



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: 1-8-16 **ONSITE SEWAGE DISPOSAL SYSTEM**

P 557961

APPROVAL DATE: 3-14-16 **PERMIT: CONSTRUCTION**

A _____

PROPERTY ADDRESS: 18329 Chelsea Knolls Drive

SUBDIVISION: Chelsea Knolls LOT: 6 TAX ID: _____

CONTRACTOR: Hatfield's Equipment EMAIL: ken@hatfieldsequipment.com

CONTRACTOR ADDRESS: P.O. Box 519 Annapolis Junction, MD 20701 PHONE: 301-490-4289

CONTRACTOR CERTIFIED FOR BAT INSTALLATION: ☒ MDE ☒ MANUFACTURER:

PROPERTY OWNER: Ryan Homes EMAIL: dsnyder@nvrinc.com

OWNER ADDRESS: 9720 Patuxent Woods Drive PHONE: 410-796-0980

BAT UNIT MODEL: Norweco TNTLP 500 PUMP SIZE: 0.5HP PUMP TANK CAPACITY: 1500 GAL

OPERATION & MAINTENANCE AGREEMENT DATE SIGNED: 5/1/14 DATE RECORDED: 5/1/14

DISTRIBUTION SYSTEM: ☒ GRAVITY ☒ PRESSURE DOSED BEDROOMS: 5 APPLICATION RATE: 0.8

TRENCHES:	LINEAR FEET REQUIRED: <u>314.5</u>	INLET DEPTH: <u>4</u>
	TRENCH WIDTH: <u>3</u>	MAXIMUM BOTTOM DEPTH: <u>6</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>10</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>5.5</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:		

ISSUED BY: Robert Bricker ISSUE DATE: 1-8-16 EXPIRATION DATE: 1-8-17

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 DOWNGRAIENT 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 _____

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'	4'	6'
NUMBER OF TRENCHES		6
TOTAL LENGTH		315'
ABSORPTION AREA		945' + SIDEWALL
DISTRIBUTION BOX LEVEL		---
DISTRIBUTION BOX BAFFLE		---
DISTRIBUTION BOX PORT		---

SEPTIC TANK DATA

SEPTIC TANK 1 LEVEL	YES
MANUFACTURER	BACKRIVER/ NORWECO
CAPACITY	1300 GAL
SEAM LOC	TOP
TANK LID DEPTH	2.5' - 4' +
BAFFLES	NO
BAFFLE FILTER	NO
MANHOLE LOC	FRONT, MIDDLE, REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	11/28/15

PUMP/SEPTIC TANK LEVEL

MANUFACTURER	BACKRIVER
CAPACITY	1500 GAL
SEAM LOC	TOP
TANK LID DEPTH	3.5' - 4' +
BAFFLES	YES
BAFFLE FILTER	NONE
MANHOLE LOC	FRONT + REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	12/19/15

PRE-CONSTRUCTION:

1/21/2016 Trench locations adjusted slightly so that trenches will be on contour. The two 45° bends are removed from the force main. Otherwise install as per plan. (BB)

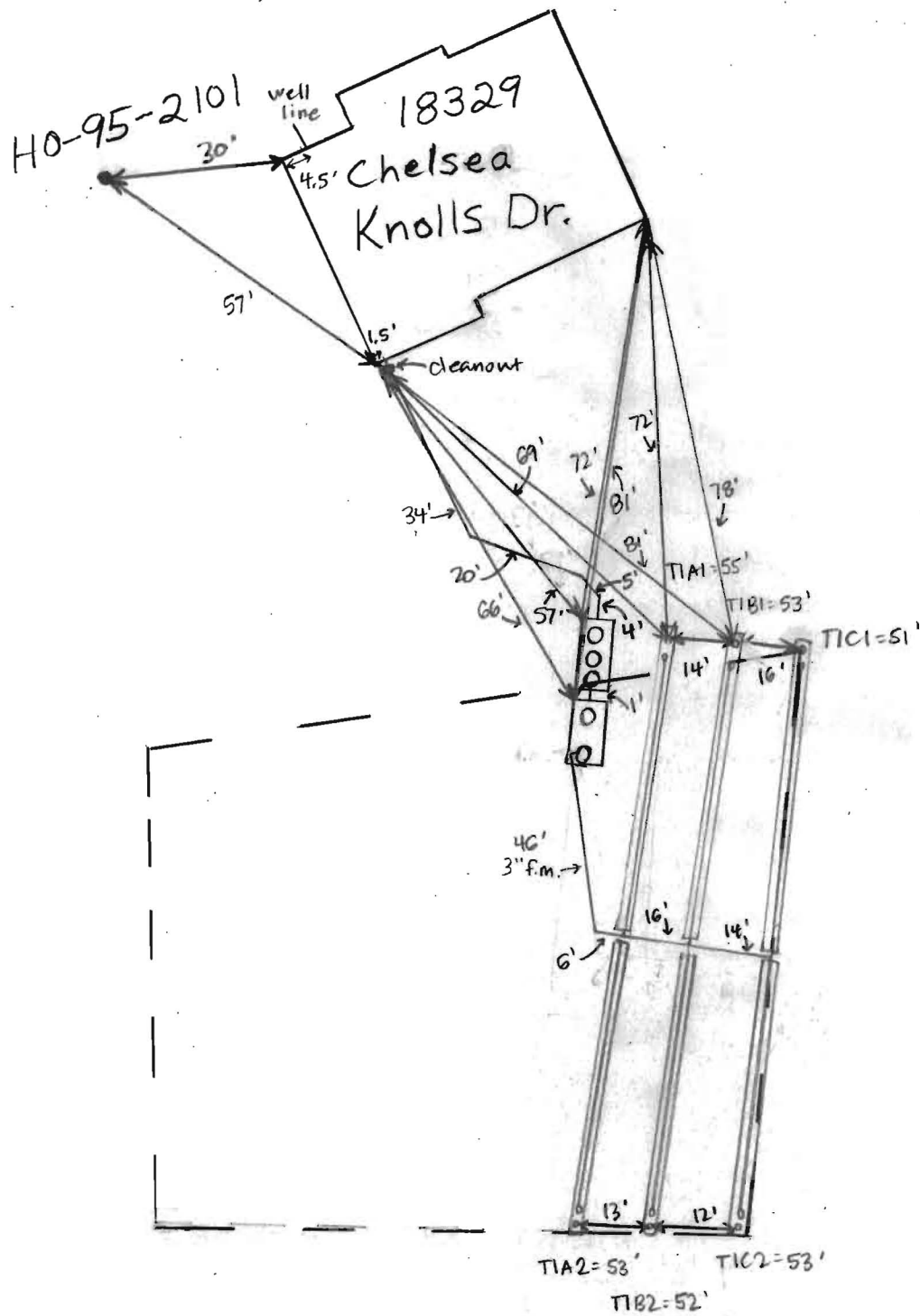
INSTALLATION: 2/2/16 On site while pump tank was set - no cracks on sides. Lots of rock in tank hole near inlet of Norweco starting at 3' depth. * Final grading over tanks not to exceed 3'. (SC) 2/4/16 Trench 1A1 dug + covered. Hatfield's laying pipe in 1B1. 4' to stone under pipe. 3" f.m. run from tank to lower trench. (SC) 2/5/16 House connection made. Line bedded from house to tank with #57 stone. All laterals + trenches complete. 1A2 + 1C1 left open - 1A2 3.5' to stone, 1C1 2.5' - 3' to stone. 1C1 slightly wider at end. Need BAT startup certification and pump + alarm. (SC) 2/16/16 BAT startup received. (SC) 3/11/16 On site for pump + alarm. Alarm sounds not enough water to do pump test.

