.0 / 3 = 250 FEET  
TRENCH SPACING = 2D+W = ((2x0.5) + 3) = 4 USE 10'

#### FRICTION LOSS IN 3" PIPE FITTINGS:

4 1/8 HB x 6 FEET PER FITTING = 24 EQUIVALENT FEET OF PIPE  
4 TEE/CROSS x 17 FEET PER FITTING = 68 EQUIVALENT FEET OF PIPE  
1 UNION x 4 FEET PER FITTING = 4 EQUIVALENT FEET OF PIPE  
4 ELBOWS x 12 FEET PER FITTING = 48 EQUIVALENT FEET OF PIPE  
TOTAL EQUIVALENT FEET OF PIPE = 144 FT

TOTAL LINEAR FEET OF 3" SCH. 40 PVC = 94.3 LF + 144 LF = 238.3 LF

**DYNAMIC HEAD**  
238.3 LF x 1.21 FT PER 100 LF OF PIPE = 2.88 FT OF FRICTION HEAD  
DISTAL HEAD = 2.0 FT  
VERTICAL FROM PUMP OFF TO DISCHARGE = 4.27 FT OF STATIC HEAD  
VERTICAL FROM DISCHARGE TO TRENCH = 3.2 FT  
TOTAL DYNAMIC HEAD = 12.35 FT

#### PIPE VOLUMES

94.3 LF (3" SCH. 40 PIPE) x 38.4 GALLONS PER 100 LF = 36.2 GALLONS  
233.15 LF (1.5" SCH. 40 PIPE) x 10.6 GALLONS PER 100 LF = 24.7 GALLONS

#### MINIMUM DOSE

MINIMUM DOSE = (5 x LATERAL PIPE VOLUME) + (FORCE MAIN & MANIFOLD)  
= (5 x 24.7) + (36.2)  
= 159.7 GALLONS

159.7 GALLONS IS MORE THAN 1/6 DESIGN FLOW (600/6=100)  
USE 222.9 GALLON DOSE (159.7 GALLON MINIMUM)  
(RUN TIME = 3 MIN (74.3 GPM X 3 = 222.9 GALLON DOSE)

PUMP NEEDS TO HANDLE 74.3 GPM AT 12.35 FT OF HEAD  
USE 0.5 HP (ME45 PUMP)

