

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: 6/22/17 **ONSITE SEWAGE DISPOSAL SYSTEM**

P 561440

APPROVAL DATE: 11/8/17 **PERMIT: CONSTRUCTION**

A _____

PROPERTY ADDRESS: 8589 Reservoir Road

SUBDIVISION: Munro Property LOT: 2 TAX ID: _____

CONTRACTOR: J & A Construction Services EMAIL: _____

CONTRACTOR ADDRESS: 7991 Bennett Branch Road, Mount Airy, MD 21771 PHONE: 301-674-6730

PROPERTY OWNER: Burkard Homes LLC EMAIL: _____

OWNER ADDRESS: 5300 Dorsey Hall Drive Suite 102, Ellicott City, MD 21042 PHONE: _____

SEPTIC TANK SIZE (GALLONS): 1500 TANK MANUFACTURER: Mayer Bros Inc.

PUMP MODEL: WEO PUMP SIZE 1/3 PUMP TANK CAPACITY: 1500

DISTRIBUTION SYSTEM: GRAVITY PRESSURE DOSED BEDROOMS: 4 APPLICATION RATE: 1.2

TRENCHES:	LINEAR FEET REQUIRED: <u>106</u>	INLET DEPTH: <u>3</u>
	TRENCH WIDTH: <u>3</u>	MAXIMUM BOTTOM DEPTH: <u>6</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>10</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>4</u>
LOCATION:	PER APPROVED SITE PLAN. SEWAGE DISPOSAL AREA AND TANK LOCATIONS MUST BE STAKED BY LICENSED SURVEYOR PRIOR TO PRE-CONSTRUCTION INSPECTION.	
NOTES:	Install 2 trenches @ 53' each	

ISSUED BY: Hank Oswald ISSUE DATE: 6/22/17 EXPIRATION DATE: 6/22/18

- 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 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 17003644
- 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.

TO RESERVOIR RD.

PRIVATE 24' EASEMENT FOR INGRESS, EGRESS, & MAINTENANCE FOR LOTS 1-4

S 05°55'15" E 232.67'

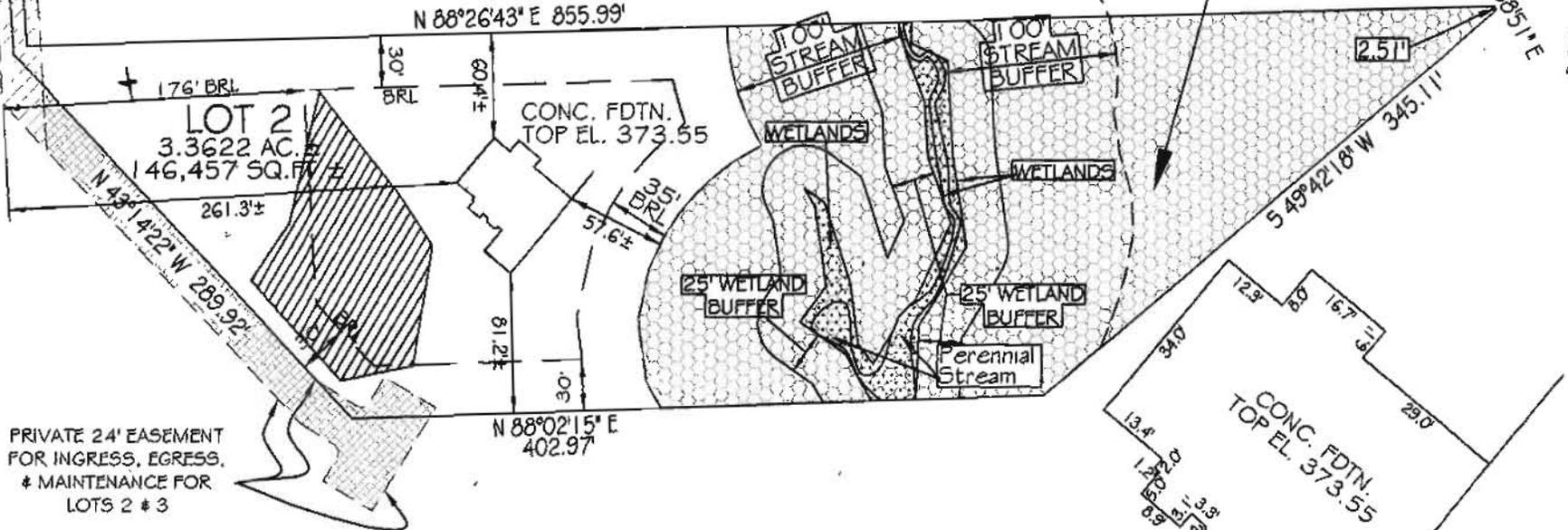
S 05°55'15" E 232.50'

