

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: 4/7/16 **ONSITE SEWAGE DISPOSAL SYSTEM** P 585070

APPROVAL DATE: 7/25/16 **PERMIT:** **CONSTRUCTION** A _____

PROPERTY ADDRESS: 11021 Fuzzy Hollow Drive Way

SUBDIVISION: Melchoir Property LOT: 2 TAX ID: 03596006

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

CONTRACTOR ADDRESS: P.O. Box 519, Annapolis Junction, MD 20701 PHONE: _____

CONTRACTOR CERTIFIED FOR BAT INSTALLATION: MDE MANUFACTURER:

PROPERTY OWNER: Williamsburg Group LLC EMAIL: marinamorris@williamsburgllc.com

OWNER ADDRESS: 5485 Harpers Farm Road, Columbia, MD 21044 PHONE: 410-997-8800

BAT UNIT MODEL: Norweco TNTLP 1000 PUMP SIZE: N/A PUMP TANK CAPACITY: N/A

OPERATION & MAINTENANCE AGREEMENT DATE SIGNED: 1/15/16 DATE RECORDED: 1/15/16

DISTRIBUTION SYSTEM: GRAVITY PRESSURE DOSED BEDROOMS: 7 APPLICATION RATE: 1.2

TRENCHES:	LINEAR FEET REQUIRED: <u>158'±</u>	INLET DEPTH: <u>3</u>
	TRENCH WIDTH: <u>23'</u>	MAXIMUM BOTTOM DEPTH: <u>7</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>109'</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>3</u>

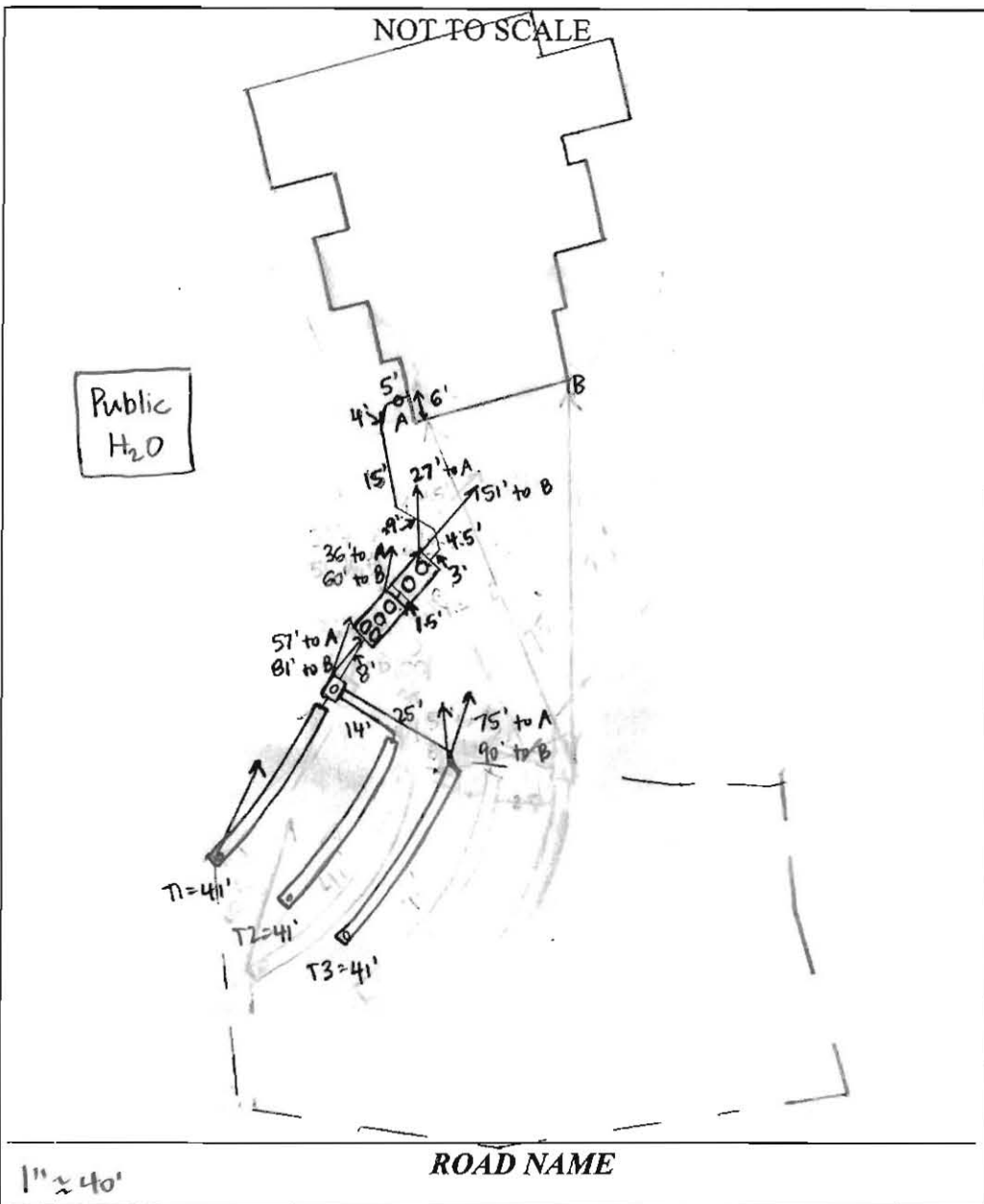
LOCATION: **PER APPROVED SITE PLAN. SEWAGE DISPOSAL AREA AND BAT UNIT LOCATION MUST BE STAKED BY LICENSED SURVEYOR PRIOR TO PRE-CONSTRUCTION INSPECTION.**

NOTES: Install 3 x 4' trenches

ISSUED BY: Robert Freemon ISSUE DATE: 7/14/16 EXPIRATION DATE: 7/14/17

- 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 16002454
- 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	3	7
NUMBER OF TRENCHES	3	
TOTAL LENGTH	123'	
ABSORPTION AREA	369' + SIDEWALL	
DISTRIBUTION BOX LEVEL	Level 10'	
DISTRIBUTION BOX BAFFLE	Yes	
DISTRIBUTION BOX PORT	Yes	

SEPTIC TANK DATA	
SEPTIC TANK I LEVEL	YES
MANUFACTURER	BACKRIVER
CAPACITY	1000 GAL
SEAM LOC	TOP
TANK LID DEPTH	2'
BAFFLES	NO
BAFFLE FILTER	NO
MANHOLE LOC	FRONT + REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	6-11-16
PUMP/SEPTIC TANK LEVEL	YES
MANUFACTURER	BACKRIVER / NORWECO
CAPACITY	GAL
SEAM LOC	TOP
TANK LID DEPTH	2-2.5'
BAFFLES	NO
BAFFLE FILTER	NO
MANHOLE LOC	FRONT, MID, 2 REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	6-02-16

PRE-CONSTRUCTION:

7/14/16 Met Hatfield's on site for layout. All SDA + tank stakes present. Laid out 3x41' trenches on contour. (S)

INSTALLATION: 7/15/16 House connection made. Trash tank set, tank hole for BAT dug. (S)