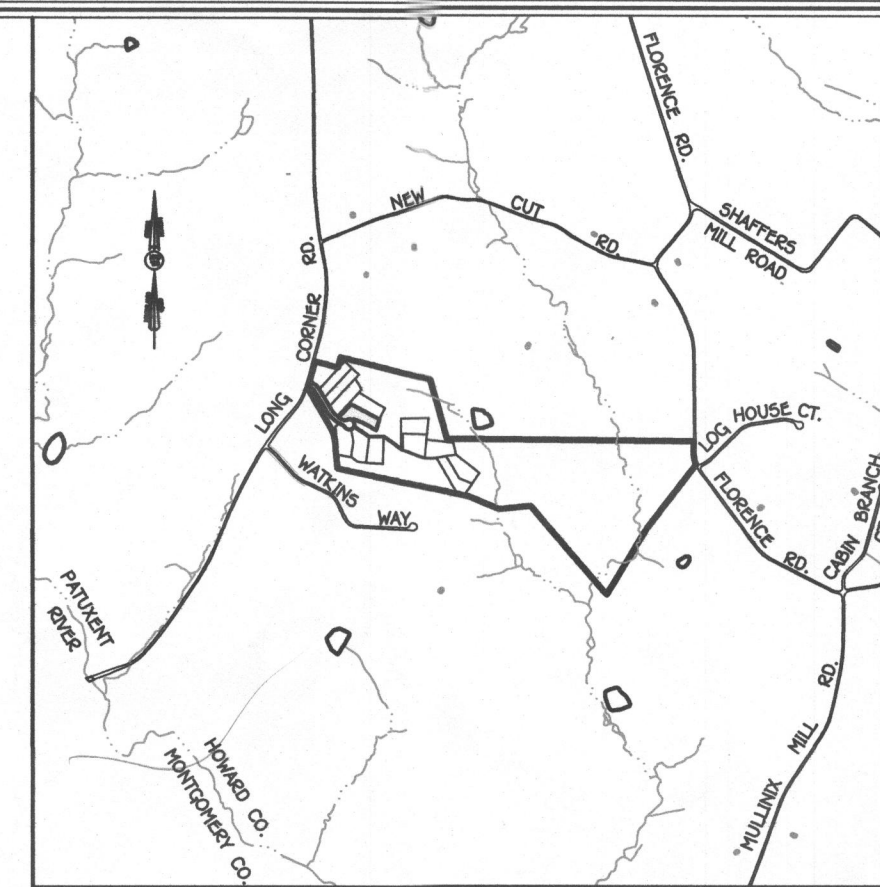
#### PROFESSIONAL CERTIFICATION

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. 38386, EXPIRATION DATE: 01/12/2018.

*Arghamir Jute* 2/3/16  
Signature of Professional Engineer DATE



LEGEND	
SYMBOL	DESCRIPTION
	EXISTING CONTOUR 2' INTERVAL
	PROPOSED CONTOUR 2' INTERVAL
x362.5	SPOT ELEVATION
W	EXISTING WELL
	EXISTING STREET TREES FROM F-12-072
	EXISTING PERIMETER TREES FROM F-12-072

