Howard County Health Department

Bureau of Environmental Health
7178 Columbia Gateway Drive, Columbia, MD 21046-2147
(410) 313-2640 Fax (410) 313-2648
TDD (410) 313-2323 Toll Free 1-866-313-6300
website: www.hchealth.org

Peter L. Beilenson, M.D., M.P.H., Health Officer

April 17, 2009

To: Edgard and Juan Uzcategui, Chief Septic

RE: Percolation Test Report, McCampbell Property, 18235 Penn Shop Road, A530347

Dear Mr Uzcategui,

Percolation testing was conducted on the subject property on April 10, 2009. Soil profiles were described and infiltrometer test results were recorded for 8 locations. Soil descriptions and the test data collected are shown on Mound Test Data Sheets. These data are maintained in a Health Department file for the subject property.

Infiltrometer tests were conducted at locations A thru H. Locations A, B, C, D, E and G all had measured infiltration rates greater than 1 inch per hour and suitable soil materials to depths of at least 24 inches. Water seeps are notable at depths specified in the recorded descriptions for the respective locations.

A restrictive layer of shale underlies the site and is the cause of the water seeps. The depth of the restriction at location D is about 32 inches, and at A, B, C, E, F and G the restrictive layer ranges from 42 inches to 48 inches depth. This shallow depth to restrictive layer is significant in that the loading rate will be adjusted to the lowest possible infiltration value of 1 inch per hour.

At location H the depth to restrictive later is 20 inches making the location unsuitable for a sand mound. Location F is also unsuitable for a sand mound as the measured infiltration rate is much less than 1 inch per hour.

The slope between areas represented by A, B, C and D, and the area represented by E and G, has a concave shape. Concave slopes are unsuitable locations for sand mounds. Due to the restrictions in potential length and shallow soil, there is likely only enough suitable area to accommodate one system for a 4-bedroom residence.

The existing well meets code requirements. It is located about 100 feet up-gradient of the existing septic tank. The well is about 30 feet east of the house foundation.

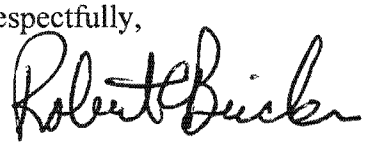
The existing septic tank is fitted with a float, assumed to be an alarm float intended to indicate when the tank is full and needing to be pumped. The tank appeared to be full at the time it was observed, the float barely visible in the scum layer.

A linear depression in the soil surface indicates the likely presence of the effluent line, leading from the septic tank downhill about 75 feet. The line ends at a mounded area where lush, dark green grass grows on and about the raised area.

Seeps were not observed, however it is also likely that a dry well is present and that it is receiving 'overflow' from the septic tank. It appears that soil has been mounded over and around a specific area to prevent surface seeps. After connection of a new sewerage treatment system, this area is to be explored. Should a dry well be discovered, it is to be properly abandoned (pumped and filled) prior to approval of the septic system installation permit.

I submitted copies the Sand Mound Data Sheets and location drawing to you on April 14. If you have any questions regarding the results, this report, Percolation Certification Plan requirements or associated procedures, please contact me at the above address or by calling (410) 313-2691.

Respectfully,



Robert Bricker, RS, CPSS
Well and Septic Program
Development Coordination Section

Copy: file

SANITARY/ENVIRONMENTAL ENG, INC
Consulting Engineers
1414 Washington Road
WESTMINSTER, MARYLAND 21157
(410) 876-7740
FAX (410) 840-9924

JOB McCAMPBELL PROPERTY
SHEET NO. 18235 PENNSHOP OF ROAD
CALCULATED BY _____ DATE 5/23/09
CHECKED BY SANDMOUND DATE _____
SCALE _____

4 BEDROOMS X 150 = 600 GPD 10% SLOPE
SAND LOADING RATE - 1 GPD / Sq. Ft = 600 Sq. Ft.
BED - 9' X 70' = 630 Sq. Ft.
9 x 66.67 = 600
UP SIDE SAND DEPTH - 24"
DOWN SIDE SAND DEPTH - 24" + (0.1 x 108") = 34.8" (35")

UP SLOPE SETBACK - 24" + 22" (3)(0.77) = 106" = 8'-10"
DOWN SLOPE SETBACK - 35" + 22" (3)(1.44) = 246" = 20'-6"
SIDE SLOPE SETBACK - $\frac{24+35}{2}$ + 28" (3) = 172" = 14'-4"

BASAL AREA REQUIRED @ 1" / 60 mm = 1,200 Sq. Ft. OK
BASAL AREA PROVIDED = 70' (9' + 20.5') = 2,065 Sq. Ft. OK

MOUND WIDTH - 9' + 8'-10" + 20'-6" = 38'-4"
MOUND LENGTH = 70' + 14'-4" + 14'-4" = 98'-8" 75.4' RR
Lateral = 66.67' RR
PUMP RATE - 40 PERFORATIONS @ 1.63 = 65 GPM

PUMP DOSE - 5 X 4 X 33.25 = .665' - 2" PVC
PLUS - 65'-2" FORCE MAIN = 730' @ 17.4 GAL / 100' = 7.3 X 17.4 = 127 GAL.
127 / 7.48 = 17 cu ft / 40 Sq. Ft = 0.42' = 5"
EMERGENCY STORAGE = 40 Sq. Ft. x 2.08' = 83.2 cu ft = 622 GAL. OK