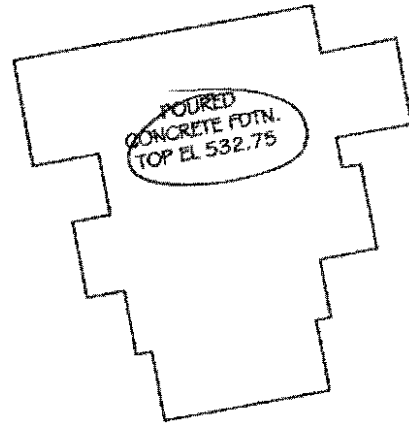
7/15/16 BAT tank set. D-box set + connected to tank. (Need baffles on trash tank.) (S)

7/18/16 Trenches complete. Need start-up certification of BAT system for final approval (KMU) 7/25/16 BAT startup certification received. (S)

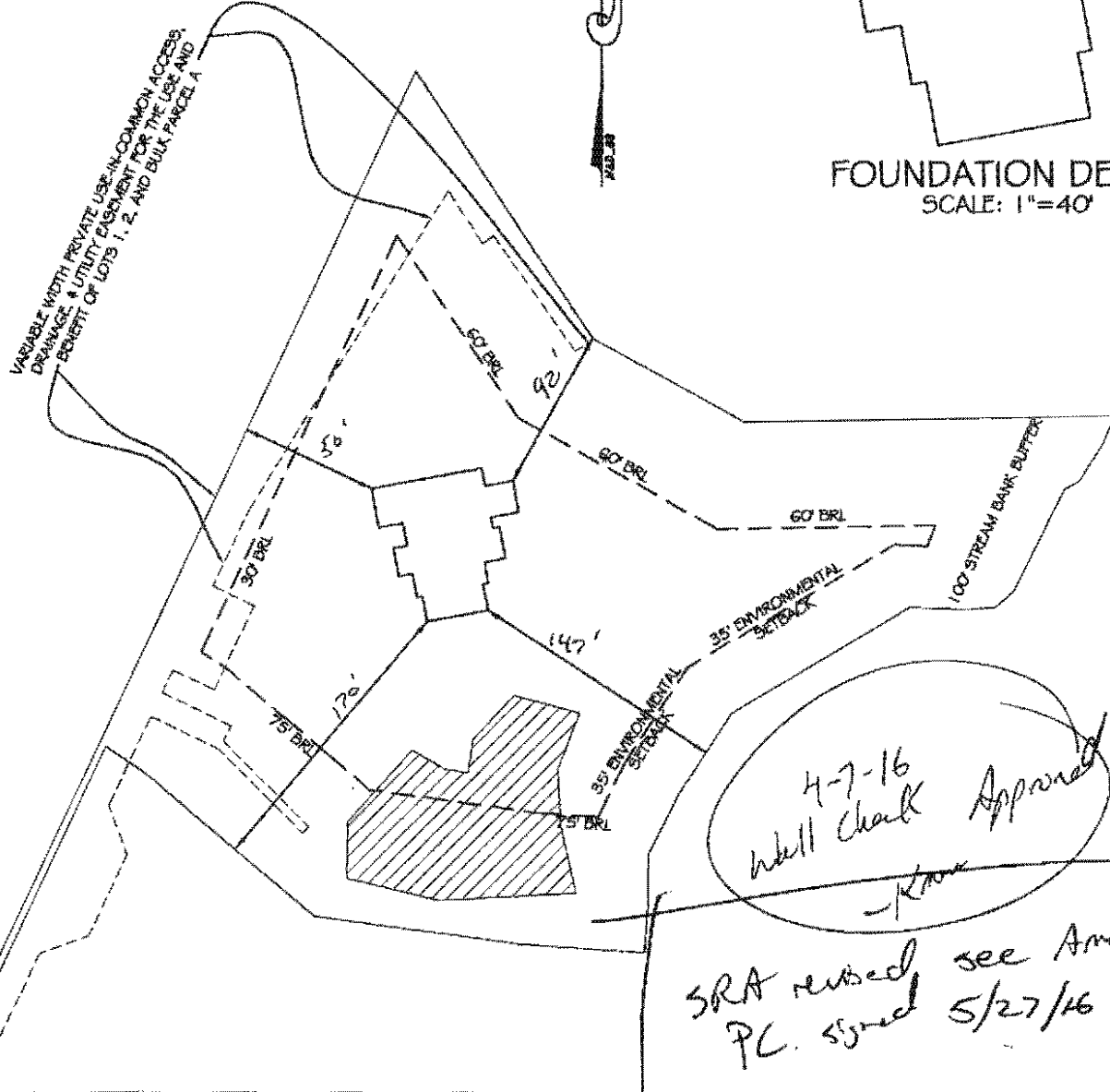
FINAL INSPECTOR Sarah Collins DATE OF APPROVAL 7/25/16

NOTES:

1. ACCURACY OF BUILDING MEASUREMENTS: 0.1'
2. ACCURACY OF SETBACK DIMENSIONS: 0.3'
3. ACCURACY OF ELEVATIONS: 0.1'
4. THE PROPERTY SHOWN HEREON LIES IN ZONE "X" AS SHOWN ON FLOOD INSURANCE RATE MAP NO. 24027C0060D DATED: 11/06/2013.
5. BEARINGS AND DISTANCES SHOWN HEREON ARE FROM A SUBDIVISION PLAT ENTITLED "MELCHIOR PROPERTY, LOTS 3 THROUGH 6 AND NONBUILDABLE PRESERVATION PARCEL A" SHEETS 1-5 OF 5, RECORDED IN PLATS #22756-22762.



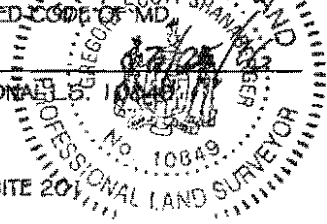
FOUNDATION DETAIL
SCALE: 1"=40'



4-7-16
Infill Check Approved
-Knox
SRA revised see Amended
PL. signed 5/27/16

THE INFORMATION SHOWN HAS BEEN ESTABLISHED BY CURRENT ACCEPTABLE SURVEY PROCEDURES AND FROM AVAILABLE RECORD INFORMATION. THIS DRAWING IS NOT TO BE USED FOR THE ESTABLISHMENT OF PROPERTY LINES, LOCATION OF FENCES, GARAGES, BUILDINGS, OR OTHER FUTURE IMPROVEMENTS. IT WAS PREPARED UNDER MY DIRECT SUPERVISION AND REVIEW IN ACCORDANCE WITH SEC. 09.13.06.06 OF THE ANNOTATED CODE OF MD.

G. Scott Shanaberger
G. SCOTT SHANABERGER PROFESSIONAL LAND SURVEYOR
LICENSE EXPIRATION DATE 4/2/2016
SHANABERGER & LANE
8726 TOWN AND COUNTRY BLVD., SUITE 201
ELICOTT CITY, MD. 21043
(410)461-9563 FAX: (410)461-9693



FOUNDATION LOCATION DRAWING
LOT 2 MELCHIOR PROPERTY
PLAT # 22721-22725
TAX MAP 10 GRID 13 PARCEL 184
3rd ELECTION DISTRICT HOWARD COUNTY, MD.
SCALE: 1"=100' DATE: 2/16/2016



BOOK: 16650 PAGE: 336
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 Twitter: HowardCoHealthDep

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 15th day of Jan 2014, among Nathan + Danelle De Graw, 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 Lot 2, Melchior Property 11021 Fuzz Hollow Way, in the 3RD 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 11142-Folio 440

20
40
80

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. The pre-treatment device being installed is Norweco 1000.

