APPLICATION

PERCOLATION TESTING

A _____

P _____

HOWARD COUNTY HEALTH DEPARTMENT
BUREAU OF ENVIRONMENTAL HEALTH
3525-H ELLICOTT MILLS DRIVE/ELLICOTT CITY, MARYLAND 21043
TELEPHONE: 313-2640

DISTRICT _____

DATE _____

TO: THE COUNTY HEALTH OFFICER
ELLICOTT CITY, MARYLAND

I HEREBY APPLY FOR THE NECESSARY TEST PRIOR TO APPLICATION FOR PERMIT TO CONSTRUCT (OR RECONSTRUCT) A SEWAGE DISPOSAL SYSTEM.

PROPERTY OWNER _____

ADDRESS _____ PHONE _____

AGENT OR PROSPECTIVE BUYER _____

ADDRESS _____ PHONE _____

PROPERTY LOCATION:

SUBDIVISION _____ LOT NO. _____

ROAD AND DESCRIPTION _____

_____

TAX MAP _____ PARCEL # _____

SIZE OF LOT _____ TYPE BLDG. _____
(SINGLE FAMILY DWELLING OR COMMERCIAL)

THE SYSTEM INSTALLED UNDER THIS APPLICATION IS ACCEPTABLE ONLY UNTIL PUBLIC FACILITIES BECOME AVAILABLE. I FULLY UNDERSTAND THE FEE CONNECTED WITH THE FILING OF THIS PERC TEST APPLICATION IS NON-REFUNDABLE UNDER ANY CIRCUMSTANCES. I ALSO AGREE TO COMPLY WITH ALL M.O.S.H.A. REQUIREMENTS IN TESTING THIS LOT. _____
(SIGNATURE OF APPLICANT)

APPROVED BY _____ FOR _____ DATE _____

DISAPPROVED BY _____ FOR _____ DATE _____

HOLD PENDING FURTHER TESTS _____

REASONS FOR REJECTION OR HOLDING _____

PERCOLATION TEST PLAT/PRELIMINARY PLAT - TITLE OR I.D. # _____ DATE _____

SITE DEVELOPMENT PLAN/FINAL PLAT - TITLE OR I.D. # _____ DATE _____

THIS IS NOT A PERMIT

HD-216 (3/92)

500 501

heavy red SiCLm

red brown SiLm some clay 40-50% Rx

11.0

503

orange red SiCLm changing to red SiLm some clay 30-40% Rx Mg stains

10.0

60% Rx

12.0

504

like 503 but 70% rock beginning @ 8.0'

11.0

505

heavy red SiCLm 30% Rx

6.0

70-80% large Rx frags

12.0

506

80% Rock frags beginning @ 5.0'

refusal

8.0

507

orange red SiCLm 40% Rx

4.0

40% Rx

7.5

water @ 9.0

515

red brown SiCLm 30% Rx

8.5

60% Rock Mg deposits

100

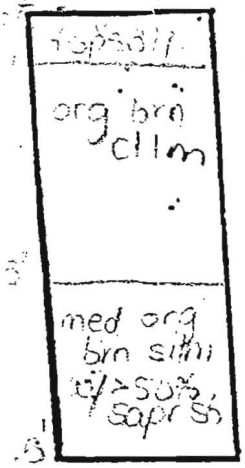
DATE	TEST NO.	DEPTH	PRE-WET START	PRE-WET STOP	TEST - 1" DROP START	TEST - 1" DROP STOP	TIME
6-5-98	500	7.0 / V11.0	10:43	10:54	10:54	11:11	17min
	501	6.0 / V12.0	10:47	10:48	10:48	10:49	1min
		repour	10:50	10:51 45	10:51 45	1:53 45	2min
		Marginal @ best - test times < 5min in					
		close to excessive rock conditions					Marginal
	502	3.5' / V11.0	10:58 30	11:12	11:12	11:40	28min
	503	6.0 / V12.0	11:12 No movement @ 11:40				
		Deep clay & insufficient depth to bedrock					F
	504	4.0 / V11.0	12:43	No movement @	2:30		
		Deep clay & insufficient depth to bedrock					F
	505	2.0 / V12.0	12:35 No movement @ 1:10				
		Insufficient depth to bedrock					F
	506	Insufficient depth to bedrock - ecc profile					F
	507	3.0 / V9.0	11:53	11:55	11:55	12:00	5min
	515	4.0 / V10.0	12:15	12:20	12:20	12:30	10min

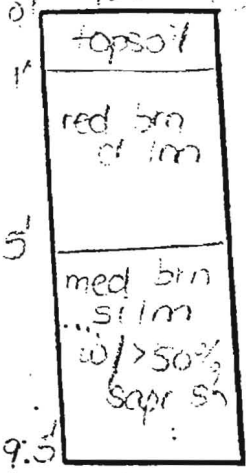
REMARKS

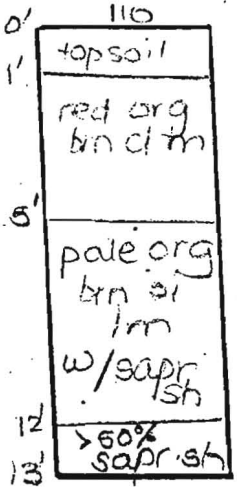
TESTED BY _____ ALSO PRESENT _____

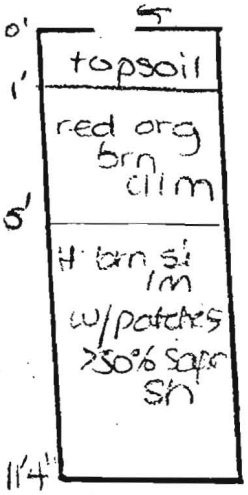
SUBDIVISION

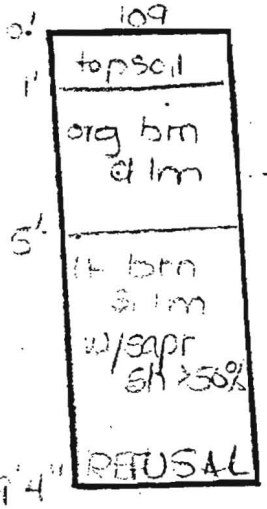
SOIL PROFILE

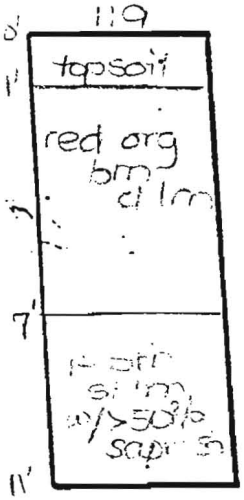


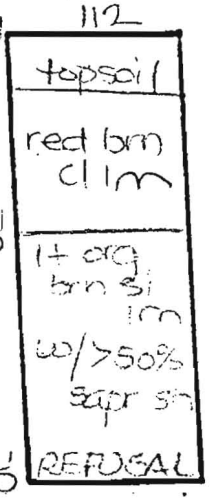


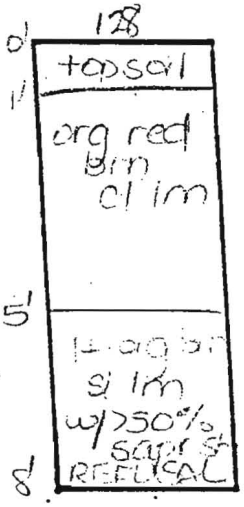








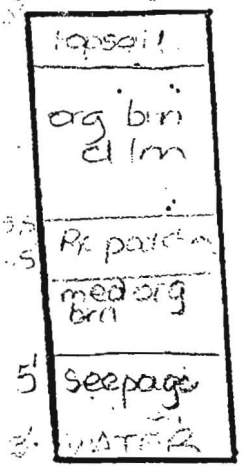


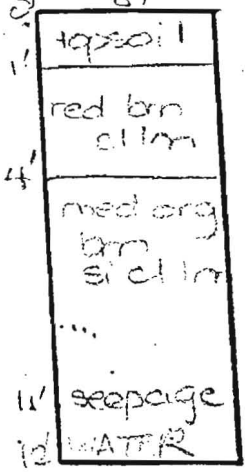


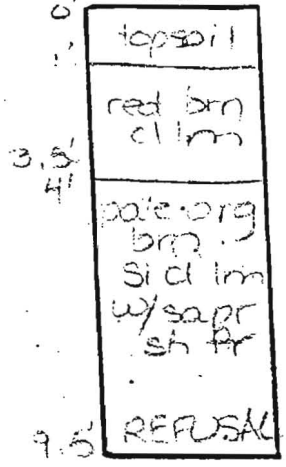
DATE	TEST NO.	DEPTH	PRE-WET START	PRE-WET STOP	TEST - 1" DROP START	TEST - 1" DROP STOP	TIME
11-20-97	112	8.5' D	→	→	→	→	FAIL
	120	9.5' D	→	→	→	→	FAIL
	110	5.0' S	1:00	1:06	1:06	1:21	15
		13.0' D					OK
	105	4'8" S	1:01	1:02	1:02	1:02	FAIL
		11.0' D					
	118	5.0' S	1:12	1:16	1:16	1:24	8
		11'2" D	→	→	→	→	FAIL
	109	9'4" D	→	→	→	→	FAIL
	119	11.0' D	→	→	→	→	FAIL
	128	8.0' D	→	→	→	→	FAIL

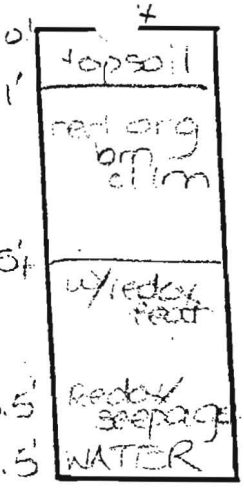
SUBDIVISION:

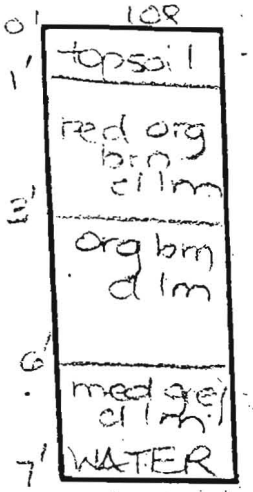
SOIL PROFILE

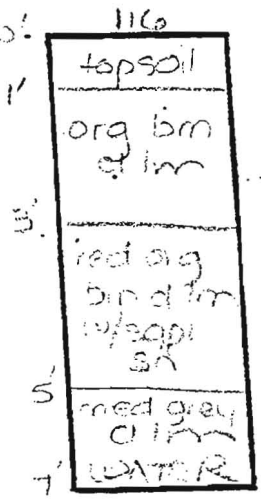


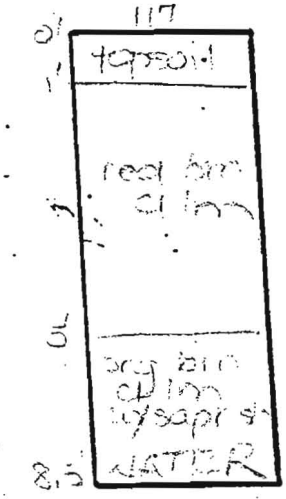


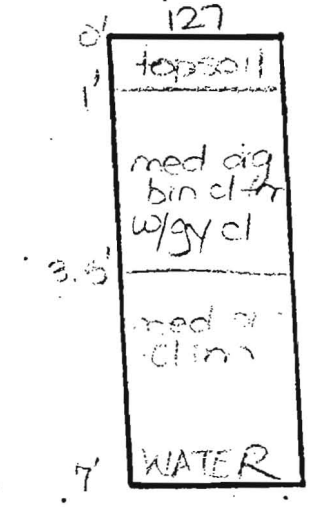


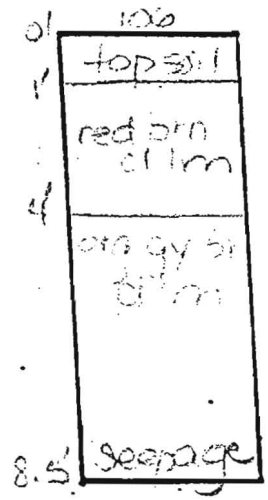


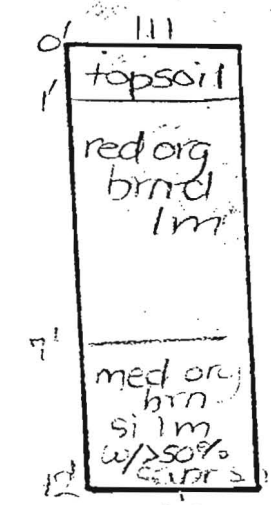




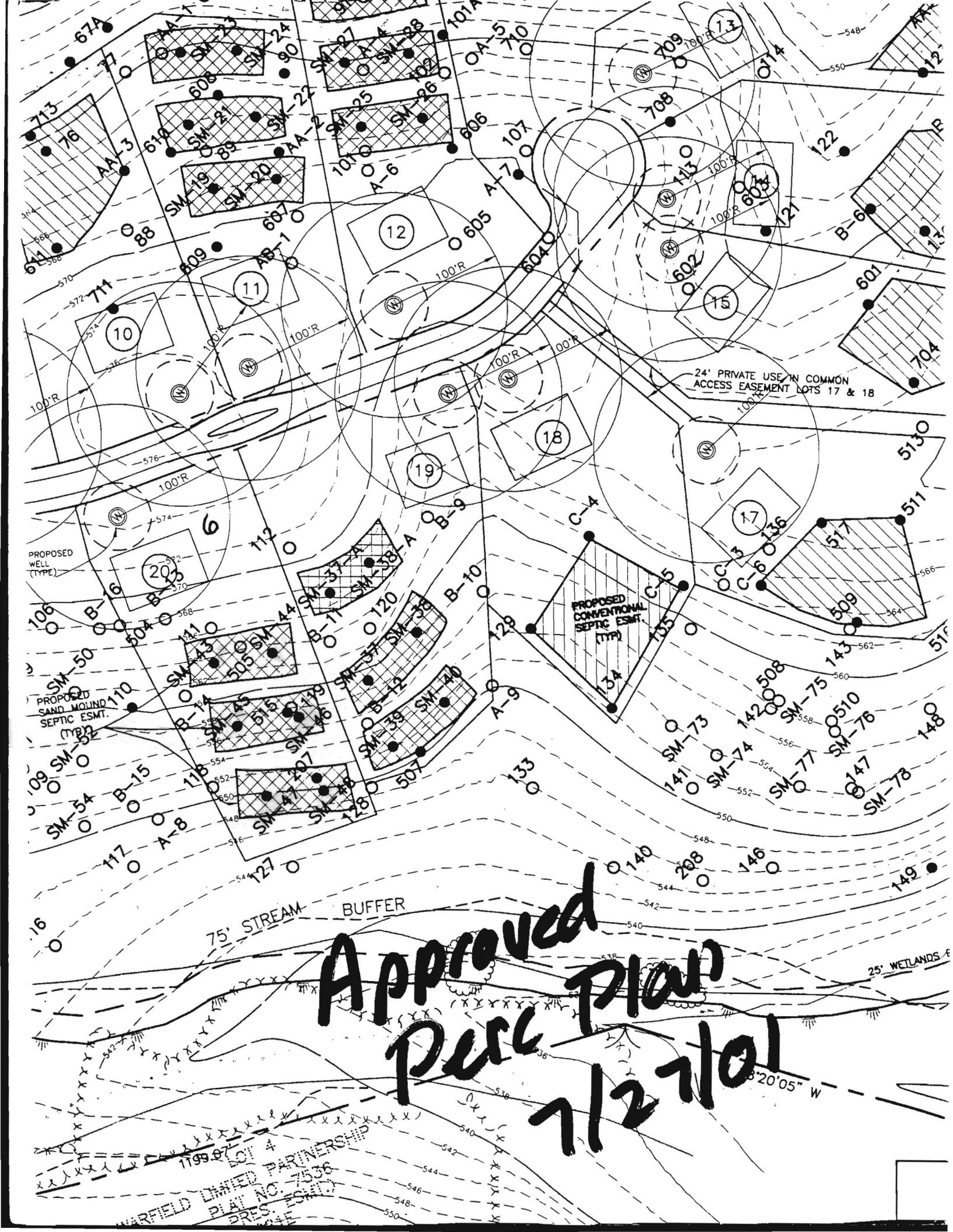








DATE	TEST NO.	DEPTH	PRE-WET START	PRE-WET STOP	TEST - 1" DROP START	TEST - 1" DROP STOP	TIME
11-20-97	73	13.0'D	water	seepage @ 11.5'	→		FAIL
	87	12.0'D	water	(seepage @ 11')	→		FAIL
	100	9.5'D	Refusal	→	→		FAIL
	104	9.5'D	water	(seepage @ 8.5')	→		FAIL
	108	7.0'D	water	→	→		FAIL
	116	7.0'D	water	→	→		FAIL
	117	8.5'D	water	→	→		FAIL
	127	7.0'D	water	→	→		FAIL
	111	12.0'D	→	→	→		FAIL
	106	8.5'D	seepage	→	→		FAIL


24' PRIVATE USE IN COMMON ACCESS EASEMENT LOTS 17 & 18
PROPOSED WELL (TYPE)
PROPOSED SAND MOUND SEPTIC ESMT. (TYP)
PROPOSED CONVENTIONAL SEPTIC ESMT. (TYP)
75' STREAM BUFFER
25' WETLANDS
LOT 4
WARFIELD LIMITED PARTNERSHIP
PLAT NO. 7536
PRES. ESMT.
Approved
Perc Plan
7/2/01

Williams, Jeffrey

From: Williams, Jeffrey
Sent: Wednesday, June 12, 2013 11:34 AM
To: 'tkeane'
Subject: CSB lot 6

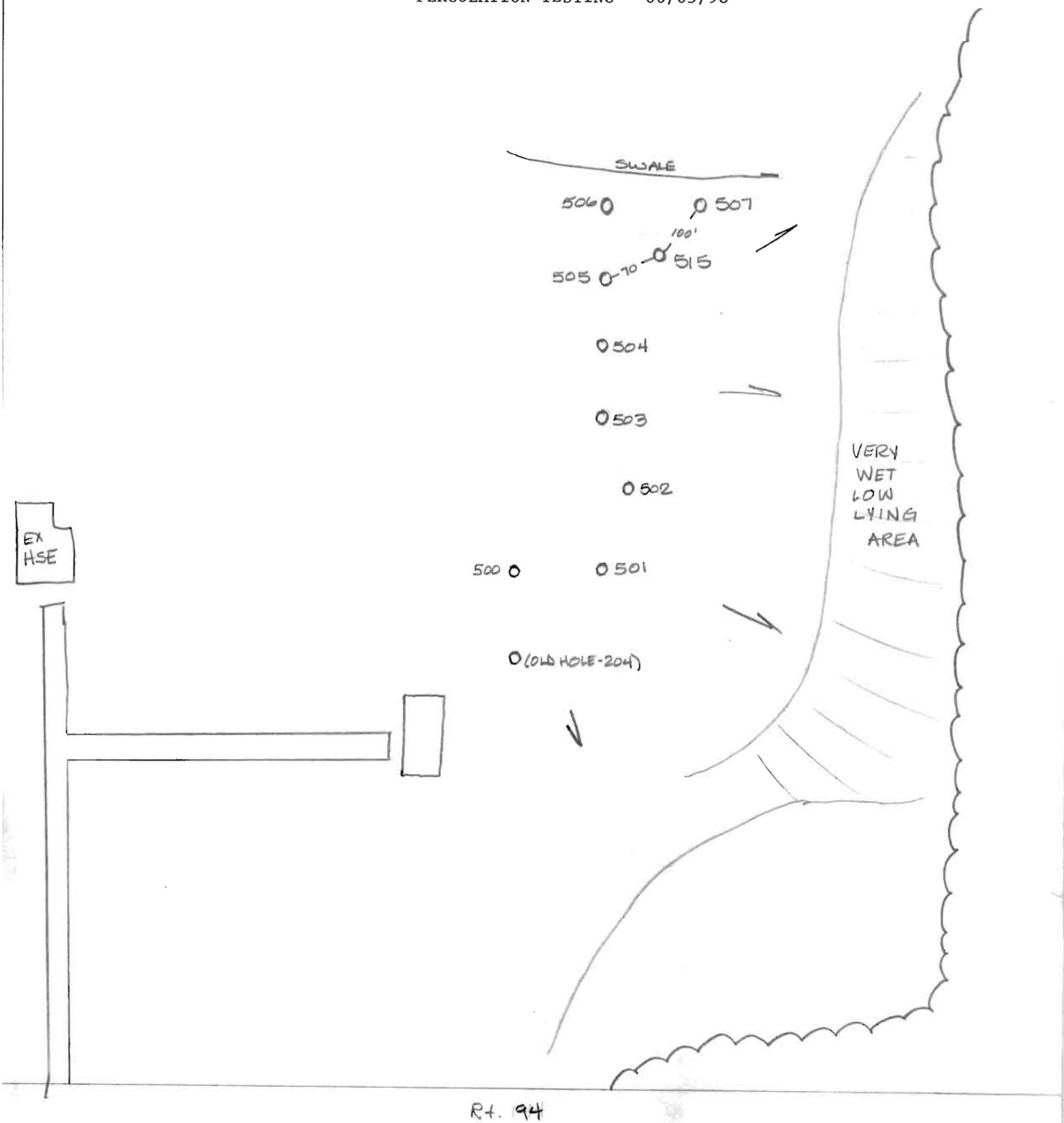
After reviewing the file, I see a letter from June 2012 from Dana stating what we need on a revised site plan:

- 3 well sites
- Perc hole locations and elevations
- 1 foot contours around the sand mound site