Norweco alarm sounds + aerator runs (SC)

FINAL INSPECTOR

DATE OF APPROVAL

3/14/16 Pump test successful 34" x 46" Digital head on all laterals. Told contractor to turn valve 1/8" of turn.



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 18329 Chelsea Knolls Dr., Mt. Airy, MD 21771 February 02, 2016 was installed according to the manufacture's specifications.

Installer: Jeff Reiter

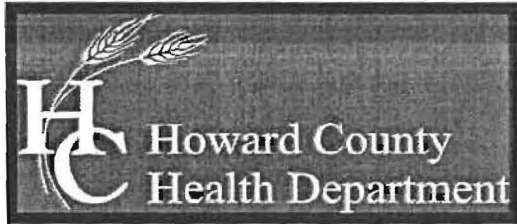
Property Owner: NVR

Permit #



MATTHEW GECKLE

Vice-President



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 6

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

THIS AGREEMENT is made this 15th 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 18329 Chelsea Knolls Drive, Mt Airy, Maryland 21771, in the 4th 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

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 Lot that the system shall require maintenance or other attention. Upon taking title to the Lot, 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.

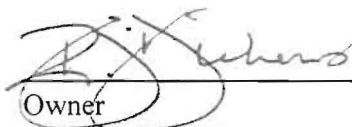
G. This agreement may be voided at any time at the discretion of the County.

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.

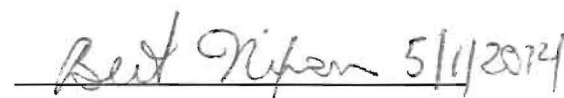
J. Owner acknowledges and agrees that interior renovations to increase the number of bedrooms or an increase in living space shall not be permitted without approval from the County.

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

 4/25/14

Owner Date
Chelsea Knolls, L.C., Russell Dickens, Manager

Owner Date

 5/1/2014

Howard County Health Department

13038-3001

Clerk of the Circuit Court for
Howard County
Land Records/Licensing
14 EAT 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
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Grantor/Grantee Name: Chelsea Knolls LC
Reference/Control #: 82

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

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

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

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

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

LR - Agreement Surcharge	1x	40.00	40.00
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LR - Agreement Recording Fee	1x	20.00	20.00
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Grantor/Grantee Name: Chelsea Knolls LC
Reference/Control #: 88

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

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

LR - Agreement Surcharge	1x	40.00	40.00
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LR - Agreement Recording Fee	1x	20.00	20.00
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Grantor/Grantee Name: Chelsea Knolls LC
Reference/Control #: 91

1x 40.00 40.00
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
Reference/Control #: 91

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 #: 92

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 #: 93

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 #: 94

LR - Agreement Surcharge
1x 40.00 40.00
LR - Agreement Recording Fee
1x 20.00 20.00
Grantor/Grantee Name: 95

LR - Agreement Surcharge
1x 40.00 40.00
LR - Agreement Recording Fee

** VOID **
1x -20.00
LR - Agreement Surcharge

** VOID **
1x -40.00
LR - Agreement Recording Fee

1x 20.00 20.00
Grantor/Grantee Name: Chelsea Knolls LC
Reference/Control #: 95

LR - Agreement Surcharge
1x 40.00 40.00

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SubTotal:	840.00
Total:	840.00

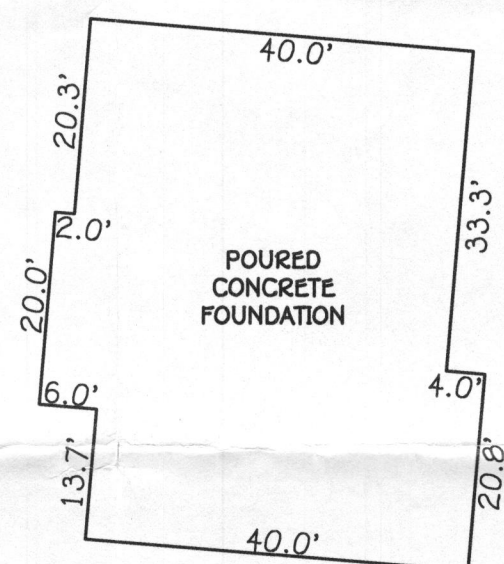
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REV-Check-80A 840.00
Number : 3616

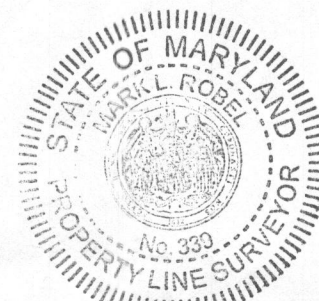
05/01/2014 14:01 CC13-JE
#2738771 /494/109
Thank you for visiting us today~

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 1.0.'
- 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-95-2101) 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-15004081



CHELSEA
KNOLLS DRIVE
PUBLIC ACCESS STREET
(50' R/W)