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

JW 8/8/2014

000068

LR - Agreement
 Recording Fee 20.00
 Grantor/Grantee Name:
 DeGraw
 Reference/Control #:
 EB
 LR - Agreement
 Surcharge 40.00
 Subtotal: 60.00
 Total: 60.00
 01/15/2014 11:33
 #5449179 CC0502
 CC13-05
 Howard Co
 Columbia/CC05.03.07
 Register 07



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 Twitter: HowardCoHealthDep

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JW 8/8/2014

99-68

LR - Agreement
 Recording Fee 20.00
 Operator/Operator Name:
 JEREM
 Reference/Control #:
 LR - Agreement
 Operator
 Subtotal: 52.00
 Total: 52.00
 01/15/2014 11:31
 425449179 638585
 Howard Co
 Columbia/COES-03.M/1
 Recorder M7

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.

Best Nuyon 1/15/2014
Howard County Health Department

[Signature]
Owner #1 Signature Date
Bob Corbett
Williamsburg Group LLC
Owner #1 Print Name

Owner #2 Signature Date

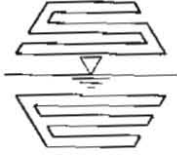
Owner #2 Print Name

Nathan De Graw 11/17/2015
Buyer #1 Signature Date
Nathan De Graw
Buyer #1 Print Name

Danelle De Graw 11/17/2015
Buyer #1 Print Name
Danelle De Graw

Nathan De Graw
Buyer #2 Signature Date

Danelle De Graw
Buyer #2 Print Name



3300 North Ridge Road, Suite 160
Ellicott City, MD 21043
Website: www.sillengineering.com

Office: 443-325-7682
Fax: 443-325-7685
Email: info@sillengineering.com
Civil Engineering for Land Development

SILL ENGINEERING GROUP, LLC

Melchior Property

Lot 2

11021 Fuzzy Hollow Way

BAT Plan

June 1, 2016

Prepared For:

Williamsburg Group, LLC
5485 Harpers Farm Road
Columbia, Maryland 21044



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. 32025,
Expiration Date: June 20, 2017

Project #15-023

Septic System Trench Design Specifications

Initial System:

- Application Rate: 1.2
- Effective Area Beginning Depth: 3.0'
- Bottom Maximum Depth: 7.0'
- Design Flow:
 - 7 Bedrooms at 150 gpd
 - $7 \times 150 \text{ gpd} = 1,050 \text{ gpd}$
- Square Footage of Drain field Required:
 - Design Flow (1,050 gpd) / Application Rate (1.2) = 875 sf
- Sidewall Reduction Credit:
 - Trench Width (W) = 3'
 - Trench Effective Depth (D) = 4'
 - $(W+2) / (W+1+2D) \times 100 = __\% = (3+2) / (3+1+2(4)) \times 100 = 5/12 = 0.417 \times 100 = 41.7\%$
- Linear Length of Trench Required:
 - Drain field Square Footage (875) x Sidewall Reduction Credit (0.417) / Trench Width (3') = $364.9/3 = 121.6'$
- Linear Length of Trench Provided = 122
 - Three trenches 41 lf each

Replacement System 1:

- Application Rate: 0.8
- Effective Area Beginning Depth: 5'
- Bottom Maximum Depth: 8.0'
- Design Flow:
 - 7 Bedrooms at 150 gpd
 - $7 \times 150 \text{ gpd} = 1,050 \text{ gpd}$
- Square Footage of Drain field Required:
 - Design Flow (1,050 gpd) / Application Rate (0.8) = 1,312.5 sf
- Sidewall Reduction Credit:
 - Trench Width (W) = 3'
 - Trench Effective Depth (D) = 3'
 - $(W+2) / (W+1+2D) \times 100 = __\% = (3+2)/(3+1+2(3)) \times 100 = 5/10 = 0.50 \times 100 = 50\%$
- Linear Length of Trench Required:
 - Drain field Square Footage (1,312.5) x Sidewall Reduction Credit (0.50) / Trench Width (3') = $656.25/3 = 218.75$
- Linear Length of Trench Provided = 219
 - Three trenches 73 lf each

Replacement System 2:

- Application Rate: 1.2
- Effective Area Beginning Depth: 3'
- Bottom Maximum Depth: 6.0'

Melchior Property

Lot 2

June 1, 2016

- Design Flow:
 - 7 Bedrooms at 150 gpd
 - $7 \times 150 \text{ gpd} = 1,050 \text{ gpd}$
- Square Footage of Drain field Required:
 - Design Flow (1,050 gpd) / Application Rate (1.2) = 875 sf
- Sidewall Reduction Credit:
 - Trench Width (W) = 3'
 - Trench Effective Depth (D) = 3'
 - $(W+2) / (W+1+2D) \times 100 = __\% = (3+2)/(3+1+2(3)) \times 100 = 5/10 = 0.5 \times 100 = 50\%$
- Linear Length of Trench Required:
 - Drain field Square Footage (875) x Sidewall Reduction Credit (0.50) / Trench Width (3') = $437.5/3 = 145.8'$
- Linear Length of Trench Provided = 146'
 - Two trenches 73 lf each



11130 Dovedale Court, Suite 200
Marriottsville, MD 21104
Website: www.sillengineering.com

Office: 443-325-5076
Fax: 410-696-2022
Email: info@sillengineering.com

Civil Engineering for Land Development

SILL ENGINEERING GROUP, LLC

Melchior Property
Lot 2
11021 Fuzzy Hollow Way

BAT Plan

November 24, 2015

Prepared For:

Williamsburg Group, LLC
5485 Harpers Farm Road
Columbia, Maryland 21044

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. 32025,
Expiration Date: June 20, 2017

Project #15-023

Melchior Property
Lot 2
11021 Fuzzy Hollow Way
November 24, 2015

Septic System Trench Design Specifications

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- Linear Length of Trench Required:
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- Linear Length of Trench Provided = 122'
 - Two trenches 61 lf each

Use 2'
11x

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 - Drain field Square Footage (1,312.5) x Sidewall Reduction Credit (0.50) / Trench Width (3') = $656.25/3 = 218.75$
- Linear Length of Trench Provided = 219
 - Three trenches 73 lf each

Replacement System 2:

- Application Rate: 1.2
- Effective Area Beginning Depth: 3'

Melchior Property
Lot 2
11021 Fuzzy Hollow Way
November 24, 2015

- Bottom Maximum Depth: 6.0'
- Design Flow:
 - 7 Bedrooms at 150 gpd
 - $7 \times 150 \text{ gpd} = 1,050 \text{ gpd}$
- Square Footage of Drain field Required:
 - Design Flow (1,050 gpd) / Application Rate (1.2) = 875 sf
- Sidewall Reduction Credit:
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 - Trench Effective Depth (D) = 3'
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 - Drain field Square Footage (875) x Sidewall Reduction Credit (0.50) / Trench Width (3') = $437.5/3 = 145.8'$
- Linear Length of Trench Provided = 146'
 - Two trenches 73 lf each