TDH - ELEVATION DIFFERENCE = 515.66 - 507.25 = 8.41'
DISTAL HEAD 2.00'
F - 2" PVC @ 65 GPM = 0.0984 $\frac{65}{2.067}$ (4.85) (4.87) = 0.0984 $\frac{2258}{34.33}$ = 6.5' / 100'
F = 6' + VALVE + L + UNION + L + L + 55' + L + 10' + T
6' + 50' + 7' + 2' + 7' + 7' + 55' + 7' + 10' + 10' = 161'
F = 6.5' X 1.61 = 10.46 TDH = 8.41' + 2.0' + 10.46' = 20.87' (21')
PUMP TO REMOVE 65 GPM @ 21' - GOULDS

TANK BUOYANCY - 13.25' X 5.25' X 8' X 62.4 lbs = 34,725 lbs
ANTI BUOYANCY - 16,740 lbs + 13.25 X 5.25 X 3 X 135 lbs = 44,913 lbs
PUMP BUOYANCY - 8.85' X 5.25' X 8' X 62.4 lbs = 23,194 lbs
ANTI BUOYANCY - 11,250 lbs + 8.85 X 5.25 X 3 X 135 lbs = 30,067 lbs

MOUND TEST DATA SHEETS

18235
Property I.D. Penn Shop Lot # _____ Date 4-10-09

Sanitarian RB / HS Landscape Position Side Slope

% Slope 9-10 Soil Type Brinkbow Contractor Chief Septic

HOLE # A DEPTH OF TEST 19" START TIME ~~12:23~~

12" moderate brn vfsbk & fkg gr cl

yellw brn cl lmsbk 15% gravel

~20" 1msbk 30% yellw brn gr cl

36" gr cl / red & lt. grey 2.5YR4/6 & 2.5Y7/2 structureless 30%

seepage @ 3' to 3.5'

4' restriction **

vgr loam - brown ~45% dense

6' bottom

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
9 16/16	12:23	Begin	—	
9 12/16	12:29	4/16		
9 8/16	12:35	4/16		
9 4/16	12:41	4/16		
8 15/16	12:47	5/16		
8 11/16	12:53	4/16		
8 7/16	12:59	4/16	4/16/6min	
8 3/16	1:05	4/16		
			~2.5 in/hr	

4/16 x 60/6

infiltrometer 11 3/4"

Begin equilibration 11:50

HOLE # B DEPTH OF TEST 19" START TIME _____

7.5YR4/3 brn gr l 2 vfsbk & 2fgr

10" 7.5YR5/6 brn gr cl 1msblk

18" 7.5YR 4/6 brn gr cl somewhat dense structureless

28" f1f 10YR 7/3 f2f 10YR 6/4 brn vgr l ø m dense 40" seep

72" ↓ f2d 2.5Y 7/2

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
9 16/16	12:29	Begin		
9 10/16	12:39	6/16		
9 4/16	12:49	6/16		
8 15/16	12:59	5/16		
8 10/16	1:09	5/16		
8 5/16	1:19	5/16	5/16/10min	
8 —	1:29	5/16		
			~1.87 in/hr	

* restrictive at ~42"+

5/16 x 60/10

11 1/4"

Begin equilibration 11:52

MOUND TEST DATA SHEETS

Property I.D. 18235 Penn Shop Rd Lot # _____ Date 4-10-09

Sanitarian RB/HS Landscape Position Side Slope

% Slope 9-10 Soil Type BrinKlow Contractor Chief Septic (Juan)

HOLE # C DEPTH OF TEST 48" START TIME ~~12:23~~

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
9 16/16	12:32	Begin		
9 14/16	12:38	2/16		
9 12/16	12:44	2/16		
9 9/16	12:50	3/16		
9 6/16	12:56	3/16		
9 3/16	1:02	3/16	}	
9-	1:08	3/16	} 3/16" / 6 min	
8 13/16	1:14	3/16	}	
			≈ 1.87 in/hr	

0" – brn fsbk gr l
8" – yellow brn gr cl lmsbk
18" – yellow brn cl dense Ø
23" – vgr yellow brn cl
27" – brownish yellow 10YR 6/6 l sam illuvial w/ faint mottles ← irregular boundary 27"±3"
42" – 65% shale red & gray sil
66" – ≥ 85% shale Mn+Fe
72"

restrictive at 42" ↙

3/16 × 60/6

Infiltrometer diameter 11 1/4"

Begin equilibration 11:55

HOLE # D DEPTH OF TEST 20" START TIME _____

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
9 16/16	1:07	Begin		
9 4/16	1:12	12/16		
8 10/16	1:18	10/16		
7 2/16	1:33	1"; 8/16		
6 8/16	1:41	10/16		
5 15/16	1:49	9/16		
5 4/16	1:57	11/16		
4 12/16	2:05	8/16		
4 4/16	2:13	8/16		
3 14/16	2:21	9/16		
9 16/16	2:23	Reset		
9 7/16	2:29	9/16		
8 14/16	2:35	9/16		
8 7/16	2:41	7/16		
7 16/16	2:47	7/16		
7 8/16	2:53	8/16		

0" – brn vfsbk 2gr l
11" – yellow brn lmsbk gr cl
21" – faint mottles common / few yellow brn gravel ~10%-15% seeps @ 24" cl
28" – seepage
28" – vgr (coarse) dense l
32" – dense gr l Mn+Fe redc coatings lt gray cl
72"

restrictive horizon begins at 32" *

Infiltrometer diameter 11 3/4"

1/2" / 6 min ≈ 5"/hr

Begin equilibration 12:18

MOUND TEST DATA SHEETS

Property I.D. 18235 Penn Shop Rd Lot # _____ Date 4/10/09

Sanitarian RB/HS Landscape Position Side Slope

% Slope 6 Soil Type ~~Brinkbank~~ Contractor Chief Septic

HOLE # E DEPTH OF TEST 16" START TIME 2:56

dk grey-brn loam 2fsbk & fg 4"

brn loam 10% gravel, 1fsbk 10"

yel-brn cl, 2fsbk

yel-brn cl 2fsbk slightly sticky 15"

brown loam fzl 10YR 7/1 5/6 7.5YR 10YR 26"