Mark L. Rose
PROPERTY LINE SURVEYOR
REG. #339

1/05/16
DATE

HOUSE LOCATION DRAWING

FOUNDATION LOCATION: 12/31/15
FINAL LOCATION: _____
BOUNDARY SURVEY: _____

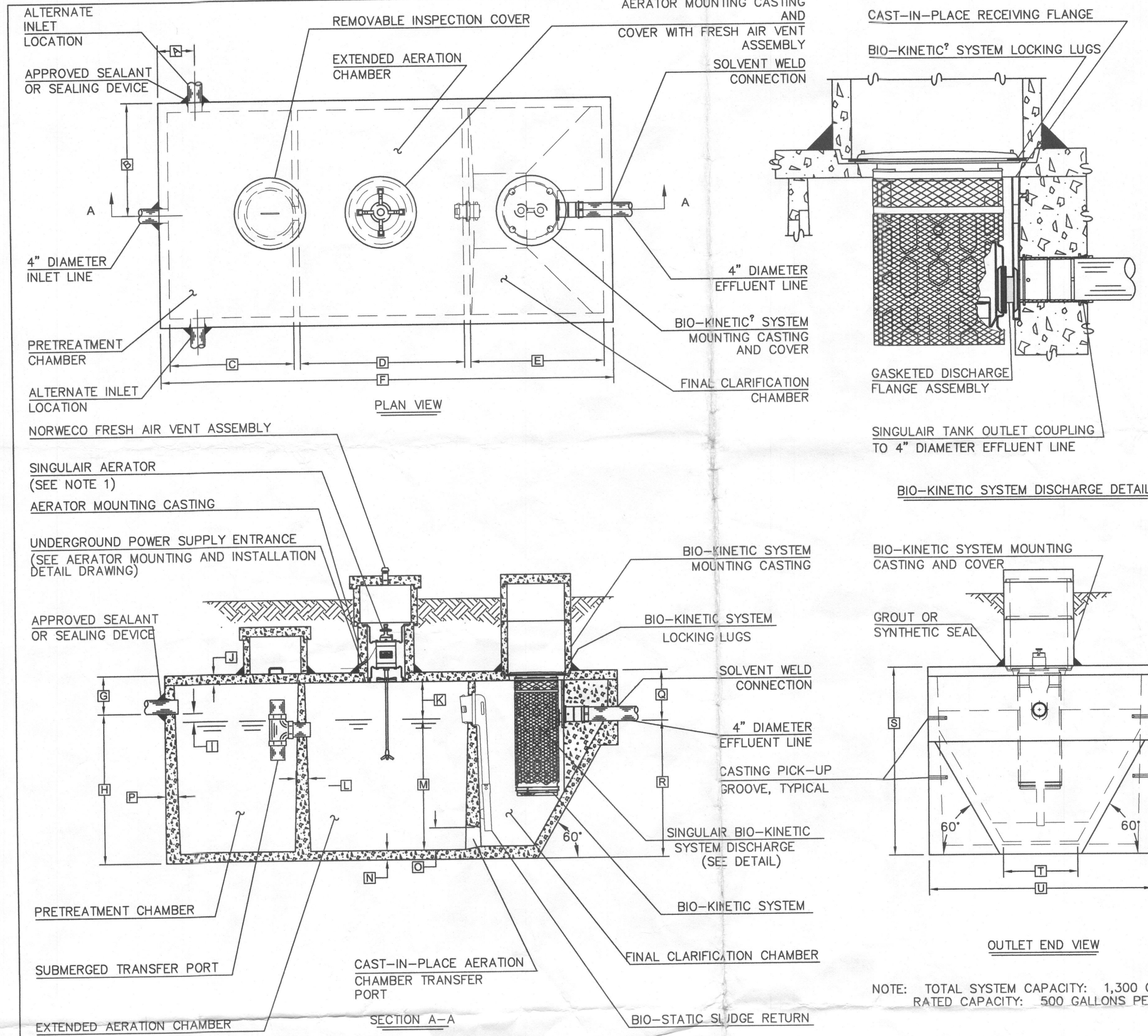
SCALE: 1"=40'
DATE: 1/5/16
DRAWN BY: GAD
CHECKED BY: MLR
PROJECT No.: 13038-3001

LOT 6
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

NON-BUILDABLE
PRESERVATION
PARCEL "A"

*Wall
check
OK
DB*

NON-BUILDABLE
PRESERVATION
PARCEL "A"



- GENERAL NOTES:**
- SINGULAR AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 60 MINUTES ON / 60 MINUTES OFF.
 - FALL THROUGH SINGULAR[®] 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 SINGULAR 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"	R	1'-4"
E	3'-7"	S	3'-8"
F	12'-2"	T	5'-0"
G	1'-0"	U	2'-0"
H	4'-0"	V	6'-0"
I	0'-3"	W	
J	0'-3"	X	
K	1'-0"	Y	
L	0'-2"	Z	
M	3'-6"		

norweco 3-26-07 B
U.S. AND FOREIGN PATENTS PENDING
LOW-PROFILE SINGULAR BIO-KINETIC WASTEWATER TREATMENT SYSTEM
MODEL: TITL-500 GPD
DATE: 10-16-06
NTS
PC-57091

- 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 079.
 - 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

FFE = 765.42
BSE = 750.50
INV. OUT OF HOUSE = 753.50
PROP. GROUND AT C/O = 755.40
INV. INTO C/O = 752.50
EX. GROUND AT BAT TANK = 755.40
TOP OF BAT TANK = 753.32
COVER OVER BAT TANK = 2.08 FT
INVERT INTO B/T TANK = 752.32
INVERT OUT OF BAT TANK = 751.99
EX. GROUND AT PUMP TANK = 755.40
TOP OF PUMP TANK = 752.66
COVER OVER PUMP TANK = 2.74 FT
INVERT INTO PUMP TANK = 751.91
INVERT OUT OF PUMP TANK = 752.83

SEPTIC SYSTEM DESIGN

5 BEDROOM HOUSE
LOADING RATE = 750 GPD
APPLICATION RATE = 0.8
EFFECTIVE SIDEWALL BEGINS AT 5.5 FEET
TRENCH DEPTH = 6.0 FEET
TRENCH WIDTH (W) = 3 FEET
EFFECTIVE DEPTH (D) = 0.5 FEET
SF OF DRAINFIELD = 750 GPD / 0.8 = 937.5 SF
COEFFICIENT OF REDUCTION OF TRENCH LENGTH = (W+2)/(W+1+2D) = (3+2)/(3+1+(2x0.5)) = 1.0
TRENCH LENGTH = 937.5 SF x 1.0 / 3 = 312.5 FEET (USE 314.5 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
5 TEE/CROSS x 17 FEET PER FITTING = 85 EQUIVALENT FEET OF PIPE
1 UNION x 4 FEET PER FITTING = 4 EQUIVALENT FEET OF PIPE
2 ELBOWS x 12 FEET PER FITTING = 24 EQUIVALENT FEET OF PIPE
TOTAL EQUIVALENT FEET OF PIPE = 137 FT

TOTAL LINEAR FEET OF 3" SCH. 40 PVC = 56 LF + 137 LF = 193 LF

DYNAMIC HEAD

193 LF x 1.74 FT PER 100 LF OF PIPE = 3.36 FT OF FRICTION HEAD
DISTAL HEAD = 2.00 FT
VERTICAL FROM PUMP OFF TO DISCHARGE = 3.66 FT OF STATIC HEAD
VERTICAL FROM DISCHARGE TO TRENCH = 0 FT
TOTAL DYNAMIC HEAD = 9.0 FT

PIPE VOLUMES

56 LF (3" SCH. 40 PIPE) x 38.4 GALLONS PER 100 LF = 21.5 GALLONS
292 LF (1.5" SCH. 40 PIPE) x 10.6 GALLONS PER 100 LF = 30.9 GALLONS

MINIMUM DOSE

MINIMUM DOSE = (5 x LATERAL PIPE VOLUME) + (FORCE MAIN & MANIFOLD)
= (5 x 30.9) + (21.5)
= 176 GALLONS

176 GALLONS IS MORE THAN 1/6 DESIGN FLOW (750/6=125)
USE 180.6 GALLON DOSE (176 GALLON MINIMUM)
(RUN TIME = 2 MIN (90.3 GPM x 2 = 180.6 GALLON DOSE))

PUMP NEEDS TO HANDLE 90.3 GPM AT 9 FT OF HEAD
USE 0.5 HP (ME50 PUMP)

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)	NUMBER OF ORIFICES	TRENCH FLOW RATE (GPM)
1A1	754.3	750.3	52.25	49.35	5/16	2	1.63	5.80	9	14.67
1A2	754.3	750.3	52.25	49.35	5/16	2	1.63	5.80	9	14.67
1B1	752.0	748.0	52.25	48.52	5/16	3.5	2.15	7.46	7	15.05
1B2	752.0	748.0	52.25	48.52	5/16	3.5	2.15	7.46	7	15.05
1C1	751.3	747.3	52.25	47.90	5/16	5	2.57	8.71	6	15.42
1C2	751.3	747.3	52.25	47.90	5/16	5	2.57	8.71	6	15.42
TOTAL TRENCH FLOW RATE										90.28

