



APPLICATION

FOR PERCOLATION TESTING AND SITE EVALUATION

TEST DATE(S) _____ TEST TIME _____

AP 535238

AGENCY REVIEW: _____

DATE 06/07/2011

DO NOT WRITE ABOVE THIS LINE

I HEREBY APPLY FOR THE NECESSARY TESTING/EVALUATION PRIOR TO ISSUANCE OF SEWAGE DISPOSAL SYSTEM PERMIT(S) TO:

CHECK AS NEEDED:

- CONSTRUCT NEW SEPTIC SYSTEM(S)
- REPAIR/ADD TO AN EXISTING SEPTIC SYSTEM
- REPLACE AN EXISTING SEPTIC SYSTEM

CHECK AS NEEDED:

- NEW STRUCTURE(S)
- ADDITION TO AN EXISTING STRUCTURE
- REPLACE AN EXISTING STRUCTURE

CHECK ONE:

- CREATE NEW LOT(S)
- BUILD ON AN EXISTING LOT IN A SUBDIVISION
- BUILD ON AN EXISTING PARCEL OF RECORD

IS THE PROPERTY WITHIN 2500' OF ANY RESERVOIR?

- YES
- NO

THE TYPE OF STRUCTURE IS:

- RESIDENTIAL WITH unknown PROPOSED BEDROOMS IN THE COMPLETED STRUCTURE (NOTE **UNKNOWN** IF APPROPRIATE)
- COMMERCIAL (PROVIDE DETAIL OF NUMBERS AND TYPES OF EMPLOYEES/ CUSTOMERS ON ACCOMPANYING PLAN)
- INSTITUTIONAL/GOVERNMENT (PROVIDE DETAIL OF NUMBERS AND TYPES OF EMPLOYEES/USERS ON ACCOMPANYING PLAN)

PROPERTY OWNER(S) Scot Keeton

DAYTIME PHONE 410-442-1653 CELL 410-802-8980 FAX _____

MAILING ADDRESS 16377 Old Frederick Rd., Mt. Airy MD 21771
STREET CITY/TOWN STATE ZIP

APPLICANT Jeff Sloman, PE

DAYTIME PHONE 443-276-6220 CELL 813-810-9737 FAX 443-276-6221

MAILING ADDRESS 6990 Columbia Gateway Dr. #150, Columbia, MD 21046
STREET CITY/TOWN STATE ZIP

APPLICANT'S ROLE: DEVELOPER BUILDER BUYER RELATIVE/FRIEND REALTOR **CONSULTANT**

PROPERTY LOCATION
SUBDIVISION/PROPERTY NAME Middle Trail Subdivision LOT NO. 17B+17C

PROPERTY ADDRESS 16381 Old Frederick Rd., Mt. Airy MD 21771
STREET TOWN/POST OFFICE

TAX MAP PAGE(S) 7 GRID 0004 PARCEL(S) 463 PROPOSED LOT SIZE 4.75 Ac

AS APPLICANT, I UNDERSTAND THE FOLLOWING: THE SYSTEM INSTALLED SUBSEQUENT TO THIS APPLICATION IS ACCEPTABLE ONLY UNTIL PUBLIC SEWERAGE IS AVAILABLE. THIS APPLICATION IS COMPLETE WHEN ALL APPLICABLE FEES AND A SUITABLE SITE PLAN HAVE BEEN RECEIVED. I ACCEPT THE RESPONSIBILITY FOR COMPLIANCE WITH ALL M.O.S.H.A. AND "MISS UTILITY" REQUIREMENTS. APPROVAL IS BASED UPON SATISFACTORY REVIEW OF A PERC CERTIFICATION PLAN.

TEST RESULTS WILL BE MAILED TO APPLICANT.

SIGNATURE OF APPLICANT

HOWARD COUNTY HEALTH DEPARTMENT, BUREAU OF ENVIRONMENTAL HEALTH, WELL AND SEPTIC PROGRAM
7178 COLUMBIA GATEWAY DRIVE COLUMBIA, MARYLAND 21046 (410) 313-2640 FAX (410) 313-2648
TDD (410) 313-2323 TOLL FREE 1-877-4MD-DHMH

MOUND TEST DATA SHEETS

Property I.D. 16381 Rt. 99 Lot # proposed lot 2 Date 9-20-11

Sanitarian HS Landscape Position _____

% Slope _____ Soil Type Ggc Contractor Ketterman

HOLE # C DEPTH OF TEST 23" START TIME 8:55

24"
32"
6m e 1fsbk
yellow br
msbk sl
50%
Shale &
Sapelite
mottles ↓
no H₂O

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
10 16/16	0			
7 14/16	15	3 2/16	9 min	
6 2/16	15	1 12/16	8.5 min	
4 8/16	15	1 10/16	9.2 min	
3 6/16	15	1 10/16	9.2 min	

9:10
9:25
9:40
9:55

9.2 min
PASS

5' 4"

HOLE # D DEPTH OF TEST 21" START TIME 9:52

6"
14"
24"
dk bm l
6m scl
2 fsbk
6m scl
1 msbk
50% shale
& Sapelite
no H₂O

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
10 16/16	0			
5 11/16	15	5 5/16	refill	H ₂ O @ 10:10
10 16/16	15	1 0/16		
6 10/16	15	4 6/16	3.4 min	
4 11/16	15	2 9/16	5.85 min	
1 13/16	15	2 4/16	7 min	

10:07
10:25
10:40
10:55
12:00

PASS 7 min

5.5

MOUND TEST DATA SHEETS

Property I.D. 16381 Rt. 99 Lot # proposed Lot 2 Date 9-20-11

Sanitarian HS Landscape Position _____

% Slope _____ Soil Type lgc Contractor Ketterman

HOLE # A DEPTH OF TEST 17" START TIME 8:35

20"
2'
3'

bm l Hsbk

bm micaceous sl

yellow
bm
sl w/ saprolite
& quartz

mottled
multi-color
sl

H₂O @
bottom

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
10 16/16	0			
9 5/16	15	1 11/16	8 min	
8 5/16	15	1"	15 min	
7 5/16	15	1"	15 min	
6 8/16	15	1 4/16	17 min	

8:50
9:05
9:20
9:35

PASS

17 mpi

HOLE # B DEPTH OF TEST 18" START TIME 8:45

20"
25'

bm l
Hsbk

lt bm
sl Hsbk

bm
ch gel
saprolite
& shale

fine saprolite
w/ mottles

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
10 16/16	0			
10 7/16	15	9/16	27 min	
10 2/16	15	5/16	48 min	
9 14/16	15	4/16	60 min	
9 11/16	15	3/16	80 min	
9 8/16	15	3/16	80 min	
9 5/16	15	3/16	80 min	

9:00
9:15
9:30
9:45
10:00
10:15

PASS

80 mpi

No H₂O

MOUND TEST DATA SHEETS

Property I.D. 16381 Rt 99 Lot # Proposed Lot 2 Date 9-20-11

Sanitarian HS Landscape Position _____

% Slope _____ Soil Type GgC Contractor Katterman

HOLE # E DEPTH OF TEST 22" START TIME 10:00

18"
24"
6"
bm & lfsbk
bm scl
2msbk
bm uch
sl w/
mottles
100% shale

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
10 16/116	0			
9 7/116	15	3 9/116	4.2	
5 4/116	15	2 3/116	6.8	
3 8/116	15	1 12/116	9	
1 12/116	15	1 12/116	9	

10:15
10:30
10:45
11:00

(9 in) **PASS**

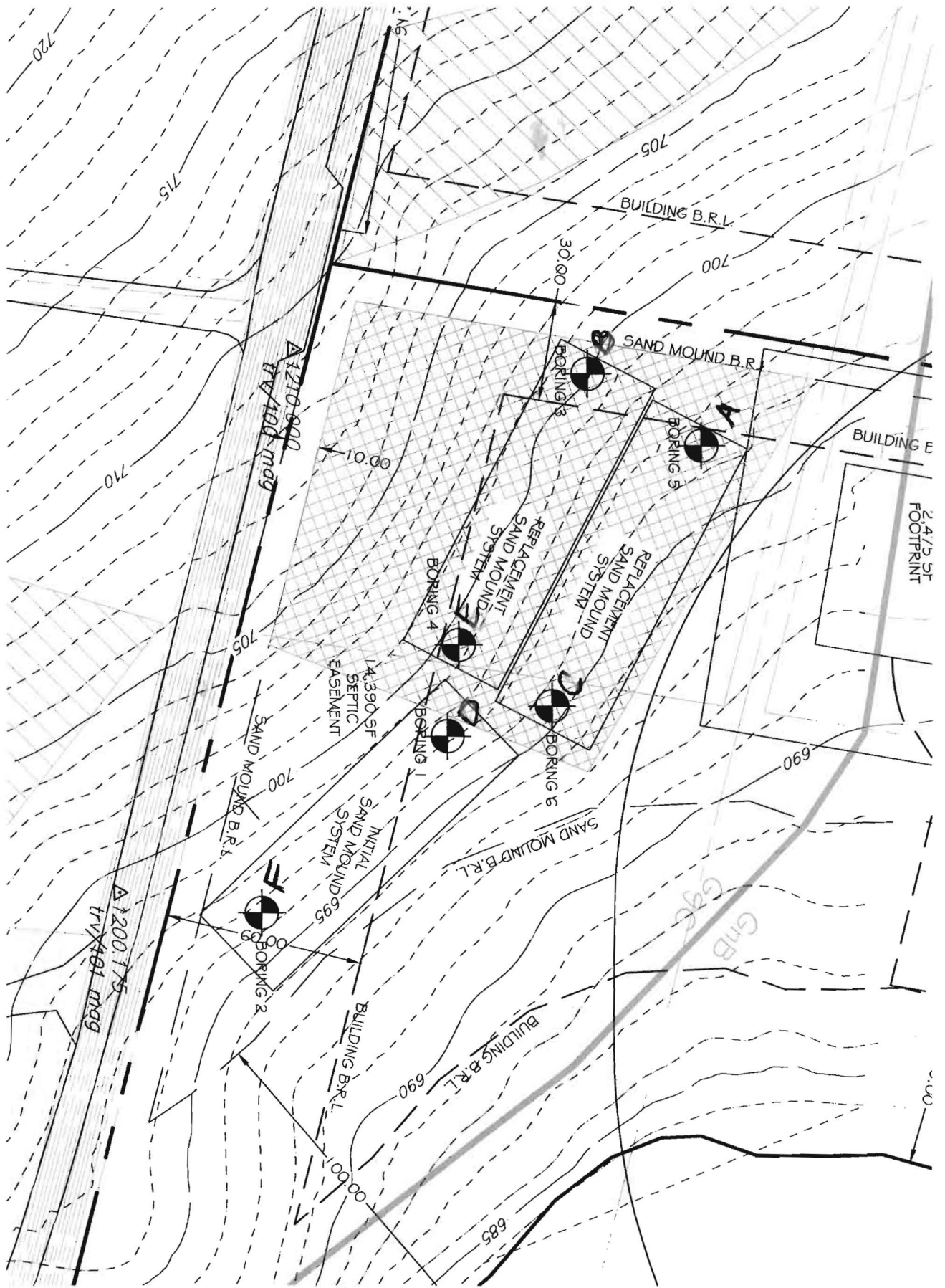
HOLE # F DEPTH OF TEST 20" START TIME 10:14

8"
18"
28"
5.5'
bm l
bm scl
2fsbk
yellow bm
ch sl
lfsbk
yellow bm
ls

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
10 16/116	0			
10 3/116	15	13/116	18 min	
9 14/116	15	5/116	48 min	
9 8/116	15	6/116	40	
9 3/116	15	5/116	48 min	
8 14/116	15	5/116	48 min	

10:29
10:44
10:59
11:14
11:29

(48 min) **PASS**



February 16, 2012

Ms. Heidi Scott, R.S.
Howard County Health Department
Well and Septic Coordination Section
7879 Columbia Gateway Drive
Columbia, MD 21046

RE: Percolation Test Site Plan
16381 Old Frederick Road
Comment Letter dated January 10, 2012

Ms. Scott:

We are submitting a revised Percolation Test Site Plan in response to your January 10, 2012 comment letter. We offer the following point-by-point responses:

Comment #1: Remove the extra contour layer.

Response #1: The extra contour layer has been removed.

Comment #2: Eliminate the proposed septic tank and piping locations.