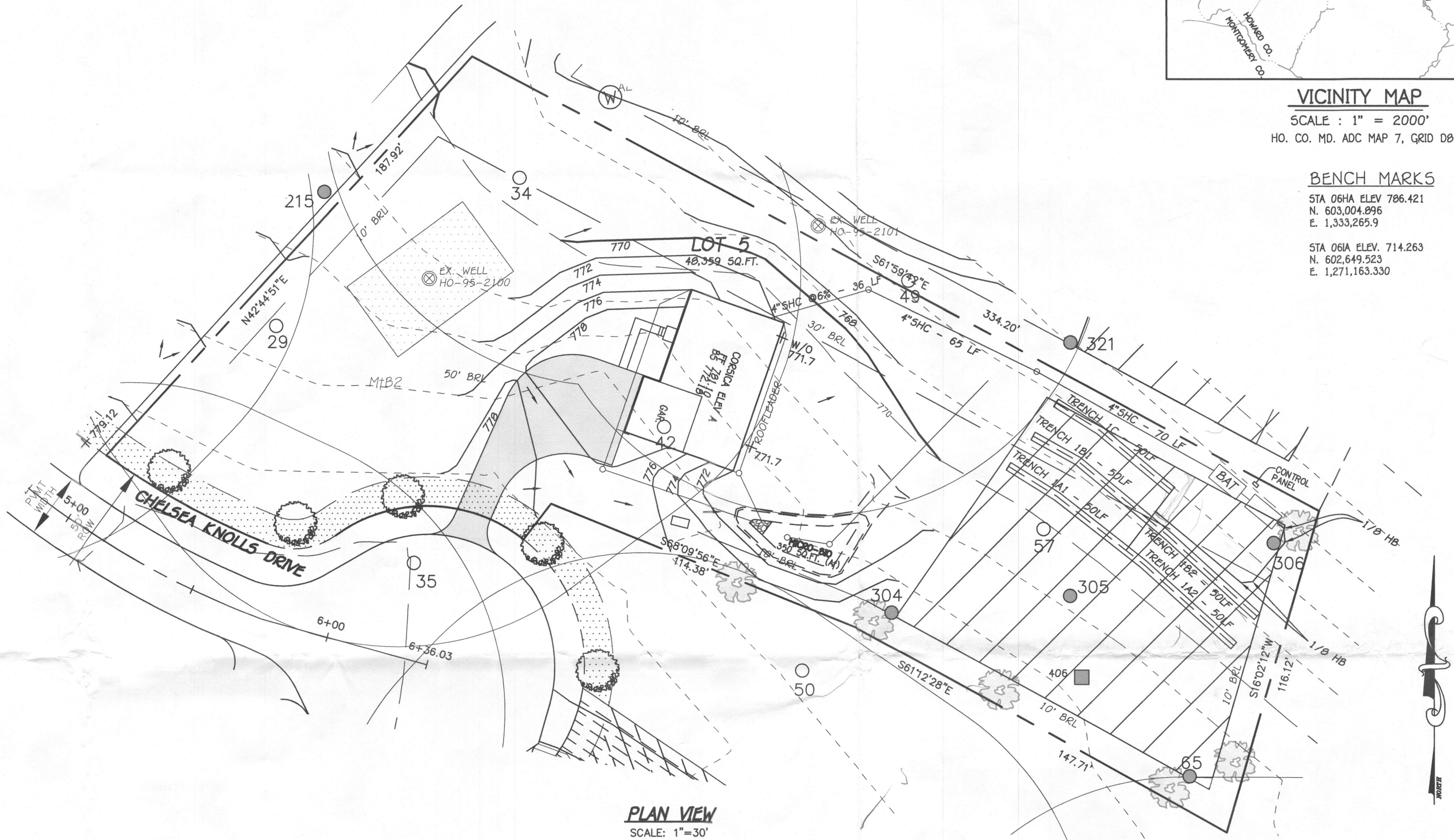


#### VICINITY MAP

SCALE : 1" = 2000'  
HO. CO. MD. ADC MAP 7, GRID D8

#### BENCH MARKS

STA 06H ELEV 786.421  
N. 603,004.896  
E. 1,333,265.9  
STA 06H ELEV 714.263  
N. 602,649.523  
E. 1,271,163.330



#### GENERAL NOTES

- SUBJECT PROPERTY ZONED: RC-DEO
- TOTAL AREA OF PROPERTY: 48,359 SQ. FT. OR 1.11 AC.
- SEPTIC EASEMENT SUBJECT TO HOWARD COUNTY HEALTH DEPARTMENT REVIEW.
- LENGTH OF TRENCH TO BE DETERMINED AT TIME OF SEPTIC PERMIT ISSUANCE.
- CONTRACTOR/BUILDER TO VERIFY ELEVATION IN THE FIELD BEFORE BEGINNING ANY CONSTRUCTION.
- BOUNDARY OF LOT BASED ON PLAT #22017.
- TOPOGRAPHY SHOWN HEREON TAKEN FROM F-07-072 WHICH IS BASED ON FIELD RUN TOPOGRAPHIC SURVEY CONDUCTED BY MILDENBERG, BOENDER & ASSOCIATES, INC. IN SEPTEMBER, 2001. TOPOGRAPHY IN NON-DEVELOPED AREAS IS BASED ON HOWARD COUNTY 200 SCALE TOPOGRAPHY.
- NO WETLANDS EXIST ON THIS LOT.
- SAND-LINED TRENCHES MAY BE NEEDED IF FRACTURED ROCK IS ENCOUNTERED WHEN THE TRENCHES ARE DUG.
- AN OBSERVATION PIT AT TIME OF THE SEPTIC SYSTEM PRE-CONSTRUCTION MEETING IS RECOMMENDED.

#### NOTE

THE EXISTING WELL SHOWN ON THIS PLAN, TAG NO. HO #95-2100 HAS BEEN FIELD LOCATED BY FISHER, COLLINS & CARTER, INC., PROFESSIONAL LAND SURVEYORS AND IS ACCURATELY SHOWN.

Approved Septic System Plan  
Howard County Health Department  
NORWECO TWT-500  
w/ MONARCH 1500-gal Pump Tank  
R. Myers ME 45 Pump or equiv.  
R. Buckner  
Signature  
2/4/2016  
Date

LOW PRESSURE DOSING SYSTEM - INITIAL INSTALLATION									
TRENCH	GROUND ELEV.	PIPE INVERT ELEV.	TRENCH LENGTH (FT)	LATERAL PIPE LENGTH (FT)	PERFORATION DIAMETER (IN)	HEAD (FT)	PERFORATION FLOW RATE (GPM)	PERFORATION SPACING (FT)	TRENCH FLOW RATE (GPM)
1A1	769.1	765.1	50	47.23	5/16	2	1.63	5.55	9
1A2	769.1	765.1	50	47.23	5/16	2	1.63	5.55	9
1B1	767.7	763.7	50	46.43	5/16	3.4	2.12	7.14	7
1B2	767.7	763.7	50	46.43	5/16	3.4	2.12	7.14	7
1C	766.2	762.2	50	45.84	5/16	4.9	2.54	8.33	6
TOTAL TRENCH FLOW RATE									74.26