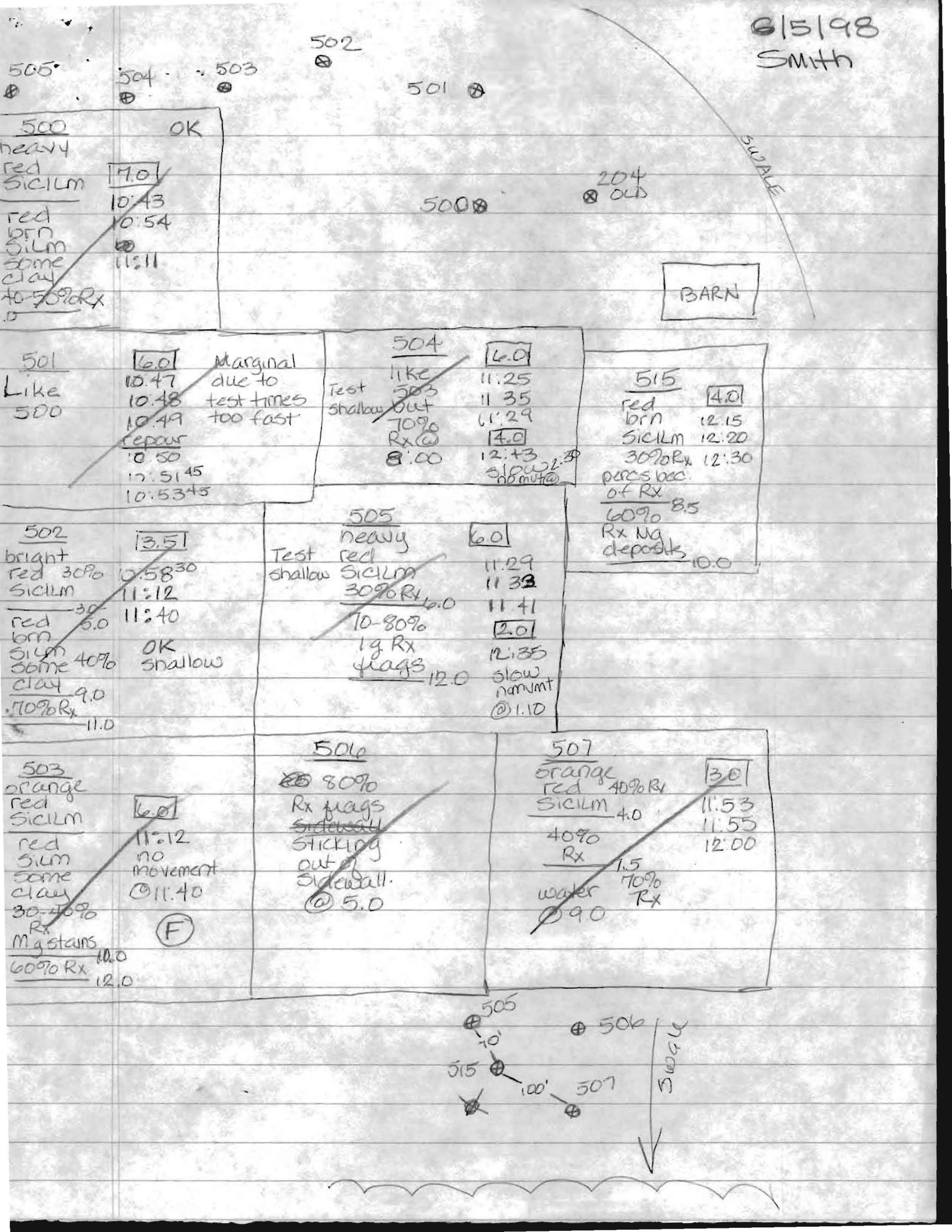
In addition we need to have the sand mound area and gravel bed area within the sand mound staked out in the field for our review. It doesn't look like any of that has happened yet. Once we get a revised plan with that info and get word of the areas staked out, we can take a look and move forward towards BP approval.

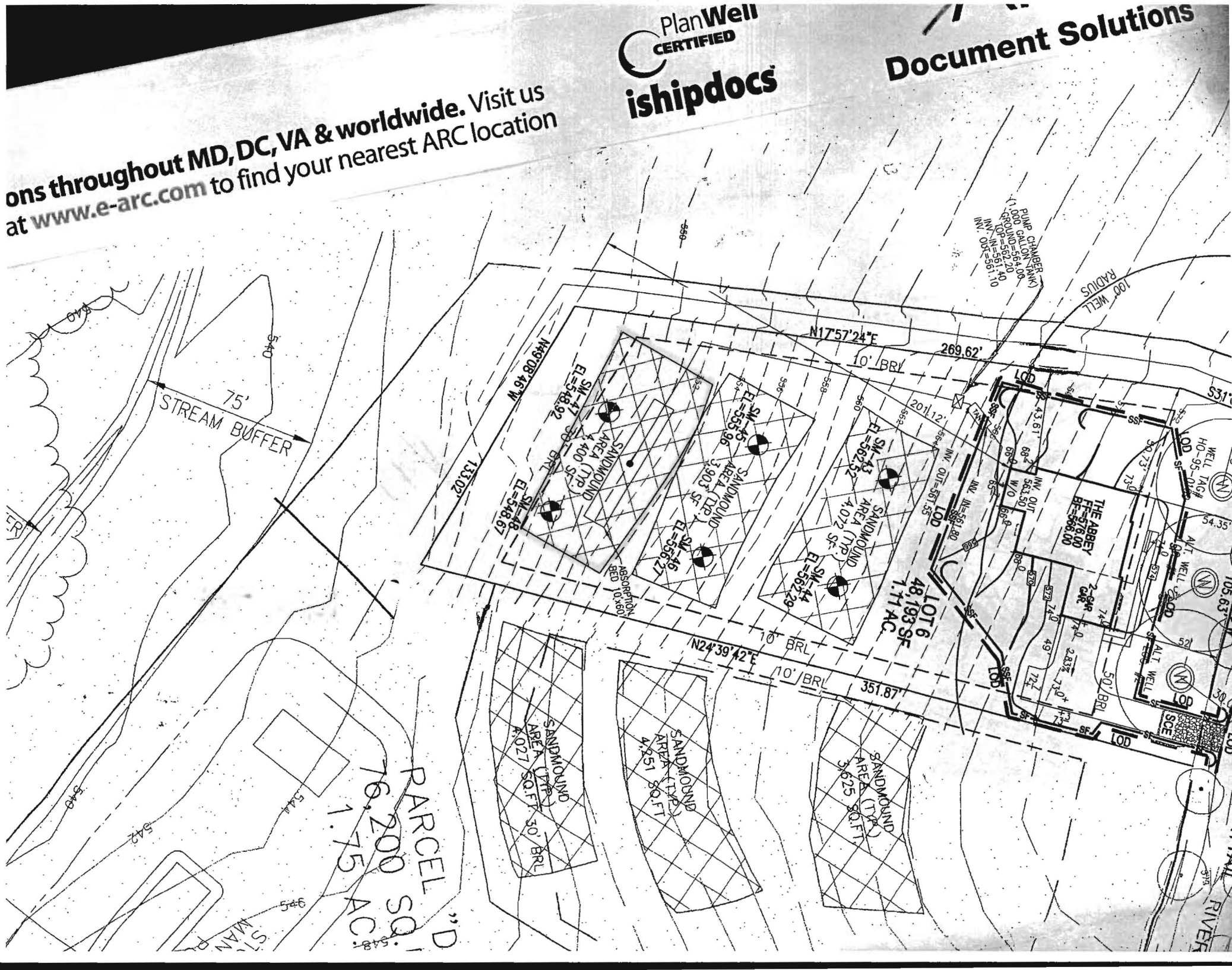
Jeff Williams
Program Supervisor, Well & Septic Program
Bureau of Environmental Health
Howard County Health Dept.
410-313-4261
jewilliams@howardcountymd.gov

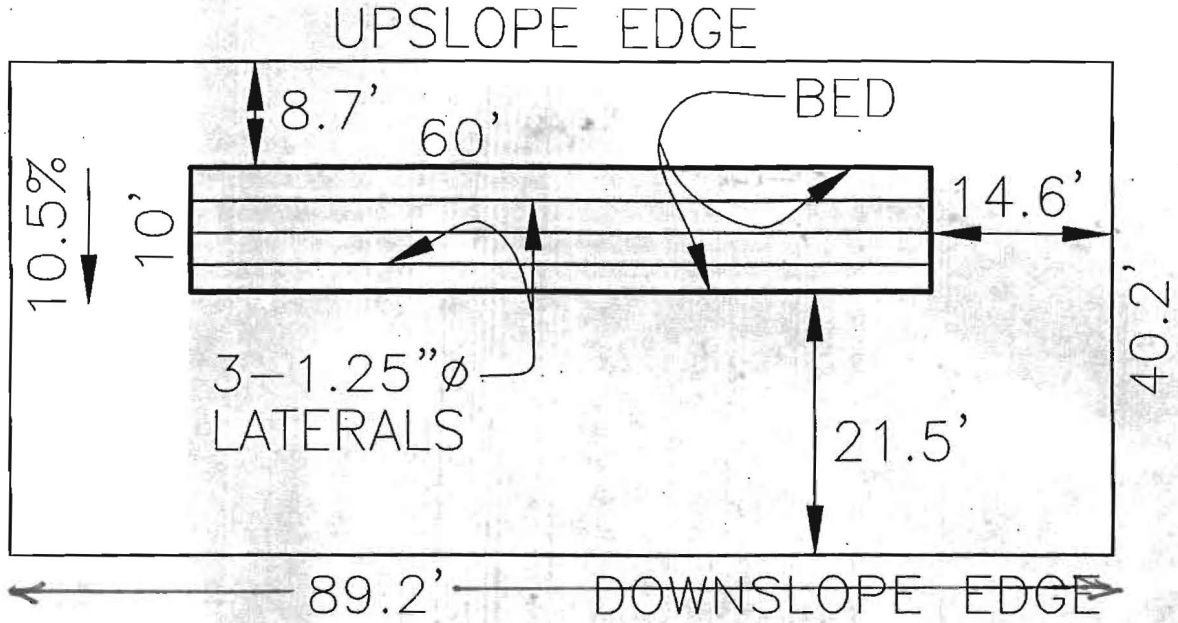
SMITH PROPERTY - ROUTE 94
PERCOLATION TESTING - 06/05/98



6/5/98
Smith


502
505
504
503
501
500
OK
heavy red SiCLm
7.0
10:43
10:54
11:11
red brn SiLm some clay 40-50% Rx
10
204 old
SWALE
BARN
501
Like 500
6.0
10:47
10:48
10:49
Repour
10:50
10:51 45
10:53 45
Marginal due to test times too fast
504
Test shallow
like 503 Out 70% Rx @ 8:00
6.0
11:25
11:35
11:29
4.0
12:13
slow 2.5
no mvmt @
515
red brn SiCLm 30% Rx
4.0
12:15
12:20
12:30
pores bec. of Rx
8.5
60% Rx Mg deposits
10.0
502
bright red 30% SiCLm
3.5
10:58 30
11:12
11:40
30
6.0
red brn SiLm some 40% clay
9.0
70% Rx
11.0
OK shallow
505
Test shallow
heavy red SiCLm 30% Rx
6.0
70-80% lg Rx flags
12.0
6.0
11:29
11:33
11:41
2.0
12:35
slow nonvmt @ 1.10
503
orange red SiCLm
6.0
red SiLm some clay 30-40% Rx
Mg stains
10.0
60% Rx
12.0
11:12
no movement @ 11:40
F
506
80% Rx flags
sidewall
sticking out of sidewall.
@ 5.0
507
orange red SiCLm
4.0
40% Rx
1.5
70% Rx
water @ 9.0
3.0
11:53
11:55
12:00
505
70'
506
515
100'
507
SWALE





BED LAYOUT SCHEMATIC

1"=20'

2/3

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS · SURVEYORS · PLANNERS

Project: Close at Stoney Brook
Customer: Lot 6 Sand Mound
Designed By: R Vogel Date
Checked By Date: Rev 5/22/13

/30/10
vised 5/22/13
vised 7/14/13
60 min)
2.6
3.4=21.5'
' 40.28'
5'
5'

* Rev 7/14/13

Description Bed Width = ~~24'~~ 60'
Use 6 Laterals 60' 24/2 = 30' − 3' = 27' From center manifold
1 1/4" Ø Lateral w/ 5/16" Ø holes.
Based of ~~Figure~~ 4.4 use 6.0 spacing 5 holes/Lateral

· Pumping System

Length of Laterals = ~~194~~ 162 LF 1 1/4" @ 7.8 gal/100' = ~~15.13~~ 12.64 gal
Length of Force Main/Manifold = 200 LF 3" @ 38.4 gal/100' 76.8 gal

Dose = 76.8 + (5 × ~~15.13~~ 12.64) = ~~152.5~~ 140 gallons.
or 1/6 ~~750~~ 600 gallons = ~~125~~ 100 gallons.
Use ~~152.5~~ 140 gallons Dose

Overday Storage = ~~750~~ 600 gallons
Dose = ~~152.5~~ 140 gallons
~~902.5~~ 740 gallons

· Size Pump.

