



Howard County
Health Department

Bureau of Environmental Health

8930 Stanford Boulevard, Columbia, MD 21045

Main: 410-313-2640 | Fax: 410-313-2648

TDD 410-313-2323 | Toll Free 1-866-313-6300

www.hchealth.org

Facebook: www.facebook.com/hocohealth

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

RECEIPT DATE: 8/9/19 **ONSITE SEWAGE DISPOSAL SYSTEM** P 565592

APPROVAL DATE: 4/29/2020 **PERMIT: CONSTRUCTION** A _____

PROPERTY ADDRESS: 10380 Cavey Lane

SUBDIVISION: _____ LOT: _____ TAX ID: _____

CONTRACTOR: Sam's Creek EMAIL: _____

CONTRACTOR ADDRESS: 2810 Sam's Creek Road, New Windsor, MD 21776 PHONE: 443-821-4932

PROPERTY OWNER: Brian Kane EMAIL: _____

OWNER ADDRESS: 355 Whitfield Road PHONE: _____

SEPTIC TANK SIZE (GALLONS): 1500 TANK MANUFACTURER: MBI

PUMP MODEL: WE 03L PUMP SIZE 1/3 PUMP TANK CAPACITY: 1500 (Babylon)

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

TRENCHES:	LINEAR FEET REQUIRED: <u>60</u>	INLET DEPTH: <u>1.6</u>
	TRENCH WIDTH: <u>3</u>	MAXIMUM BOTTOM DEPTH: <u>8</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>10</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>3</u>
LOCATION:	PER APPROVED SITE PLAN. SEWAGE DISPOSAL AREA AND TANK LOCATIONS MUST BE STAKED BY LICENSED SURVEYOR PRIOR TO PRE-CONSTRUCTION INSPECTION.	
NOTES:		

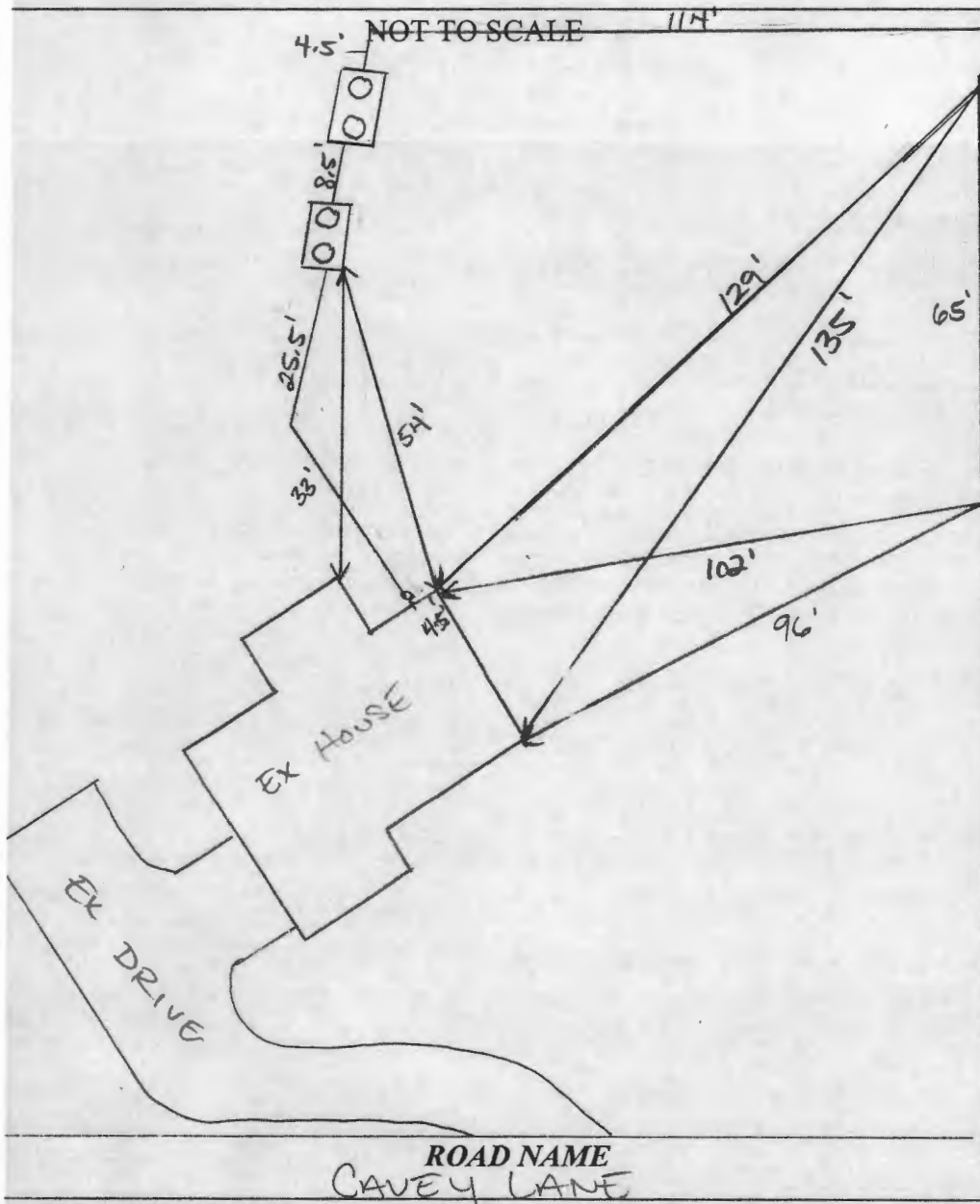
ISSUED BY: Hank Oswald ISSUE DATE: 8/9/19 EXPIRATION DATE: 8/9/20