TRENCH DESIGN								
TRENCH	GROUND ELEV.	TOP OF STONE ELEV.	PIPE INVERT DEPTH TO STONE ELEV.	DEPTH OF TRENCH FROM GROUND	DEPTH OF TRENCH (FT)	BOTTOM OF TRENCH ELEV.	EFFECTIVE DEPTH AT	EFFECTIVE DEPTH (D)
1A1	769.1	765.6	765.1	3.5'	2.5'	763.1	5.5'	0.5'
1A2	769.1	765.6	765.1	3.5'	2.5'	763.1	5.5'	0.5'
1B1	767.7	764.2	763.7	3.5'	2.5'	761.7	5.5'	0.5'
1B2	767.7	764.2	763.7	3.5'	2.5'	761.7	5.5'	0.5'
1C	766.2	762.7	762.2	3.5'	2.5'	760.2	5.5'	0.5'

SOILS LEGEND		
SOIL	NAME	CLASS
MIB2	Mt. Airy channery loam, 3 to 8 percent slopes, moderately eroded	A
MIC2	Mt. Airy channery loam, 8 to 15 percent slopes, moderately eroded	A

#### OWNER

CHELSEA KNOLLS, LC  
1355 BEVERLY RD., SUITE 240  
MCLEAN, VIRGINIA 22101  
(703) 734-9730  
(301) 720-3021

#### DEVELOPER

RYAN HOMES, INC.  
ATTN: KEVIN BOVENS  
9720 PATIENT WOODS DRIVE  
COLUMBIA, MARYLAND 21046  
410-796-0980

ZONING: RC-DEO  
TAX MAP No. 12 GRID No. 5 PARCEL No. 78  
FOURTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
DATE: FEBRUARY, 2016  
SHEET 1 OF 2