15 holes × 6 Laterals = 30 holes.
Flow 30 × 1.63 gpm = 49.0 gpm (2' head)

Design Head
Static Head Lateral elevation = 551.5
Pump off = elevation = 559.16
Hs = 551.5 − 559.16 = −7.66' (Ignore neg. head)

Friction Head
~~194~~ 162' + 90° + 45° + 45° + 90° + Valve

For 2" Ø @ 49.0 gpm Friction Loss is 3.98

Fittings: 90° + 45° + 45° + 90° + Valve = 7 + 4 + 4 + 7 + 13 = 23.3
Head at Distal End of Lateral = 3.0' (conservative)
Hf = ~~194~~ 162 + 23.3 = 217.3 @ 3.98/100' = 8.6 + 3 head at end
185.3 7.4
11.6" head
10.4'

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS · SURVEYORS · PLANNERS

1/3

Project Chase at Snake Brook
Customer Lot 6 Sand mound
Designed By RVogel Date 11/30/10
Checked By _____ Date Revised 7/22/13

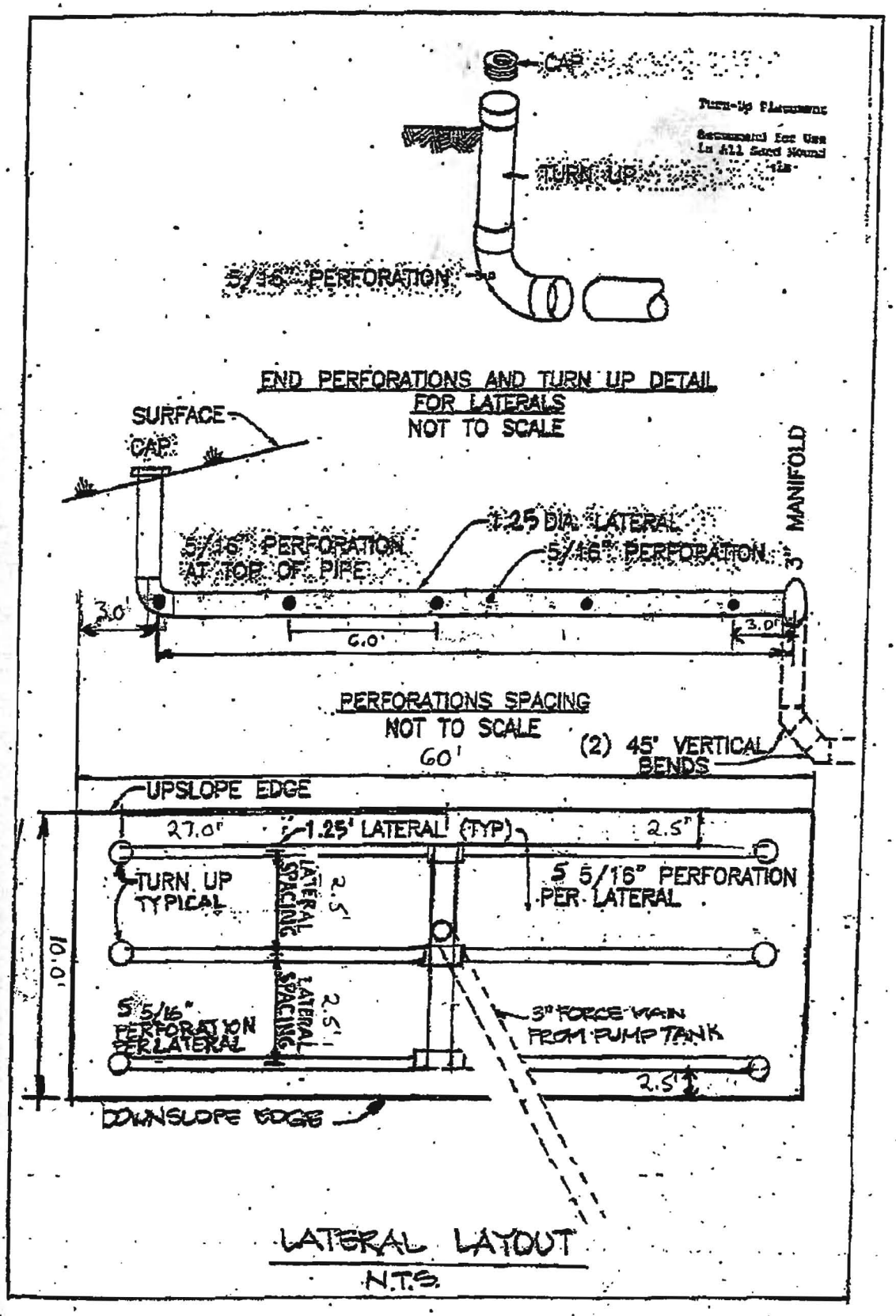
* Revised 7/19/13

Number of Bedrooms: 3/4
Design Flow: 600 750 GPD
Design Infiltration Rate (Sand): 1.00 GPD/FT²
Soil Infiltration Rate: 0.50 GPD/FT² - (Worst Time 60 min)
Depth to Water Table: 24" (Min Assumed) (E)
Absorption Area: 600/0.50 GPD/1.00 GPD/FT² 750 SF
Bed Length (B) = 71.2 60'
Bed Width (A) = 10.5' 10'
Slope Across Bed = 10.5%
Upslope Sand Fill Depth = 48 - 24 = 24 (D)
Downslope Sand Fill Depth (E) = [(12)(10.5/10)](.105) + 24 = 37.23" 36.6
Cap + Topsoil at Bed Center (H) = 10"
Cap + Topsoil at Bed Edge (G) = 12"
Total Bed Depth (F) = 10"
Sideslope Setback (K) = [(D+E)/2 + 12.5]3 = 175.5" 174.9
Upslope Setback (J) = (22' + 24)(3)(0.76) = 104.9" = 8.74'
Downslope Setback (T) = (22' + 36.6)(3)(1.47) = 251.2" = 21.5' 258.4" = 21.5'
Total Width of Mound (W) = (12)(10.5/10) + 104.9 + 258.4" = 492.1" = 41.0' 40.88'
Total Length of Mound (L) = 12(71.2/60) + 750/174.9 + 750/174.9 + 1200" = 1070" = 89.15'

Basal Area Req'd = 750/600 GPD / 0.50 GPD/FT² = 1500 SF 1200 SF

Basal Area Provided = ((10.5) + (21.5)) (71.2) = 2300 SF
10.0 21.54 60.0 1892

Basal Area Provided OK


CAP
TURN UP
5/16" PERFORATION
END PERFORATIONS AND TURN UP DETAIL
FOR LATERALS
NOT TO SCALE
SURFACE CAP
5/16" PERFORATION AT TOP OF PIPE
1.25 DIA. LATERAL
5/16" PERFORATION
3" MANIFOLD
3.0'
6.0'
3.0'
PERFORATIONS SPACING
NOT TO SCALE
60'
(2) 45° VERTICAL BENDS
UPSLOPE EDGE
27.0'
1.25' LATERAL (TYP)
2.5'
TURN UP TYPICAL
LATERAL SPACING
2.5'
5 5/16" PERFORATION PER LATERAL
10.0'
5 5/16" PERFORATION PER LATERAL
LATERAL SPACING
2.5'
3" FORCE MAIN FROM PUMP TANK
2.5'
DOWNSLOPE EDGE
LATERAL LAYOUT
N.T.S.

ROBERT H. VOGEL ENGINEERING, INC
8407 Main Street
Ellicott City, Maryland 21043
410-461-7666
410-461-8961 FAX
http://www.vogeleng.com

From: Williams, Jeffrey [mailto:jewilliams@howardcountymd.gov]
Sent: Monday, July 8, 2013 4:01 PM
To: Rob Vogel
Cc: Tim Keane
Subject: RE: Tim Keane Chase at Stony Brook 6

There was a miscommunication between myself and Dana. When Robert went out to look at the mound site, he noticed a graded drainage swale off the property nearby downslope. The mound site can be moved up 10' from its approved spot on the perc cert without interfering with the other mound site. We would like to see that site reflected on a revised septic plan to show it on contour and with the proper dimensions, but we don't need to do a revised perc cert. Also, we would need to see the new area staked out for our review prior to septic layout.

From: Rob Vogel [mailto:rvogel@vogeleng.com]
Sent: Monday, July 08, 2013 3:51 PM
To: Williams, Jeffrey
Cc: 'Tim Keane'
Subject: FW: Tim Keane Chase at Stony Brook 6

Can you please check the following comment from Dana? It is for Lot 6 Chase at Stony Brook. The sand mound design is within the box established by the signed percolation plat. Computations show 8.75 upslope setback and 21.1 downslope setback. The graphic shows about 7.5'-8' for upslope and about 23' for downslope. We can adjust the graphic slightly but this should not require a perc cert plat revision. Please confirm. Thanks.

From: Tim Keane [mailto:tkeane@trinityhomes.com]
Sent: Monday, July 08, 2013 11:40 AM
To: rvogel@vogeleng.com
Subject: FW: Tim Keane

Can we discuss on Wednesday, please

From: Bernard, Dana [mailto:dbernard@howardcountymd.gov]
Sent: Wednesday, July 3, 2013 2:37 PM
To: Tim Keane
Subject: RE: Tim Keane

Hello Tim,

The lot was reviewed and approved in accella. However, we will need a revised percolation certification plan to move the lower mound site up the hill 10 feet and show the edges on contour. We will need a revised percolation certification plan and the site will need to be restaked in the new spot prior to the septic layout.

Have a Great Holiday
Dana Bernard

From: Tim Keane [mailto:tkeane@trinityhomes.com]
Sent: Monday, July 01, 2013 11:16 AM
To: Bernard, Dana
Cc: Williams, Jeffrey
Subject: Tim Keane

RE: Chase at Stoney Brook

Hi Dana
The lot will be mowed today, and it is staked, could someone please inspect sooner than later, I am trying to get a building permit.

Thx

tim

Williams, Jeffrey

From: Williams, Jeffrey
Sent: Thursday, July 11, 2013 10:05 AM
To: 'Eric Salmi'
Cc: Jeremiah Reynolds; tkeane@trinityhomes.com; Megan Brett
Subject: RE: Tim Keane Chase at Stony Brook 6

This is going to be a bit of a tricky layout because the contours on paper do not exactly match what is found on site. For the paper submittal, I would like to see the top edge of the mound site to run on contour just below the 553 contour line. The gravel bed area should be shifted a bit to get it more or less on contour with the 551 contour line running through its middle.

In the field is the important part. We need the surveyors in the field to start at the lower left stake (as seen from below, the southwestern most stake, the lower stake on the same side as the pump tank) and move that 10' up the hill. From that stake location, they can move the rest of the mound to match that location. They should run the lower mound line along contour from that spot and stake the other bottom corner accordingly. Then, they can move the upper left (pump tank side) stake up according to the required mound width and find the upper contour to stake the other upper corner stake, keeping the minimum mound width in mind. They can then stake the bed area within the mound according to contour and the required upslope, downslope, and sideslope setbacks.

The field stakes may not exactly match the paper version, but the field stakes are the more important of the two. Thanks Jeff

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From: Eric Salmi [mailto:esalmi@vogeleng.com]
Sent: Wednesday, July 10, 2013 3:24 PM
To: Williams, Jeffrey
Cc: Jeremiah Reynolds; tkeane@trinityhomes.com; Megan Brett
Subject: RE: Tim Keane Chase at Stony Brook 6

Hello Jeff

Your email stated

1. "...noticed a graded drainage swale off the property nearby downslope. The mound site can be moved up 10' from its approved spot on the perc cert without interfering with the other mound site"

We moved the mound uphill 10 feet. Bottom left corner was near elevation 547+/-, this shifted uphill to near elevation 548. We then rotated the downslope edge onto the 548 contour.
Please see attached, the downslope edge generally runs along the 548 contour. The upslope edge (reading left to right) and the 9'x68' bed runs uphill. Would you like to amend this or should we proceed with detailing the septic plan?

2. We would like to see that site reflected on a revised septic plan to show it on contour and with the proper dimensions, but we don't need to do a revised perc cert.