18% gravel waterseeps @ 5/16 3:56

red & pale yellow-brn loam c2d 10YR 7/2 40"

Mn coatings 30% channers

mank 80% shale 48"

72"

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change
9 16/16	Begin	—		
9 8/16	3:02	8/16		
9 3/16	3:08	5/16		
8 12/16	3:14	7/16		
8 8/16	3:20	4/16		
7 16/16	3:26	8/16		
7 11/16	3:32	5/16		
7 6/16	3:38	7/16		
6 15/16	3:44	5/16		
6 10/16	3:50	5/16		
6 5/16	3:56	5/16		

5/16" / 6 min = 2.5 in/hr

restrictive at 48" * 5/16 6/16

Begin equilibration 2:29

HOLE # F DEPTH OF TEST 15" START TIME 3:19

brn l 2fsbk gr 10"

brn cl gr 1fsbk

yellow brn cl Fe/Mn coatings 20"

Faint mottles dense cl yellow brn 35"

H2O seepage brn l 75% shale 40"

H2O 68"

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change
9 16/16	Begin	—		
9 16/16	3:25	Ø		
9 16/16	3:31	Ø		
9 14/16	3:37	2/16		
9 14/16	3:43	Ø		
9 13/16	3:49	1/16		

restrictive at 40" to 48"

FAIL

Begin equilibration 2:52

MOUND TEST DATA SHEETS

Property I.D. 8235 Penn Shop Rd. Lot # _____ Date 4-10-09

Sanitarian RB/HS Landscape Position Sideslope

% Slope 6 Soil Type Brinkbow Contractor Chief Septic

HOLE # G DEPTH OF TEST _____ START TIME 3:48

grey-brn loam 2 vfsbk to 2fgr

10" brn gr cl to yel-brn gr cl 1fsbk

18" yel brn gr cl slightly sticky 1fsbk

32" brn vgr l f1d grey 45-50% rock

36"

40" water seeps red & lt grey loam in 60% rock

48"

dk brn xgr loam 75-80% rock

68"

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change
9 6/16	Begin	—		
9 6/16	3:58	10/16		
8 14/16	4:08	8/16		
8 4/16	4:18	10/16	5/16/10min	
7 10/16	4:28	10/16		

* restrictive at 48"

5/16 60/10

1.87 in/hr

Began equilibration at 3:18

HOLE # H DEPTH OF TEST 20" Fail START TIME N.A.

dk brn loam 2vfsbk & 2fgr

14" brn gr l, 2fsbk gradual boundary dense, structureless yel-brn loam & lt. grey silt loam 30-35% channers many Mn coatings few Fe enrichments

20" abrupt, wavy boundary

* dense vcl loam 50-55% channers dk brn & lt. grey

42" ~~yel~~ red & pale yel & black dence 65-70% channers few grey depletions

72"

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate	% Change

Fail restrictive at 20"

SITE INSPECTION SHEET

OWNER: McCampbell PHONE #:

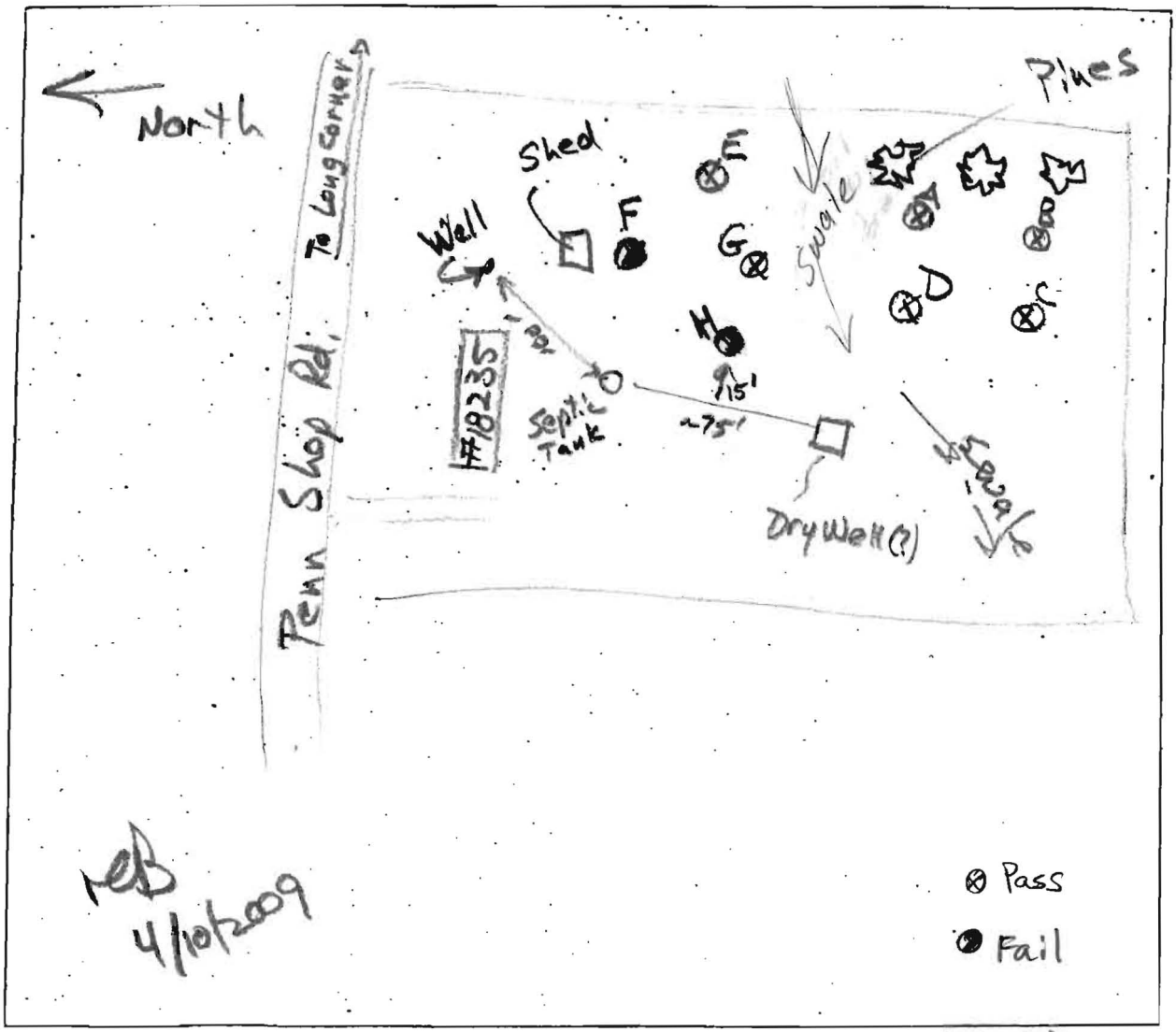
ADDRESS: 18235 Penn Shop Rd CONTRACTOR: Chief Septic