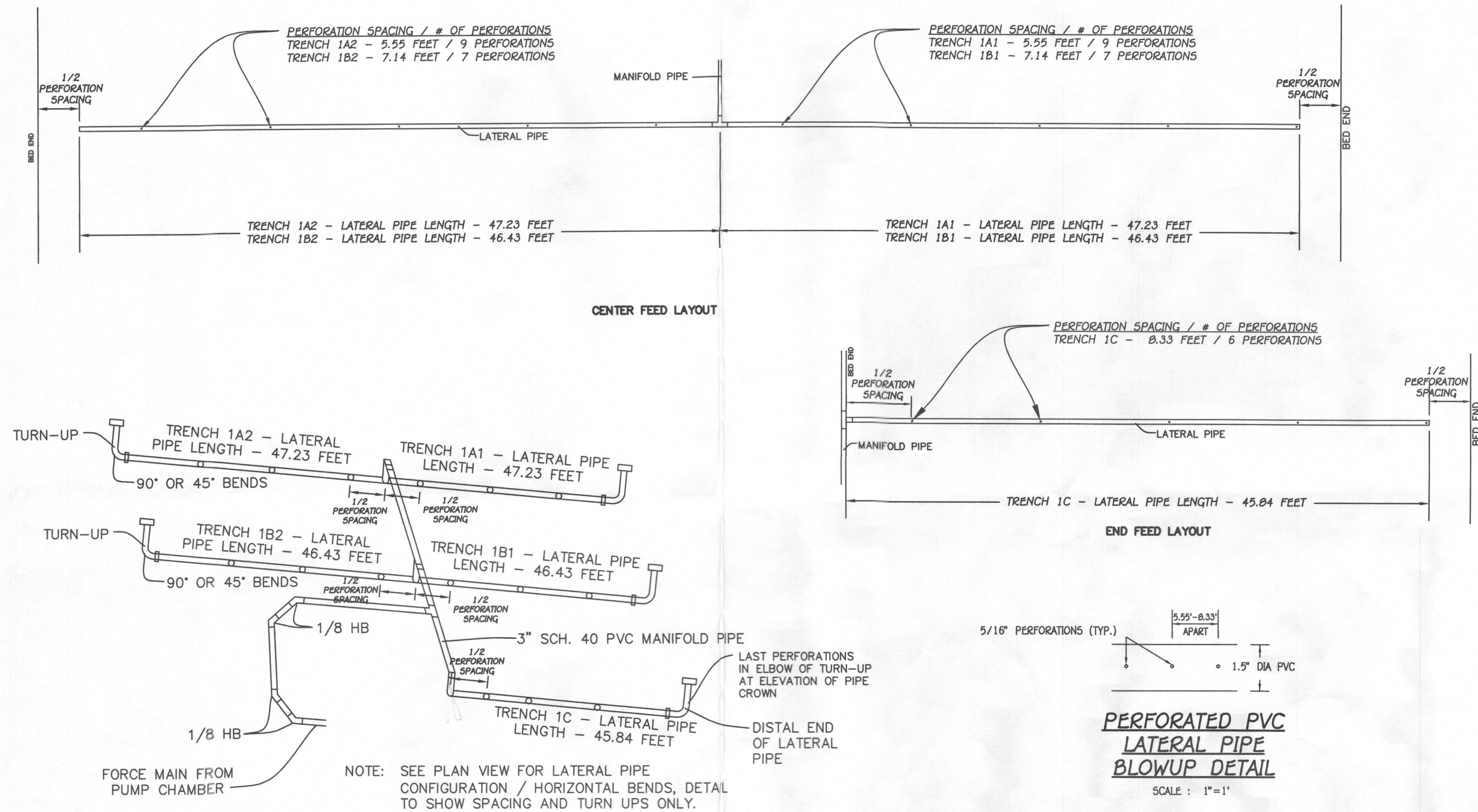
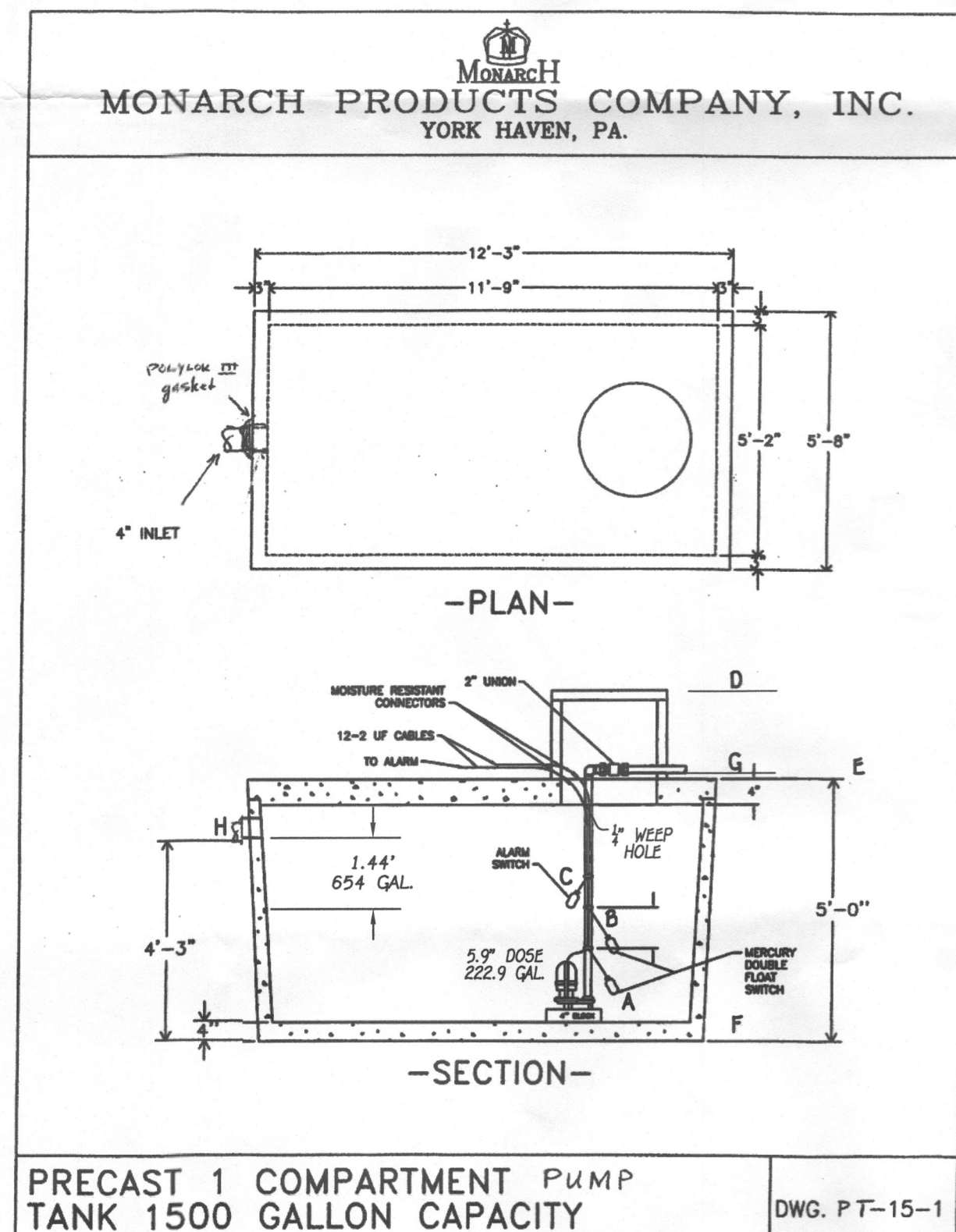