-Noted, no revised perc cert is required.
-Per explanation above, please review and when acceptable we will forward a revised septic plan

3. Also, we would need to see the new area staked out for our review prior to septic layout.

-Tim is aware of this requirement

Thanks for your help
Eric D. Salmi, Prof. LS

TEST DATA

NAME _____ FILE NO _____

LOCATION Smith Property COUNTY _____

Rt. 94 DATE 3/29/00

_____ GRID _____ E

RECORDED BY _____ _____ N

HOLE NO.	TEST NO.	DEPTH	CLOCK TIME	ELAPSED TIME	MEASUREMENT	REMARKS (Method, Moisture, Biopores)
1.	44		8:30		7.0	> 12/16
			8:50	20	6 4/16	> 4/16
			9:05	15	6.0	> 5/16
			9:20	15	5 11/16	> 4/16
			9:35	15	5 7/16	> 4/16
			9:50	15	5 3/16	> 5/16 STOP
			10:05	15	4 14/16	> 4/16
			10:20	15	4 10/16	> 4/16
			10:35	15	4 6/16	
						60 min/inch (OK)
2.	43		8:33		7 0	> 5/16
			8:50	17	6 11/16	> 4/16
			9:05	15	6 10/16	> 0
			9:20	15	6 10/16	> .5/16 STOP
			9:35	15	6 9.5/16	> .5/16
			9:50	15	6 9/16	> 0
			10:05	15	6 9/16	> 0
			10:20	15	6 9/16	> 0
			10:35	15	6 9/16	
						(F)

		Time		Meas.			
3.	45	8:37		7.0	> 13/16		
		8:51	14	$5\frac{13}{16}$	> 12/16		
		9:06	15	$4\frac{11}{16}$			
		9:21	15	$3\frac{9}{16}$			
		9:36		7.0	> 15/16		
		9:51	15	$6\frac{4}{16}$	> 14/16		
		10:06	15	$5\frac{3}{16}$	> 17/16	17min	
		10:21	15	$4\frac{2}{16}$	> 12/16	14min	
		10:36	15	$3\frac{6}{16}$	> 11/16	20min	OK
		10:55	19	$2\frac{5}{16}$	> 13/16	18min	
		11:10	15	$1\frac{8}{16}$		18min	
4.	47	8:40		7.0	> 15/16		
		8:52	12min	$6\frac{1}{16}$	> 7/16		
		9:07	15min	$5\frac{10}{16}$	> 6/16		
		9:22	15min	$5\frac{4}{16}$	> 6/16		
		9:37	15min	$4\frac{14}{16}$	> 4/16		
		9:52	15min	$4\frac{10}{16}$	> 5/16		
		10:07	15min	$4\frac{5}{16}$	> 8/16		
		10:22	15min	$3\frac{13}{16}$			
		10:25		7.0	> 5/16		
		10:40	15min	$6\frac{11}{16}$	> 8/16	48min	
		10:55	15min	$6\frac{3}{16}$	> 7/16	30min	
		11:10	15min	$5\frac{12}{16}$	> 5/16	34min	
		11:25	15min	$5\frac{7}{16}$	> 6/16	48min	OK
		11:40	15min	$5\frac{1}{16}$	> 6/16	40min	
		11:55	15	$4\frac{11}{16}$		40min	

TEST DATA

NAME _____ FILE NO _____

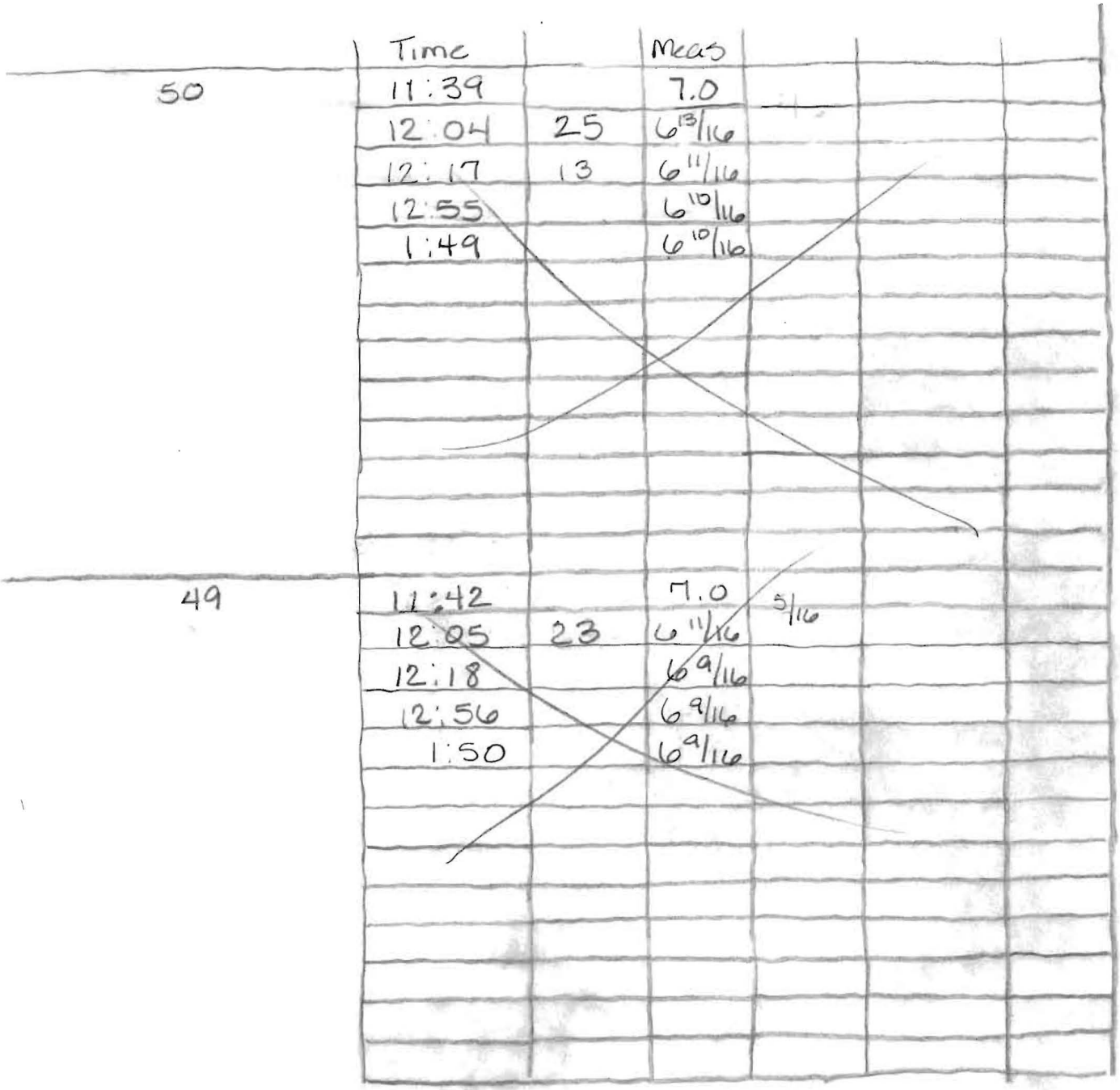
LOCATION Smith Prop Rt 94 COUNTY _____

DATE _____

GRID _____ E

RECORDED BY Amy McMillan _____ N

HOLE NO.	TEST NO.	DEPTH	CLOCK TIME	ELAPSED TIME	MEASUREMENT	REMARKS (Method, Moisture, Biopores)
5	48	18"	9:10		7.0	> 1 11/16 set by Hand
			9:25	15	5 5/16	
			9:41		7.0	> 15/16
			9:56	15	6 1/16	> 1 2/16 16 min/inch
			10:11	15	5 15/16	> 15/16 13
			10:26	15	4	16
			10:27		7.0	> 12/16
			10:42	15	6 4/16	> 1 3/16 20
			10:57	15	5 1/16	> 13/16 13
			11:17	20	4 4/16	> 10/16 24
			11:32	15	3 10/16	24 min/inch OK
6	46	18"	8:48		7	> 5/16
			8:53	5	6 11/16	> 12/16
			9:11	18	5 15/16	> 8/16
			9:26	15	5 7/16	> 10/16
			9:41	15	4 13/16	> 9/16
			9:56	15	4 4/16	> 7/16
			10:11	15	3 13/16	
			10:12		7	> 9/16 26
			10:27	15	6 7/16	> 10/16 24
			10:42	15	5 13/16	> 9/16 26
			10:57	15	5 4/16	> 9/16 37
			11:18	21	4 11/16	> 9/16 26 min/inch OK
			11 33	15	4 2/16	


Time
Meas
50
11:39
7.0
12:04
25
6 13/16
12:17
13
6 11/16
12:55
6 10/16
1:49
6 10/16
49
11:42
7.0
5/16
12:05
23
6 11/16
12:18
6 9/16
12:56
6 9/16
1:50
6 9/16

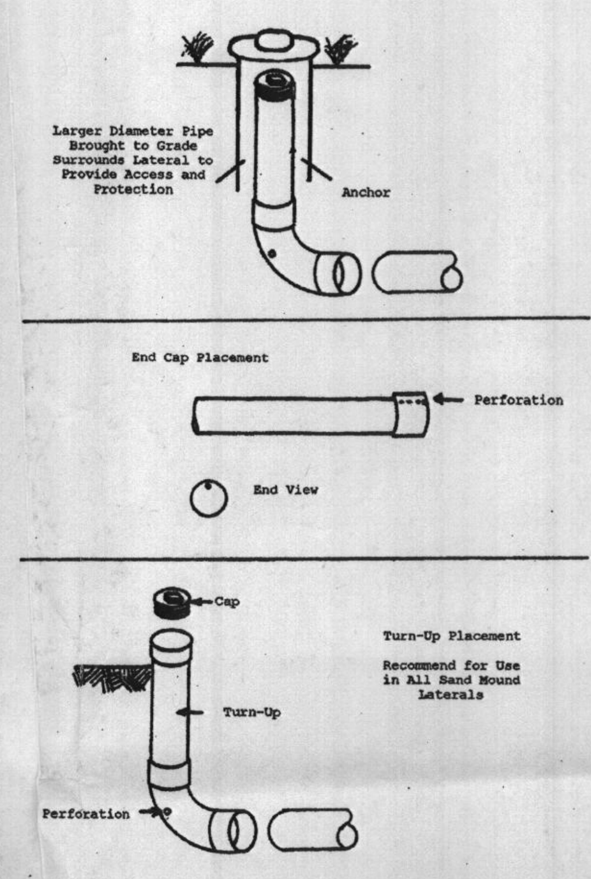


FIGURE 4.5 – ALTERNATIVES FOR PLACEMENT OF THE END PERFORATION IN A DISTRIBUTION LATERAL

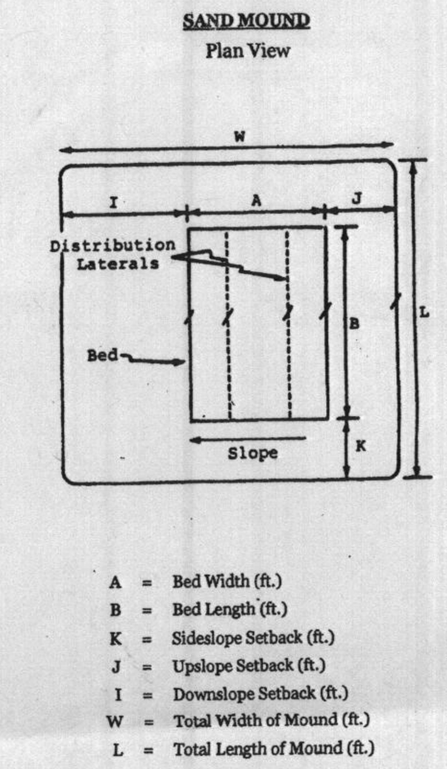
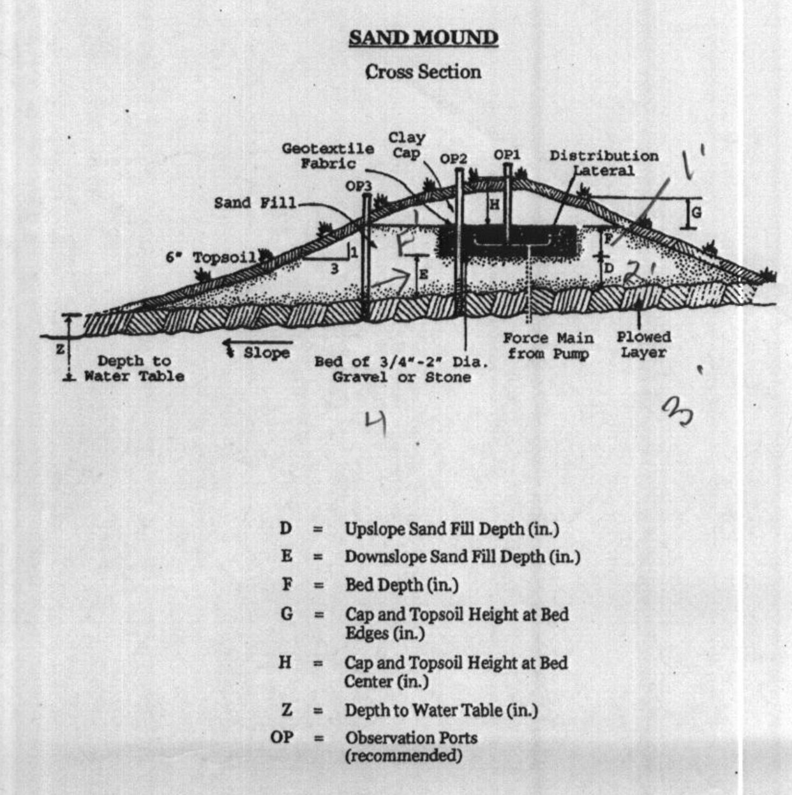