WELL TAG #:

SUBDIVISION: LOT: COUNTY #: ~~No~~ward

PROPOSAL: Sand Mound (~~Infiltrometer~~) Perc Test Sketch

LOCATION DIAGRAM



MB 4/10/2009

COMMENTS: A, B, C, D, E & G 'Pass'; F & H 'Fail'

Use lowest permeability rate (~1"/hr) due to restrictive rock layers within 3 feet of surface

SANITARY/ENVIRONMENTAL ENG., INC.
Consulting Engineers
1414 Washington Road
WESTMINSTER, MARYLAND 21157

(410) 876-7740
FAX (410) 840-9924

LETTER OF TRANSMITTAL

TO HOWARD CO. HEALTH DEPT.
BUREAU OF ENV. HEALTH
COLUMBIA, MD. 21046

DATE	JOB NO.
SEPT 1	
ATTENTION: ROBERT BRICKER	
RE: 18235 PENN SHOP ROAD SANDYMOUND	

WE ARE SENDING YOU ☑ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☑ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2			PRINTS - PLANS + SPECIFICATIONS

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS AS PER 8/6/09 COMMENTS

COPY TO File.

SIGNED: Jim Clise

If enclosures are not as noted, kindly notify us at once.

SANITARY/ENVIRONMENTAL ENGINEERING, INC.
1414 WASHINGTON ROAD
WESTMINSTER, MARYLAND 21157

James D. Clise, PE

(410) 876-7740
Fax (410) 840-9924

August 31, 2009

To: Robert Bricker, RS, CPSS

Re: Campbell Property
18235 Penn Shop Road
Sandmound Design

Dear Mr. Bricker,

This is in response to your August 6 memo concerning the Campbell Property plans.

1. I totally misread a note on the field sheet concerning the test results. The correct test results are now shown on the revised drawings.

2. In the past Howard County has requested diagonal location of lateral end turn-ups as we showed on our plan. They are now shown on all 4 laterals.

3. Protective sleeves have been shown on the lateral turn-ups in place of the alternate choice of design shown in figure 4.3 of the design manual.

4. Observation pipes have been shown on the mound design and on the mound layout drawings. These were left off our drawing because several counties, including Howard County, have experienced problems from mowing due to above grade pipes. However, we have now shown them and will continue to do so on any Howard County plans we may prepare.

5. Field run 1-foot contours are shown and identified. Elevations requested on low corners of the mound and sandbed are shown.

I hope this satisfies your concerns. Upon approval of the plans, our surveyor will stake out the mound and bed.

Respectfully,

Jim Clise

Jim Clise, PE

Howard County Health Department

Bureau of Environmental Health
7178 Columbia Gateway Drive, Columbia, MD 21046-2147
(410) 313-2640 Fax (410) 313-2648
TDD (410) 313-2323 Toll Free 1-866-313-6300
website: www.hchealth.org

Peter L. Beilenson, M.D., M.P.H., Health Officer

August 6, 2009

To: Jim Clise, P.E.
S/E Engineering, Inc

RE: Russell Campbell Property, 18235 Penn Shop Road, A530347

Dear Mr. Clise,

I have reviewed the plan for the replacement system sand mound on the subject property. The prepared plan and associated calculations are thorough and organized. The content is primarily correct with few exceptions. The following corrections or additions are required:

1. SOIL TEST. The correct times (min.) by respective test locations: A, 24; B, 32; C, 32; D, 12; E, 24; F, failed; G, 32; H, failed.
2. Lateral End Turn-Ups need to be on all 4 laterals.
3. The turn-ups need to be protected by sleeves as shown in Figure 4.5 of the Sand Mound Design Manual.
4. Observation pipes should be in the mound as indicated in Figure 3.1 of the Sand Mound Design Manual.
5. Concerning the site plan drawing:
   a. Presentation of field-run elevation contours at 1-foot intervals is required.
   b. The elevations of the 2 low corners of the sand mound should be presented (and be the same).
   c. The elevations of the 2 low corners of the gravel bed should be shown.

The corners of the sand mound and the corners of the gravel bed need to be staked for inspection by an Environmental Sanitarian. The septic permit cannot be released until this inspection is conducted with a satisfactory result.