TRENCH DESIGN

TRENCH	GROUND ELEV.	TOP OF STONE ELEV.	PIPE INVERT ELEV.	DEPTH TO STONE FROM GROUND	DEPTH OF STONE	BOTTOM OF TRENCH ELEV.	EFFECTIVE DEPTH AT	EFFECTIVE DEPTH (D)	WIDTH OF TRENCHES (W)	TRENCH SPACING
1A1	754.3	750.0	750.3	3.5'	2.5'	748.3	5.5'	0.5	0'	10'
1A2	754.3	750.0	750.3	3.5'	2.5'	748.3	5.5'	0.5	0'	10'
1B1	752.0	749.3	748.0	3.5'	2.5'	746.8	5.5'	0.5	0'	10'
1B2	752.0	749.3	748.0	3.5'	2.5'	746.8	5.5'	0.5	0'	10'
1C1	751.3	747.0	747.3	3.5'	2.5'	745.3	5.5'	0.5	0'	10'
1C2	751.3	747.0	747.3	3.5'	2.5'	745.3	5.5'	0.5	0'	10'

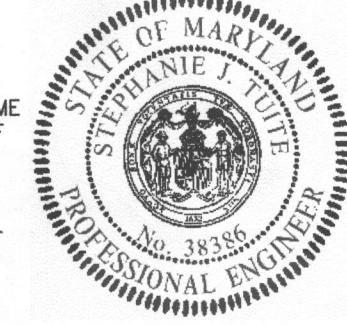
FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLSWORTH CITY, MARYLAND 21042
(410) 461-2895

0' 30' 60' 120'
SCALE: 1" = 30'

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: 01/12/2016.

Stephan J. Jurek 12/16/15
Signature Of Professional Engineer DATE



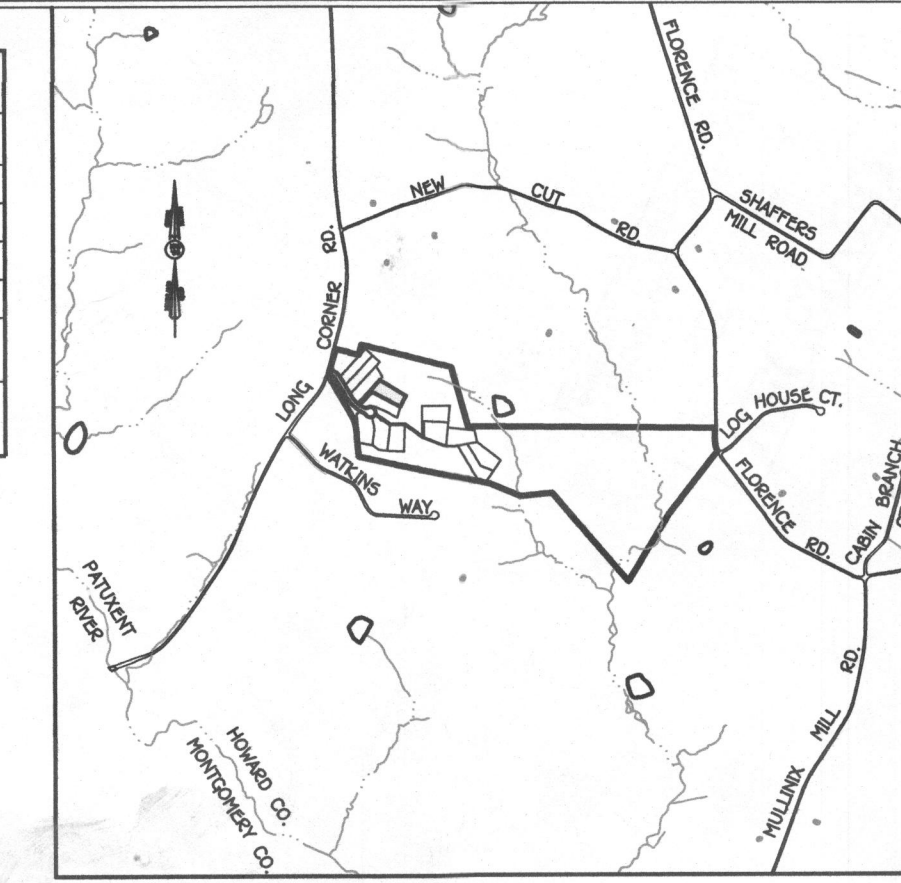
OWNER
CHELSEA KNOLLS, LC
1359 BEVERLY RD., SUITE 240
MCLEAN, VIRGINIA 22101
(703) 734-9730
(301) 720-3021

DEVELOPER
RYAN HONES, INC.
ATTN: KEVIN BOWSER
920 PATUXENT WOODS DRIVE
COLUMBIA, MARYLAND 21046
410-796-0980

BAT SITE PLAN
LOT 6
CHELSEA KNOLLS
18329 CHELSEA KNOLLS DRIVE
ZONING: RC-DEO
TAX MAP No. 12 GRID No. 5 PARCEL No. 78
FOURTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: DECEMBER, 2015
SHEET 1 OF 2

LEGEND

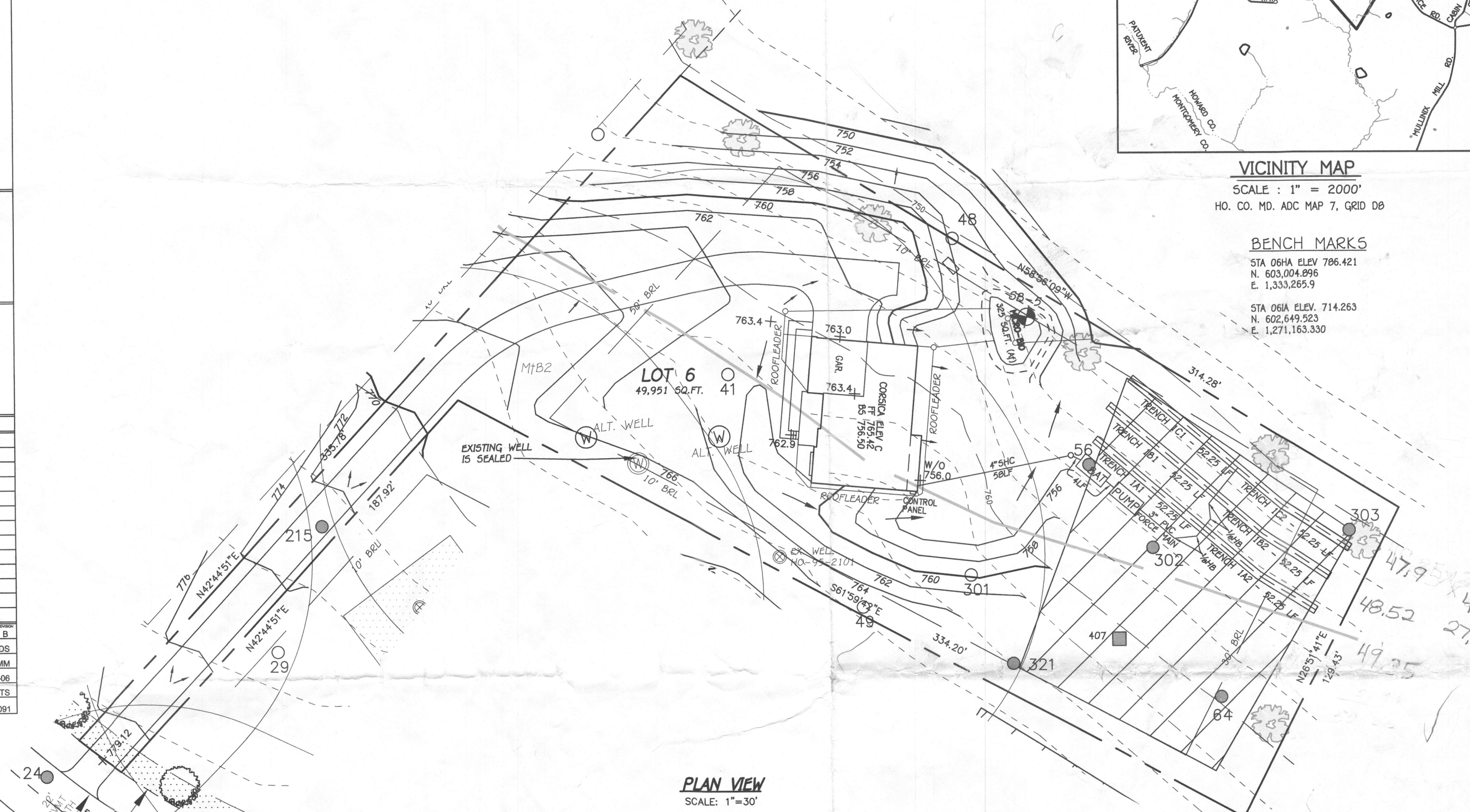
SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
- - -	PROPOSED CONTOUR 2' INTERVAL
•	SPOT ELEVATION
○	EXISTING WELL
○	EXISTING STREET TREES FROM F-12-072
○	EXISTING PERIMETER TREES FROM F-12-072