FIGURE 3.2 – DESIGN WORKSHEET, PLAN VIEW


SAND MOUND
Cross Section
Geotextile Fabric
Clay Cap
Distribution Lateral
Sand Fill
6" Topsoil
Slope
Depth to Water Table
Bed of 3/4"-2" Dia. Gravel or Stone
Force Main from Pump
Plowed Layer
D = Upslope Sand Fill Depth (in.)
E = Downslope Sand Fill Depth (in.)
F = Bed Depth (in.)
G = Cap and Topsoil Height at Bed Edges (in.)
H = Cap and Topsoil Height at Bed Center (in.)
Z = Depth to Water Table (in.)
OP = Observation Ports (recommended)
FIGURE 3.1 – DESIGN WORKSHEET CROSS SECTION

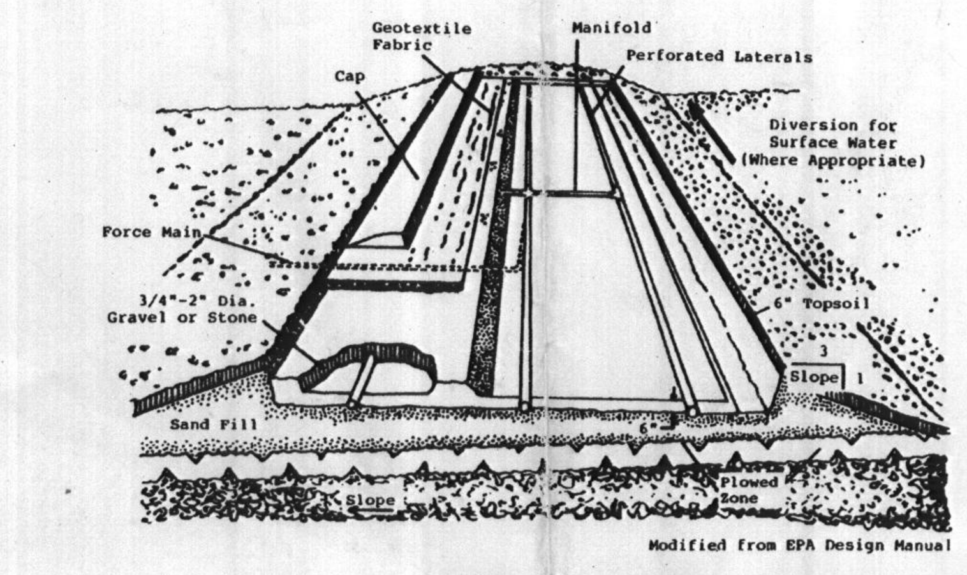
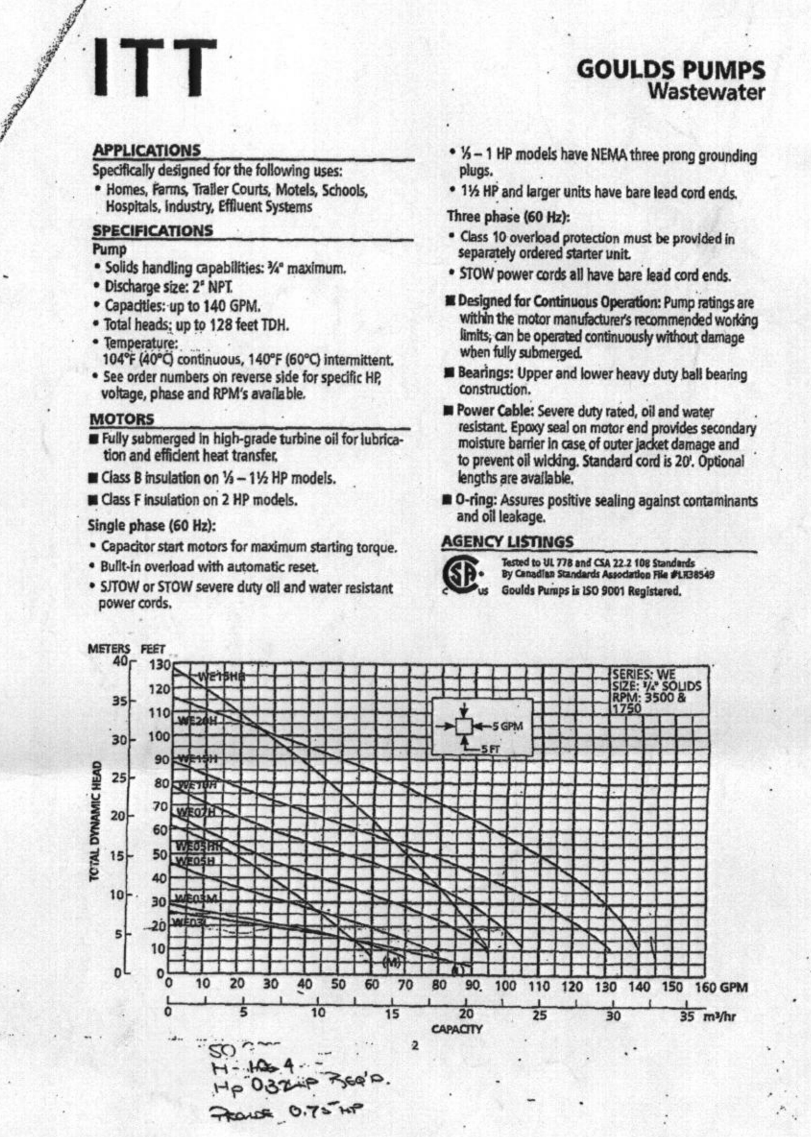
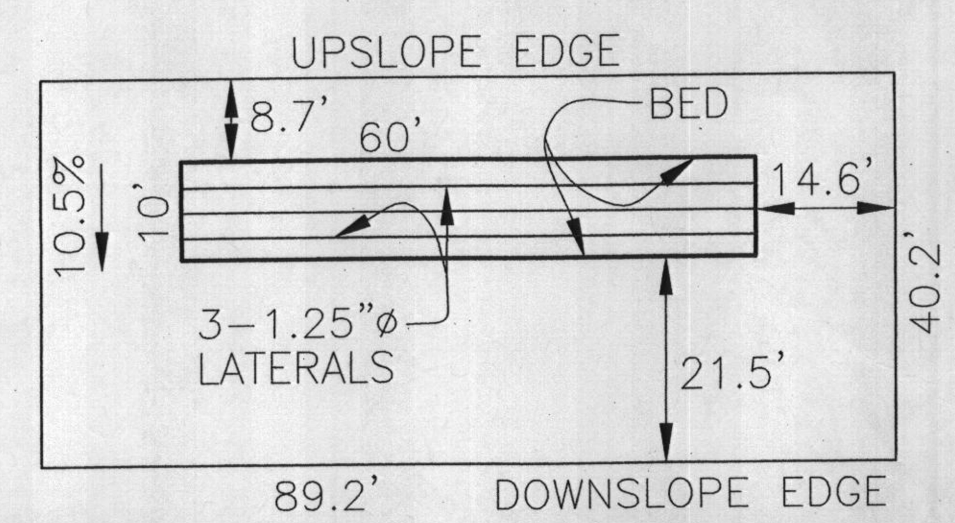
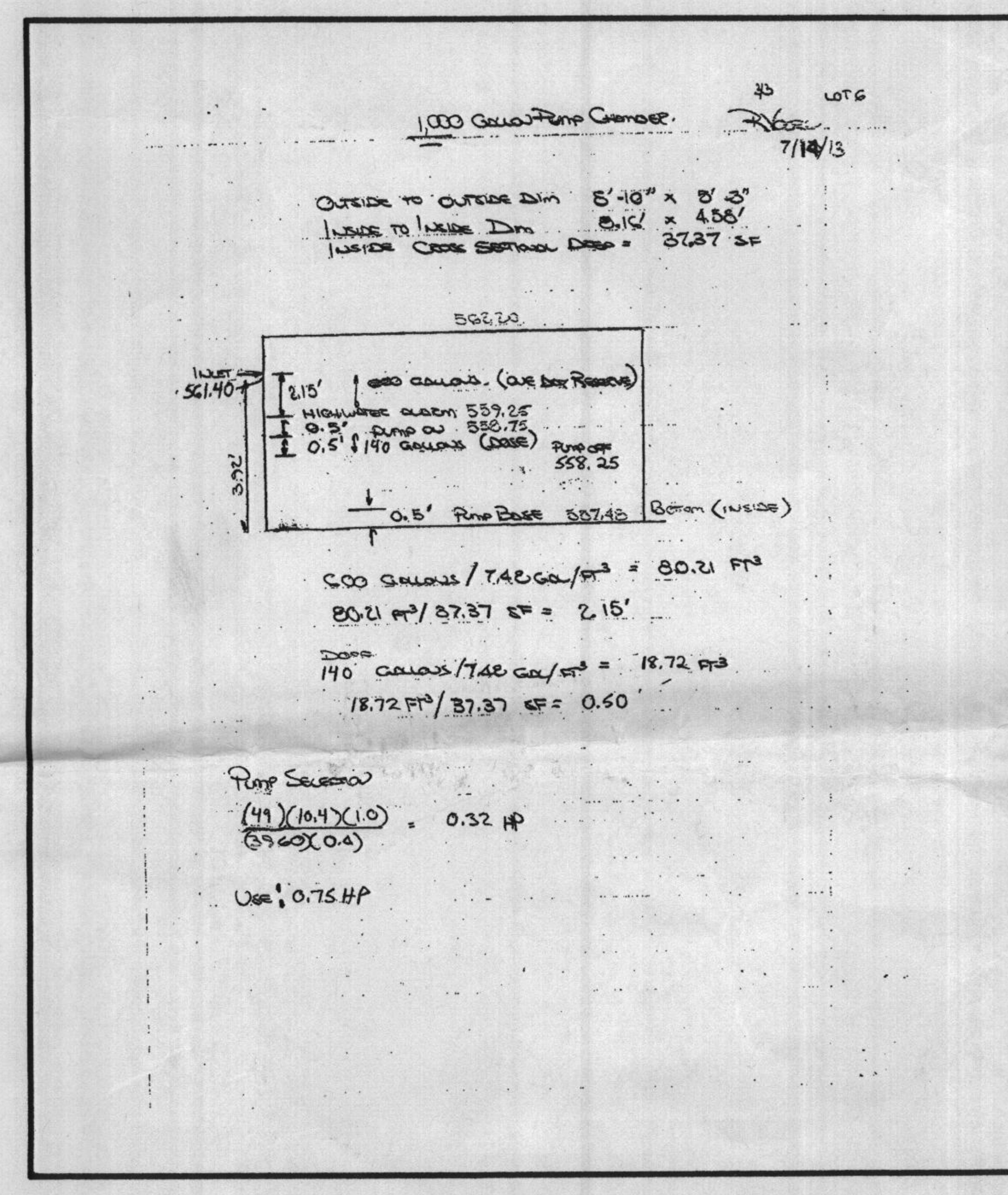