Please contact me at the above address or by calling (410) 313-2691.

Respectfully,

Robert Bricker, RS, CPSS
Well and Septic Program
Development Coordination Section

Copy: Edgard and Juan Uzcategui, Chief Septic
file

-77^9.'20"

39^20'30"

N

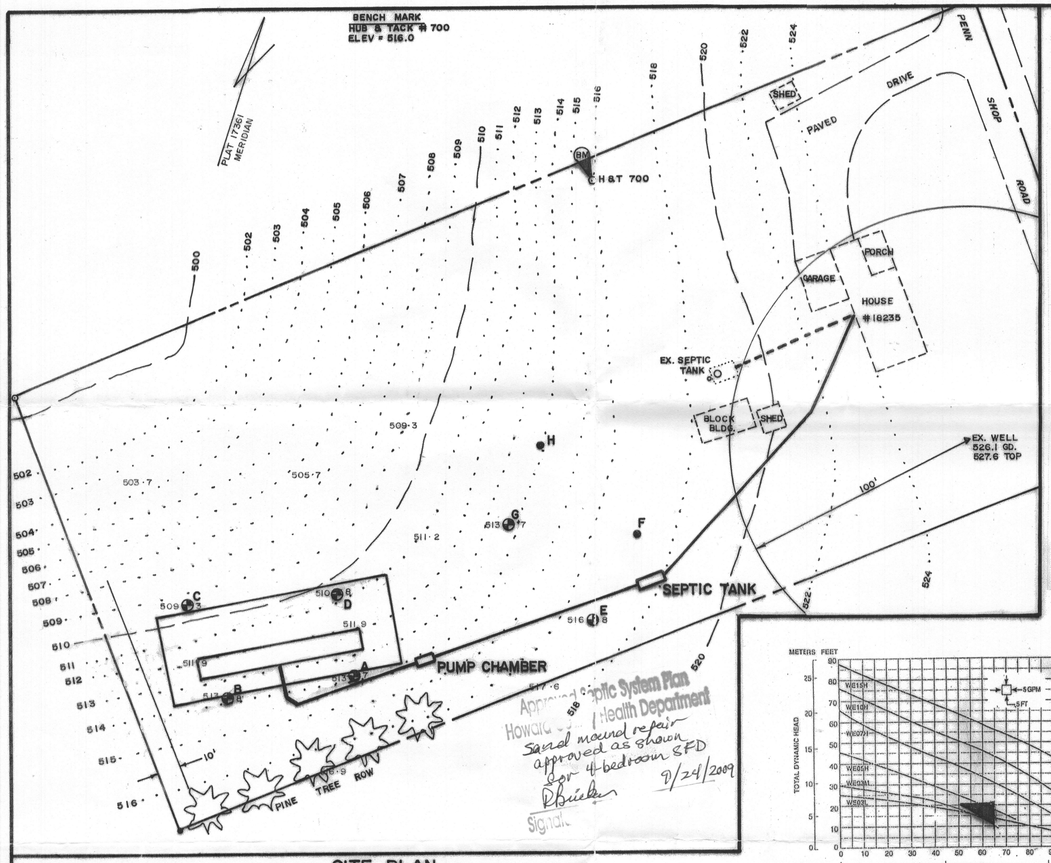
39^20'30"

-77^9.'20"

Howard County GIS

Howard County
MARYLAND

By:
Office:
Map Width: 910.00 ft.
Print Date: 1/16/2009
Scale: 1 in. = 100 ft.



SITE PLAN
SCALE: 1" = 30'

DESIGN CRITERIA

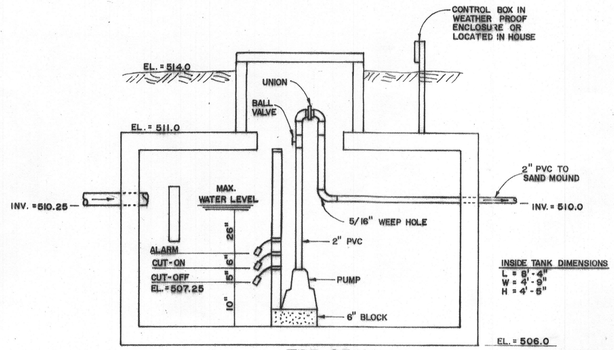
4 Bed Rooms x 150 = 600 GPD
Loading Rate : 1.0 GPD/Sq. Ft. = 600 Sq. Ft.
Bed 9' x 70' = 630 Sq. Ft.
1 – 1,500 GAL. Compartmented Top Seam Septic Tank
1 – 1,000 GAL. Top Seam Pump Chamber
Pump Rate – 40 Perforations @ 1.63 GPM = 65 GPM
Mound Width = 38'-4"
Mound Length = 98'- 8"

SOIL TEST

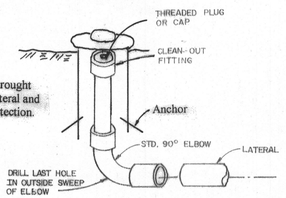
A – 24 min.
B – 32 min.
C – 32 min.
D – 12 min.
E – 24 min.
F – Failed
G – 32 min.
H – Failed

SPECIFICATIONS

- Tank measurements and elevations are based on septic tanks and pump chambers as manufactured by Mayer Bros., Elkridge, Md. (410) 796-1454.
- All piping to be schedule 40 PVC of sizes shown.
- The force main from the pump chamber to the sand bed is to be installed with a continuous slope back to the chamber to assure complete drainage following each pump cycle.
- A submersible pump to remove 65GPM against 21' TDH to be provided. Pump to be a Goulds Model 3885-WE-07H, or equal.
- A test of the pump system and distribution piping is required prior to covering the system.
- The High Water Alarm is to be on a separate circuit.
- Alarm to be located in the house.
- Stone bed to be ½" to 2 ½" clean gravel. Crushed lime stone is not acceptable.
- Septic tank to be altered for installation of a Model AX-20 Orenco Systems Unit, installed as per manufactures directions.