BENCH MARKS

STA 06+A ELEV. 786.421
N. 603,004.896
E. 1,333,265.9

STA 06+A ELEV. 714.263
N. 602,649.523
E. 1,271,163.330



- GENERAL NOTES**
- SUBJECT PROPERTY ZONED: RC-DEO
 - TOTAL AREA OF PROPERTY: 49,951 SQ. FT. OR 1.14 AC.
 - SEPTIC EASEMENT SUBJECT TO HOWARD COUNTY HEALTH DEPARTMENT REVIEW.
 - 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 HILDEBERG, 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.

NOTE

THE EXISTING WELL SHOWN ON THIS PLAN, TAG NO. HO #95-2101 HAS BEEN FIELD LOCATED BY FISHER, COLLINS & CARTER, INC., PROFESSIONAL LAND SURVEYORS AND IS ACCURATELY SHOWN.

SOILS LEGEND

SOIL	NAME	CLASS
HSE	ht. Any channery loam, 3 to 8 percent slopes, moderately eroded	A
HCE	ht. Any channery loam, 8 to 15 percent slopes, moderately eroded	A

Approved by Howard County Health Department
NORWECO TITL-500
w/ Monarch 1500-gal Pump tank
3 1/2" x 1 1/2" NISO pump or equiv.
12/31/15
Date