S 03°33'00" E 61.52'

S 03°33'00" E 65.64'

- NOTES:**
1. ACCURACY OF BUILDING MEASUREMENTS: 0.1'
 2. ACCURACY OF SETBACK DIMENSIONS: 1'
 3. SETBACKS SHOWN ARE FROM FOUNDATION TO PROPERTY LINE.
 4. ACCURACY OF ELEVATIONS: 0.1'
 5. THE PROPERTY SHOWN HEREON LIES IN ZONE "X" AS SHOWN ON FLOOD INSURANCE RATE MAP NO. 24027C0140D DATED: 11/06/2013.
 6. BEARINGS AND DISTANCES SHOWN HEREON ARE FROM A SUBDIVISION PLAT ENTITLED "MUNRO PROPERTY, LOTS 1-4" RECORDED IN PLATS #23309-23311

PUBLIC FOREST CONSERVATION EASEMENT #2
3.3 AC. ± RETENTION



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.

Gregory S. Shanaberger

G. SCOTT SHANABERGER PROFESSIONAL L.S. 10849

SHANABERGER & LANE
8726 TOWN AND COUNTRY BLVD., SUITE 201
ELLCOTT CITY, MD. 21043
(410)461-9563 FAX: (410)461-9693

PROFESSIONAL LAND SURVEYOR
No. 10849

6/5/17

EXP. DATE 4/2/2018

FOUNDATION LOCATION DRAWING
LOT 2 MUNRO PROPERTY
PLAT NUMBERS 23309-23311
5TH ELECTION DISTRICT, HOWARD COUNTY, MD
TAX MAP 45 BLOCK 12 PARCEL 9 & P/O PARCEL 50
ZONING: RR-DEO
SCALE: 1"=100' DATE: 6/5/17

Oswald, Hank

From: Oswald, Hank
Sent: Friday, April 28, 2017 7:19 AM
To: 'Tim Burkard'
Subject: RE: B17000596_8589 Reservoir Road_Floor Plans

Hi Tim:

The new floor plan shows 5 bedrooms (including "Den" in basement) which exceeds the capacity of the Onsite Sewage Disposal System (OSDS) specifications. Please revise the OSDS Plan or floor plan to match

Should you have any questions, please don't hesitate to ask.

Respectfully,

Hank

From: Tim Burkard [<mailto:tim@burkardhomes.com>]
Sent: Thursday, April 27, 2017 4:16 PM
To: Oswald, Hank
Subject: Re: B17000596_8589 Reservoir Road_Floor Plans

Here you go. Thanks.

Tim

On Thu, Apr 27, 2017 at 2:28 PM, Oswald, Hank <hoswald@howardcountymd.gov> wrote:

Hi Tim:

When you get the chance, please forward an e-copy of the new floor plans for 8589 Reservoir Road (Potomac House).

Thanks,

Hank

Hank Oswald, L.E.H.S.

Howard County Health Department

Bureau of Environmental Health

Well & Septic Program

8930 Stanford Boulevard

Columbia, MD 21045

410.313.1786 (Office)

410.313.2648 (Fax)

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Tim Burkard

Burkard Homes, LLC

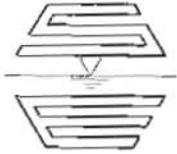
5850 Waterloo Road, Suite 140

Columbia, MD 21045

www.burkardhomes.com

Mobile: (240) 375-1052

Sales Office: (410) 992-2221



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

March 15, 2017

Howard County Health Department
Bureau of Environmental Health
8390 Stanford Boulevard
Columbia, Maryland 21045

Attn: Mr. Hank Oswald

Re: Munro Subdivision
Lot 2

Dear Mr. Oswald:

Please find below the Septic System Design for this project.