FIGURE 4.1 CENTER FEED MANIFOLD DISTRIBUTION NETWORK

NOTE: PLACE AN OBSERVATION PIPE IN THE GRAVEL BED AT THE DISTAL END OF EACH TRENCH SEGMENT.



**PUMP ALARMS / INFORMATION**  
 A PUMP OFF : 750.63  
 B PUMP ON : 759.12  
 C HIGH WATER ALARM : 759.61  
 D TOP OF ACCESS COVER : 764.5  
 E TOP OF TANK : 761.80  
 F BOTTOM OF TANK : 756.80  
 G DISCHARGE OUT OF TANK : 762.90  
 H INVERT INTO TANK : 761.05

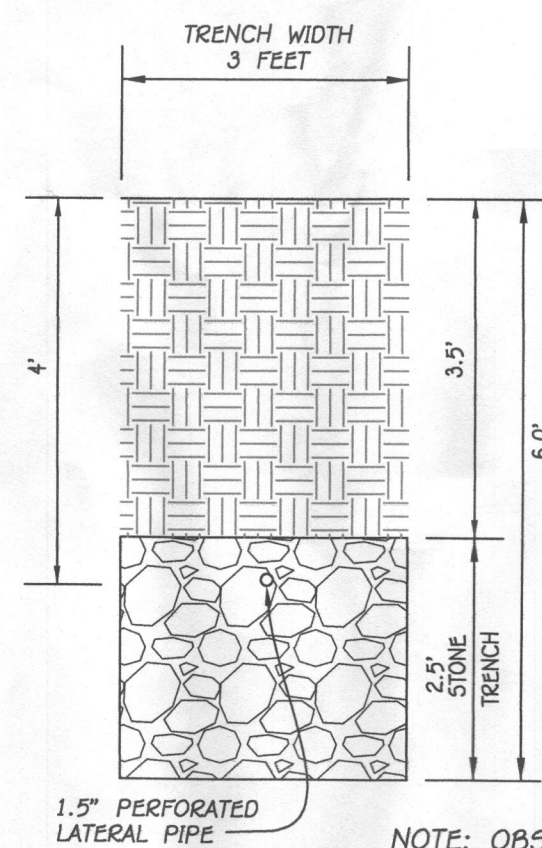
NOTE: SEPTIC SYSTEM ALARM WILL BE ON A CIRCUIT SEPARATE FROM ANY OTHER SEPTIC SYSTEM COMPONENTS OR ALARMS.

**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. 38386, EXPIRATION DATE: 01/12/2018.



Signature of Professional Engineer  
 Andrew L. Lutz 2/3/16  
 DATE



NOTE: OBSERVATION PIPE MUST BE INSTALLED AT EACH END OF EACH TRENCH

**OWNER**

CHELSEA KNOLLS, LC  
 1355 BEVERLY RD., SUITE 240  
 McLEAN, VIRGINIA 22101  
 (703) 734-9730  
 (301) 720-3021

**DEVELOPER**

RYAN HOMES, INC.  
 ATTN: KEVIN BOWSER  
 9720 PATRICK WOODS DRIVE  
 COLUMBIA, MARYLAND 21046  
 410-796-0980

# ME SERIES EFFLUENT PUMPS

Trust The Pump Experts.