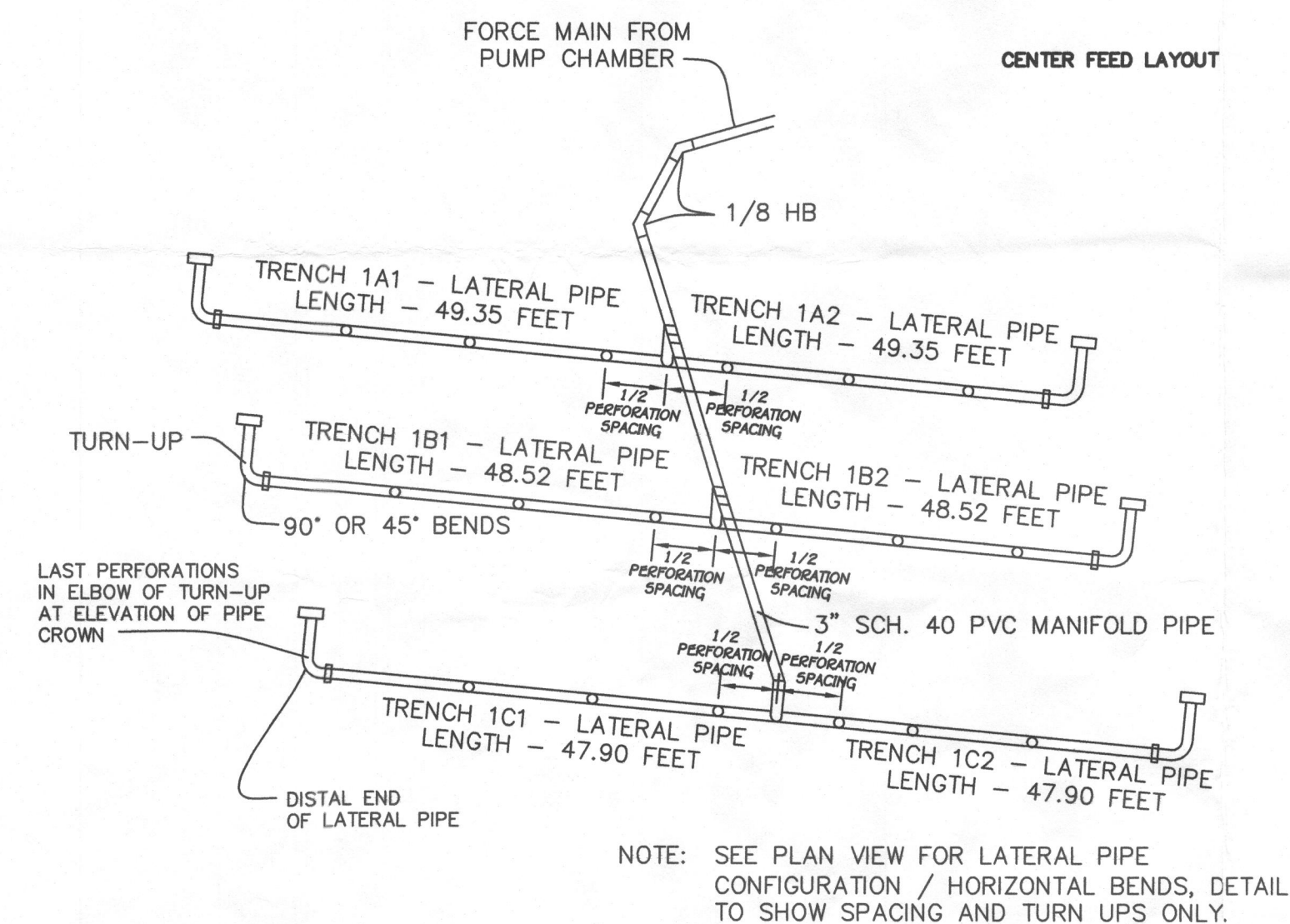
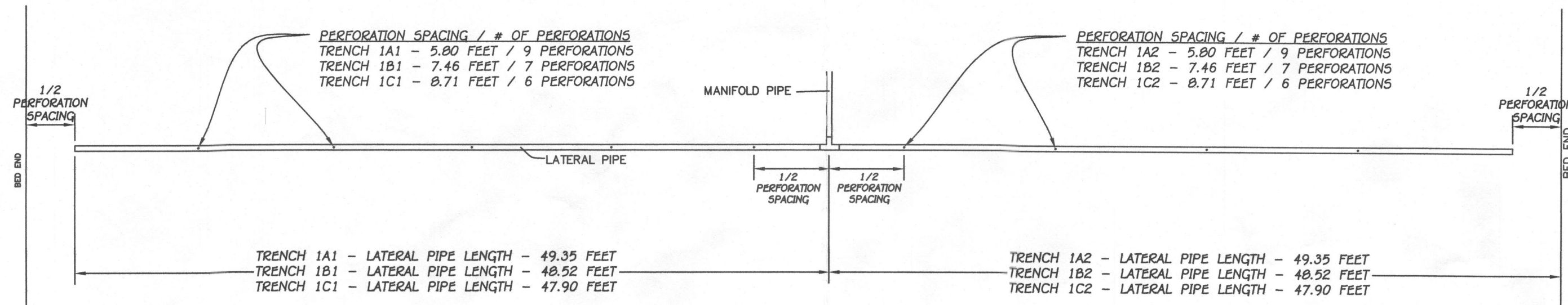
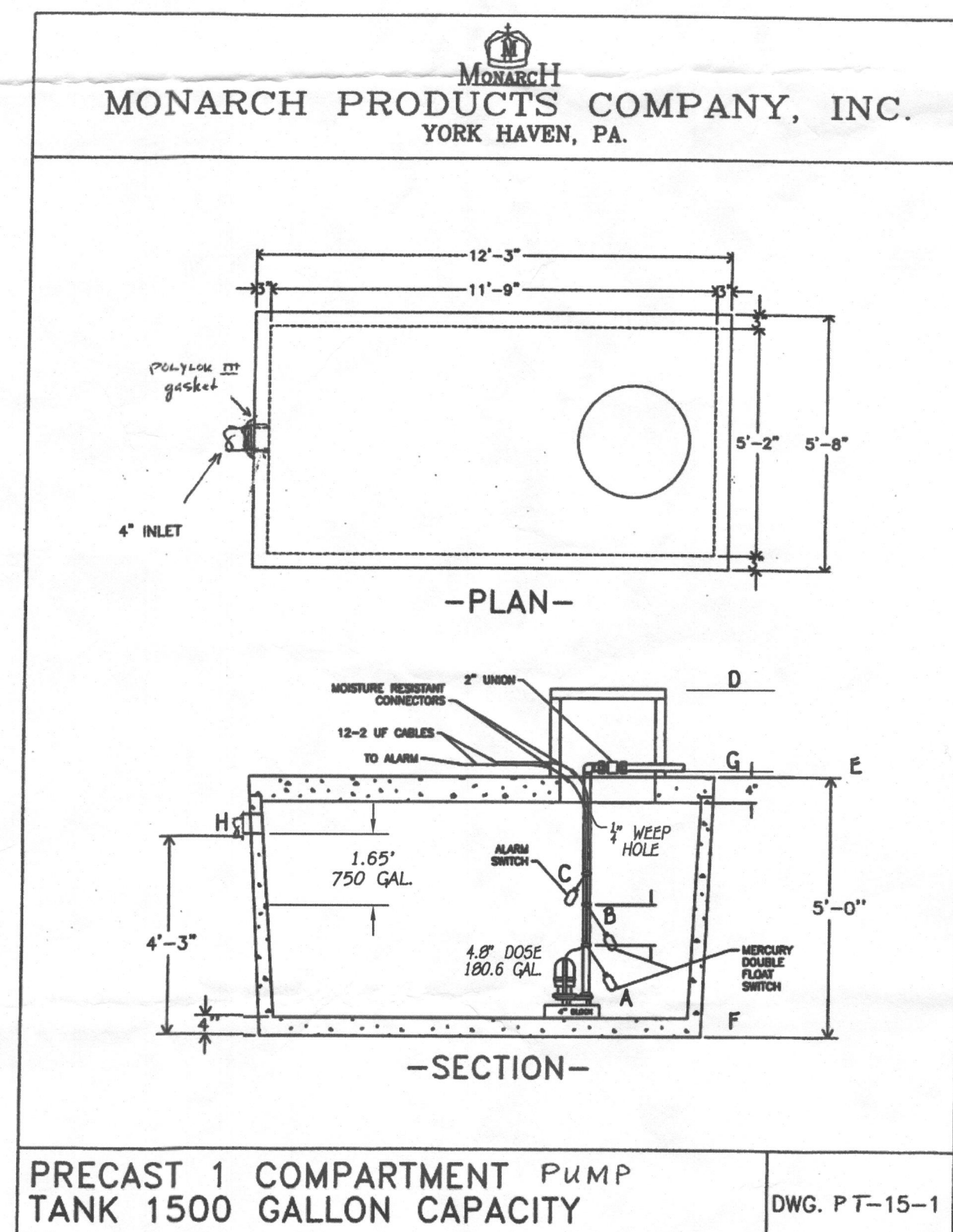


FIGURE 4.1 CENTER FEED MANIFOLD DISTRIBUTION NETWORK

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



PUMP ALARMS / INFORMATION
 A PUMP OFF : 749.16
 B PUMP ON : 749.56
 C HIGH WATER ALARM : 750.26
 D TOP OF ACCESS COVER : 755.40
 E TOP OF TANK : 752.66
 F BOTTOM OF TANK : 747.66
 G DISCHARGE OUT OF TANK : 752.83
 H INVERT INTO TANK : 751.91

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: 01/12/2016.