1) Septic System Trench Design

- Initial System And Replacements:
 - Application Rate: 1.2
 - Effective Area Beginning Depth: 4.0' (Replacement area is 4.5')
 - Bottom Maximum Depth: 6.0'
- Design Flow:
 - 4 Bedrooms at 150 gpd
 - $4 \times 150 \text{ gpd} = 600 \text{ gpd}$
- Square Footage of Drain field Required:
 - Design Flow (600 gpd) / Application Rate (1.2) = 500 sf
- Sidewall Reduction Credit:
 - Trench Width (W) = 3'
 - Trench Effective Depth (D) = 2.0'
 - $(W+2) / (W+1+2D) \times 100 = (2'+2') / (2'+1+2(2.0)) = 5/8 = 62.5\%$
 - Replacement area = 5/7 or 71.4%
- Linear Length of Trench Required:
 - Drain field Square Footage (500) x Sidewall Reduction Credit (62.5%) / Trench Width (3') = 104.17
 - Replacement area req'd & prov'd = 119'
- Linear Length of Trench Provided = 106'
 - Two trenches 53 lf each

2) Dose Tank Design

- Design Flow: 600 GPD
- Diameter of Force Main: 2.0"
- Material: Schedule 40 PVC

- Dose Calculations:
 - Design Flow: 600 gpd
 - Length of force main:
 - 2.0" force main = 172.7'
 - Volume of force main:
 - 172.7' x 17.4 gallons per 100' = 30.0gallons
 - Minimum dose is the greater of:
 - Volume of force main: 30.0
 - Or
 - 1/6th the design flow: 1/6 x 600 gallons = 100.0 gallons min. dose
- Therefore, use 100 gallons for dose min.

PUMP DESIGN :

- Pump Flow required : 30 gpm
- Dose Amount : 100 gallons
- Pump Run Time : 3.3 minutes to achieve required dose

3) Calculate Friction Loss in delivery pipe

Fittings	Equiv. L (ft.)
Fitting	2.0" Force Main
1/4 Bend (90°)	-
1/8 Bend (45°)	4 @ 2.0'=8.0'
1/16 Bend (22.5°)	1 @ 2.0' = 2.0'
1/32 Bend (11.25°)	-
Gate Valve	1 @ 4.5'=4.5'
Standard Tee	-
Run Tee	-
Cross	-
Reducer	-
Couplings	8 @ 2.0' = 10.0'
Quick Connect/Disconnect	1 @ 4.5'=4.5'
Total Equivalent Length of pipe	29'

Length of delivery pipe @ distribution box = 172.7'

Fittings equiv. = 29.00

TOTAL "L" = 201.7

- Flow at 2.0" pipe = 30 gpm
- Friction loss per 100' (Table 4.4) of 2.0" schedule 40 plastic pipe: 1.54
 - Total equivalent length of 2.0" Force Main and appurtenances = 172.7' + 29.00' = 201.70'
 - Friction loss in 2.0" pipe = 201.70/100 x 1.54 = 3.11'
 - Total Friction Head = 3.11'

4) Determine Static Head

- Grade above tanks = 367.45
- Top of Tank Elev = 365.7

- Pipe below grade = 3.0
- Elevation of pipe inv out = 364.45
- Elevation of Dose Tank Bottom inv = 359.53
- Elevation of low water = 361.08 + 22" = 361.36
- Elevation of distribution pipe inv = 374.10
- Static Head = 376.30 - 362.91 = 12.74'

5) Calculate TDH

- Total Dynamic Head = Static head + Distal Head + Friction head
- 12.74 + 2.0' + 3.11'
= 17.85 use 18' TDH

6) Pump Chamber Design

- Pump Flow required : 30 gpm
- Dose Amount : 100 gallons
- Pump Run Time : 3.3 minutes to achieve required dose
 - For pump tank dimensions and detail, see attached and plans.
 - Pump chamber elevations:
 - Proposed grade at top of tank : 367.45
 - Top of pump tank: 365.70
 - Elev. of Pipe inv. Out = 364.45
 - Pump chamber invert in: 364.62
 - High Water Alarm: 362.15
 - Pump On: 361.65
 - Pump Off: 361.36
 - Bottom inside slab of tank: 359.53
 - Pump Chamber volumes:
 - Invert in to Pump On: 1,017.81 gallons (2.97' x 8.33' x 5.5' x 7.48)
 - Pump Dose : Pump On to Pump Off: 0.29' x 8.33' x 5.5' x 7.48 = 99.4 gallons
 - Excess High Water Alarm to top of tank: 2.47' x 8.33' x 5.5' x 7.48 = 846.5 gallons to the invert of the pipe in.
 - Design based on:
 - One (1) Mayer Bros, Inc 1,500 gallon top seam tank
 - Goulds WEO3L (1/3 hp) series pump or equivalent.