Pumping System Design

- Dose Calculations:
 - Design Flow: 1050 gpd
 - Length of 2.0" force main = 36.73'
 - Volume of force main:
 - $36.73 \times 17.4 \text{ gallons per } 100' = 6.4 \text{ gallons}$
 - Minimum dose is the greater of:
 - Volume of force: 6.4 gallons
 - Or
 - $1/6^{\text{th}}$ the design flow:
 - $1/6 \times 1050 \text{ gallons} = 175.0 \text{ gallons}$

Use 175 gallons for dose

Pump Design:

- Pump flow required: 43.75 gpm
- Dose amount: 175.0 gallons
- Pump run time: 4 minutes
- Static head (see profile for detail): 9.39 use 9.4'

Melchior Property
 Lot 2
 11021 Fuzzy Hollow Way
 November 24, 2015

- Friction head calculation (Table 4.3):

Pipe size		2.0" FORCE MAIN
1/4 Bend (90°)	-	-
1/8 Bend (45°)	-	2 @ 4.0' = 8.0'
1/16 Bend (22.5°)	-	-
1/32 Bend (11.25°)	-	-
Gate Valve	-	1 @ 1.3' = 1.3'
Standard Tee	-	-
Run Tee	-	-
Quick Disconnect	-	1 @ 4.5' = 4.5'
Reducer	-	-
Couplings	-	1 @ 2.0' = 2.0'
Total Equivalent Length of pipe		15.8'

- Flow at 2.0" pipe = 43.75 gpm

- Friction loss per 100' (Table 4.4) of 2.0" schedule 40 plastic pipe: 1.28

- Total equivalent length of 2.0" Force Main and appurtenances =
 $36.73 + 15.8 = 52.53'$

- Friction loss in 2.0" pipe = $52.53/100 \times 1.28 = 0.7'$

- Total Friction Head = 0.70'

- Total Dynamic Head = Static head + Distal Head + Friction head

- $9.4' + 2.0' + 0.7' = 12.1'$

- Pretreatment Chamber Design:

- For pretreatment dimensions and details, see plans.

- Pump Chamber Design:

- For pump tank dimensions and detail, see plans.

- Pump chamber elevations:

- Proposed grade at top of tank: 511.00'

- Top of pump tank: 509.38'

- Pump chamber invert in: 508.30'

- High Water Alarm: 505.90'

- Pump On: 505.40'

- Pump Off: 504.89'

- Bottom inside slab of tank: 503.21'

- Pump Chamber volumes:

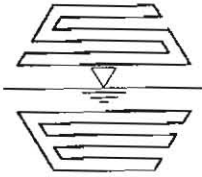
- Inside top of tank to Pump On: 167.22 cf or 1,250.92 gallons

- Pump On to Pump Off: 23.37cf or 174.82 gallons

- Design based on:

- Norweco TNTLP-1000 GPD or equivalent

- Meyers MWS5 series pump or equivalent



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 Marriottsville, MD 21104
 Website: www.sillengineering.com
 Civil Engineering for Land Development

Office: 443-325-5076
 Fax: 410-696-2022
 Email: info@sillengineering.com

SILL ENGINEERING GROUP, LLC

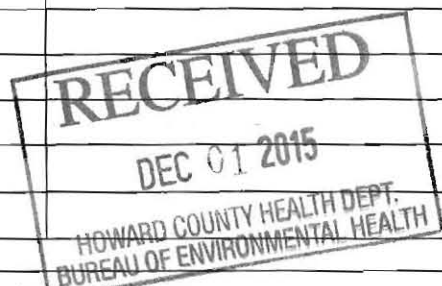
To: Mr. Jeff Williams
 Howard County Health Department
 Bureau of Environmental Health
 8930 Stanford Boulevard
 Columbia, MD 21045

Date:	November 30, 2015
Attention:	Robert Bricker
Re:	11021 Fuzzy Hollow Drive Melchior Property, Lot 2 Site Plan For BAT
Project #:	15-023

We are sending you

<input checked="" type="checkbox"/> Attached	Under Separate Cover Via Mail the following:	
Letter	Originals	Other:
<input checked="" type="checkbox"/> Plans	Computations	

Quantity	Description	Quantity	Description
3	Site Plan for BAT Installation		
1	BAT Plan Report		



These are transmitted as checked below

<input checked="" type="checkbox"/> For Approval	As Requested	<input checked="" type="checkbox"/> Please Return A Copy After Using
<input checked="" type="checkbox"/> For Review	For Your Use	As Approved

Comments:

Copy To:

Signed:

Anita E. Allen
 Anita E. Allen

Received by:

Date Received:

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 1000 GPD Septic Tank installed at 11021 Fuzzy Hollow Way, Marriottsville, MD 21104 on July 15, 2016 was installed according to the manufacture's specifications.

Installer: Ken Hatfield Sr.

Property Owner: Williamsburg Group, 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



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

Twitter: HowardCoHealthDep

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

SEWAGE DISPOSAL SYSTEM SPECIFICATIONS WORKSHEET

Address: Fuzzy Hollow Way

Subdivision: Melchior Property Lot: 2

Initial system:	Application rate: <u>1.2</u>	Effective area beginning depth: <u>3</u>	Bottom maximum depth: <u>7</u>
1 st Replacement:	Application rate: <u>0.8</u>	Effective area beginning depth: <u>5</u>	Bottom maximum depth: <u>8</u>
2 nd Replacement:	Application rate: <u>1.2</u>	Effective area beginning depth: <u>3</u>	Bottom maximum depth: <u>6</u>

Design Flow = 150 gallons per day per bedroom

Design flow ÷ application rate = square footage of drainfield required

Linear length of trench required = drainfield square footage x sidewall reduction percentage ÷ trench width

Sidewall reduction credit formula:

$$\frac{W + 2}{W + 1 + 2D} \times 100 = \text{Percent of length of standard trench where } W = \text{trench width and } D = \text{depth between effective area beginning depth and trench bottom.}$$

Standard design requirements:

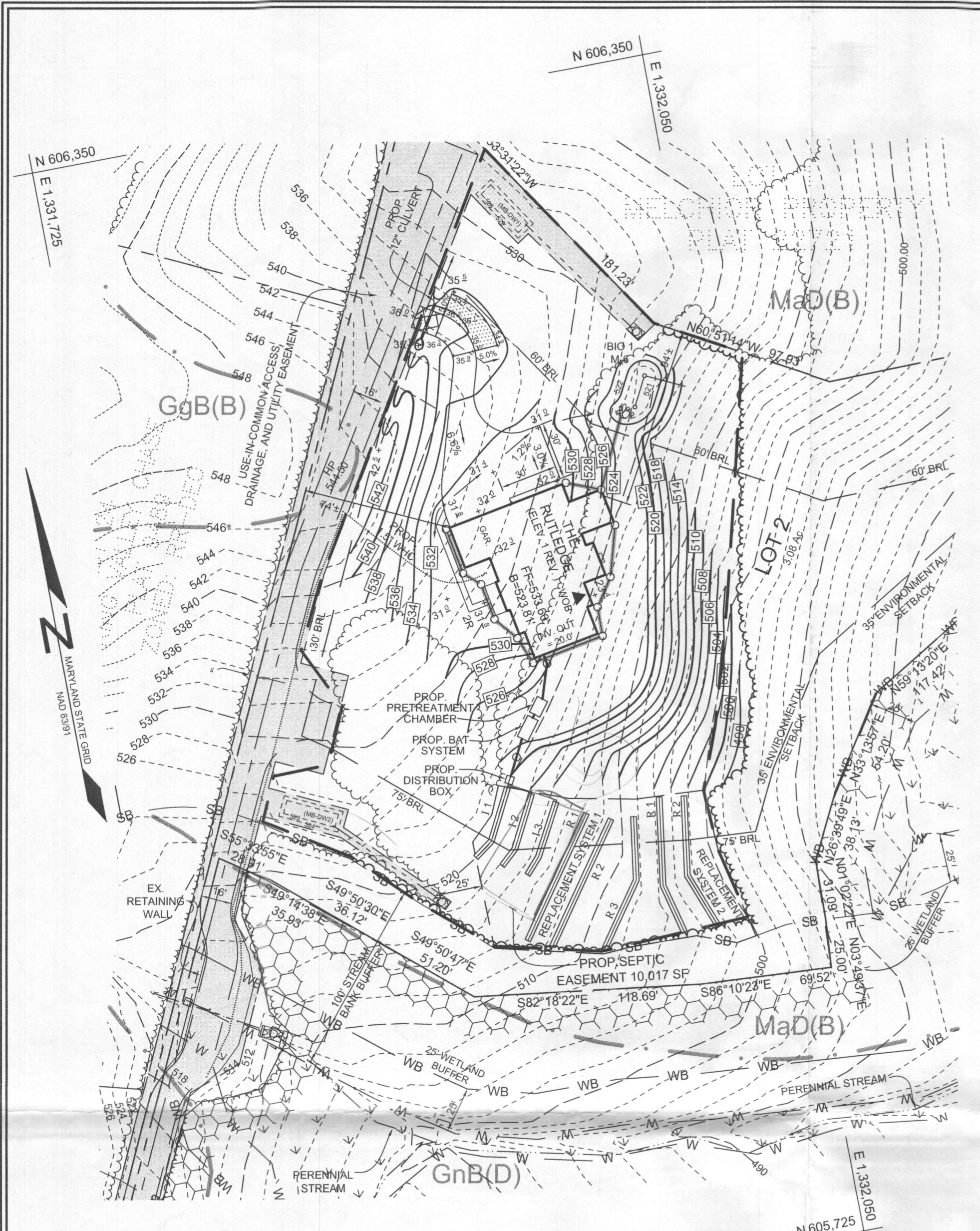
- All trenches must be equal length unless low pressure dosed
- All trenches must be on contour
- Minimum trench spacing: 10' for all trenches utilizing sidewall reduction credit. Additional spacing may be necessary for any trench using over 3.5' of effective sidewall. In those cases, the spacing formula is 2D + W up to a maximum spacing of 18'.
- Minimum trench spacing for trenches with no sidewall credit (bottom area only) is 6' for a 2' wide trench and 9' for a 3' wide trench (spacing is measured edge to edge)
- Maximum trench length is 100'
- Maximum pipe depth is 4'

Additional requirements:

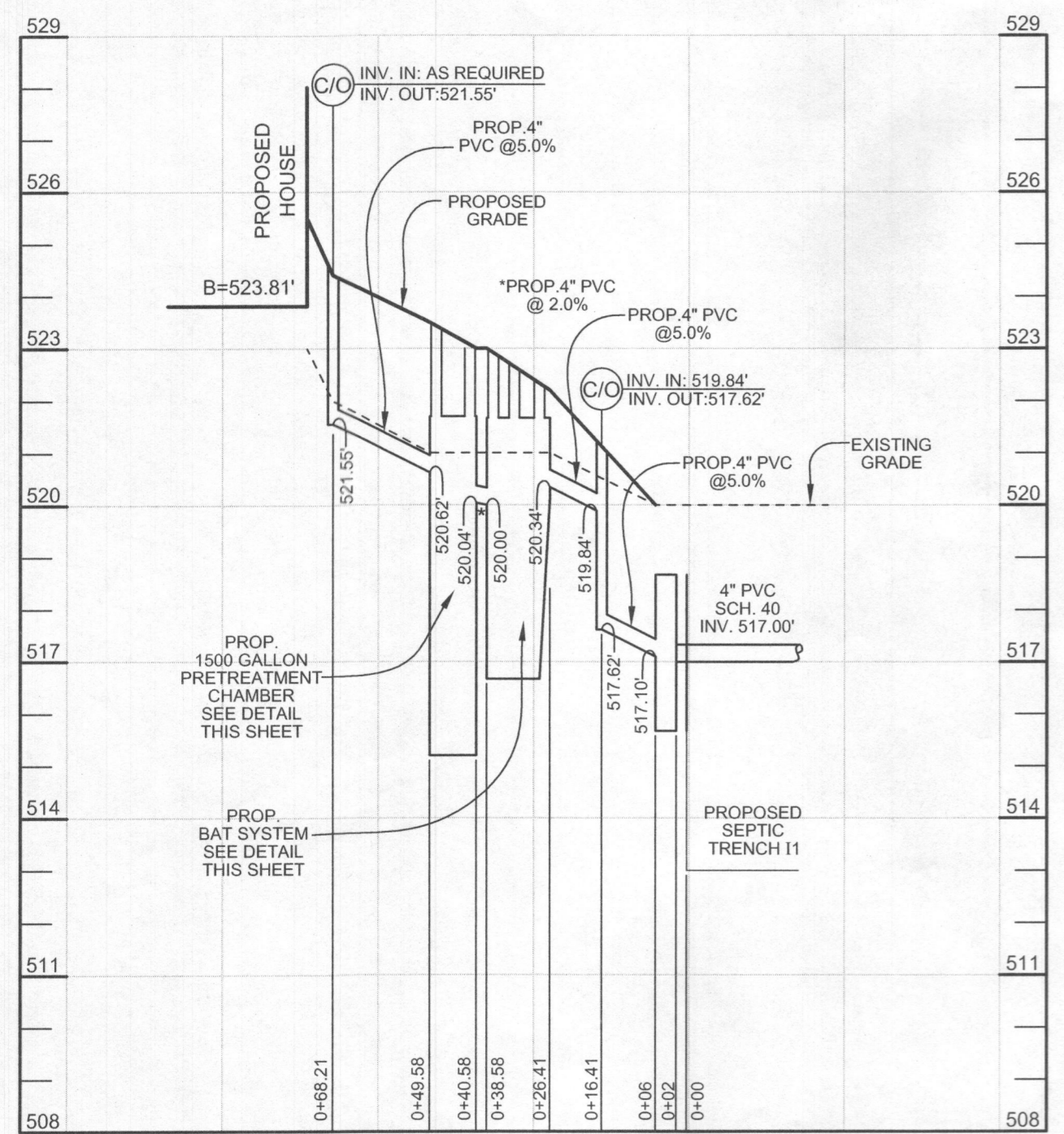
BAT unit.