Signature of Professional Engineer
 DATE 12/16/15

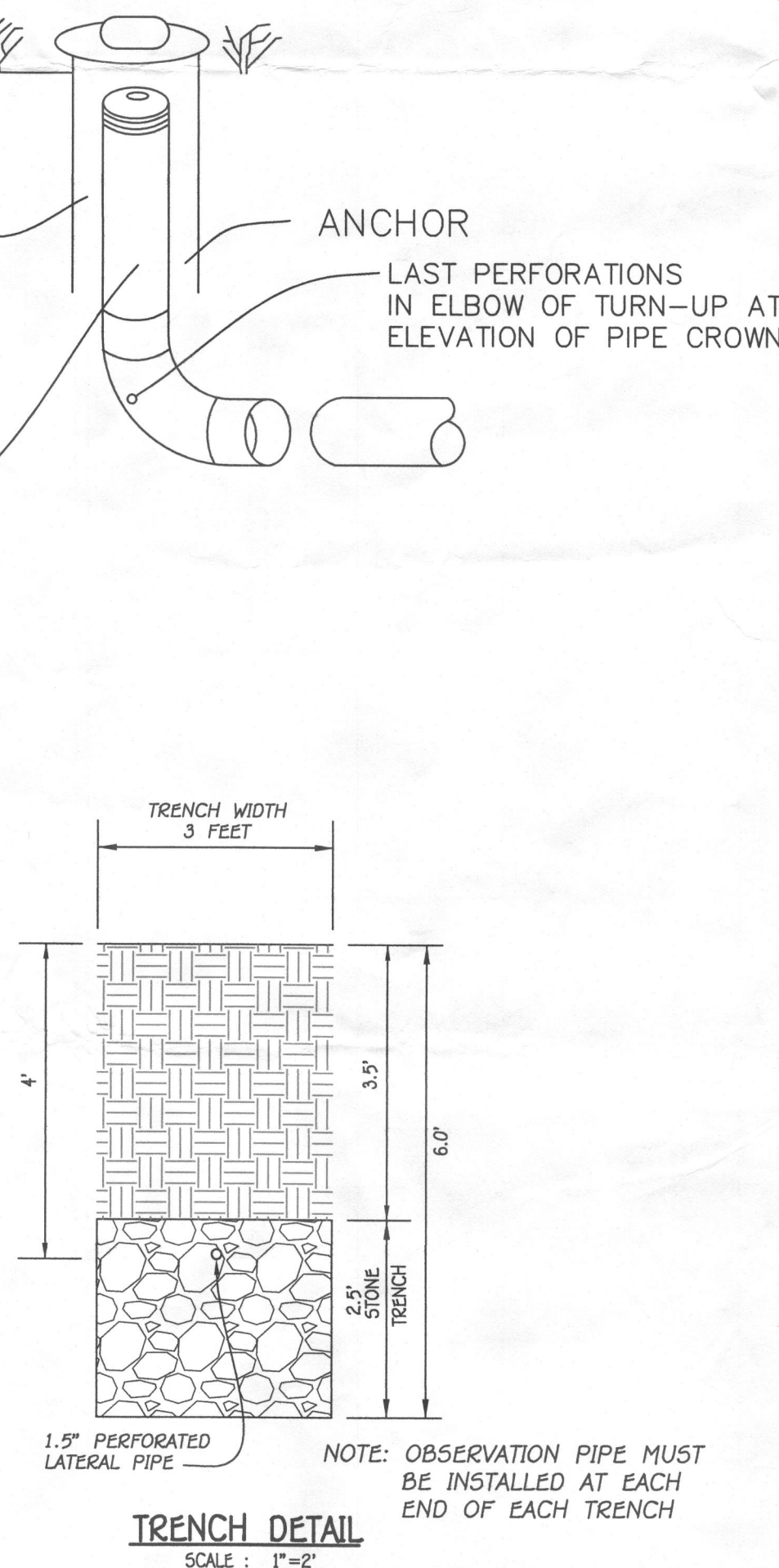


OWNER

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

DEVELOPER

RYAN HOMES, INC.
 ATTN: KEVIN BOWSER
 9720 PATRICK WOODS DRIVE
 COLUMBIA, MARYLAND 21046
 410-798-0980



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

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

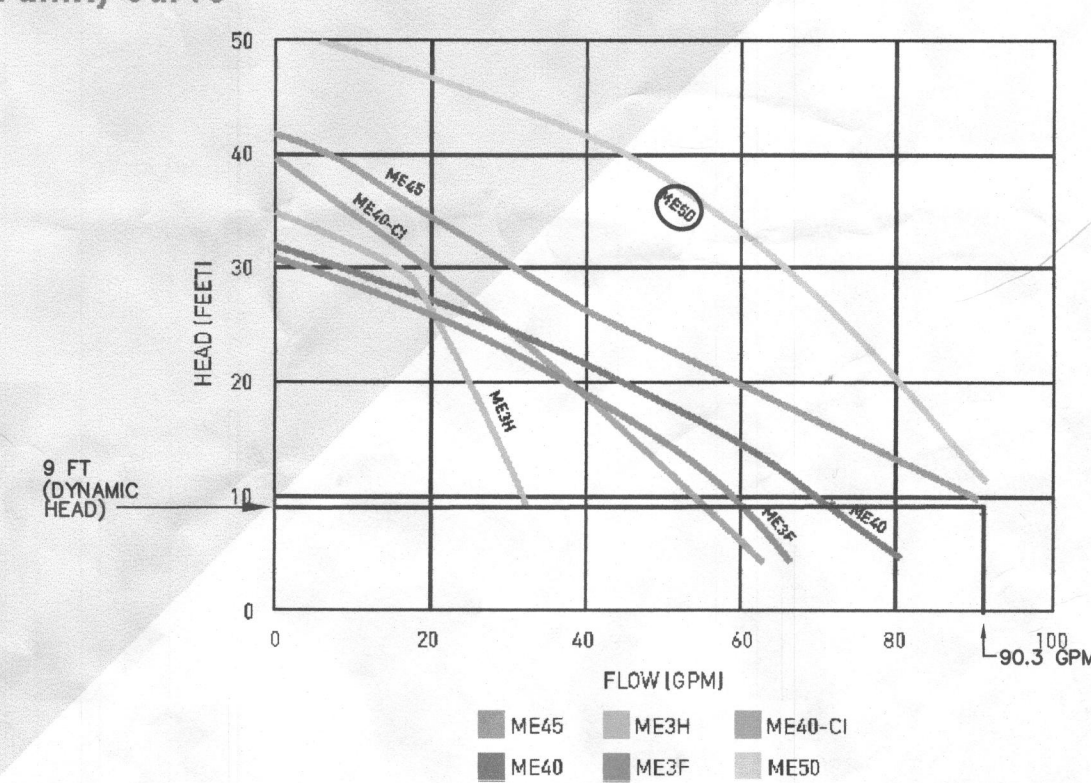
NO DRILLING REQUIRED

- Anti-airlock hole in base reduces added labor

EASY SERVICEABILITY

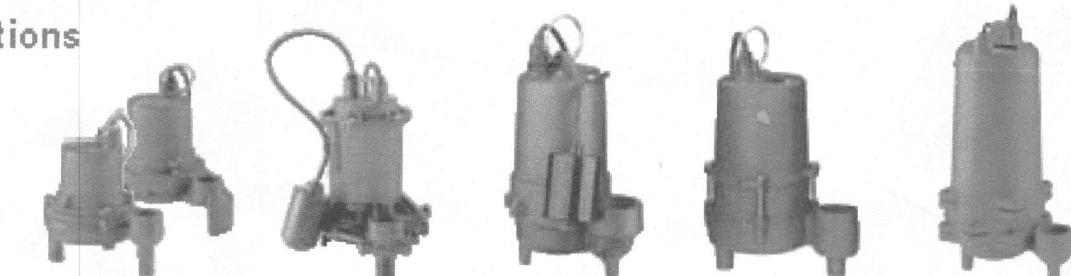
- Pump intake screen valve base, switch and power cord are serviceable