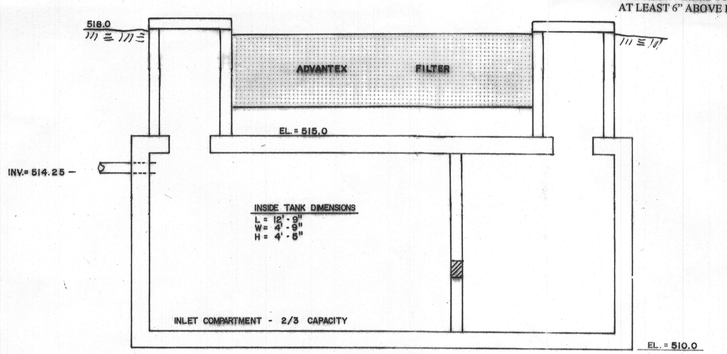
TOP SEAM
1000 GAL. PUMP CHAMBER
NOT TO SCALE



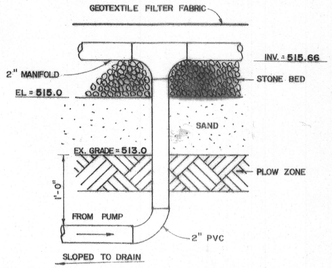
Larger diameter pipe brought to grade to surround lateral and provide access and protection.

LATERAL END TURN-UP
USE ON ALL 4 LATERALS
NOT TO SCALE

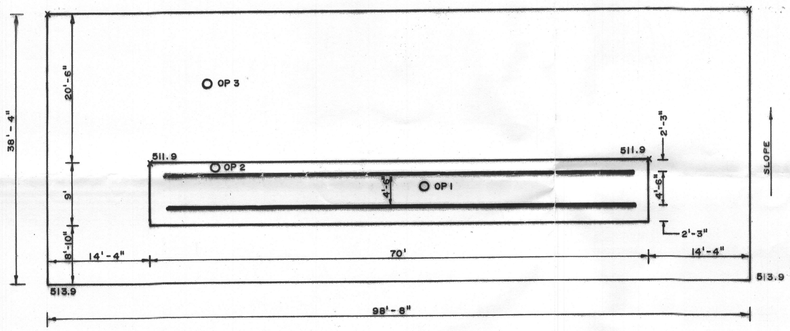
NOTE: THE SEPTIC TANK AND PUMP CHAMBER RISERS TO TERMINATE AT LEAST 6" ABOVE FINAL GRADE.



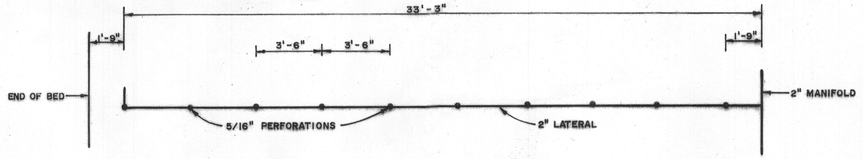
TOP SEAM
1500 GAL. SEPTIC TANK
WITH ADVANTEX UNIT
N.T.S.



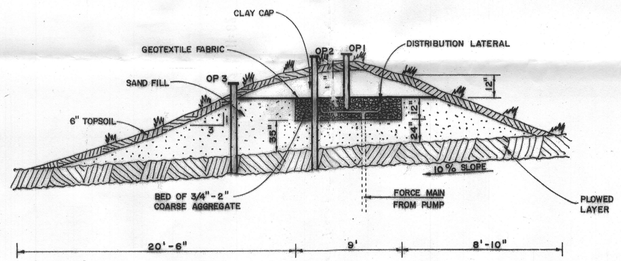
SUPPLY LINE – MANIFOLD DETAIL
NOT TO SCALE



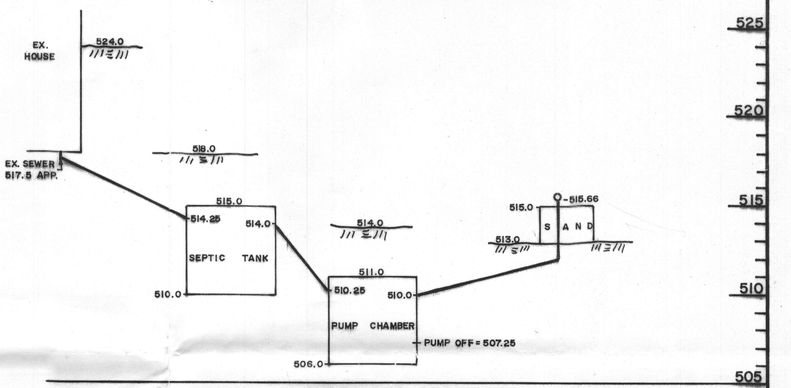
MOUND LAYOUT
SCALE: 1" = 10'



LATERAL DETAIL
SCALE: 1/4" = 1'