FIGURE 1.2 – DETAILED SCHEMATIC OF A SAND MOUND SYSTEM





BED LAYOUT SCHEMATIC
1"=20'



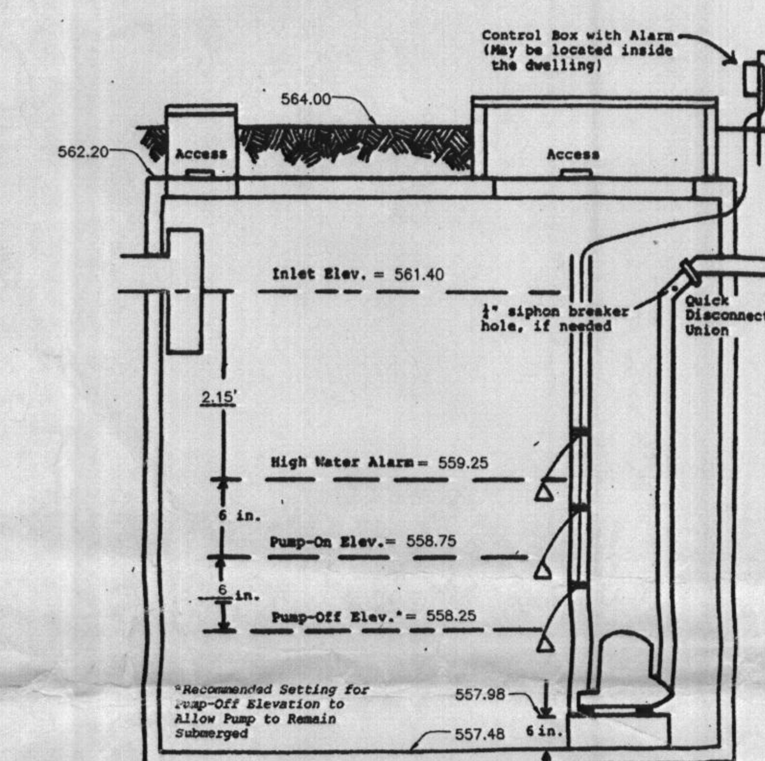
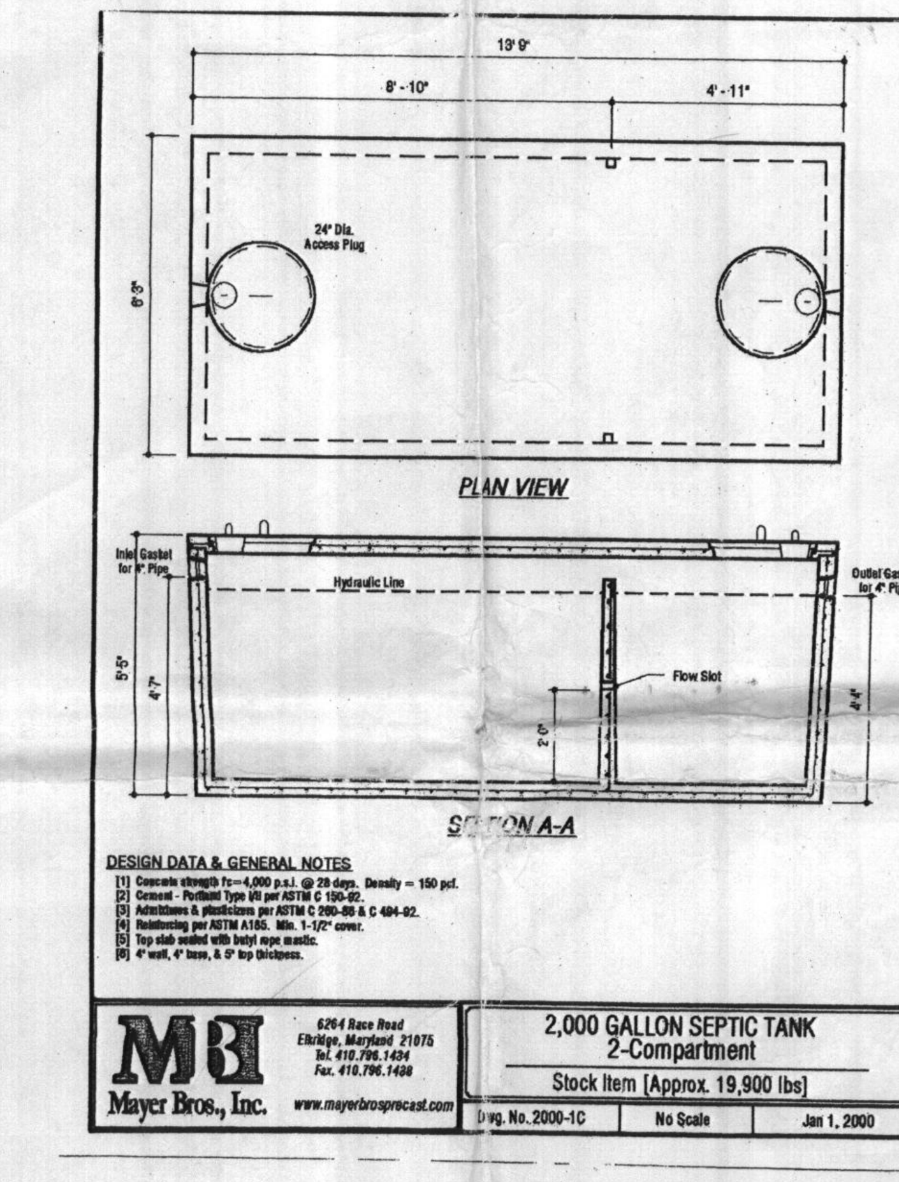
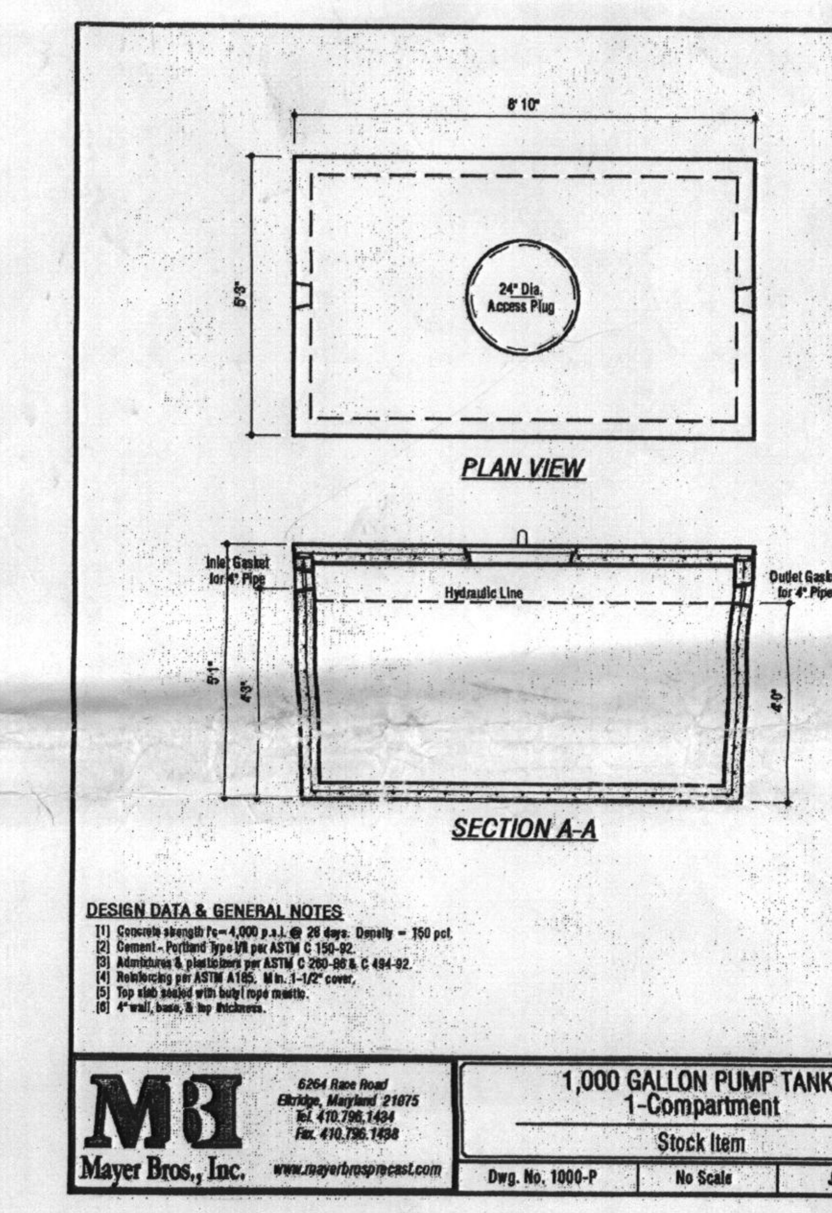