Response #2: These have been removed.

Comment #3: Designate the current replacement mound system as the initial mound system and the vice versa.

Response #3: The designations have been reversed as requested.

Comment #4: Show all four corner elevations for the mound and bed areas. Corners must be staked in the field for Health Dept. review.

Response #4: The corners of the mound system have been staked. These are noted in the bottom left hand corner of the attached plan. Please note the elevations are based on an assumed datum, based on the field stakeout location by Axiom Engineering, and are relative to each other. They do not correspond to the GIS contours shown on the overall plan view.

Comment #5: Label the 25' downslope protection area from the edge of the mound closest to the proposed house (see Design and Construction Manual Section 3.2.16).

Response #5: This protection area has been labeled.

Comment #6: Revise calculations to reflect a 6.0' wide bed area.

Response #6: Per your email on February 16, 2012, this comment is no longer applicable.

Thank you for your time and effort in this matter. If have any questions, or require any addition information, please contact us at 443-276-6220.

Sincerely,

AXIOM ENGINEERING DESIGN, LLC

A handwritten signature in black ink, appearing to read 'W. Zawislak', written over the company name.

Walter G. Zawislak, PE
Senior Project Manager

Cc: Scot Keeton



12/19/2011

Mr. Michael Davis
Assistant Director
Howard County Health Department
Well & Septic Program
7178 Columbia Gateway Dr, # E
Columbia, MD 21046-2581

Re: Property Address: 16377 Old Frederick Road, Mt. Airy, MD 21771
Health Department Property ID#16381 Rt 99

Dear Mr. Richards,

In regard to the above referenced property and associated perc application, we hereby request a variance to allow the proposed wellbox on Lot 2 directly downgradient of the septic area for 16373 Old Frederick Road. The separation distance between the existing septic area and proposed well location is greater than 200'.

Scot Keeton, Owner, 16377 Old Frederick Road, Mt. Airy, MD 21771

If you have any questions, please contact myself or Axiom Engineering Design, Yuning Qu at 443-276-6220, or e-mail me at y.qu@axiom-ed.com. Thank you.

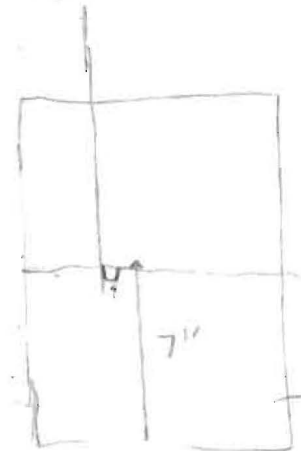
Sincerely Yours

Scot Keeton

Scot Keeton
Owner
16377 Old Frederick Road,
Mt. Airy, MD 21771




1.75

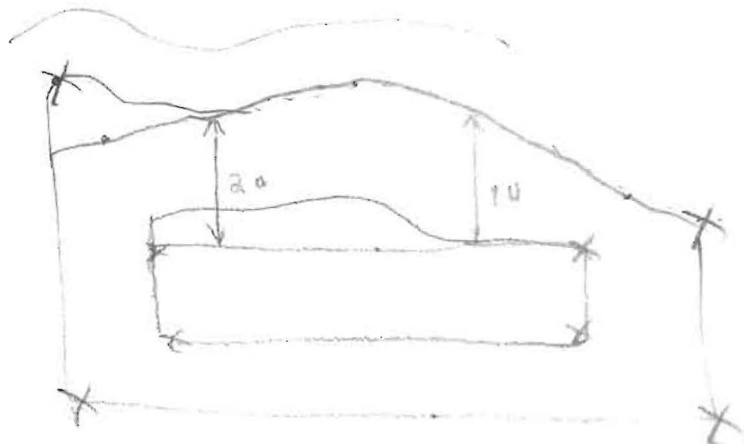


3-6-12

- ✓ 1) Extra contour layer?
- ✓ 2) All 4 Corners of the sand mounds & All 4 " of the beds. need to be staked out by LLS w/ corner elevations shown, on the field stakes.
- ✓ 3) Construct upper sm 1st
- ✓ 4) Eliminate D box? What is other square?
- ✓ 5) Designate the 25' ~~prot~~ downslope protected area

12%	600 gpd	at	1.0 gpd / ft ² sand = 130' x 36' m 120' x 6' B
			1.2 gpd / ft ² sand = 111' x 36' m 83' x 6' B
10.5%		1.0 gpd	128' x 35' m 100' x 6' B
10.5%		1.2 gpd	111' x 35' m 83' x 6' B

✓ Legend = 
This area



Williams, Jeffrey

From: Williams, Jeffrey
Sent: Monday, November 17, 2014 9:21 AM
To: 'Walt Zawislak'
Cc: Scot Keeton
Subject: RE: 16377 OLD FREDERICK ROAD

Hello Walter. The original well location for lot 2 is downgradient of the septic area on the neighboring property at 16373 Old Frederick. If you propose a new location, it must stay at least 200' away from that septic area. The new area you proposed might be less than 200' from it, it's hard to tell. You do not have to have a perfectly square well box, you could make it more rectangular in shape to put it on that side of the new driveway while keeping it 1500 sq ft and 10' from the drive as well as at least 200' from the neighboring septic area.

In order to approve the new area, you would have to submit a revised perc cert plan (3 paper copies) for signature. As long as you maintain those setbacks, it should be ok. One other thing I noticed: if you are revising the perc cert, I'd like an additional note added. MDE approved a variance for that well box location subject to the condition that the well be drilled with steel casing extending at least 50' or 10' into bedrock, whichever is deeper. We usually put a note on the perc cert in these cases, but missed putting it on this one. If you revise, please add the following note:

- The Maryland Department of the Environment has approved a variance allowing the well location on lot 2 to be downgradient of the sewage disposal area for 16373 Old Frederick Road with the condition that the well be constructed using steel casing extending down to 50 feet depth or ten feet into competent bedrock, whichever is deeper.

Thanks,
Jeff

From: Walt Zawislak [<mailto:W.Zawislak@axiom-ed.com>]
Sent: Friday, November 07, 2014 3:56 PM
To: Williams, Jeffrey
Cc: Scot Keeton
Subject: FW: 16377 OLD FREDERICK ROAD

Jeff,
Heidi Scott was the previous reviewer on this project and we are trying to determine the impacts and requirement if we shift the previously approved well location, shown in red on the attached.
I got a bounce back on the email to Heidi, which is why I forwarding this to you.

Thanks

Walter G. Zawislak, PE
Axiom Engineering Design

From: Walt Zawislak
Sent: Friday, November 07, 2014 3:37 PM
To: Scott, Heidi
Cc: 'Scot Keeton'; Peggy White
Subject: 16377 OLD FREDERICK ROAD

Heidi,
In speaking with the Client, Mr. Keeton, we are considering shifting the well location by 11 feet and flipping the driveway to the east side rather than the west to save some trees. This revision is shown in red on the attached pdf.

A few questions on related to this:

1. Is there objection to this?
2. Would a revised well and septic plan be required to be submitted? If so what is the process and what fees are involved?
3. How long would this take to review?

Thank you for your assistance with this matter.

Walter G. Zawislak, PE

Axiom Engineering Design

6990 Columbia Gateway Drive

Suite 150

Columbia, Maryland 21046

Ph: 443-276-6220

Fx: 443-276-6221

December 2, 2014

Mr. Jeffrey Williams
Howard County Health Department
Well and Septic Coordination Section
7879 Columbia Gateway Drive
Columbia, MD 21046

RE: Revised Percolation Test Site Plan
16381 Old Frederick Road

Mr. Williams:

We are submitting a revised Percolation Test Site Plan to show a relocated well box on Lot 2. This plans was prepared based on our email correspondence on November 17, 2014. We have added the required note as General Note #4 and added the previously handwritten notes from the previously plan approval as General Notes #5 & 6..

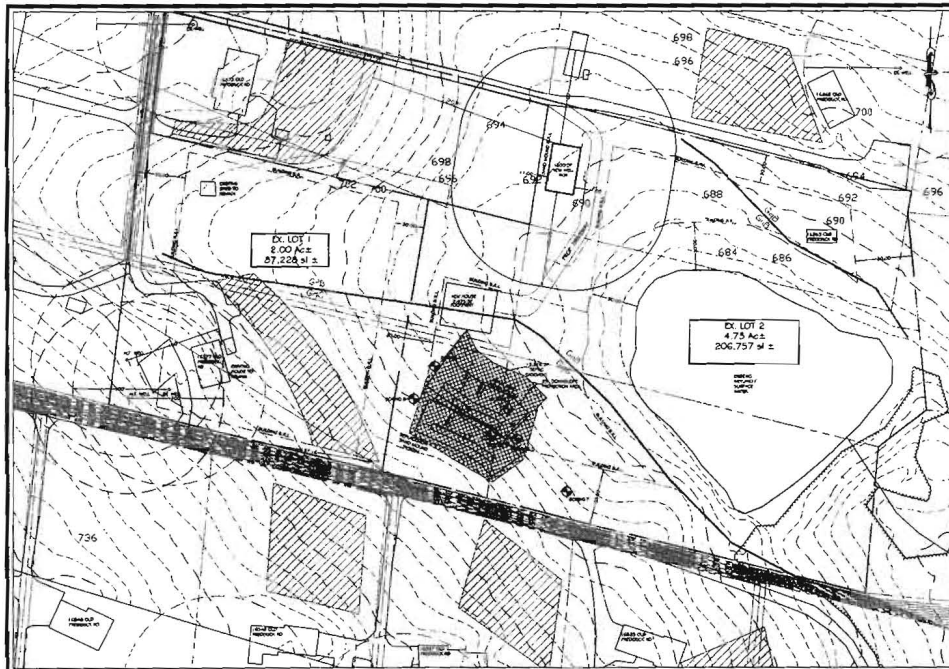
Thank you for your time and effort in this matter. If have any questions, or require any addition information, please contact us at 443-276-6220.

Sincerely,

AXIOM ENGINEERING DESIGN, LLC



Walter G. Zawislak, PE
Senior Project Manager

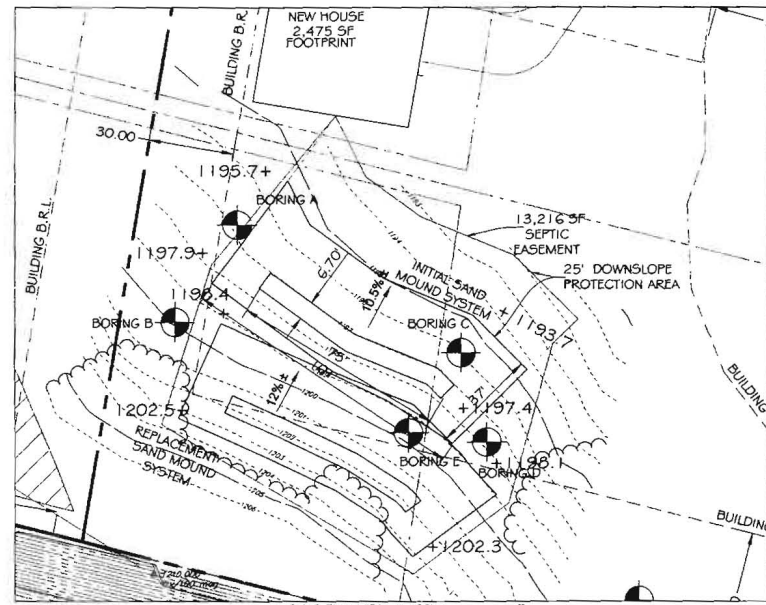


OVERALL PROPERTY PLAN VIEW, 1" = 60'
1. The topography of this OVERALL PROPERTY PLAN VIEW is taken from HOWARD COUNTY GIS

- LEGEND**
- PERCOLATION TEST LOCATION PLANTED
 - EXISTING SEPTIC EASEMENT (APPROX. LOCATION)
 - NEW SEPTIC EASEMENT
 - PROPOSED LOT LINE
 - EXISTING LOT LINE
- SOIL LEGEND**
- GgD Clayey Loam, 3 to 9% Slope
 - GgC Clayey Loam, 0 to 1% Slope
 - GhB Clayey Sand and Gravel, 0 to 0 percent Slope



- SITE NOTES**
- ZONING: R-2000
 - BOUNDARY SOURCE: HOWARD COUNTY GIS
 - BOUNDARY LINE SOURCE: HOWARD COUNTY GIS
 - SOIL SOURCE: BASED ON HOWARD COUNTY DEPARTMENT OF THE ENVIRONMENT'S SOIL DATA AND CONSTRUCTION FOR SHED ROAD IMPROVED LOT SCOPE. A-BEFORE, GSD 0719
 - D.E.S. = SEWAGE TREATMENT LINE
 - PROPERTY OWNER: SCOR AND SANDRA LITTON, 1537 OLD FREDERICK ROAD, #1000, WASHINGTON, DC 20004
 - DATE: 12-1-2014
 - PROJECT NO: 111-0026-00



MOUND PLAN VIEW, 1" = 20'

- The elevations (1190.2+) at the corners of the mound system shown in this plan view are not based on any vertical datum. The elevations shown are relative to one another on an assumed datum, and were field notes by Axiom Engineering Design, February and April, 2012. These elevations are NOT comparable to the GSD elevations shown in the plan view above.
- The average slope of the mound systems are less than 12%.