Family Curve

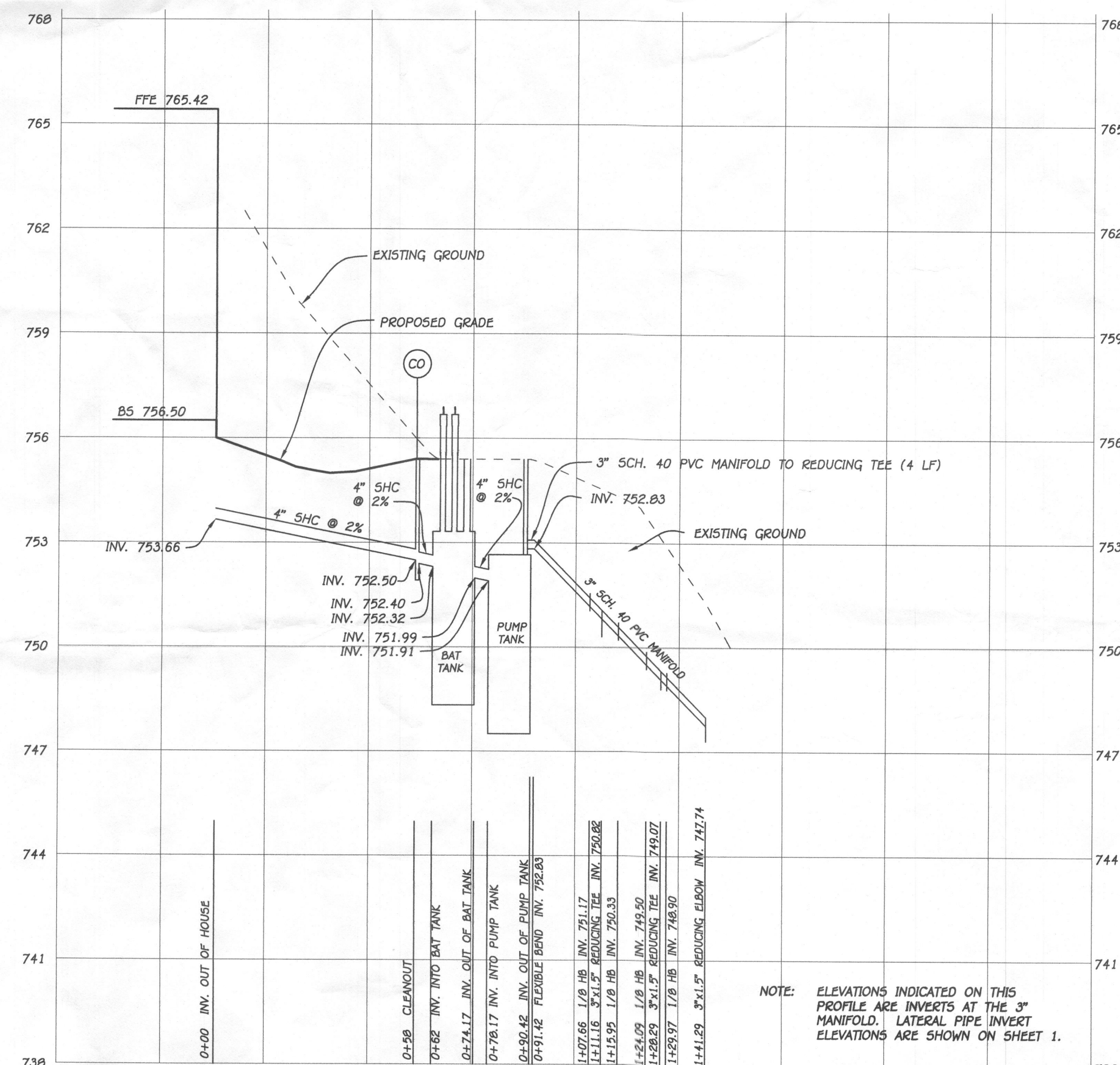
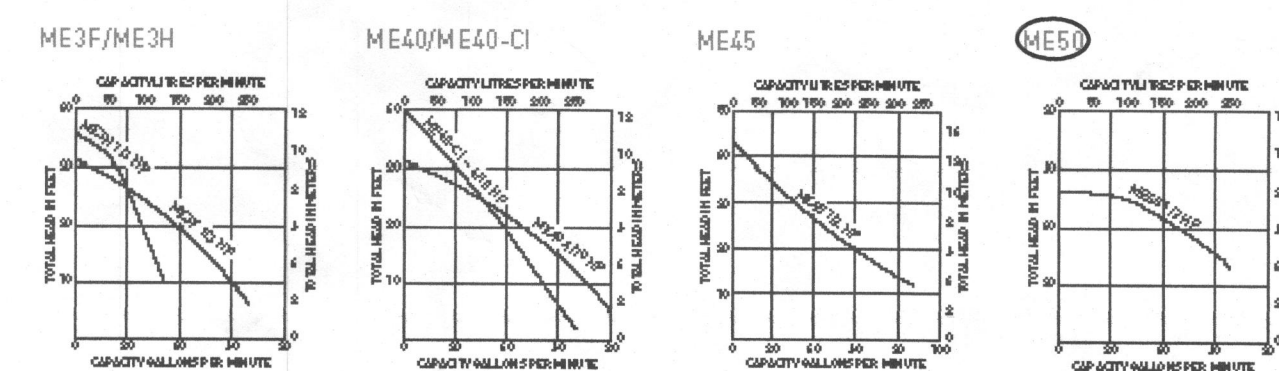


NOTE: USE A ME50 PUMP

Specifications



	ME3F/ME3H	ME40	ME40-CI	ME45	ME50
Capacities	ME3H: 36 GPM (134 LPM) ME3F: 60 GPM (227 LPM)	60 GPM (227 LPM)	60 GPM (227 LPM)	87 GPM (327 LPM)	120 GPM (454 LPM)
Shut-off Head	ME3H: 35' (10.7 m) ME3F: 21' (6.5 m)	32' (9.75 m)	40' (12 m)	44' (13.41 m)	95' (28.9 m)
Operation	Automatic or manual	Automatic or manual	Automatic or manual	Automatic or manual	Automatic or manual
Solder Handling	24" (19 mm)	24" (19 mm)	24" (19 mm)	24" (19 mm)	24" (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 140°F (60°C)	Intermittent up to 140°F (60°C)	Continuous 120°F (50°C)	Intermittent up to 140°F (60°C)	Intermittent up to 140°F (60°C)
Motor Electrical Data	1/2 HP, 1800 RPM, shaded pole, oil-filled, 115V, 12A, 18, 60Hz; 230V, 6A, 18, 60Hz	1/2 HP, 1800 RPM, PSC with thermal overload, oil-filled, 115V, 12A, 18, 60Hz; 230V, 6A, 18, 60Hz	1/2 HP, 1800 RPM, PSC with thermal overload, oil-filled, 115V, 12A, 18, 60Hz; 230V, 6A, 18, 60Hz	1/2 HP, 1800 RPM, PSC with thermal overload, oil-filled, 115V, 12A, 18, 60Hz; 230V, 6A, 18, 60Hz	1/2 HP, 1800 RPM, PSC with thermal overload, oil-filled, 115V, 12A, 18, 60Hz; 230V, 6A, 18, 60Hz
Acceptable pH Range	6-9	5-9	5-9	5-9	5-9
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/Valve	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Valve Base	Cast iron	Fiberglass reinforced polypropylene	Cast iron	Cast iron	Cast iron
Impeller	Fiberglass-reinforced	Cast iron	Thermoplastic, non-clog, 30 max type	Cast iron	Cast iron
Exterior Hardware	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Power Cord	20', 14/2, SJTW	20', 14/2, SJTW	20' 16 in, 14/2, SJTW, 4.5/1W	20', 14/2, 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)



NOTE: ELEVATIONS INDICATED ON THIS PROFILE ARE INVERTS AT THE 3" MANIFOLD, LATERAL PIPE INVERT ELEVATIONS ARE SHOWN ON SHEET 1.

Approved Septic System Plan
 Howard County Health Department
 NORMAN TINTIP, ESQ.
 1500 E. 1500 E. 1500 E.
 12/13/15
 Date

BAT SITE PLAN

LOT 6
CHELSEA KNOLLS
 18329 CHELSEA KNOLLS DRIVE

ZONING: RC-DEO
 TAX MAP No. 12 GRID No. 5 PARCEL No. 78
 FOURTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 DATE: DECEMBER, 2015
 SHEET 2 OF 2