- NOTE: CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION INSPECTION PRIOR TO BEGINNING ANY INSTALLATION
- NOTE: CONTRACTOR MUST SCHEDULE AN INSPECTION AND GAIN APPROVAL OF ALL COMPONENTS PRIOR TO COVERING
- NOTE: STONE MUST BE APPROVED BY HEALTH DEPARTMENT AND GRAVEL TICKET MUST BE AVAILABLE FOR REVIEW.
- NOTE: WATERTIGHT TANKS REQUIRED
- NOTE: ALL PARTS OF SEPTIC SYSTEM SHALL BE AT LEAST 100 FEET DOWNGRADIENT FROM ANY WATER WELL
- NOTE: MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS
- NOTE: AN ELECTRICAL PERMIT IS REQUIRED FOR INSTALLATION OF ANY ELECTRICAL COMPONENTS OF THE SYSTEM
 ELECTRICAL PERMIT ISSUED E _____
- NOTE: MDE RECOMMENDS SEPTIC TANKS, BAT, AND OTHER PRETREATMENT UNITS BE PUMPED AT A FREQUENCY ADEQUATE TO ENSURE THAT SOLIDS ARE NOT DISCHARGED TO THE DISPOSAL AREA

NEITHER THE HOWARD COUNTY COUNCIL NOR THE HEALTH DEPARTMENT IS RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF ANY SYSTEM.

PERMITTEE RESPONSIBLE FOR OBTAINING FINAL APPROVAL ON THIS PERMIT.

CALL 410-313-1771 TO SCHEDULE INSPECTIONS.



TRENCH/DRAINFIELD DATA		
WIDTH	INLET	BOTTOM
3	1.5	8
NUMBER OF TRENCHES 1		
TOTAL LENGTH 65 F		
ABSORPTION AREA 195 SF		
DISTRIBUTION BOX LEVEL N/A		
DISTRIBUTION BOX BAFFLE YES		
DISTRIBUTION BOX PORT YES		

SEPTIC TANK DATA	
SEPTIC TANK 1 LEVEL	YES
MANUFACTURER	BABYLON
CAPACITY	1500 GAL
SEAM LOC	TOP
TANK LID DEPTH	3'
BAFFLES	YES
BAFFLE FILTER	NO
MANHOLE LOC	FRONT/BACK
6" PORT LOC	
WATERTIGHT TEST	-
SLOTTED	YES
DATE ON LID	07/12/2019
PUMP/SEPTIC TANK LEVEL	YES
MANUFACTURER	BABYLON
CAPACITY	1500 GAL
SEAM LOC	TOP
TANK LID DEPTH	3.5'
BAFFLES	=
BAFFLE FILTER	=
MANHOLE LOC	FRONT/BACK
6" PORT LOC	=
WATERTIGHT TEST	=
SLOTTED	=
DATE ON LID	06/28/2019

PRE CONSTRUCTION:

8/20/2019 TANK LOCATION STAKED. COULD NOT FIELD LOCATE SDA STAKE. LAYOUT TRENCH WHEN STAKED. (P)

* 8/21/2019 LAYOUT 1X 60' TRENCH ON CONTOUR. (P)

INSTALLATION: 8/21/2019 TANK HOLES DUG. SEWER HOUSE CONNECTION AND SEWER LINE INSTALLED. (P) (PM) TANKS SET. OK TO BACKFILL. * (P) 8/23/2019 FORCE MAIN INSTALLED. D BOX SET. HAS 2" FM. DISCHARGING ONTO PERPENDICULAR BAFFLE. OK IS SMALL D BOX. NO DIRECT PRESSURE DISCHARGE INTO TRENCH PIPE INVERT. OK (INSTEAD OF CH KNOCK OUT BAFFLE, GO INTO CENTER OF BOX BELOW TRENCH INVERT.) (P) 9/23/20 - pump alarm test failed, alarm & electric inside riser, no access to circuit breaker in house. (P) 9/29/20 Pump and alarm work, alarm inside house. Observed on separate circuits. (P)

FINAL INSPECTOR Austin Thomas DATE OF APPROVAL 4/29/2020

LEGEND

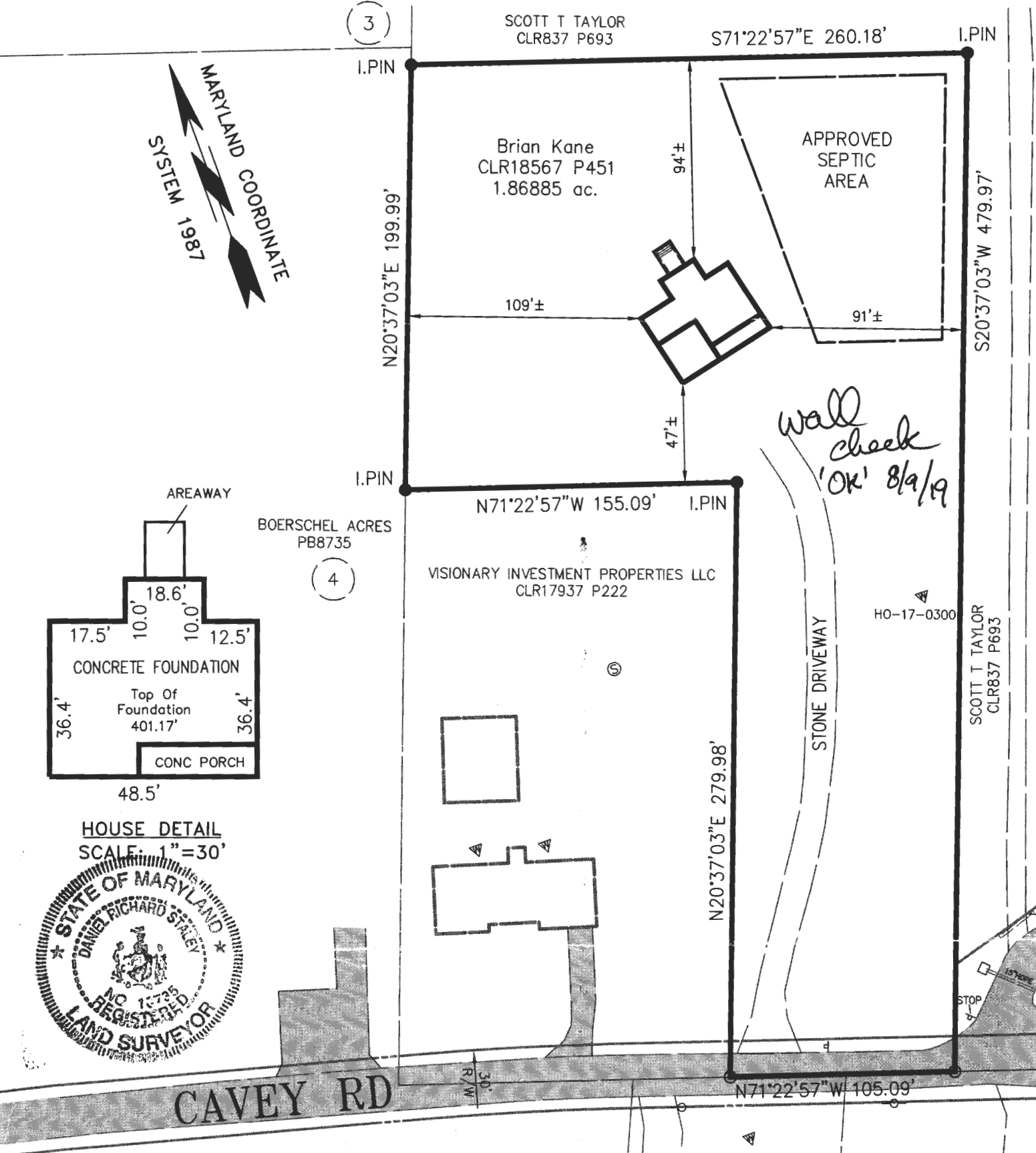
- ⊙ CLEANOUT, Sewer
- PROP. COR. NOT SET
- PROP. COR. SET/FOUND