PRE-TREATMENT NOTE:

An advanced pre-treatment system, which utilizes best available technology to perform nitrogen reduction must be installed on the septic system on the subject property due to insufficient area to support three sand mound systems. A supplemental plan with all of the necessary details for installation of the system will be required prior to release of the building permit and septic permit. In addition, an operations and maintenance contract agreement must be filed and recorded in the Howard County Land Records.

NOTE:

This area designates a private sewage disposal area of at least 10,000 square feet as required by the Maryland Department of the Environment for individual sewage disposal. Improvements of any nature in this area are restricted. This sewage disposal area shall become null and void upon connection to a public sewerage system. The County Health Officer shall have authority to grant adjustments to the private sewage easement. Reconnection of a revised sewage easement shall not be necessary.

All wells to be drilled prior to final plat submission.

"Approved For Private Water and Private Sewerage Systems"

Health Officer, Howard County Health Dept. Date

REPLACEMENT SAND MOUND COMPS

4 Sandmound approved 999 sqft.
Permitted load area with sub-base equivalent 1.0 gpm/ft.
Soil Area (Equivalent) = 10,000 sq ft.
Slope = 0.04%, multiple corr. factor = 0.75, drainage coeff. factor = 1.07

TABLE 2.1
EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

Absorption bed $A = \frac{Q \times D}{S} = \frac{100 \times 1.0}{0.04} = 2,500 \text{ sq ft}$
Bed length $CL = 75 \text{ ft}$ (at 6 ft wide, dependent on soil)
Bed width $(W) = \frac{A}{CL} = \frac{2,500}{75} = 33.3 \text{ ft}$ (or 34 ft, round up)
Development bed depth $(D) = 24 \text{ in} = 2 \text{ ft}$ (at 6 ft wide) = 3 feet
Development bed depth $(D) = 24 \text{ in} = 2 \text{ ft}$ (at 6 ft wide) = 3 feet
Cap = equal to bed width $(W) = 34 \text{ ft}$
Cap = equal to bed width $(W) = 34 \text{ ft}$
Total bed depth $(D) = 2 \text{ ft}$
Absorption surface $(A) = (CL \times W) = (75 \times 34) = 2,550 \text{ sq ft}$
Development $(D) = (CL \times W) = (75 \times 34) = 2,550 \text{ sq ft}$
Development surface $(A) = (CL \times W) = (75 \times 34) = 2,550 \text{ sq ft}$
Total width of mound $(W) = 34 \text{ ft}$
Total length of mound $(CL) = 75 \text{ ft}$

INITIAL SAND MOUND COMPS

4 Sandmound approved 999 sqft.
Permitted load area with sub-base equivalent 1.0 gpm/ft.
Soil Area (Equivalent) = 10,000 sq ft.
Slope = 0.04%, multiple corr. factor = 0.75, drainage coeff. factor = 1.07

TABLE 2.2
EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

Absorption bed $A = \frac{Q \times D}{S} = \frac{100 \times 1.0}{0.04} = 2,500 \text{ sq ft}$
Bed length $CL = 75 \text{ ft}$ (at 6 ft wide, dependent on soil)
Bed width $(W) = \frac{A}{CL} = \frac{2,500}{75} = 33.3 \text{ ft}$ (or 34 ft, round up)
Development bed depth $(D) = 24 \text{ in} = 2 \text{ ft}$ (at 6 ft wide) = 3 feet
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Cap = equal to bed width $(W) = 34 \text{ ft}$
Total bed depth $(D) = 2 \text{ ft}$
Absorption surface $(A) = (CL \times W) = (75 \times 34) = 2,550 \text{ sq ft}$
Development $(D) = (CL \times W) = (75 \times 34) = 2,550 \text{ sq ft}$
Development surface $(A) = (CL \times W) = (75 \times 34) = 2,550 \text{ sq ft}$
Total width of mound $(W) = 34 \text{ ft}$
Total length of mound $(CL) = 75 \text{ ft}$

GENERAL NOTES

- Any changes to a private sewage disposal plan require a revised percolation test plan.
- All wells and septic systems located within 100' of the property boundaries and 200' down gradient of any well or septic system have been shown.
- The local slope horizon, consistently with the minimum ownership width and lot area as required by the Maryland Department of the Environment.
- The Maryland Department of the Environment has approved a variance allowing the well location on lot 2 to be down-gradient of the sewage disposal area for 15,373 Old Frederick Road with the condition that the well be constructed using best casing extending down to 50 feet depth on fan feet, also consistent bearing, whenever a deeper.
- The area reserved for sand mound systems shall be protected from disturbance prior to system construction. Disturbance of any kind may render the area unsuitable for sewage disposal, which may turn over the lot to be deemed non-suitable.
- The sand mound system shall be placed and a 25 foot setback from the mound area to the building footprint must be verified before building permit approval.

Axiom Engineering Design
Civil Engineering • Land Surveying • Landscape Architecture • Land Planning
8890 Columbia Gateway Dr. Ste 150
Columbia, Maryland 21046
www.axiom-ed.com
Office: 443.278.8290
Fax: 443.278.8221
info@axiom-ed.com

PREPARED FOR:
Scott Keeton
16377 Old Frederick Rd
Mt. Airy, MD 21771

PERCOLATION CERTIFICATION PLAN
OLD FREDERICK ROAD #16381
Mt. Airy, Maryland
Parcel 463
Tax Map 7 Grid 0004
Election District 04-05 Howard County, Maryland

STATE OF MARYLAND
PROFESSIONAL ENGINEER
Walter G. Zawlski P.E.
6290 Gateway Gateway Drive, Suite 100 Columbia, Maryland 21046
PH: 443-278-6290 FAX: 443-278-6221
www.wgzawlski.com

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE CALCULATIONS AND PERMITS ON APPROVED BY ME AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 13003, EXPIRES ON DATE 08/31/15

Drawn:	WGZ
Checked:	WGZ
Date:	12-1-2014
Project No.:	111-0026-00
Scale:	AS SHOWN
Sheet:	C 1.0

April 24, 2012

Ms. Heidi Scott, R.S.
Howard County Health Department
Well and Septic Coordination Section
7879 Columbia Gateway Drive
Columbia, MD 21046

RE: Revised Percolation Test Site Plan
16381 Old Frederick Road

Ms. Scott:

We are submitting a revised Percolation Test Site Plan in based on our meeting this morning. We offer the following point-by-point responses:

Comment #1: Remove the GIS contours from the "Mound Plan View".

Response #1: These have been removed.

Comment #2: Remove the 1-foot, field surveyed contours from the "Overall Property Plan View".

Response #2: These have been removed.

Comment #3: Add the Septic Hatch area to only the "Overall Property Plan View".

Response #3: The Septic area is now only hatched on the "Overall Property Plan View".

Comment #4: Switch the Replacement and Initial Mounds system locations back to having the Initial on the downslope side and revise the calculation titles accordingly.

Response #4: These have been switched as requested.

Comment #5: Revise the mound systems per the Health Department mark-up provided in our meeting.

Response #5: These have been revised as requested.

Thank you for your time and effort in this matter. *We asked for an expedited review and approval of this application.* If have any questions, or require any addition information, please contact us at 443-276-6220.

Sincerely,

AXIOM ENGINEERING DESIGN, LLC



Walter G. Zawislak, PE
Senior Project Manager

April 19, 2012

Ms. Heidi Scott, R.S.
Howard County Health Department
Well and Septic Coordination Section
7879 Columbia Gateway Drive
Columbia, MD 21046

RE: Revised Percolation Test Site Plan
16381 Old Frederick Road

Ms. Scott:

We are submitting a revised Percolation Test Site Plan in based on our meeting this morning. We offer the following point-by-point responses:

Comment #1: Revise the beds to run along the contour.

Response #1: The beds have been revised.

Comment #2: Revise the mounds to run parallel to the beds.

Response #2: The mounds have been revised.

Comment #3: Revise the sheet layout to show the 20 scale plan view as the main plan view and the 60 scale to show the overall property.

Response #3: The plan views have been revised accordingly. The 60 scale has a note associated with it stating the contours are GIS and the 20 scale has a note stating the contours were field surveyed.

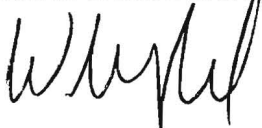
Comment #4: Eliminate the Section view.

Response #4: The section view has been revised as requested.

Thank you for your time and effort in this matter. We asked for an expedited review and approval of this application. If have any questions, or require any addition information, please contact us at 443-276-6220.

Sincerely,

AXIOM ENGINEERING DESIGN, LLC



Walter G. Zawislak, PE
Senior Project Manager

April 19, 2012

Ms. Heidi Scott, R.S.
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Response #1: The beds have been revised.

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Response #2: The mounds have been revised.

Comment #3: Revise the sheet layout to show the 20 scale plan view as the main plan view and the 60 scale to show the overall property.

Response #3: The plan views have been revised accordingly. The 60 scale has a note associated with it stating the contours are GIS and the 20 scale has a note stating the contours were field surveyed.

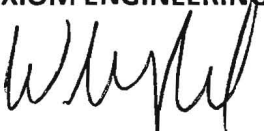
Comment #4: Eliminate the Section view.

Response #4: The section view has been revised as requested.

Thank you for your time and effort in this matter. We asked for an expedited review and approval of this application. If have any questions, or require any addition information, please contact us at 443-276-6220.