Oswald, Hank

From: Oswald, Hank
Sent: Wednesday, March 01, 2017 10:51 AM
To: Paul (paul@sillengineering.com)
Subject: OSDS Plan_8589 Reservoir Road

Hi Paul:

The OSDS Plan for 8589 Reservoir Road was reviewed with the following comments.

- 1.) The internal wall of the proposed tank does not contain a slot of minimum height of 2 inches and extend 4 feet in length per Howard County Code.
- 2.) All drywells must be at least 25 feet from all septic system components (tank, trench, and sewage disposal area or SDA).
- 3.) Show well line on plan meeting 10 foot setback from sewage disposal area. Any part of the line that isn't 10 feet from the sewage disposal area must be sleeved.
- 4.) Add note: Well line must be staked per approved OSDS plan prior to installation.
- 5.) Add dose and pump runtime to plan. Dose is no less than 1/6th the design flow or volume of water in FM.
- 6.) Show design head calculations
- 7.) Show cul-de-sac 10 feet from SDA

Please revise the plan accordingly. If you have any questions, please don't hesitate to ask.

Respectfully,

Hank

Hank Oswald, L.E.H.S.
Howard County Health Department
Bureau of Environmental Health
Well & Septic Program
8930 Stanford Boulevard
Columbia, MD 21045
410.313.1786 (Office)
410.313.2648 (Fax)

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Please revise the plan accordingly. If you have any questions, please don't hesitate to ask.

Respectfully,

Hank

Hank Oswald, L.E.H.S.
Howard County Health Department
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Well & Septic Program
8930 Stanford Boulevard
Columbia, MD 21045
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11130 Dovedale Court, Suite 200
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Fax: 410-696-2022
Email: info@sillengineering.com
Civil Engineering for Land Development

SILL ENGINEERING GROUP, LLC

March 15, 2017

Howard County Health Department
Bureau of Environmental Health
Well and Septic Program
8930 Stanford Boulevard
Columbia, Maryland 21045

Attn: Mr. Hank Oswald

Re: 8589 Reservoir Road
OSDS Plan

Dear Mr. Oswald:

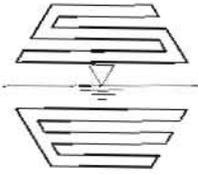
In response to your comment email dated March 1, 2017 please find attached a revised Onsite Sewage Disposal System Plan and this point-by-point response letter.

1. Please find the updated proposed tank with a slot that meets Howard County Code minimum standards.
2. Please note the house type has been revised. The bedroom count remains 4. The onsite sewage disposal system components have been relocated to meet minimum cover and setback requirements. The drywells have been moved and are 25' away from the system components, specifically the SDA and tanks. Please also note the revised calculations attached.
3. The well line has been shown on the plan. There is no need to sleeve the pipe.
4. Please see note 6 under Septic System Notes.
5. Please see note 7 under Septic System Notes that states dose and pump run time.
6. Please see note 8 under Septic System Notes for head calculations.
7. A dimension has been added at the T-turn around. There is not place where the distance from the SDA is less than 10'.

Thank you for your review of this submission. Should you have any questions or comments regarding this matter, please do not hesitate to contact this office.

Sincerely,
SILL ENGINEERING GROUP, LLC

Paul M. Sill, PE, LEED AP



11130 Dovedale Court, Suite 200
 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:	March 17, 2017
Attention:	Robert Freemon
Re:	8589 Reservoir Road Munro Property, Lot 2 OSDS Plan
Project #:	16-047

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	OSDS Plan		
1	Response Letter		
1	Revised Report		