MOUND DESIGN
NOT TO SCALE



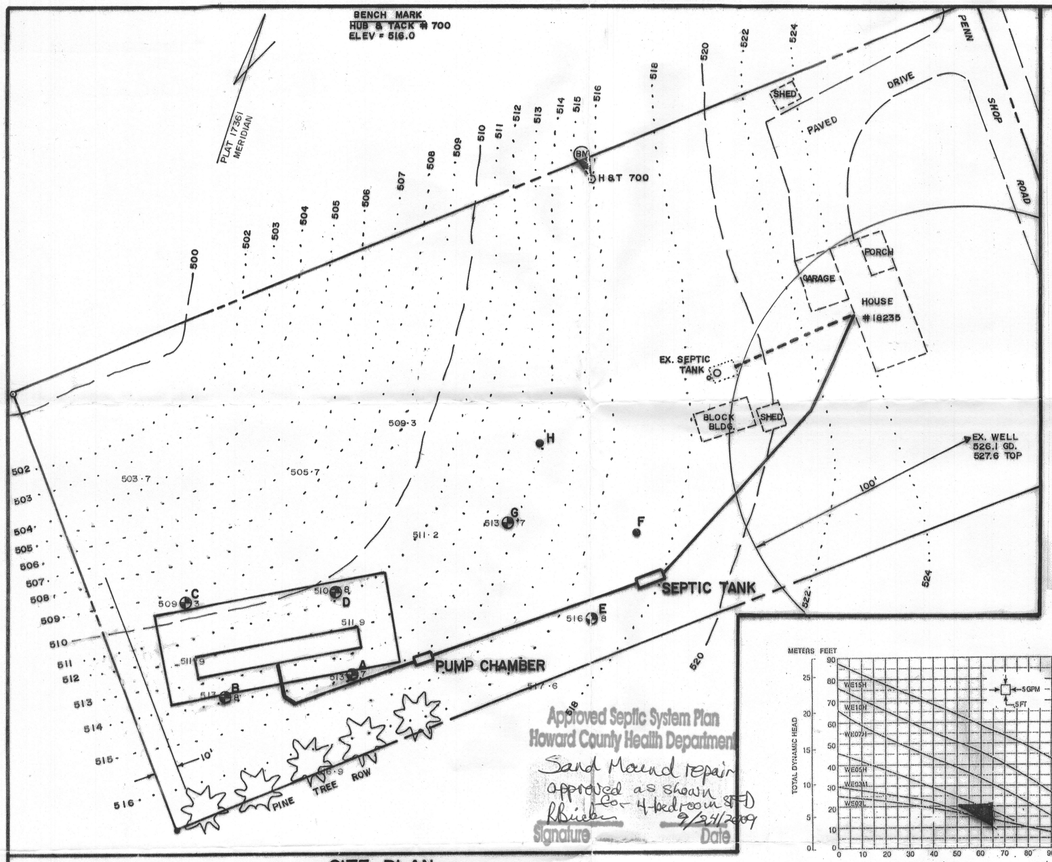
HYDRAULIC PROFILE
SCALE: V: 1/4" = 1'
H: N.T.S.

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. 10086, Expiration Date 11/02/10.

James D. Clise

REVISED: 8/24/09 PER HEALTH DEPT. LETTER DATED 8/6/09 JCD
9/14/09 PER R. BRICKER, HEALTH DEPT. ROTATE MOUND, ADD SPOT ELEVS JDC

S/E ENGINEERING, INC. WESTMINSTER, MARYLAND		
SCALE: AS SHOWN	APPROVED: JDC	DRWN: RSK
DATE: MAY, 2009		DES: JDC
RUSSELL CAMPBELL PROPERTY * 18235 PENN SHOP ROAD		
REPLACEMENT SYSTEM SANDMOUND		DRAWING NO. 1 OF 1



SITE PLAN
SCALE: 1"=30'

DESIGN CRITERIA

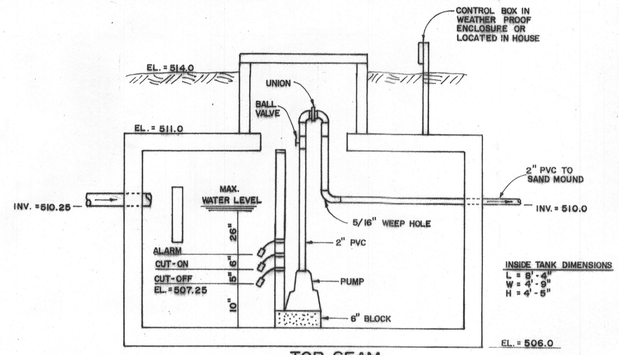
4 Bed Rooms x 150 = 600 GPD
Loading Rate : 1.0 GPD/Sq. Ft. = 600 Sq. Ft.
Bed 9' x 70' = 630 Sq. Ft.
1 – 1,500 GAL. Compartmented Top Seam Septic Tank
1 – 1,000 GAL. Top Seam Pump Chamber
Pump Rate – 40 Perforations @ 1.63 GPM = 65 GPM
Mound Width = 38'-40"
Mound Length = 98'- 8"

SOIL TEST

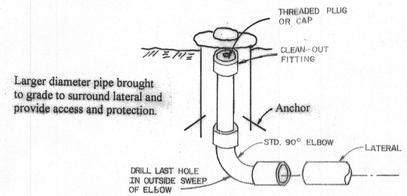
A – 24 min.
B – 32 min.
C – 32 min.
D – 12 min.
E – 24 min.
F – Failed
G – 32 min.
H – Failed

SPECIFICATIONS

- Tank measurements and elevations are based on septic tanks and pump chambers as manufactured by Mayer Bros., Elkridge, Md. (410) 756-1454.
- All piping to be schedule 40 PVC of sizes shown.
- The force main from the pump chamber to the sand bed is to be installed with a continuous slope back to the chamber to assure complete drainage following each pump cycle.
- A submersible pump to remove 65GPM against 21' TDH to be provided. Pump to be a Goulds Model 3885-WE-07H, or equal.
- A test of the pump system and distribution piping is required prior to covering the system.
- The High Water Alarm is to be on a separate circuit.
- Alarm to be located in the house.
- Stone bed to be ½" to 2 ½" clean gravel. Crushed lime stone is not acceptable.
- Septic tank to be altered for installation of a Model AX-20 Orenco Systems Unit, installed as per manufactures directions.