Approved: Bricker

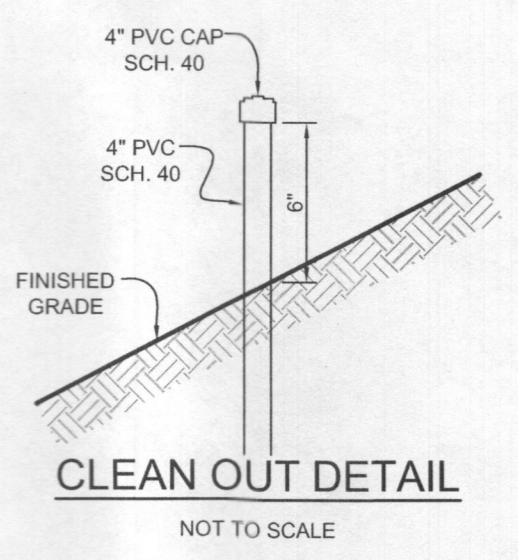
Date: 7/22/15



PLAN VIEW
SCALE: 1"=50'



BAT SYSTEM PROFILE
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=3'



CLEAN OUT DETAIL
NOT TO SCALE

BAT NOTES

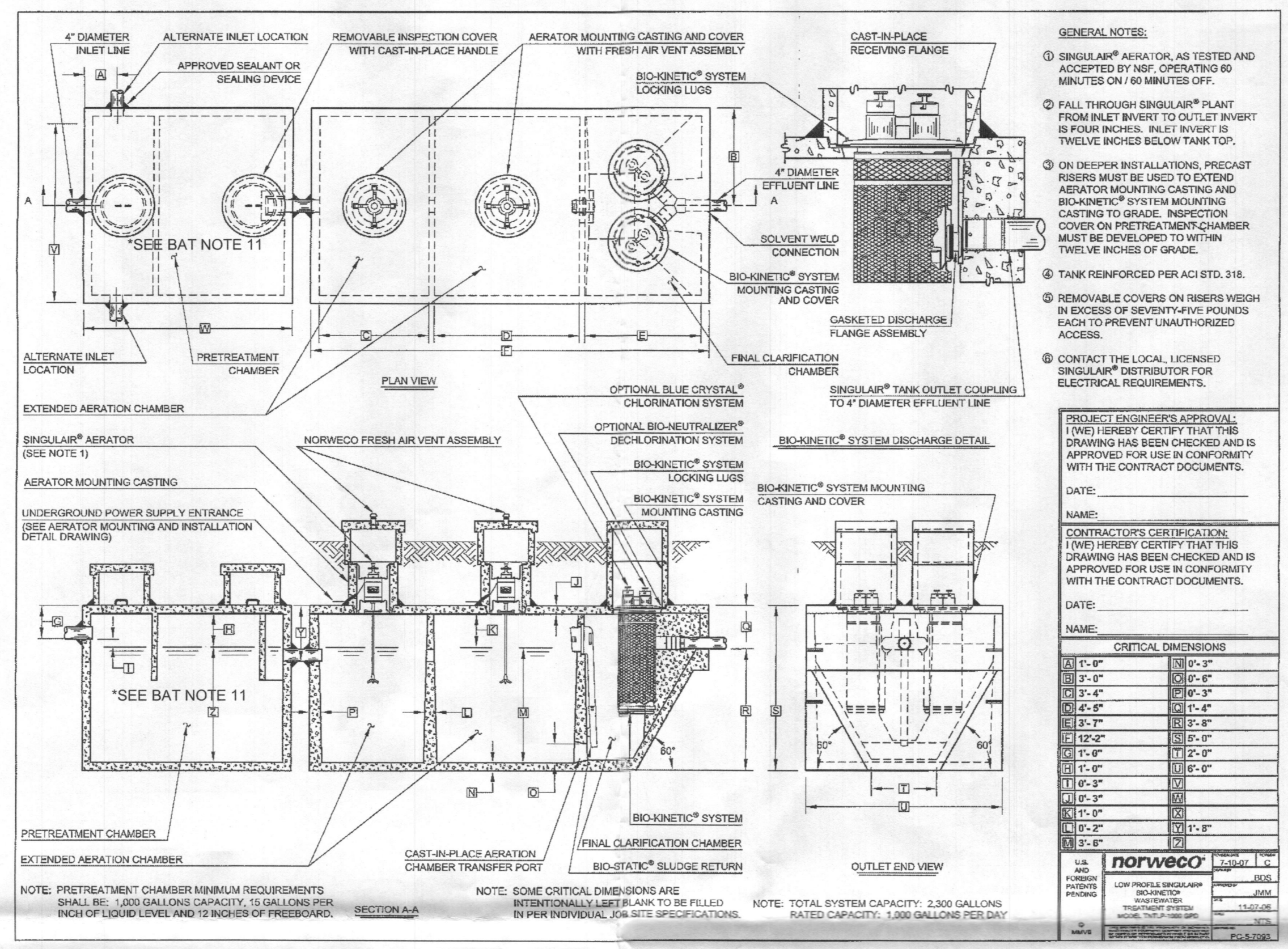
1. ANY CHANGE TO THE LOCATIONS OR DEPTHS TO ANY COMPONENTS MUST BE APPROVED BY THE ENGINEER AND THE HOWARD COUNTY HEALTH DEPARTMENT PRIOR TO INSTALLATION. A REVISED SITE PLAN MAY BE REQUIRED.
2. THE MAXIMUM DEPTH OF THE BAT PER THE MANUFACTURER'S SPECIFICATION IS 5 FEET.
3. THE BLOWER MAY NOT BE LOCATED MORE THAN 50 FEET FROM THE TANK BASED ON 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.
10. BAT SYSTEM TO BE A NORWECO SINGULAR MODEL INTLP-1000 OR EQUIVALENT.
11. PRE-TREATMENT CHAMBER IS TO BE THE C.R. SEMLER, INC. 1500 GALLON TOP SEAM SINGLE COMPARTMENT TANK MODIFIED AS SHOWN ON THE DETAIL THIS SHEET OR EQUIVALENT.