Myers has a market leading portfolio of horsepower and pump curve combinations, delivered with distinctive service.

## Features

### RELIABLE AND TOUGH

- Rugged, oil-cooled motor provides continuous bearing lubrication and maximizes heat dissipation

### EXTENDED SERVICE

- Lubricated ball bearings and shaft seal for longer service life

### MOTOR PROTECTION

- Long-life carbon/ceramic seal protects motor against water leakage

### THERMAL OVERLOAD

- Heat sensor overload protection with automatic reset when motor cools to safe operating temperature

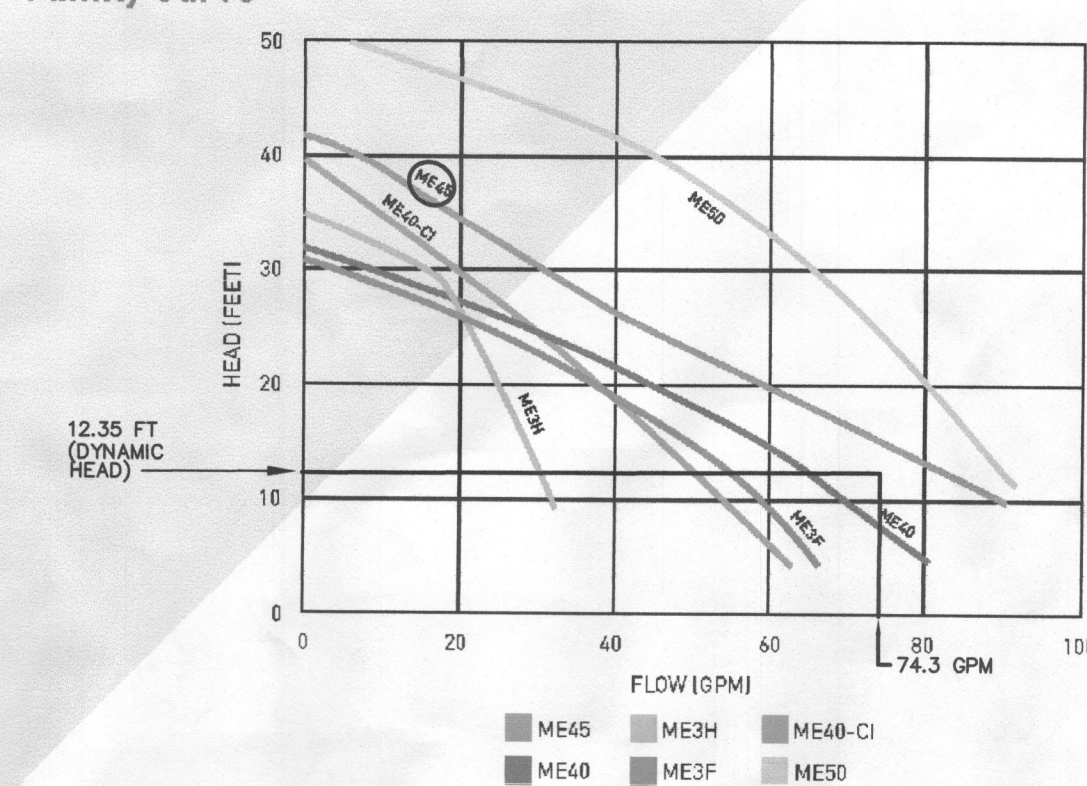
### NO DRILLING REQUIRED

- Anti-airlock hole in base reduces added labor

### EASY SERVICEABILITY

- Pump, intake screen valve base, switch and power cord are serviceable

## Family Curve

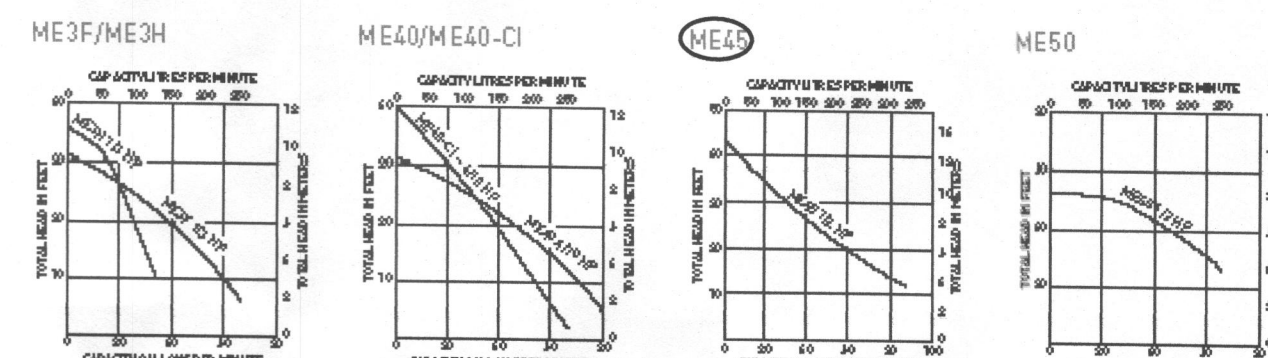


NOTE: USE A ME45 PUMP

# ME SERIES

## Specifications

	ME3F/ME3H	ME40	ME40-CI	ME45	ME50
Capacities	ME3H: 36 GPM (133 LPM) ME3F: 66 GPM (249 LPM)	80 GPM (303 LPM)	60 GPM (227 LPM)	97 GPM (367 LPM)	120 GPM (454 LPM)
Shut-off Head	ME3H: 25' (7.6 m) ME3F: 31' (9.5 m)	32' (9.75 m)	40' (12 m)	44' (13.41 m)	55' (16.8 m)
Operation	Automatic or manual	Automatic or manual	Automatic or manual	Automatic or manual	Automatic or manual
Solids Handling	3/4" (19 mm)	3/4" (19 mm)	3/4" (19 mm)	3/4" (19 mm)	3/4" (19 mm)
Liquids Handling	Domestic effluent and drain water	Domestic effluent and drain water	Domestic effluent and drain water	Domestic effluent and drain water	Domestic effluent and drain water