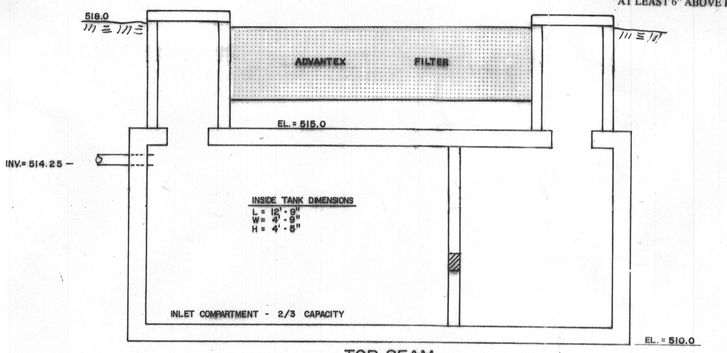
TOP SEAM
1000 GAL. PUMP CHAMBER
NOT TO SCALE



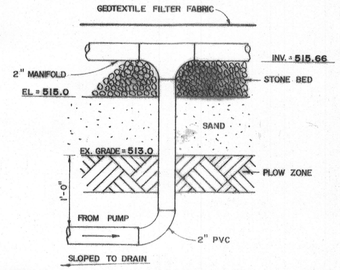
Larger diameter pipe brought to grade to surround lateral and provide access and protection.

LATERAL END TURN-UP
USE ON ALL 4 LATERALS
NOT TO SCALE

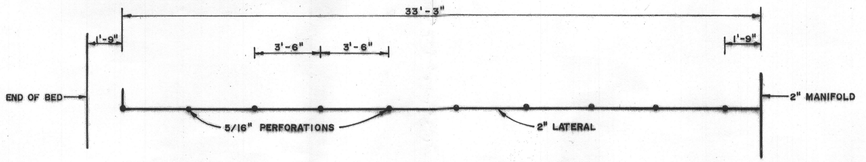
NOTE: THE SEPTIC TANK AND PUMP CHAMBER RISERS TO TERMINATE AT LEAST 6" ABOVE FINAL GRADE.



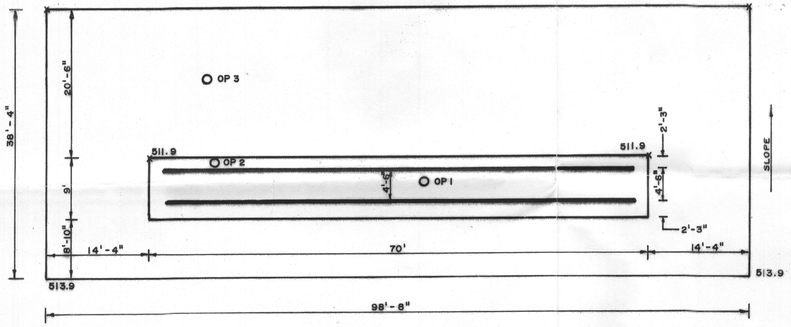
TOP SEAM
1500 GAL. SEPTIC TANK
WITH ADVANTEX UNIT
N.T.S.



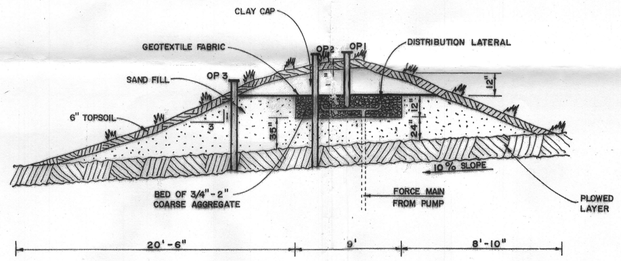
SUPPLY LINE – MANIFOLD DETAIL
NOT TO SCALE



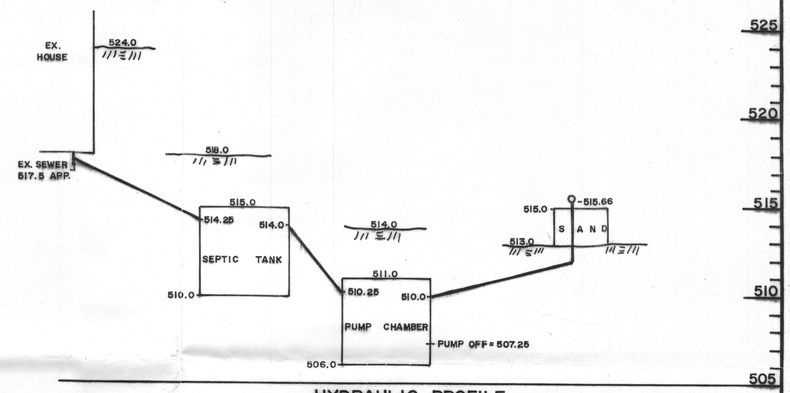
LATERAL DETAIL
SCALE : 1/4" = 1'



MOUND LAYOUT
SCALE : 1"=10'



MOUND DESIGN
NOT TO SCALE



HYDRAULIC PROFILE
SCALE : V: 1/4"=1'
H: N.T.S.

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. 10086, Expiration Date 11/02/10.

STATE OF MARYLAND — JAMES D. CLICE — No. 10086 — PROFESSIONAL ENGINEER

James D. Clice

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