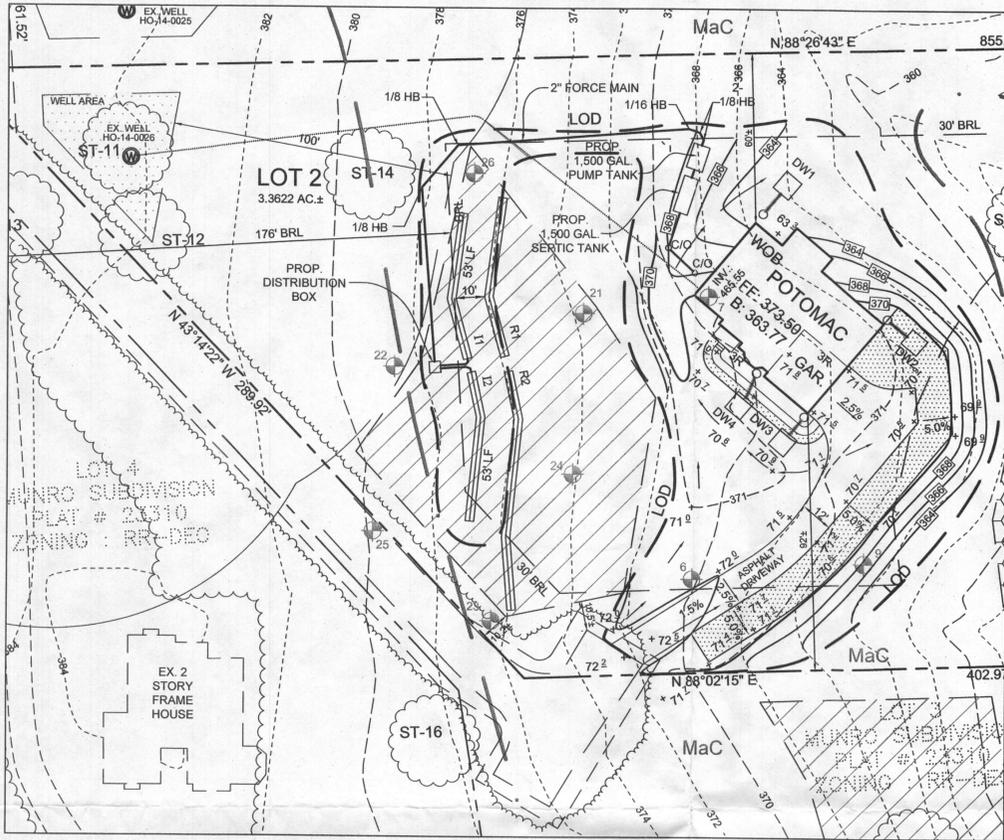
These are transmitted as checked below		
<input checked="" type="checkbox"/> For Approval	As Requested	Please Return After Using
<input checked="" type="checkbox"/> For Review	For Your Use	As Approved

Comments:

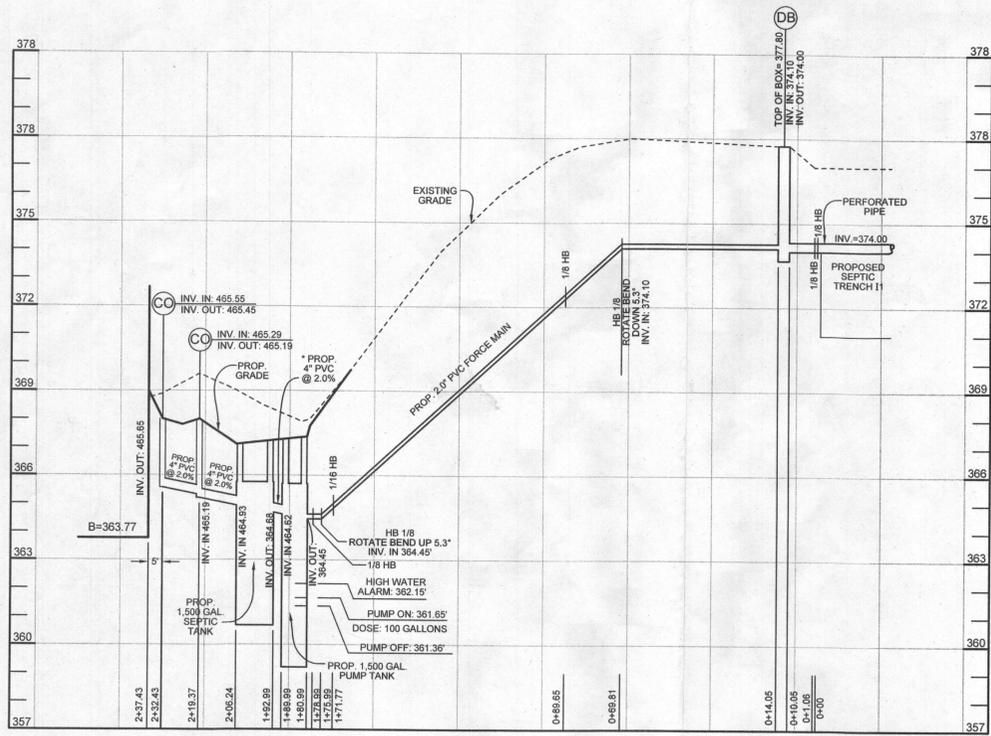
Copy To:	Signed:  Paul M. Sill, PE, LEED AP
Received by:	
	Date Received:

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	'K' FACTOR
MaC	MANOR LOAM, 3 TO 8 PERCENT SLOPES	B	0.28

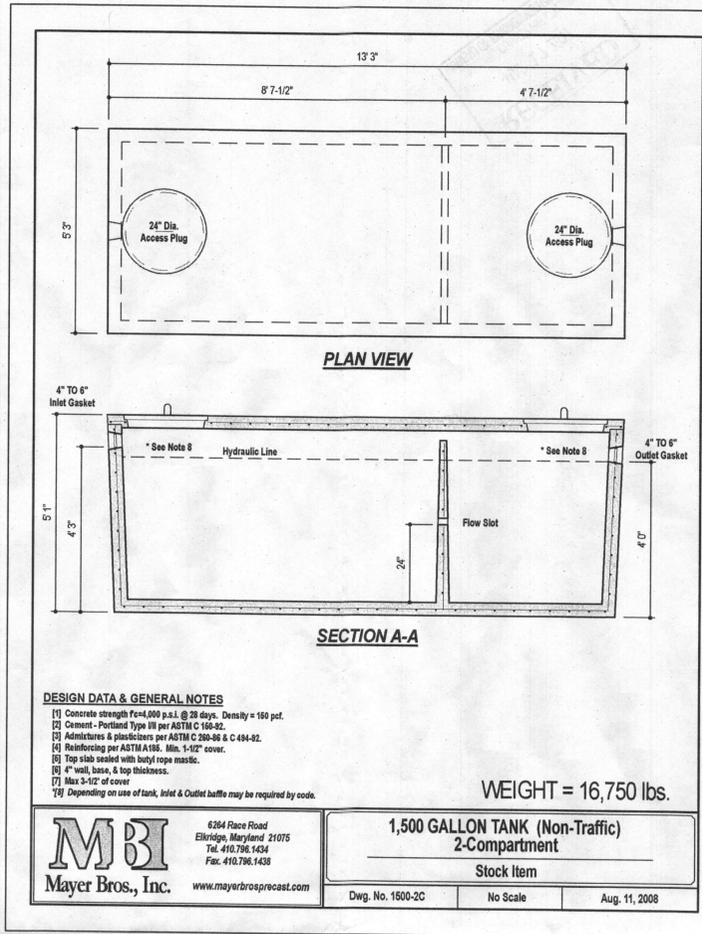
NOTES:
 1) SOIL INFORMATION HAS BEEN TAKEN FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE; WEB SOIL SURVEY.
 2) HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR 'K' GREATER THAN 0.35 AND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



PLAN VIEW
SCALE: 1"=30'