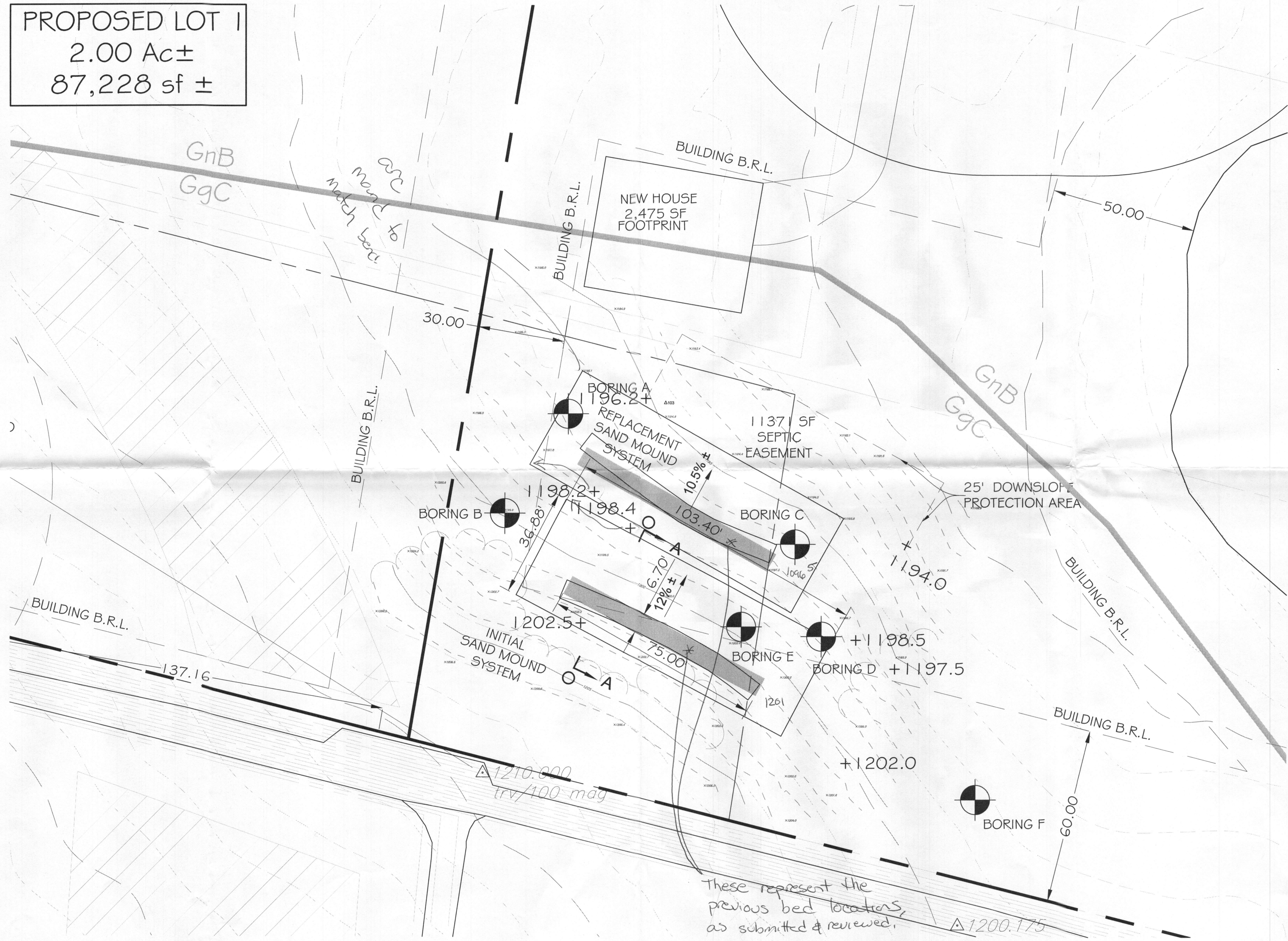
Sincerely,

AXIOM ENGINEERING DESIGN, LLC



Walter G. Zawislak, PE
Senior Project Manager

PROPOSED LOT 1
 2.00 Ac±
 87,228 sf ±

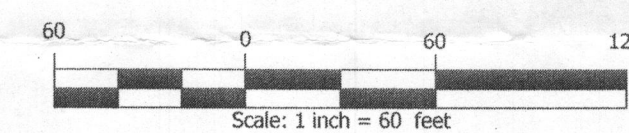


4/19/12
 1" = 20'
 Old Frederick Road
 #16381

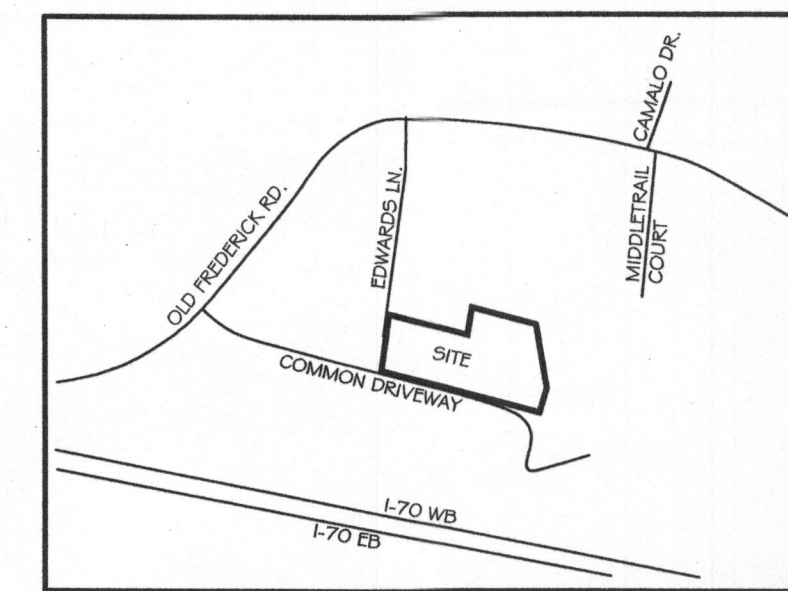


OVERALL PROPERTY PLAN VIEW, 1"=60'

1. The topography of this "OVERALL PROPERTY PLAN VIEW" is taken from HOWARD COUNTY GIS.

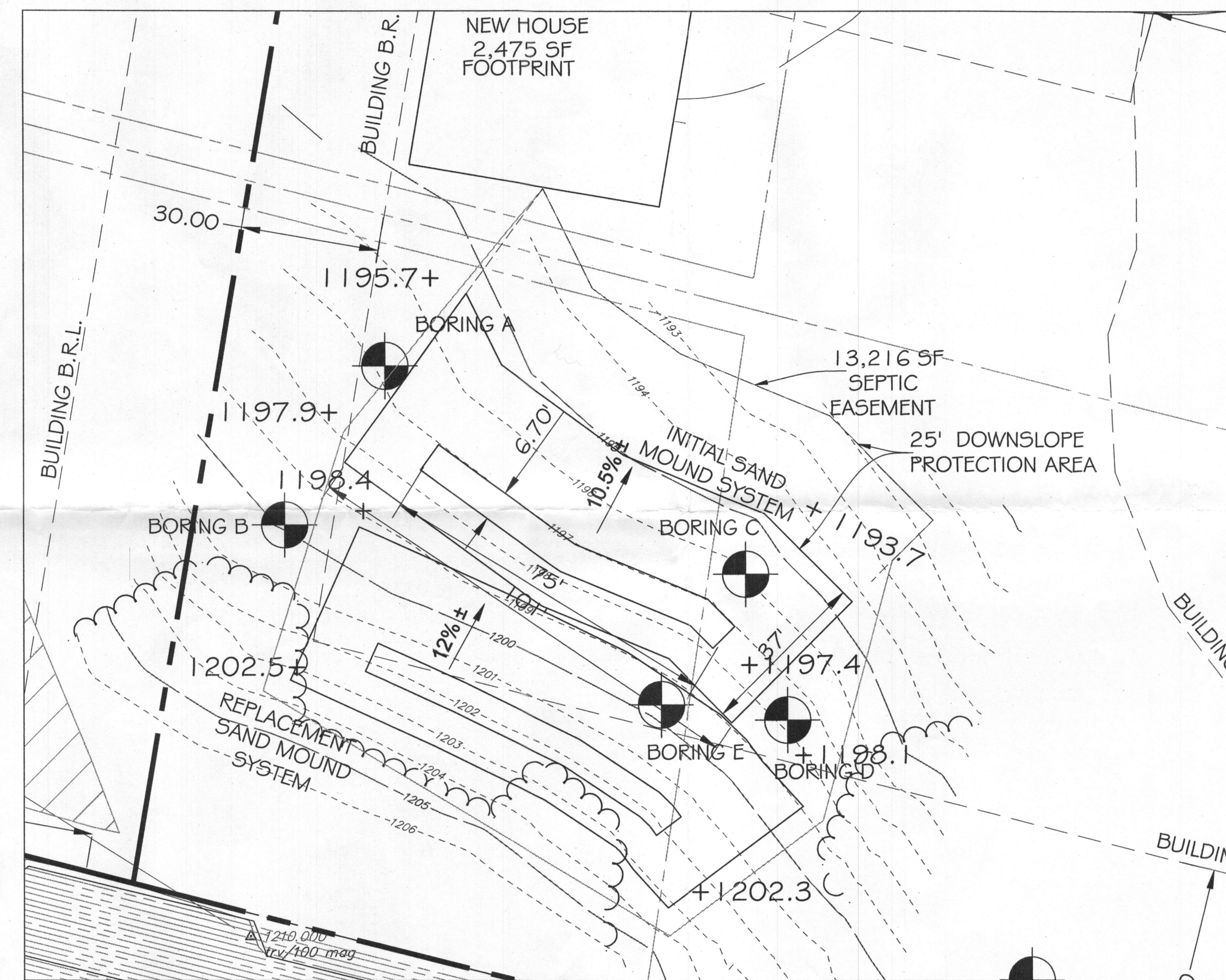


THIS AREA DESIGNATES A PRIVATE SEWAGE EASEMENT OF AT LEAST 10,000 SQUARE FEET



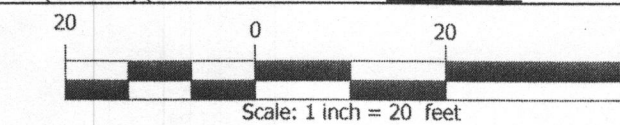
SITE NOTES

- ZONING: RC-DEO
- TOPOGRAPHY SOURCE: HOWARD COUNTY GIS
- BOUNDARY LINE SOURCE: HOWARD COUNTY GIS
- SAND MOUND SIZING BASED ON MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) DESIGN AND CONSTRUCTION FOR SAND MOUND SYSTEMS (6% SLOPE, 4-BEDROOM, 600 GPD)
- B.R.L. = BUILDING RESTRICTION LINE
- PROPERTY OWNER: SCOT AND SANDRA KEETON
16377 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
(410)802-6980
- SITE ADDRESS: 16381 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
MIDDLE TRAIL SUBDIVISION



MOUND PLAN VIEW, 1"=20'

- The elevations (1198.2+) at the corners of the mound systems shown in this plan view are not based on any vertical datum. The elevations shown are relative to one another, on an assumed datum, and were field surveyed by Axiom Engineering Design, February and April 2012. These elevations do NOT correspond to the GIS elevations shown in the plan view above.
- The average slope of the mound systems are less than 12%.



PRE-TREATMENT NOTE:

An advanced pre-treatment system, which utilizes best available technology to perform nitrogen reduction must be installed on the septic system on the subject property due to insufficient area to support three sand mound systems. A supplemental plan with all of the necessary details for installation of the system will be required prior to release of the building permit and septic permit. In addition, an operation and maintenance contract agreement must be filed and recorded in the Howard County Land Records

GENERAL NOTES

- Any changes to a private sewage easement shall require a revised percolation certification plan.
- 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.
- The lot(s) shown hereon complies/comply with the minimum ownership width and lot area as required by the Maryland Department of Environment.

Note: The area reserved for sand mound systems must be protected from disturbance prior to system construction. Disturbance of any kind may render the area unsuitable for sewage disposal, which may in turn cause the lot to be deemed non-billable.

Note: The sand mound areas must be staked and a 25 foot setback from the mound area to the building footprint must be verified before building permit approval.

"Approved For Private Water and Private Sewerage Systems"
Walter G. Zawislak, P.E.
Health Officer, Howard County Health Dept. Date 5/3/2012

REPLACEMENT SAND MOUND COMPS

4 Bedrooms generated 600 gpd,
Percolation test rate = 18 min./inch equivalent 1.2 gpd/sft
Bed Area (BA)=600 sft
Slope = 12.0%, upslope corr. factor = 0.75, downslope corr. factor = 1.87

TABLE 3.1

EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

Absorption bed ft² (A x B) = Design flow = **500** ft³ / 1.2 gpd/ft²

Bed length (B) = **75** ft. (42 ft. to 104 ft. dependent on site)

Bed width (A) = Bed area / Bed length = **6.67** ft. (12 ft. or less)

Upslope sand fill depth (D) = 48 in. - Z in. = **24** in. (12 in. min.) = **2 feet**

Downslope sand fill depth (E) = (12A x % slope) + D in. = **33.6** in. = **2.8 feet**

Cap + topsoil at bed center (H) = **18** in.

Cap + topsoil at bed edge (G) = **18** in.

Total bed depth (F) = **18** in.

Sideslope setback (K) = [(D + E) + 28 in.] x 3 = **170.4** in. = **14.20** feet

Upslope setback (J) = (22 in. + D) x 3 x upslope corr. factor = **100.74** in. = **8.40 feet**

Downslope setback (I) = (22 in. + E) x 3 x downslope corr. factor = **261.88** in. = **21.82 feet**

Total width of mound (W) = 12A + J + I = **442.62** in. = **36.88 feet**

Total length of mound (L) = 12B + K + K = **1240.8** in. = **103.40 feet**

INITIAL SAND MOUND COMPS

4 Bedrooms generated 600 gpd,
Percolation test rate = 18 min./inch equivalent 1.2 gpd/sft
Bed Area (BA)=600 sft
Slope = 10.8%, upslope corr. factor = 0.73, downslope corr. factor = 1.87

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EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

Absorption bed ft² (A x B) = Design flow = **500** ft³ / 1.2 gpd/ft²

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Total bed depth (F) = **18** in.