DRS & ASSOCIATES
LAND DESIGN CONSULTANTS

ABBREVIATIONS

- CLR County Land Record
- P Page
- PB PlatBook
- R/W Right of Way

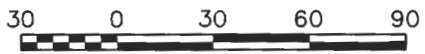


wall check 'OK' 8/9/19



This is to certify that I have surveyed the property shown hereon, known as, Kane Property, located at 10380 Cavey Lane Near Woodstock, in the 3rd Election District of Howard County, Maryland for the purpose of locating the improvements only, and that the improvements are located (±) as shown hereon, and are not in a flood prone or flood hazardous area.

Daniel R. Staley 2019-08-07 11 13 39 1"=60'
Daniel R. Staley L.S. 10735 Date Map Block Parcel Scale



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Oswald, Hank

From: Oswald, Hank
Sent: Thursday, February 07, 2019 9:09 AM
To: 'drs@ramss.com'
Subject: OSDS Plan_10380 Cavey Lane
Attachments: OSDS Memo_DRS_Cavey Lane _2019.pdf

DRS:

Attached, please find comments pertaining to the review of the OSDA Plan for 10380 Cavey Lane. Should you have any questions, please don't hesitate to ask.

Respectfully,

Hank

Hank Oswald
Licensed Environmental Health Specialist
Howard County Health Department
Bureau of Environmental Health
Well & Septic Program
8930 Stanford Boulevard
Columbia, MD 21045
410.313.1786 (Office)
hoswald@howardcountymd.gov

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X-Envelope-To: drs@ramss.com
X-Envelope-From: hoswald@howardcountymd.gov
From: "Oswald, Hank" <hoswald@howardcountymd.gov>
To: "'drs@ramss.com'" <drs@ramss.com>
Subject: OSDS Plan_10380 Cavey Lane
Date: Mon, 11 Mar 2019 18:47:48 +0000
X-CC-Diagnostic:

DRS:

Attached, please find comments on the OSDS Plan for 10380 Cavey Lane. Should you have any questions, please don't hesitate to ask.

Thanks,

Hank

Hank Oswald
Licensed Environmental Health Specialist
Howard County Health Department
Bureau of Environmental Health
Well & Septic Program
8930 Stanford Boulevard
Columbia, MD 21045
410.313.1786 (Office)
hoswald@howardcountymd.gov

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OSDS Memo To DRS 2019.pdf



Bureau of Environmental Health

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Twitter: [HowardCoHealthDep](https://twitter.com/HowardCoHealthDep)

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

Conventional Onsite Sewage Disposal System Design Plan Requirements

The design of the disposal system must conform to the sizing, design, and location requirements set forth in COMAR 26.04.02 and Howard County Code Title 3 Subtitle 8. In addition, the following items must be shown on the plan:

- X 1. Title box with the following title, *Onsite Sewage Disposal System Design Plan*.
The title box shall also include the street address, tax identification number, and subdivision name or property owner name(s).
- X 2. The name, address, and telephone number of the owner, developer, and the person preparing the plan.
- X 3. The date the plan was drawn, the plan scale (1:30 – 1:40), and a scaled vicinity map. Scales larger than 1:40 (examples 1:50, 1:100) require scale approval prior to plan submittal.
- X 4. All property lines and dimensions.
- X 5. Show all existing and proposed structures including stormwater management features.
- X 6. All percolation test holes (pass or fail with corresponding test number or letter) and the approved sewage disposal area (SDA).
- X 7. Field run topography at two-foot intervals. One-foot intervals are required for mound systems and systems with pipe depth less than two feet.
- X 8. Illustrate the three (3) proposed well sites or 1500 sq. ft. well box with elliptical radius of 100 feet around each of the three (3) wells or the well box.
- NONE 9. Illustrate streams, ponds, floodplains, 25% and greater slopes, and any other pertinent land features.
- X 10. Illustrate the locations of all Onsite Sewage Disposal System (OSDS) components on the site Plan.
- X 11. Include a cross section and details of all treatment tanks and pump tanks.