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

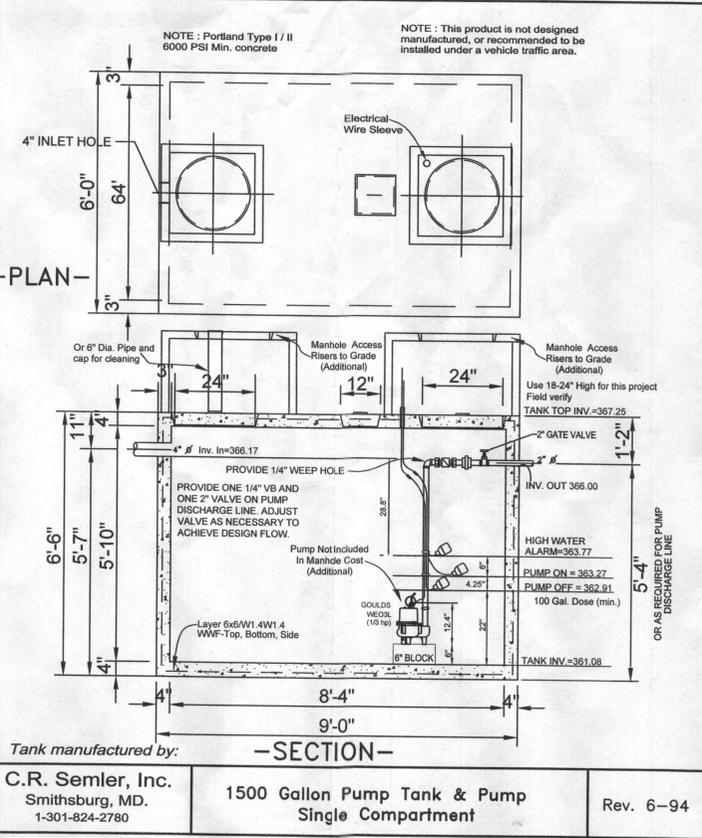


DESIGN DATA & GENERAL NOTES

- Concrete strength Fc=4,000 p.s.i. @ 28 days. Density = 150 pcf.
- Cement - Portland Type III per ASTM C 150-82.
- Admixtures & plasticizers per ASTM C 266-98 & C 494-92.
- Reinforcing per ASTM A193. Min. 1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, base, & top thickness.
- Max 3/4" of cover.
- Depending on use of tank, Inlet & Outlet baffles may be required by code.

MBI
Mayer Bros., Inc.
6264 Race Road
Elkridge, Maryland 21075
Tel: 410.796.1434
Fax: 410.796.1433
www.mayerbroscast.com

**1,500 GALLON TANK (Non-Traffic)
2-Compartment**
Stock Item
Dwg. No. 1500-2C No Scale Aug. 11, 2008



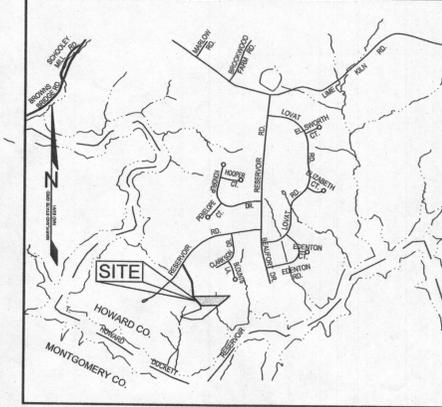
Tank manufactured by:
C.R. Semler, Inc.
Smithsburg, MD.
1-301-824-2780

**1500 Gallon Pump Tank & Pump
Single Compartment**

Rev. 6-94

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING TREELINE
- EXISTING TREE
- SOIL BOUNDARY
- LIMIT OF DISTURBANCE
- EXISTING SPECIMEN TREE
- EXISTING FOREST CONSERVATION EASEMENT PER F-12-041
- INITIAL TRENCH SYSTEM
- REPLACEMENT TRENCH SYSTEM
- PASSED PERCOLATION TEST LOCATION
- PROPOSED SPOT ELEVATION
- DIRECTION OF FLOW
- PROPOSED WELL LOCATION
- PROPOSED DRYWELL (TYP.)
- WALK OUT BASEMENT



HOWARD COUNTY, MARYLAND ADD MAP 18 GRID D7
VICINITY MAP
SCALE: 1"=2000'

GENERAL NOTES

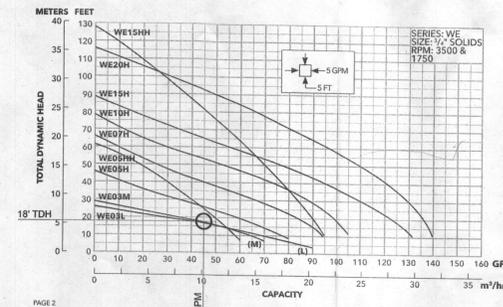
- SUBJECT PROPERTY ZONED RR-DEO PER 02/02/04 COMPREHENSIVE ZONING PLAN.
- TOTAL AREA OF PROPERTY = 3.36 AC ±
- PRIVATE WATER AND PRIVATE SEWER WILL BE USED WITHIN THIS SITE.
- THIS AREA DESIGNATES A PRIVATE SEWER EASEMENT, OF AT LEAST 10,000 SF AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL (COMAR 26.04.03). IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWERAGE IS AVAILABLE. THESE EASEMENTS SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWERAGE EASEMENT. RECORDED OF A MODIFIED SEWERAGE EASEMENT SHALL NOT BE NECESSARY.
- THE BOUNDARY SHOWN HEREON IS BASED ON HOWARD COUNTY A FIELD RUN BOUNDARY SURVEY PREPARED BY SHANABERGER & LANE IN JUNE 2016.
- THE TOPOGRAPHY SHOWN HEREON WAS FIELD RUN BY SHANABERGER & LANE, DATED JUNE 1, 2016.
- PROPERTY ADDRESS: 8589 RESERVOIR ROAD, FULTON, MD 20759 - LIBER 16958, FOLIO 226.
- THE LOT SHOWN HEREON COMPLIES WITH THE MINIMUM OWNERSHIP, WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.
- A WETLAND AND FOREST STAND DELINEATION STUDY WAS PERFORMED BY ECO-SCIENCE PROFESSIONALS DATED JANUARY 14, 2013.
- LIMIT OF DISTURBANCE: 23,562 SF ± OR 0.54 AC ±