FIGURE 4.6 – TYPICAL PUMP CHAMBER DETAIL





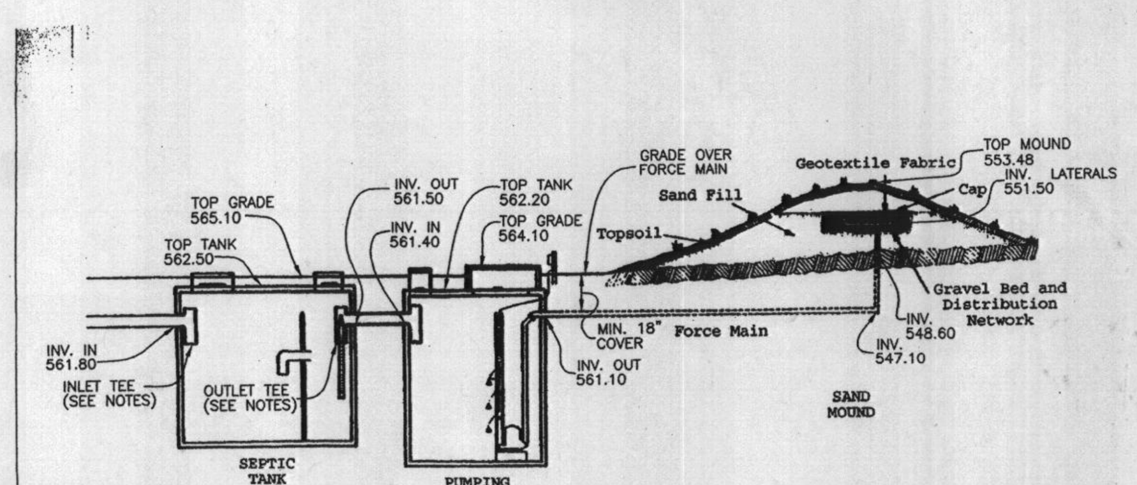
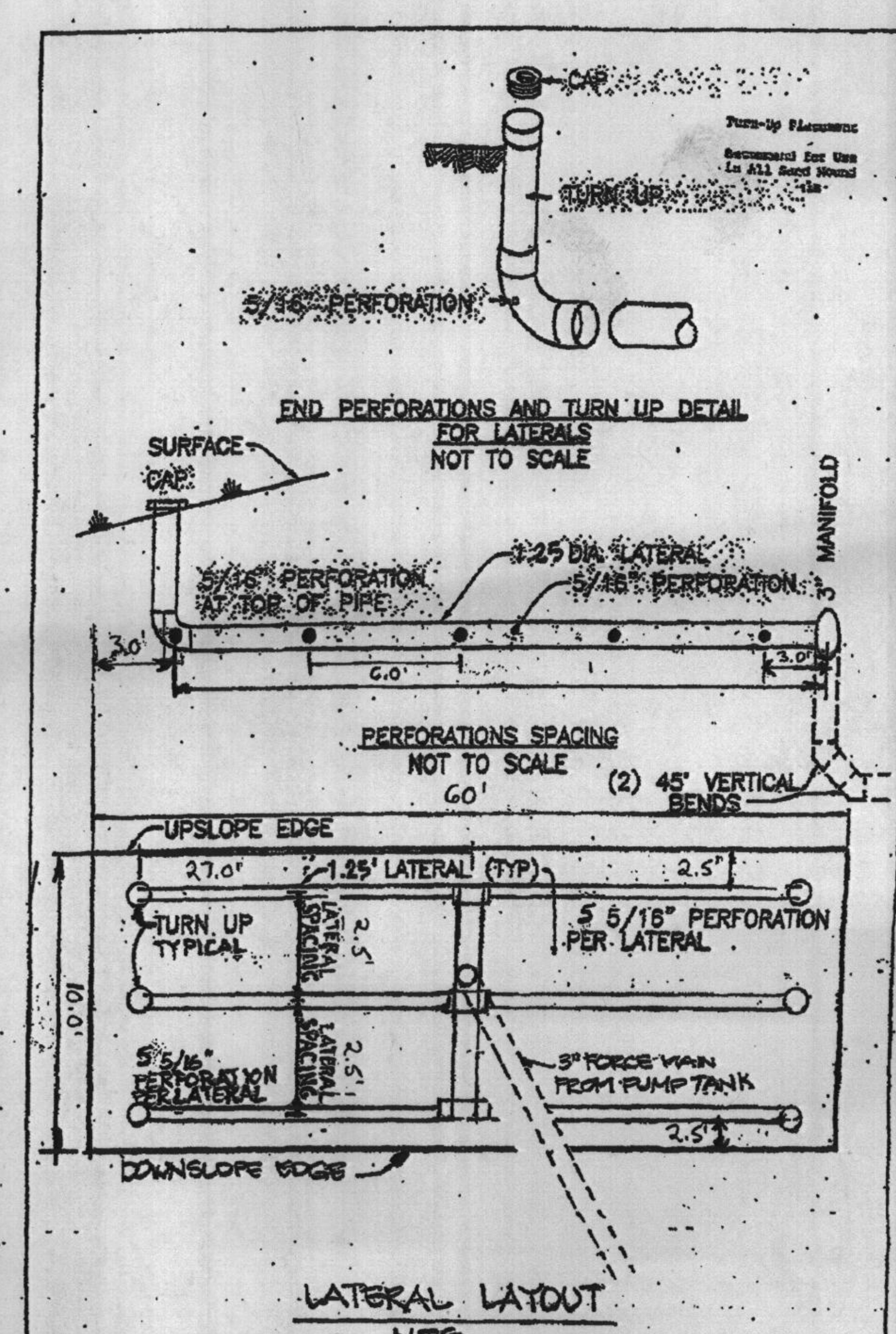
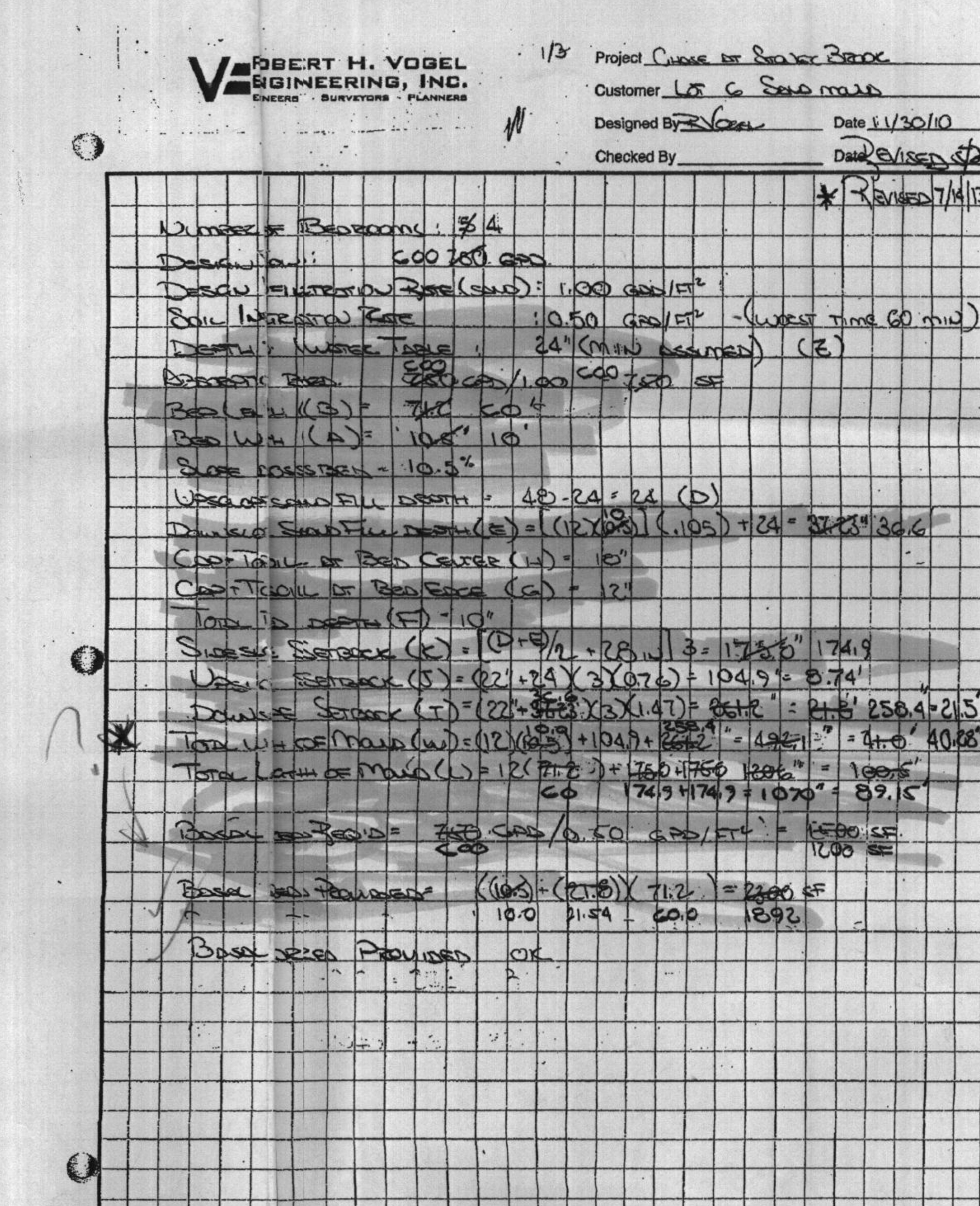
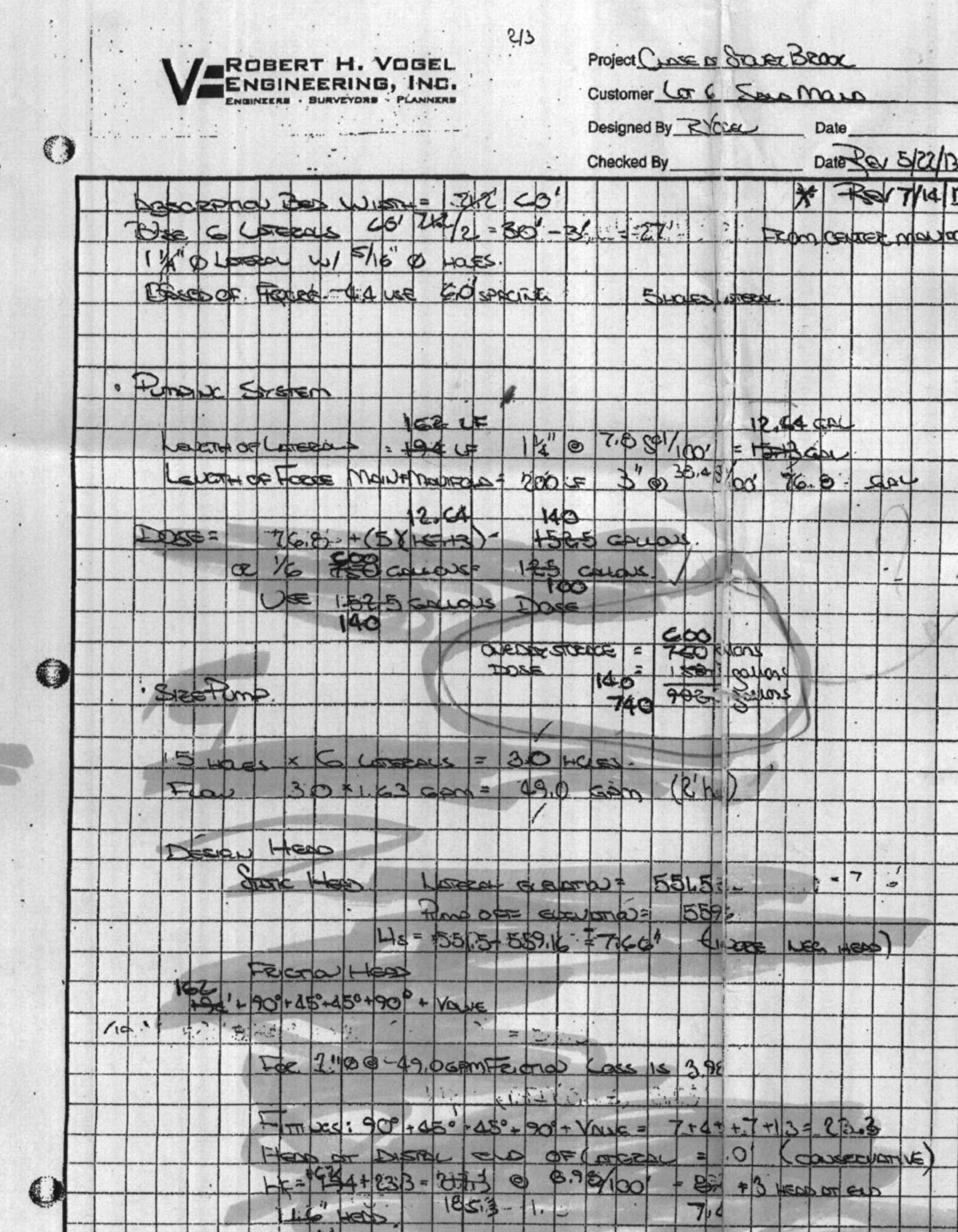


FIGURE 1.1 – TYPICAL CROSS SECTION OF A SAND MOUND SYSTEM
(not to scale)







Volume of Force Main + Manifold
Volume of Laterals

OWNER / DEVELOPER

TRINITY QUALITY HOMES, INC.
3675 PARK AVENUE, SUITE 301
ELLICOTT CITY, MARYLAND 21043
(410) 480–0023

SAND MOUND DETAILS LOT 6
THE CHASE AT STONEY BROOK

REF: S-01-21, P-05-001, F-05-170
ZONED: RC-DEO

TAX MAP: 7 BLOCK: 17
4TH ELECTION DISTRICT

PARCEL 133
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELLICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

DESIGN BY:	JCO
DRAWN BY:	HS
CHECKED BY:	RHV
DATE:	DECEMBER, 2010 REVISED: MAY, 2013
SCALE:	1"=50'
W.O. NO.:	06-34.00

ROBERT H. VOGEL, PE #16193

SHEET 5 OF 5

GP-07-69