Sideslope setback (K) = [(D + E) + 28 in.] x 3 = **168.7** in. = **14.05** feet

Upslope setback (J) = (22 in. + D) x 3 x upslope corr. factor = **100.74** in. = **8.40 feet**

Downslope setback (I) = (22 in. + E) x 3 x downslope corr. factor = **256.22** in. = **21.35 feet**

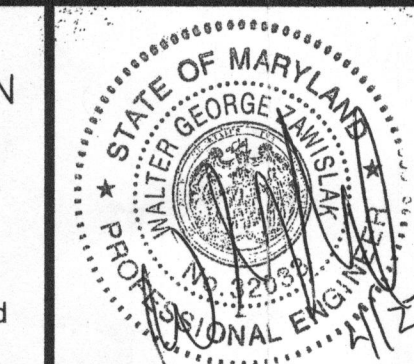
Total width of mound (W) = 12A + J + I = **436.96** in. = **36.41 feet**

Total length of mound (L) = 12B + K + K = **1237.2** in. = **103.10 feet**

Axiom Engineering Design
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Columbia, Maryland 21046 Fax: 443.276.6221
www.axiom-ed.com info@axiom-ed.com

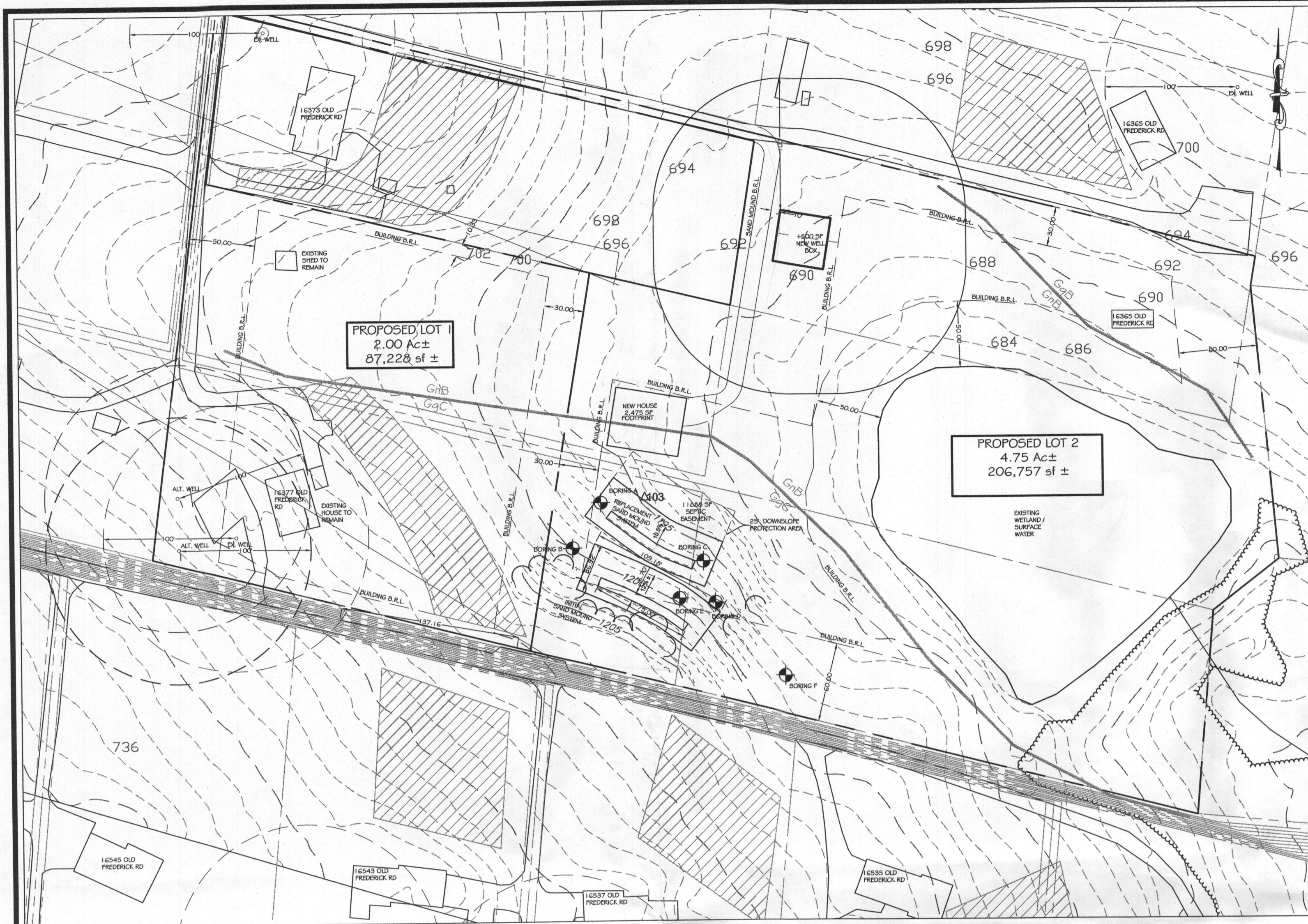
PREPARED FOR:
Scot Keeton
16377 Old Frederick Rd.
Mt. Airy, MD 21771

PERCOLATION CERTIFICATION PLAN
OLD FREDERICK ROAD #16381
Mt. Airy, Maryland
Parcel 463
Tax Map 7 Gnd 0004
Election District 04-05 Howard County, Maryland



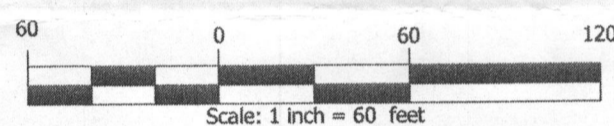
Walter G. Zawislak P.E.
Professional Engineer
6990 Columbia Gateway Drive, Suite 150, Columbia, Maryland 21046
Ph: 443-276-6220 Fax: 443-276-6221 w.zawislak@axiom-ed.com
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 32033, EXPIRATION DATE 6/20/2013

Drawn: WGZ
Checked: WGZ
Date: 4-27-2012
Project No.: 11-0026.00
Scale: AS SHOWN
Sheet: C 1.0



OVERALL PROPERTY PLAN VIEW, 1"=60'

1. The topography of this "OVERALL PROPERTY PLAN VIEW" is taken from HOWARD COUNTY GIS.

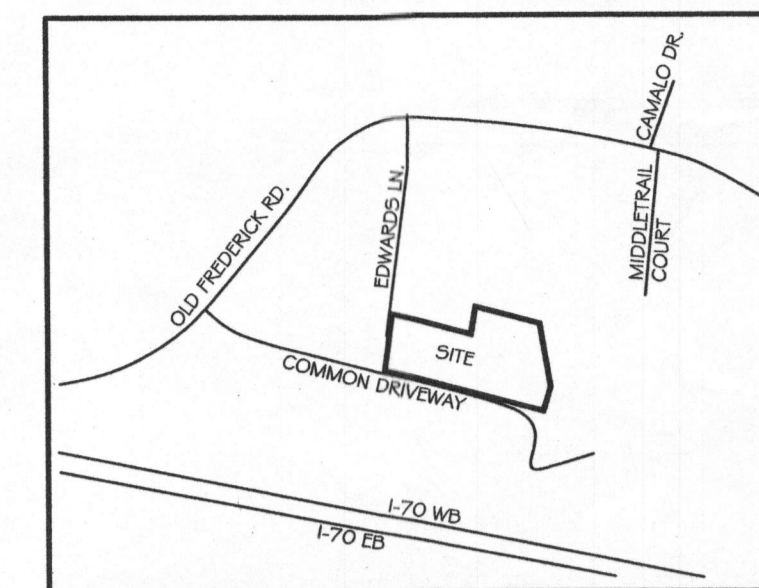


LEGEND

- PERCOLATION TEST LOCATION PASSED
- EXISTING SEPTIC EASEMENT (APPROX. LOCATION)
- NEW SEPTIC EASEMENT
- PROPOSED LOT LINE
- EXISTING LOT LINE

SOIL LEGEND

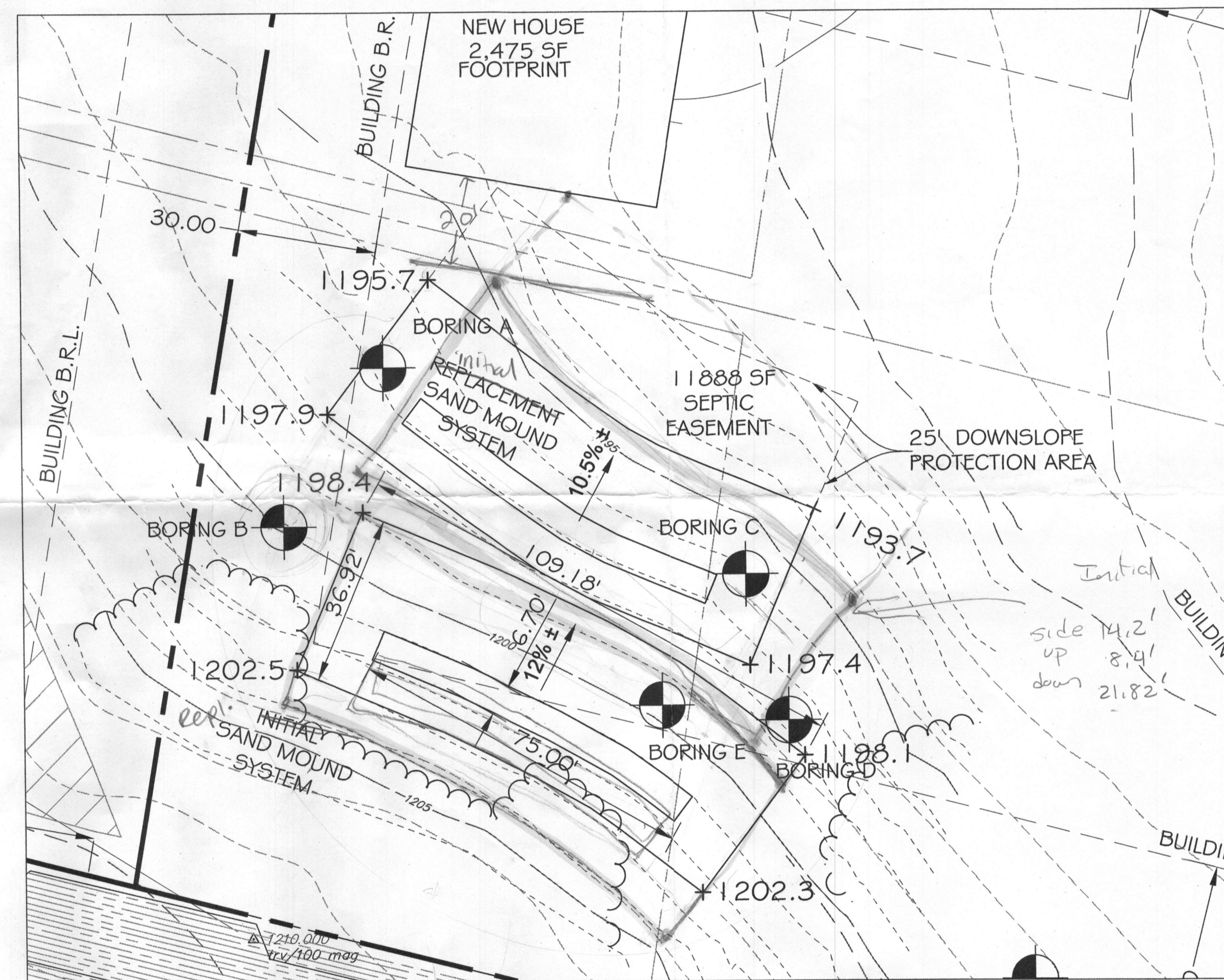
- GqB Glenelg Loam, 3 to 8% Slope
- GqC Glenelg Loam, 8 to 15% Slope
- GnB Glenwie-Dale silt loam, 2 to 8 percent Slope



VICINITY MAP
NOT TO SCALE

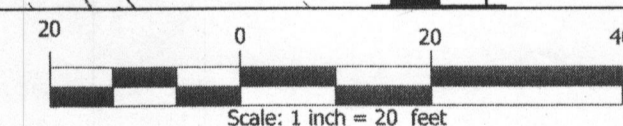
SITE NOTES

1. ZONING: RC-DEO
2. TOPOGRAPHY SOURCE: HOWARD COUNTY GIS
3. BOUNDARY LINE SOURCE: HOWARD COUNTY GIS
4. SAND MOUND SIZING BASED ON MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) DESIGN AND CONSTRUCTION FOR SAND MOUND SYSTEMS (6% SLOPE, 4-BEDROOM, 600 GPD)
5. B.R.L. = BUILDING RESTRICTION LINE
6. PROPERTY OWNER: SCOT AND SANDRA KEETON
16377 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
(410)602-0590
7. SITE ADDRESS: 16381 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
MIDDLE TRAIL SUBDIVISION



MOUND PLAN VIEW, 1"=20'

1. The elevations (1198.2+) at the corners of the mound systems shown in this plan view are not based on any vertical datum. The elevations shown are relative to one another, on an assumed datum, and were field surveyed by Axiom Engineering Design, February and April 2012. These elevations do NOT correspond to the GIS elevations shown in the plan view above.
2. The average slope of the mound systems are less than 12%.