- X 12. Include a profile drawing with all invert elevations necessary for installation of the initial system.
- X 13. Show the location of the initial absorption system and two replacements with perforated pipe elevations.
- X 14. The designing Professional Engineer or other qualified designer must sign the plan.
- n/a 15. Low pressured dosed systems or other pumped systems must include pump station details including:
- a. Total dynamic head calculations
 - b. Pump curve
 - c. Pump on, pump off, and alarm elevations
- n/a 16. Low pressure dosed systems, including sand mounds and at-grade mounds must show all details necessary for installation of the lateral network and mound.

Required Plan Notes

- X 1. Any change to the locations or depths to any components must be approved by the engineer and the Howard County Health Department prior to installation. A revised site plan may be required.
- X 2. The maximum earth cover over the tank is 3 feet. Greater earth cover will require a heavy load bearing tank.
- X 3. Electrical work for the installation must be performed by a licensed electrician.
- X 4. The well (tag # _____) has been field located and is accurately shown.
- X 5. 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.

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

MEMORANDUM

TO: D.R.S. & Associates
52 Winters Street
Westminster, MD 21157

FROM: Hank Oswald, L.E.H.S.
Well & Septic Program

RE: OSDS Plan Review
10380 Cavey Lane
Woodstock, MD
Map 11, Parcel 39

Date: March 11, 2019

The OSDS Plan for has been reviewed with the following comments:

- ✓1.) Well sites may not be within 50 feet of the swale along driveway. 3/12/19 [handwritten note]
- 2.) Dose Volume is just 1/6 design flow or 100 gallons in this case.
- 3.) At TDH of 17.306, the line intersects the curve at 35 GPM. The pump run time should be 3 minutes to achieve dose volume.
- ✓4.) In keeping with proper system design, raise trench inverts to a minimum depth of 18 inches.

$$47 = 3.98$$

$$2.06 \times 3.27 = 6.7$$

$$\begin{array}{l} \text{stat} = 15.9 \\ \text{fric} = 6.7 \end{array}$$

$$205.49 \times 17.4 / 100 = 35.75$$

or $\frac{1}{6}$ design

$$4 \times 150 / 6 = 100 \text{ gallons}$$

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

MEMORANDUM

TO: D.R.S. & Associates
52 Winters Street
Westminster, MD 21157

FROM: Hank Oswald, L.E.H.S.
Well & Septic Program

RE: OSDS Plan Review
10380 Cavey Lane
Woodstock, MD
Map 11, Parcel 39

Date: February 7, 2019

The OSDS Plan for has been reviewed with the following comments:

- 1.) Swale is within 50 feet of the well sites.
- 2.) Swale is within 25 feet of the Sewage Disposal Area
- 3.) Tanks are within direct path of swale.
- 4.) Add additional elevation labels to plan.

Oswald, Hank

From: Oswald, Hank
Sent: Friday, April 12, 2019 11:16 AM
To: 'drs@ramss.com'
Subject: FW: (03355-97396) Kane Prop,ST - S, HCHD, WS, Rev2

Hi Dan:

In response to your voicemail, the WE05H should be an appropriate pump but I should mention that this system isn't under pressure like a LPD design because its discharging through an open pipe into a d-box. When the pump turns on, the gpm will settle on some point on the curve (not likely at 35 gpm as indicated). You also may have mentioned something about valves to control the flow which we do not accept on designs in Howard County.

2 revisions moving forward: The 4 in. pvc storm water pipe must be extended 25 feet from the tanks. In addition, the trenches must be shown on contour. I could probably redline the plan but I would prefer revised copies of the first page.

I didn't see a building permit application in the system. Are they waiting on the OSDS Plan to be approved?