Liquid Temp.	Intermittent up to 160°F (80°C)	Intermittent up to 160°F (80°C)	Continuous 120°F (50°C)	Intermittent up to 160°F (80°C)	Intermittent up to 160°F (80°C)
Motor Electrical Data	1/2 HP, 1550 RPM, shaded pole, oil-filled, 115V, 12A, 1ø, 60Hz	4/10 HP, 1550 RPM, PSC with thermal overload, oil-filled, 115V, 12A, 1ø, 60Hz	4/10 HP, 3450 RPM, PSC with thermal overload, oil-filled, 115V, 12A, 1ø, 60Hz	1/2 HP, 3450 RPM, PSC with thermal overload, oil-filled, 115V, 9.5A, 1ø, 60Hz	1/2 HP, 115V, 1ø, 1/2 to 1-1/2 HP, 220V, 1ø, 08/220/240/275V, 3ø, PSC with thermal overload, oil-filled, permanent split capacitor type, 1ø, 3450 RPM, 60Hz
Acceptable pH Range	6-9	5-9	5-9	5-9	6-9
Shaft Seal	Carbon and ceramic mechanical seal	Carbon and ceramic mechanical seal	Carbon and ceramic mechanical seal	Carbon and ceramic mechanical seal	Carbon and ceramic mechanical seal
Housing/Volute	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Volute Base	Cast iron	Fiberglass reinforced polypropylene	Cast iron	Cast iron	Cast iron
Impeller	Fiberglass-reinforced Noryl®	Cast iron	Thermoplastic, non-clog, vortex type	Cast iron	Cast iron
Exterior Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Power Cord	20', 16/2, SJTW	20', 16/2, SJTW	20', 16/2, SJTW	20', 16/2, SJTW	10'
Discharge, HP1	1-1/2" (38.1 mm)	1-1/2" (38.1 mm)	2" (50.8 mm)	2" (50.8 mm)	2" (50.8 mm)



## BAT SITE PLAN

LOT 5  
**CHELSEA KNOLLS**  
 18335 CHELSEA KNOLLS DRIVE

ZONING: RC-DEO

TAX MAP No. 12 GRID No. 5 PARCEL No. 78  
 FOURTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 DATE: FEBRUARY, 2016  
 SHEET 2 OF 2