SEPTIC SYSTEM 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 EARTH COVER OVER THE TANK IS 3 FEET. GREATER EARTH COVER WILL REQUIRE A HEAVY LOAD BEARING TANK.
- ELECTRICAL WORK FOR THE INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
- THE WELL TAG # HAS BEEN FIELD LOCATED AND IS ACCURATELY SHOWN.
- ALL WELLS AND SEPTIC SYSTEMS LOCATED WITHIN 100' OF THE PROPERTY BOUNDARIES AND 200' DOWN GRADIENT OF ANY WELLS AND OR SEPTIC SYSTEMS HAVE BEEN SHOWN.
- WELL LINE MUST BE STAKED PER APPROVED OSOG PLAN PRIOR TO INSTALLATION.
- PUMP DOSE: 100 GPM, PUMP RUN TIME 3.3 MINUTES.
TOTAL DYNAMIC HEAD:
STATIC HEAD + DISTAL HEAD + FRICTION HEAD
12.74 + 2.0' + 3.11' = 17.85' USE 18'
- PUMP TO BE A GOULD WE3L (1/3HP) SERIES PUMP OR EQUIVALENT.

SEPTIC SYSTEM TRENCH DESIGN SPECIFICATIONS

- INITIAL SYSTEM:
 - APPLICATION RATE: 1.2
 - EFFECTIVE AREA BEGINNING DEPTH: 1.2
 - BOTTOM MAXIMUM DEPTH: 6'
- DESIGN FLOW:
 - 4 BEDROOMS AT 150 GPD
 - 4X150 GPD = 600 GPD
- SIDEWALL REDUCTION CREDIT:
 - TRENCH EFFECTIVE DEPTH (D) = 2'
 - (W+2) / (W+1+2D) X 100 = 62.5%
- LINEAR LENGTH OF TRENCH REQUIRED:
 - DRAIN FIELD SQUARE FOOTAGE (500' X SIDEWALL REDUCTION CREDIT (62.5%) / TRENCH WIDTH (3') = 105'
- EX. GRADE:
 - TRENCH I1: 377.0
 - TRENCH I2: 374.0
- INVERT:
 - TRENCH I1: 374.0
 - TRENCH I2: 373.0
- REPLACEMENT SYSTEM:
 - APPLICATION RATE: 1.2
 - EFFECTIVE AREA BEGINNING DEPTH: 4'
 - BOTTOM MAXIMUM DEPTH: 6.0'
- DESIGN FLOW:
 - 4 BEDROOMS AT 150 GPD
 - 4X150 GPD = 600 GPD
- SIDEWALL REDUCTION CREDIT:
 - TRENCH EFFECTIVE DEPTH (D) = 3'
 - (W+2) / (W+1+2D) X 100 = 71.4%
- LINEAR LENGTH OF TRENCH REQUIRED:
 - DRAIN FIELD SQUARE FOOTAGE (500' X SIDEWALL REDUCTION CREDIT (71.4%) / TRENCH WIDTH (3') = 119'
- EX. GRADE:
 - TRENCH R1: 376.0
 - TRENCH R2: 376.0
 - TRENCH R1: 373.0
 - TRENCH R2: 373.0



GOULDS PUMPS PERFORMANCE CURVES

Approved Septic System Plan
 Howard County Health Department
 Hank Coward
 Signature Date
OWNER/DEVELOPER
 TIM BURKARD
 BURKARD HOMES, LLC
 5850 WATERLOO ROAD, SUITE 140
 COLUMBIA, MARYLAND 21045
 443.325.5076 EXT. 102
 tim@burkardhomes.com

ONSITE SEWAGE DISPOSAL SYSTEM DESIGN PLAN
MUNRO SUBDIVISION-LOT 2
 8589 RESERVOIR RD. FULTON, MD 20759

TAX MAP 49 GRID 12 PARCEL 9 & P/O PARCEL 50
 5TH ELECTION DISTRICT TAX ID# 598279 HOWARD COUNTY, MARYLAND

DESIGN BY: PS
 DRAWN BY: PA/AEA
 CHECKED BY: PS
 SCALE: AS SHOWN
 DATE: MARCH 17, 2017
 PROJECT #: 15-049
 SHEET #: 1 of 1

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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.