THIS AREA DESIGNATES A PRIVATE SEWAGE EASEMENT OF AT LEAST 10,000 SQUARE FEET

GENERAL NOTES

1. Any changes to a private sewage easement shall require a revised percolation certification plan.
2. 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.
3. The lot(s) shown hereon complies/comply with the minimum ownership width and lot area as required by the Maryland Department of Environment.

"Approved For Private Water and Private Sewerage Systems"

Health Officer, Howard County Health. Dept. Date

NOTE:

This area designates a private sewage disposal area of at least 10,000 square feet as required by the Maryland Department of the Environment for individual sewage disposal. Improvements of any nature in this area are restricted. This sewage disposal area shall become null and void upon connection to a public sewerage system. The county health officer shall have authority to grant adjustments to the private sewage easement. Recordation of a revised sewage easement shall not be necessary.

All wells to be drilled prior to final plat submission.

PRE-TREATMENT NOTE:

An advanced pre-treatment system, which utilizes best available technology to perform nitrogen reduction must be installed on the septic system on the subject property due to insufficient area to support three sand mound systems. A supplemental plan with all of the necessary details for installation of the system will be required prior to release of the building permit and septic permit. In addition, an operation and maintenance contract agreement must be filed and recorded in the Howard County Land Records

INITIAL SAND MOUND COMPS

4 Bedrooms generated 600 gpd,
Percolation test rate = 15 min./inch equivalent 1.2 gpd/ft
Bed Area (BA)=500 sq ft
Slope = 12.0%, upslope corr. factor = 0.73, downslope corr. factor = 1.57

TABLE 3-1
EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

Absorption bed ft² (A x B) = $\frac{\text{Design flow} = 500}{1.2 \text{ gpd/ft}^2}$ ft²

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Total bed depth (F) = **10** in.

Sideslope setback (K) = $\frac{[(D+E) + 28 \text{ in.}] \times 3}{2}$ = **170.4** in. = **14.20** feet

Upslope setback (J) = (22 in. + D) x 3 x upslope corr. factor = **100.74** in. = **8.40 feet**

Downslope setback (L) = (22 in. + E) x 3 x downslope corr. factor = **261.68** in. = **21.82 feet**

Total width of mound (W) = 12A + J + L = **442.62** in. = **36.88 feet**

Total length of mound (L) = 12B + K + K = **1240.8** in. = **103.40 feet**

REPLACEMENT SAND MOUND COMPS

4 Bedrooms generated 600 gpd,
Percolation test rate = 15 min./inch equivalent 1.2 gpd/ft
Bed Area (BA)=500 sq ft
Slope = 10.5%, upslope corr. factor = 0.73, downslope corr. factor = 1.57

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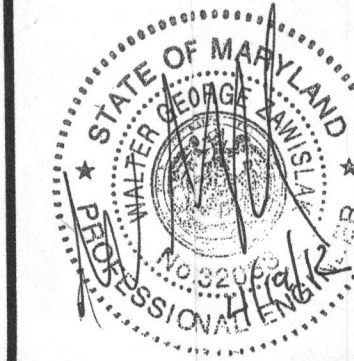
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www.axiom-ed.com info@axiom-ed.com

PREPARED FOR:
Scot Keeton
16377 Old Frederick Rd.
Mt. Airy, MD 21771

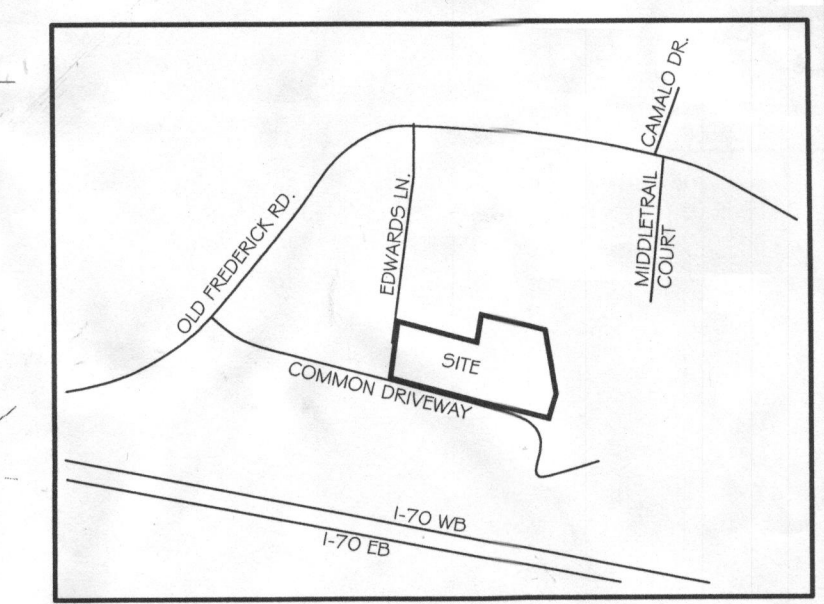
PERCOLATION CERTIFICATION PLAN
OLD FREDERICK ROAD #16381
Mt. Airy, Maryland
Parcel 463
Tax Map 7 Gnd 0004
Election District 04-05 Howard County, Maryland



Walter G. Zawislak P.E.
Professional Engineer
6990 Columbia Gateway Drive, Suite 150, Columbia, Maryland 21046
Ph: 443-276-6220 Fax: 443-276-6221 w.zawislak@axiom-ed.com
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 32033, EXPIRATION DATE 6/20/2013

Drawn:	Y. QU
Checked:	WGZ
Date:	4-10-2012
Project No.:	11-0026.00
Scale:	AS SHOWN
Sheet:	C 1.0

4-24-12
marked plan from
mtg w/ Heidi Scott

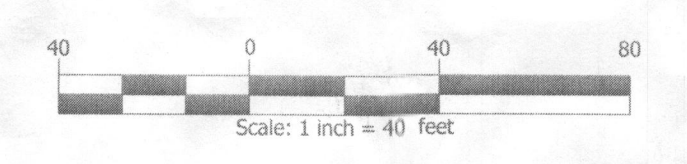


VICINITY MAP
NOT TO SCALE

- SITE NOTES**
1. ZONING: RC-DEO
 2. TOPOGRAPHY SOURCE: HOWARD COUNTY GIS
 3. BOUNDARY LINE SOURCE: HOWARD COUNTY GIS
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16377 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
(410)852-2990
 7. SITE ADDRESS: 16361 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
MIDDLE TRAIL SUBDIVISION

- LEGEND**
- PERCOLATION TEST LOCATION
 - EXISTING SEPTIC EASEMENT (APPROX. LOCATION)
 - NEW SEPTIC EASEMENT
 - PROPOSED LOT LINE
 - EXISTING LOT LINE

- SOIL LEGEND**
- GgB Glenelg Loam, 3 to 8% Slope
 - GgC Glenelg Loam, 8 to 15% Slope
 - GnB Glenville-Bate site loam, 0 to 8 percent Slope



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www.axiom-ed.com info@axiom-ed.com

PREPARED FOR:
Scot Keeton
16377 Old Frederick Rd.
Mt. Airy, MD 21771

PERCOLATION TEST SITE PLAN
OLD FREDERICK ROAD #16381
Mt. Airy, Maryland
Parcel 463
Tax Map 7 Grd 0004
Election District 04-05 Howard County, Maryland

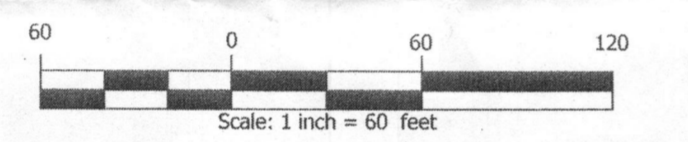
Jeffrey L. Sloman, P.E.
Professional Engineer
6990 Columbia Gateway Drive, Suite 150, Columbia, Maryland 21046
Ph: 443-276-6220 Fax: 443-276-6221 J.Sloman@axiom-ed.com
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 40091, EXPIRATION DATE 2-13-2013

Drawn: J. Sloman
Checked: J. Sloman
Date: June 16, 2011
Project No.: 11-0026.00
Scale: 1"=40'
Sheet: C 1.0



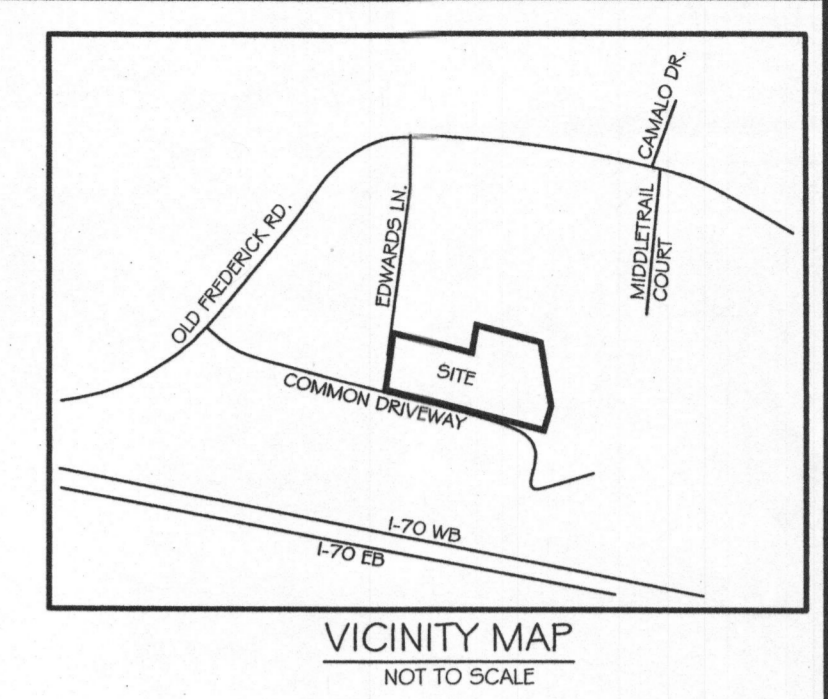
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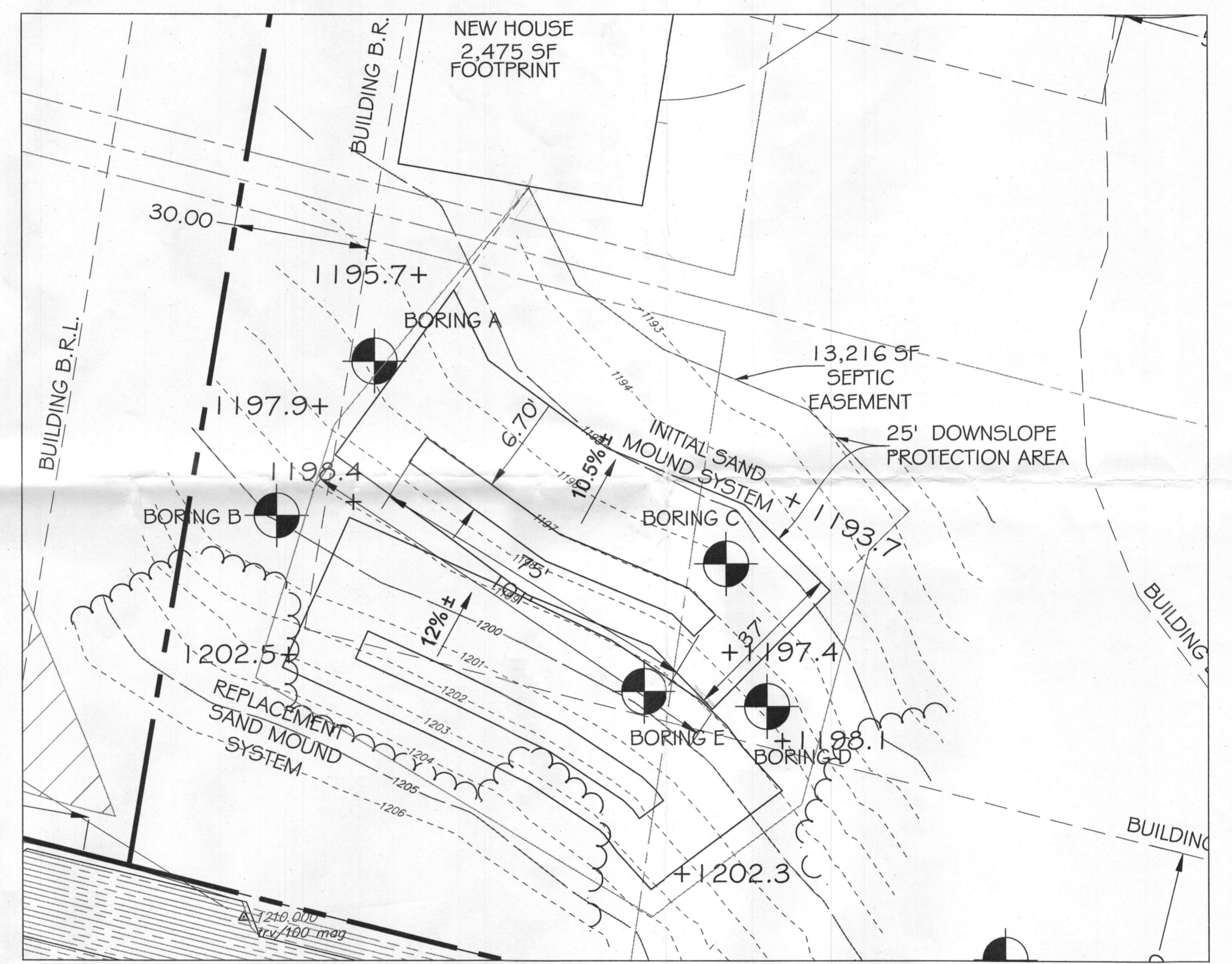