SEPTIC SYSTEM TRENCH DESIGN SPECIFICATIONS

- INITIAL SYSTEM:
 - APPLICATION RATE: 1.2
 - EFFECTIVE AREA BEGINNING DEPTH: 3'
 - BOTTOM MAXIMUM DEPTH: 7'
 - DESIGN FLOW:
 - 7 BEDROOMS AT 150 GPD
 - 7X150 GPD = 1,050 GPD
 - 2. SQUARE FOOTAGE OF DRAIN FIELD REQUIRED:
 - DESIGN FLOW (1,050 GPD) / APPLICATION RATE (1.2)
 - = 875 SF
 - 3. SIDEWALL REDUCTION CREDIT:
 - TRENCH WIDTH (W) = 3'
 - TRENCH EFFECTIVE DEPTH (D) = 4'
 - (W+D) / (W+1.2D) X 100 = 41.7%
 - 4. LINEAR LENGTH OF TRENCH REQUIRED:
 - DRAIN FIELD SQUARE FOOTAGE (875) X SIDEWALL REDUCTION CREDIT (41.7%) / TRENCH WIDTH (3) = 121.6'
 - 5. LINEAR LENGTH OF TRENCH PROVIDED = 122'
 - THREE TRENCHES 41 LF EACH
 - 6. EXISTING GRADE: TRENCH 1: 520.0'
 - INVERT: TRENCH 1: 517.0'
 - EXISTING GRADE: TRENCH 2: 517.9'
 - INVERT: TRENCH 2: 514.9'
 - EXISTING GRADE: TRENCH 3: 515.5'
 - INVERT: TRENCH 3: 512.5'
- REPLACEMENT SYSTEM 1:
 - APPLICATION RATE: 0.8
 - EFFECTIVE AREA BEGINNING DEPTH: 5'
 - BOTTOM MAXIMUM DEPTH: 8'
 - DESIGN FLOW:
 - 7 BEDROOMS AT 150 GPD
 - 7X150 GPD = 1,050 GPD
 - 2. SQUARE FOOTAGE OF DRAIN FIELD REQUIRED:
 - DESIGN FLOW (1,050 GPD) / APPLICATION RATE (0.8)
 - = 1,312.5 SF
 - 3. SIDEWALL REDUCTION CREDIT:
 - TRENCH WIDTH (W) = 3'
 - TRENCH EFFECTIVE DEPTH (D) = 3'
 - (W+D) / (W+1.2D) X 100 = 50%
 - 4. LINEAR LENGTH OF TRENCH REQUIRED:
 - DRAIN FIELD SQUARE FOOTAGE (1,312.5) X SIDEWALL REDUCTION CREDIT (50%) / TRENCH WIDTH (3) = 218.75'
 - 5. LINEAR LENGTH OF TRENCH PROVIDED = 219'
 - THREE TRENCHES 73 LF EACH
 - 6. EXISTING GRADE: TRENCH R1: 513.1'
 - INVERT: TRENCH R1: 510.1'
 - EXISTING GRADE: TRENCH R2: 511.5'
 - INVERT: TRENCH R2: 508.5'
 - EXISTING GRADE: TRENCH R3: 508.5'
 - INVERT: TRENCH R3: 505.5'
- REPLACEMENT SYSTEM 2:
 - APPLICATION RATE: 1.2
 - EFFECTIVE AREA BEGINNING DEPTH: 3'
 - BOTTOM MAXIMUM DEPTH: 8'
 - DESIGN FLOW:
 - 7 BEDROOMS AT 150 GPD
 - 7X150 GPD = 1,050 GPD
 - 2. SQUARE FOOTAGE OF DRAIN FIELD REQUIRED:
 - DESIGN FLOW (1,050 GPD) / APPLICATION RATE (1.2)
 - = 875 SF
 - 3. SIDEWALL REDUCTION CREDIT:
 - TRENCH WIDTH (W) = 3'
 - TRENCH EFFECTIVE DEPTH (D) = 3'
 - (W+D) / (W+1.2D) X 100 = 50%
 - 4. LINEAR LENGTH OF TRENCH REQUIRED:
 - DRAIN FIELD SQUARE FOOTAGE (875) X SIDEWALL REDUCTION CREDIT (50%) / TRENCH WIDTH (3) = 149.6'
 - 5. LINEAR LENGTH OF TRENCH PROVIDED = 146'
 - TWO TRENCHES 73 LF EACH
 - 6. EXISTING GRADE: TRENCH R1: 505.5'
 - INVERT: TRENCH R1: 502.5'
 - EXISTING GRADE: TRENCH R2: 502.1'
 - INVERT: TRENCH R2: 499.1'

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	'K' FACTOR
GgB	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	B	0.20
MaD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	0.24

- NOTES:
- 1) SOIL INFORMATION HAS BEEN TAKEN FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, WEB SOIL SURVEY.
 - 2) HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR 'K' GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.



GENERAL NOTES:

- 1) SINGULAR AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 60 MINUTES ON / 60 MINUTES OFF.
- 2) FALL THROUGH SINGULAR 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 PRE-TREATMENT 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 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"
B	2'-0"
C	2'-0"
D	4'-0"
E	3'-0"
F	12'-0"
G	12'-0"
H	11'-0"
I	11'-0"
J	11'-0"
K	11'-0"
L	11'-0"
M	11'-0"
N	11'-0"
O	11'-0"
P	11'-0"
Q	11'-0"
R	11'-0"
S	11'-0"
T	11'-0"
U	11'-0"
V	11'-0"
W	11'-0"
X	11'-0"
Y	11'-0"
Z	11'-0"

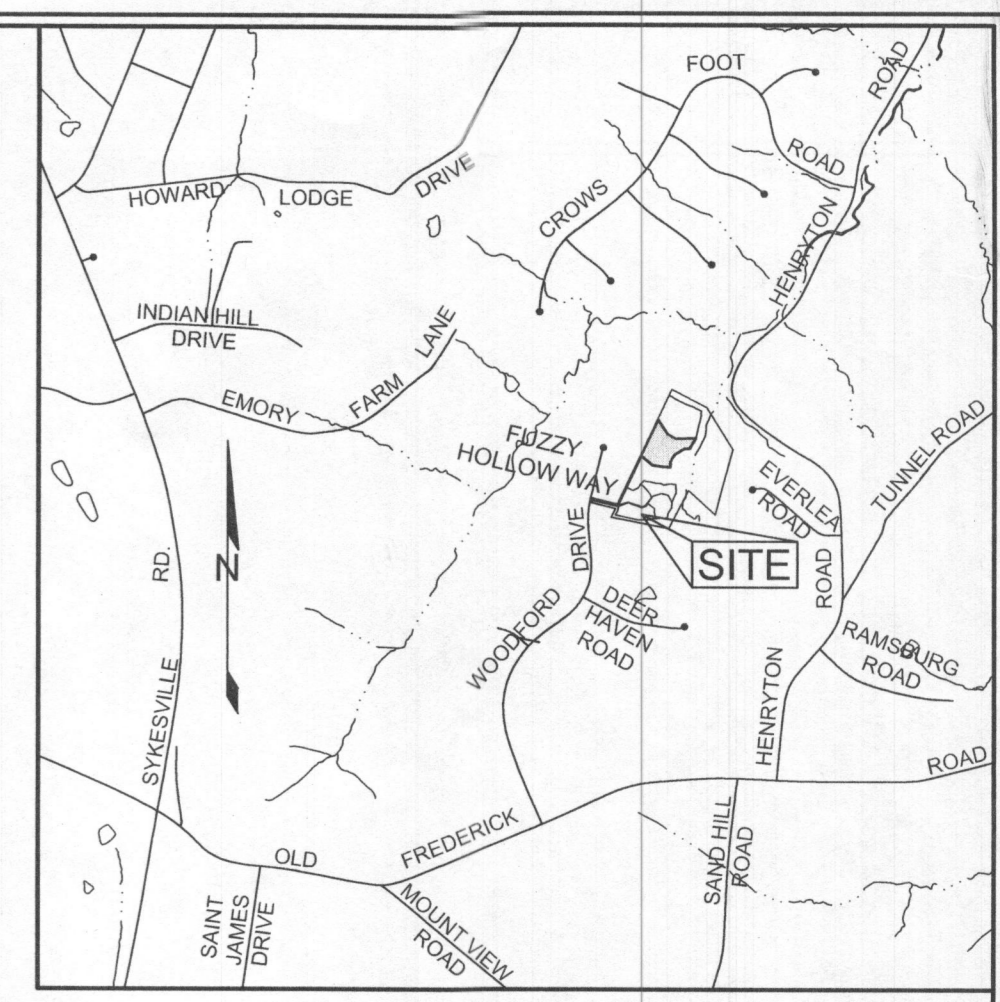
NOTE: PRE-TREATMENT CHAMBER MINIMUM REQUIREMENTS SHALL BE: 1,500 GALLONS CAPACITY, 15 GALLONS PER INCH OF LIQUID LEVEL AND 12 INCHES OF FREEBOARD.

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

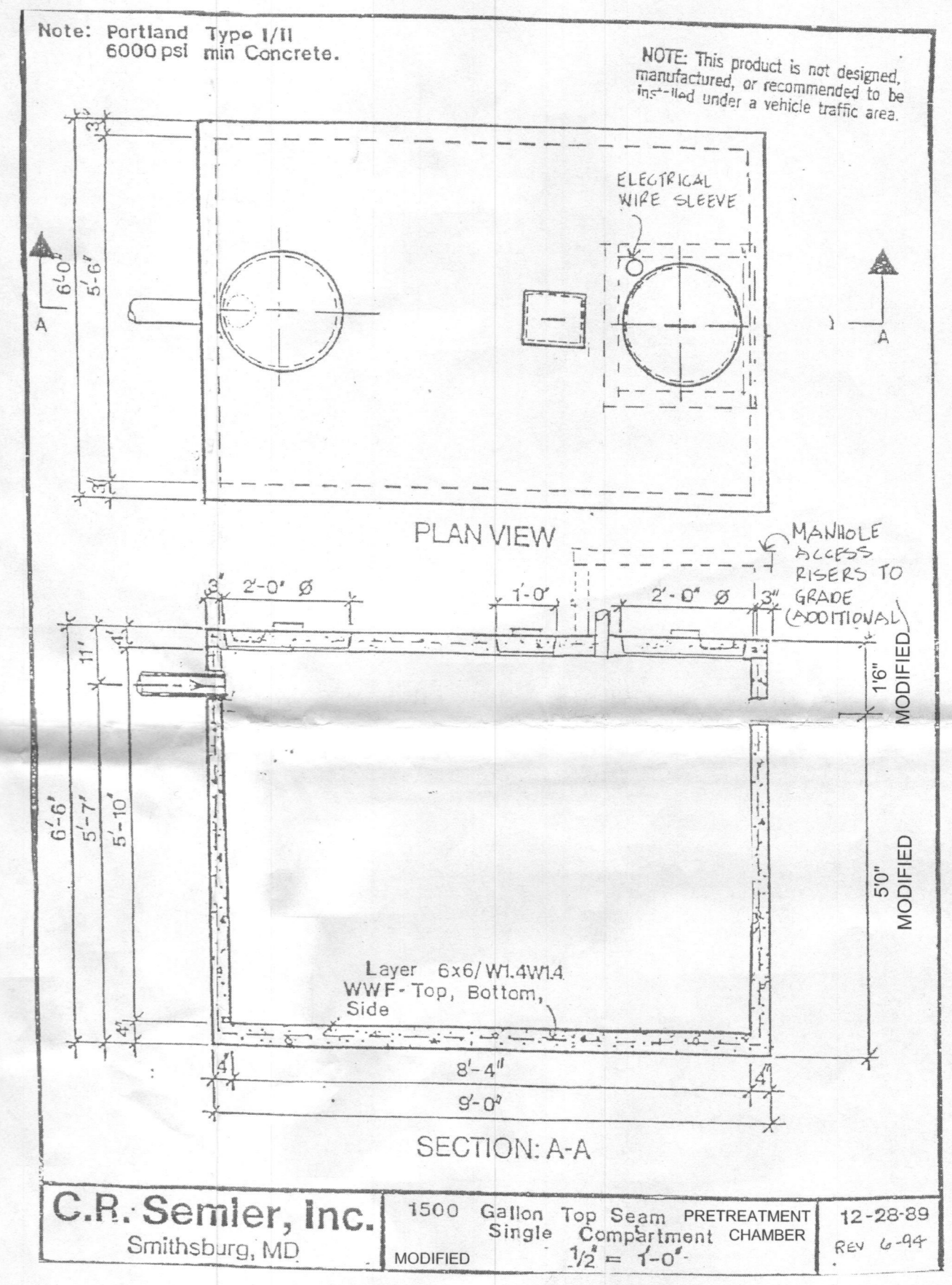
NOTE: TOTAL SYSTEM CAPACITY: 2,500 GALLONS RATED CAPACITY: 1,000 GALLONS PER DAY

norweco SINGULAR™
1500 GALLON TOP SEAM SINGLE COMPARTMENT TANK MODIFIED AS SHOWN ON THE DETAIL THIS SHEET OR EQUIVALENT.

- LEGEND
- EXISTING CONTOUR
 - PROPOSED CONTOUR
 - PROPOSED SPOT ELEVATION
 - DIRECTION OF FLOW
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - EXISTING TREE
 - SOIL BOUNDARY
 - EXISTING FOREST CONSERVATION EASEMENT PER F-13-075
 - PROPOSED ROOF LEADER (4" PVC TYP. WITH DOWNSPOUT)
 - PROPOSED BIORETENTION FACILITY (M-6)
 - EX. SEPTIC EASEMENT
 - PROPOSED 1.5" WHC



VICINITY MAP
SCALE: 1"=2000'



C.R. Semler, Inc.
Smithsburg, MD

1500 Gallon Top Seam Single Compartment Chamber Modified

12-28-89
REV 6-99

Approved Septic System Plan
Howard County Health Department
Signature: _____ Date: 6/16/16

SITE PLAN FOR BAT INSTALLATION
MELCHIOR PROPERTY
11021 FUZZY HOLLOW DRIVE
LOT 2

TAX MAP 10 GRID 13
3RD ELECTION DISTRICT

PARCEL 184
HOWARD COUNTY, MARYLAND

OWNER/DEVELOPER
WILLIAMSBURG GROUP
5485 HARRIS FARM ROAD
COLUMBIA, MARYLAND 21044

DESIGN BY: PS
DRAWN BY: AEA
CHECKED BY: PS
SCALE: AS SHOWN
DATE: JUNE 1, 2016
PROJECT #: 15-023
SHEET #: 1 of 1

STATE OF MARYLAND
SILL ENGINEERING GROUP, LLC
11130 Dovesdale Court, Suite 200
Marriottsville, Maryland 21104
Phone: 443.325.5076
Fax: 410.696.2022
Email: info@sillengineering.com
Civil Engineering for Land Development

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. 32295, EXPIRATION DATE: JUNE 20, 2017.