THIS AREA DESIGNATES A PRIVATE SEWAGE EASEMENT OF AT LEAST 10,000 SQUARE FEET

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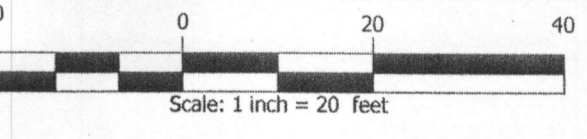


- SITE NOTES**
- ZONING: RC-020
 - TOPOGRAPHY SOURCE: HOWARD COUNTY GIS
 - BOUNDARY LINE SOURCE: HOWARD COUNTY GIS
 - SAND MOUND SIZING BASED ON MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) DESIGN AND CONSTRUCTION FOR SAND MOUND SYSTEMS (6% SLOPE, 4-BEDROOM, 600 GPD)
 - B.R.L. = BUILDING RESTRICTION LINE
 - PROPERTY OWNER: SCOT AND SANDRA KEETON
16377 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
(410)802-8990
 - SITE ADDRESS: 16381 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
MIDDLE TRAIL SUBDIVISION



MOUND PLAN VIEW, 1"=20'

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Absorption bed ft² (A x B) = Design flow = 500 ft³
1.2 gpd/ft²

Bed length (B) = 75 ft. (42 ft. to 104 ft. dependent on site)

Bed width (A) = Bed area / Bed length = 6.67 ft. (12 ft. or less)

Upslope sand fill depth (D) = 48 in. - Z in. = 24 in. (12 in. min.) = 2 feet

Downslope sand fill depth (E) = (12A x % slope) + D in. = 32.4 in. = 2.7 feet

Cap + topsoil at bed center (H) = 18 in.

Cap + topsoil at bed edge (G) = 12 in.

Total bed depth (F) = 10 in.

Sideslope setback (K) = ((D + E) + 28 in.) x 3 = 166.7 in. = 14.05 feet

Upslope setback (L) = (22 in. + D) x 3 x upslope corr. factor = 100.74 in. = 8.40 feet

Downslope setback (I) = (22 in. + E) x 3 x downslope corr. factor = 256.22 in. = 21.35 feet

Total width of mound (W) = 12A + J + 1 = 436.96 in. = 36.41 feet

Total length of mound (L) = 12B + K + K = 1237.2 in. = 103.10 feet

Note: The area reserved for sand mound systems must be protected from disturbance prior to system construction. Disturbance of any kind may render the area unsuitable for sewage disposal, which may in turn cause the lot to be deemed non-buildable.

Note: The sand mound areas must be staked and a 25 foot setback from the mound area to the building footprint must be verified before building permit approval.

GENERAL NOTES

- Any changes to a private sewage easement shall require a revised percolation certification plan.
- 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.
- The lot(s) shown hereon complies/comply with the minimum ownership width and lot area as required by the Maryland Department of Environment.

"Approved For Private Water and Private Sewerage Systems"
B. N. [Signature] for Peter [Signature] 5/3/2012
Health Officer, Howard County Health Dept. Date

NOTE:

This area designates a private sewage disposal area of at least 10,000 square feet as required by the Maryland Department of the Environment for individual sewage disposal. Improvements of any nature in this area are restricted. This sewage disposal area shall become null and void upon connection to a public sewerage system. The county health officer shall have authority to grant adjustments to the private sewage easement. Recordation of a revised sewage easement shall not be necessary.

PRE-TREATMENT NOTE:

An advanced pre-treatment system, which utilizes best available technology to perform nitrogen reduction must be installed on the septic system on the subject property due to insufficient area to support three sand mound systems. A supplemental plan with all of the necessary details for installation of the system will be required prior to release of the building permit and septic permit. In addition, an operation and maintenance contract agreement must be filed and recorded in the Howard County Land Records.

Axiom Engineering Design
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www.axiom-ed.com info@axiom-ed.com

PREPARED FOR:
Scot Keeton
16377 Old Frederick Rd.
Mt. Airy, MD 21771

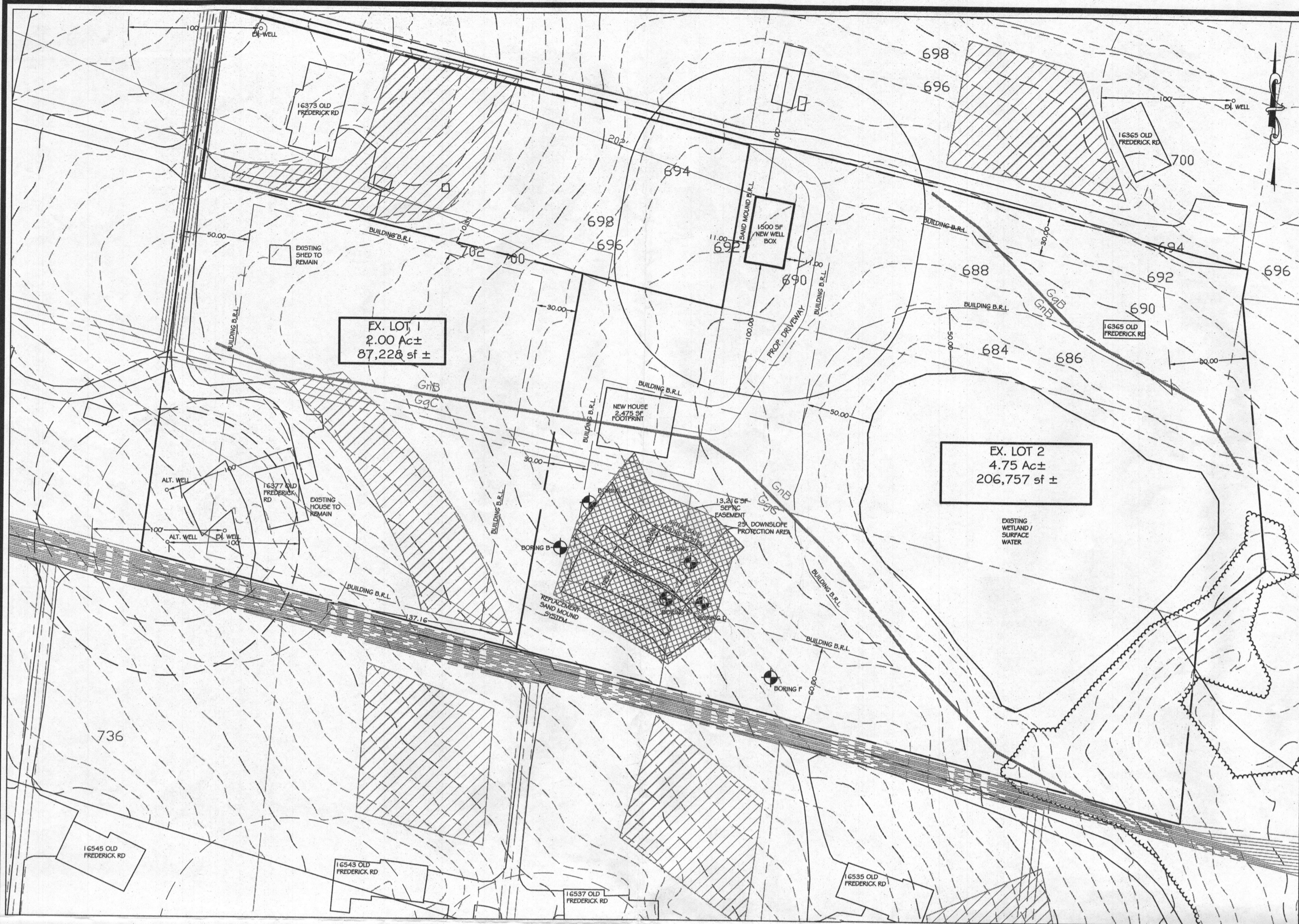
PERCOLATION CERTIFICATION PLAN
OLD FREDERICK ROAD #16381
Mt. Airy, Maryland
Parcel 463
Tax Map 7 Gnd 0004
Election District 04-05 Howard County, Maryland



Walter G. Zawislak P.E.
Professional Engineer
6990 Columbia Gateway Drive, Suite 150, Columbia, Maryland 21046
Ph: 443-276-6220 Fax: 443-276-6221 w.zawislak@axiom-ed.com

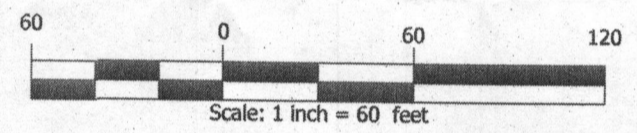
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 32033, EXPIRATION DATE 6/20/2013

Drawn:	WGZ
Checked:	WGZ
Date:	4-27-2012
Project No.:	11-0026.00
Scale:	A5 SHOWN
Sheet:	C 1.0



OVERALL PROPERTY PLAN VIEW, 1"=60'

1. The topography of this "OVERALL PROPERTY PLAN VIEW" is taken from HOWARD COUNTY GIS.



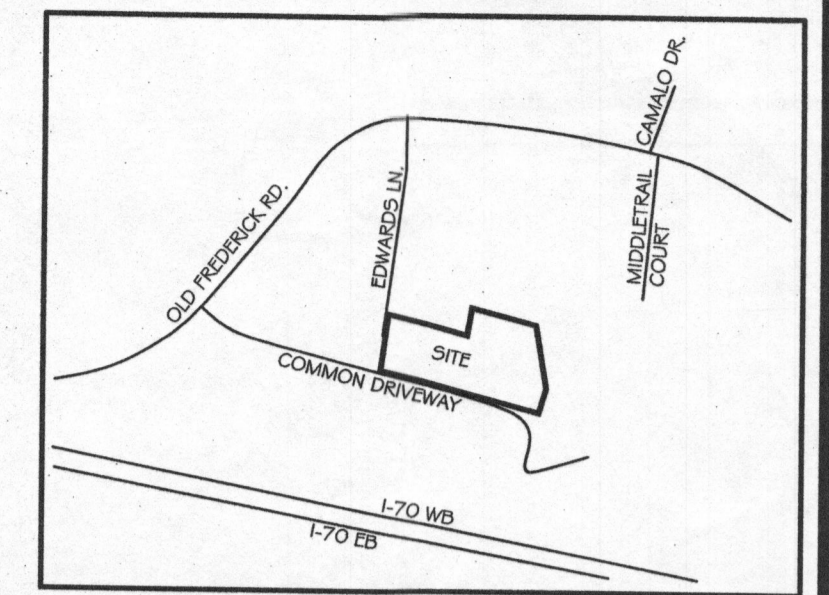
THIS AREA DESIGNATES A PRIVATE SEWAGE EASEMENT OF AT LEAST 10,000 SQUARE FEET

LEGEND

- PERCOLATION TEST LOCATION PASSED
- EXISTING SEPTIC EASEMENT (APPROX. LOCATION)
- NEW SEPTIC EASEMENT
- PROPOSED LOT LINE
- EXISTING LOT LINE

SOIL LEGEND

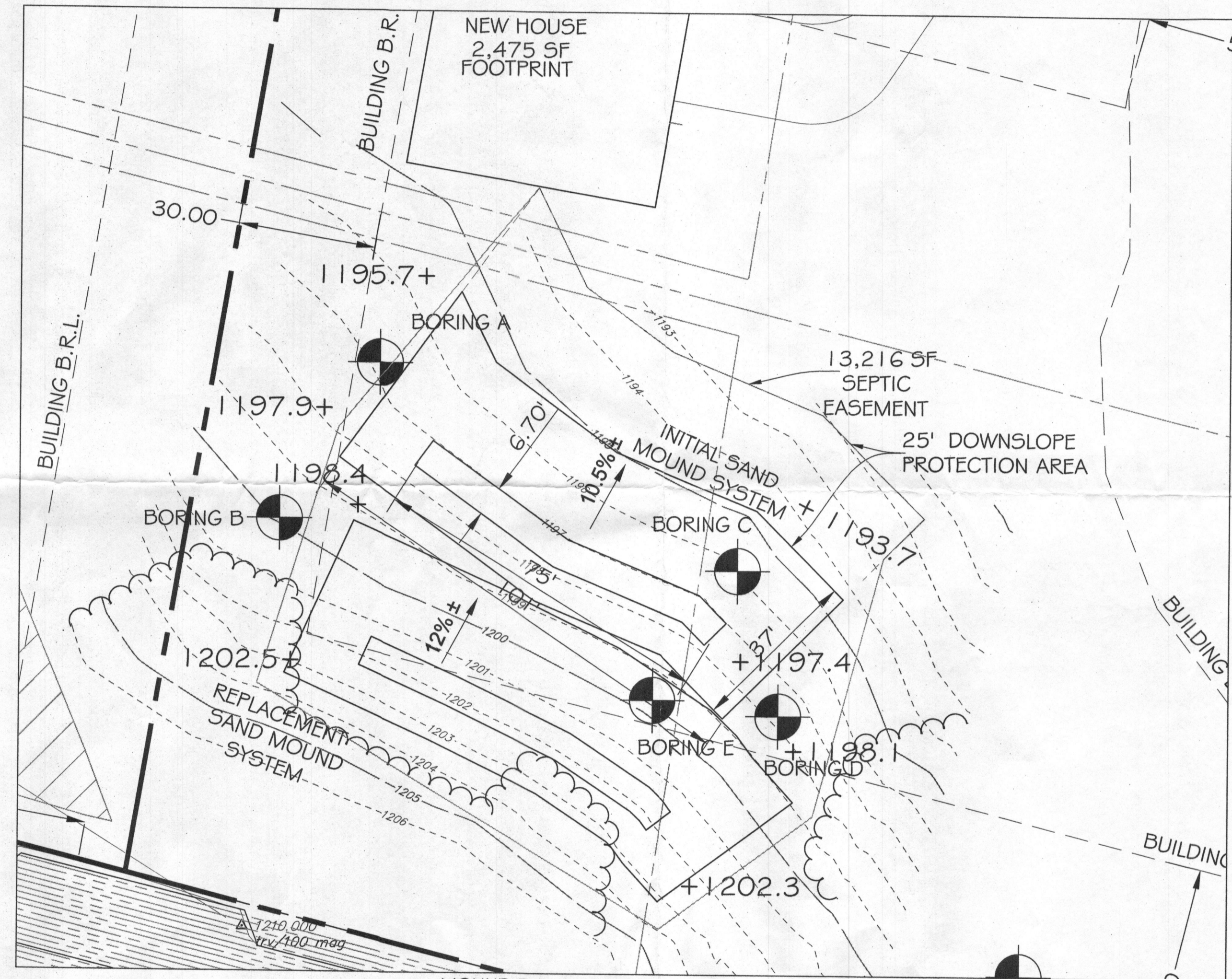
- GgB Glenelg Loam, 3 to 8% Slope
- GgC Glenelg Loam, 0 to 15% Slope
- GnB Glenville-Baile silt loam, 0 to 8 percent Slope



VICINITY MAP
NOT TO SCALE

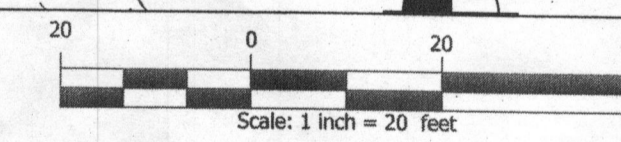
SITE NOTES

1. ZONING: RC-DEO
2. TOPOGRAPHY SOURCE: HOWARD COUNTY GIS
3. BOUNDARY LINE SOURCE: HOWARD COUNTY GIS
4. SAND MOUND SIZING BASED ON MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) DESIGN AND CONSTRUCTION FOR SAND MOUND SYSTEMS (6% SLOPE, 4-BEDROOM, 600 GPD)
5. B.R.L. = BUILDING RESTRICTION LINE
6. PROPERTY OWNER: SCOT AND SANDRA KEETON
16377 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
(410)802-8900
7. SITE ADDRESS: 16381 OLD FREDERICK ROAD
MT. AIRY, MARYLAND 21771-3333
MIDDLE TRAIL SUBDIVISION



MOUND PLAN VIEW, 1"=20'

1. The elevations (1199.2+) at the corners of the mound systems shown in this plan view are not based on any vertical datum. The elevations shown are relative to one another, on an assumed datum, and were field surveyed by Axiom Engineering Design, February and April 2012. These elevations do NOT correspond to the GIS elevations shown in the plan view above.
2. The average slope of the mound systems are less than 12%.



PRE-TREATMENT NOTE:

An advanced pre-treatment system, which utilizes best available technology to perform nitrogen reduction must be installed on the septic system on the subject property due to insufficient area to support three sand mound systems. A supplemental plan with all of the necessary details for installation of the system will be required prior to release of the building permit and septic permit. In addition, an operation and maintenance contract agreement must be filed and recorded in the Howard County Land Records.

NOTE:

This area designates a private sewage disposal area of at least 10,000 square feet as required by the Maryland Department of the Environment for individual sewage disposal. Improvements of any nature in this area are restricted. This sewage disposal area shall become null and void upon connection to a public sewerage system. The county health officer shall have authority to grant adjustments to the private sewage easement. Recordation of a revised sewage easement shall not be necessary.

All wells to be drilled prior to final plat submission.

GENERAL NOTES

1. Any changes to a private sewage easement shall require a revised percolation certification plan.
2. 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.
3. The lot(s) shown hereon comply/complies with the minimum ownership width and lot area as required by the Maryland Department of the Environment.
4. The Maryland Department of the Environment has approved a variance allowing the well location on lot 2 to be down-gradient of the sewage disposal area for 16373 Old Frederick Road with the condition that the well be constructed using steel casing extending down to 50 feet depth or ten feet into competent bedrock, whichever is deeper.
5. The area reserved for sand mound systems must be protected from disturbance prior to system construction. Disturbance of any kind may render the area unsuitable for sewage disposal, which may in turn cause the lot to be deemed non-buildable.
6. The sand mound areas must be staked and a 25 foot setback from the mound area to the building footprint must be verified before building permit approval.

"Approved For Private Water and Private Sewerage Systems"

Walter G. Zawislak
Health Officer, Howard County Health Dept. Date 12/16/2014

REPLACEMENT SAND MOUND COMPS

4 Bedrooms generated 600 gpd,
Percolation test rate = 1.5 min./inch equivalent 1.2 gpd/sft
Bed Area (BA)=600 sft
Slope = 12.0%, upslope corr. factor = 0.73, downslope corr. factor = 1.87

TABLE 3.1
EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

Absorption bed ft² (A x B) = Design flow = $\frac{500}{1.2 \text{ gpd/ft}^2}$ ft.²

Bed length (B) = $\frac{75}{1}$ ft. (42 ft. to 104 ft. dependent on site)

Bed width (A) = $\frac{\text{Bed Area}}{\text{Bed length}}$ ft. = $\frac{6.67}{1}$ ft. (12 ft. or less)

Upslope sand fill depth (D) = 48 in. - Z in. = $\frac{24}{1}$ in. (12 in. min.) = 2 feet

Downslope sand fill depth (E) = [12% x % slope] + D in. = $\frac{33.6}{1}$ in. = 2.8 feet

Cap + topsoil at bed center (H) = 18 in.

Cap + topsoil at bed edge (G) = 12 in.

Total bed depth (F) = 10 in.

Sideslope setback (K) = $\frac{[(D+E) + 28 \text{ in.}] \times 3}{2}$ = $\frac{170.4}{2}$ in. = 14.05 feet

Upslope setback (J) = (22 in. + D) x 3 x upslope corr. factor = $\frac{100.74}{1}$ in. = 8.40 feet

Downslope setback (I) = (22 in. + E) x 3 x downslope corr. factor = $\frac{261.88}{1}$ in. = 21.82 feet

Total width of mound (W) = 12A + J + I = $\frac{442.62}{1}$ in. = 36.88 feet

Total length of mound (L) = 12B + K + K = $\frac{1240.8}{1}$ in. = 103.40 feet

INITIAL SAND MOUND COMPS

4 Bedrooms generated 600 gpd,
Percolation test rate = 1.5 min./inch equivalent 1.2 gpd/sft
Bed Area (BA)=600 sft
Slope = 10.8%, upslope corr. factor = 0.73, downslope corr. factor = 1.87

TABLE 3.1
EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

Absorption bed ft² (A x B) = Design flow = $\frac{500}{1.2 \text{ gpd/ft}^2}$ ft.²

Bed length (B) = $\frac{75}{1}$ ft. (42 ft. to 104 ft. dependent on site)

Bed width (A) = $\frac{\text{Bed Area}}{\text{Bed length}}$ ft. = $\frac{6.67}{1}$ ft. (12 ft. or less)

Upslope sand fill depth (D) = 48 in. - Z in. = $\frac{24}{1}$ in. (12 in. min.) = 2 feet

Downslope sand fill depth (E) = [12% x % slope] + D in. = $\frac{32.4}{1}$ in. = 2.7 feet

Cap + topsoil at bed center (H) = 18 in.

Cap + topsoil at bed edge (G) = 12 in.

Total bed depth (F) = 10 in.

Sideslope setback (K) = $\frac{[(D+E) + 28 \text{ in.}] \times 3}{2}$ = $\frac{168.7}{2}$ in. = 14.05 feet

Upslope setback (J) = (22 in. + D) x 3 x upslope corr. factor = $\frac{100.74}{1}$ in. = 8.40 feet

Downslope setback (I) = (22 in. + E) x 3 x downslope corr. factor = $\frac{256.22}{1}$ in. = 21.35 feet

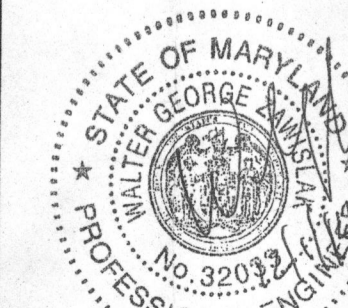
Total width of mound (W) = 12A + J + I = $\frac{436.96}{1}$ in. = 36.41 feet

Total length of mound (L) = 12B + K + K = $\frac{1237.2}{1}$ in. = 103.10 feet

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PERCOLATION CERTIFICATION PLAN
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PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 32033, EXPIRATION DATE 6/20/2015

Drawn:	WGZ
Checked:	WGZ
Date:	12-1-2014
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Sheet:	C 1.0