Thanks,

Hank

-----Original Message-----

From: Oswald, Hank
Sent: Monday, April 08, 2019 1:07 PM
To: 'DRS & Associates' <drs@ramss.com>
Cc: Williams, Jeffrey <jewilliams@howardcountymd.gov>
Subject: RE: (03355-97396) Kane Prop,ST - S, HCHD, WS, Rev2

Hello Dan:

If your choosing some version of the WE05H, then the GPM would be approximately 57 GPM (not 35 GPM)? The pump should be fine but the runtime would be around 2 minutes. In addition, I don't see where I made the comment that the trenches must be on contour. Also, the 4 in. PVC storm water discharge pipe must be 25 feet from the tank. Other than that, we will need at least 2 copies (or 3 if you'd like one back).

Thanks,

Hank

-----Original Message-----

From: DRS & Associates <drs@ramss.com>
Sent: Friday, March 29, 2019 2:44 PM
To: Oswald, Hank <hoswald@howardcountymd.gov>
Subject: RE: (03355-97396) Kane Prop,ST - S, HCHD, WS, Rev2

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

Hank,

In response to your questions:

That plan is the final version.

The red line was just doodling while discussing the plan at the meeting.

The friction loss chart you sent follows the equation sent to you on
2019-03-21 by Mark Hurt.

Hopefully that clears it up.

Dan Staley

At 2019-03-29 07:45 AM, you wrote:

>DRS:

>

>My supervisor stated that he met with you about the plan for Kane Property and discussed the swale near the well sites. Apparently, it's no longer a concern. You left him with one copy of the plan. Is this the final version? The plan had a redline on the pump chart (See attachment). What does that indicate? I also wanted to see if the Friction Loss chart that we follow is like the one that you use (See attachment).

>

>Thanks,

>

>Hank

>

>-----Original Message-----

>From: DRS <drs+proj@ramss.com>

>Sent: Monday, March 25, 2019 4:45 PM

>To: Oswald, Hank <hoswald@howardcountymd.gov>; Cary/VikingDevelopmentCorp. <cary@vikingcustomhomes.com>; Moore, Dan/Viking <dan@vikingcustomhomes.com>; Kane, Brian <briankane355@msn.com>; Williams, Jeffrey <jewilliams@howardcountymd.gov>

>Subject: (03355-97396) Kane Prop,ST - S, HCHD, WS, Rev2

>

>[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

>

>

>Attached is the data requested. Please contact us if you have any questions.

>--

>DRS & Associates

>52 Winters St

>Westminster, MD 21157

>410-848-4060 * 410-876-6040

--

DRS & Associates

52 Winters St

Westminster, MD 21157

410-848-4060 * 410-876-6040

Oswald, Hank

From: Oswald, Hank
Sent: Friday, March 29, 2019 7:46 AM
To: 'drs@ramss.com'
Subject: RE: (03355-97396) Kane Prop,ST - S, HCHD, WS, Rev2
Attachments: fric chRt.pdf; [Untitled]_2019032907472711.pdf

DRS:

My supervisor stated that he met with you about the plan for Kane Property and discussed the swale near the well sites. Apparently, it's no longer a concern. You left him with one copy of the plan. Is this the final version? The plan had a redline on the pump chart (See attachment). What does that indicate? I also wanted to see if the Friction Loss chart that we follow is like the one that you use (See attachment).

Thanks,

Hank

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From: DRS <drs+proj@ramss.com>
Sent: Monday, March 25, 2019 4:45 PM
To: Oswald, Hank <hoswald@howardcountymd.gov>; Cary/VikingDevelopmentCorp. <cary@vikingcustomhomes.com>; Moore, Dan/Viking <dan@vikingcustomhomes.com>; Kane, Brian <briankane355@msn.com>; Williams, Jeffrey <jewilliams@howardcountymd.gov>
Subject: (03355-97396) Kane Prop,ST - S, HCHD, WS, Rev2

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Attached is the data requested. Please contact us if you have any questions.

--

DRS & Associates
52 Winters St
Westminster, MD 21157
410-848-4060 * 410-876-6040

As you increase the peak flow rate the total loss increases as shown in an email from Mark Hurt of DRS & Associates, dated 2019-03-21, based on the Hazen-Williams Equation. The 35 gallons per minute would produce a velocity of 3.35 feet per second and would require at pump to be changed to a Goulds Submersible Effluent Pump Model WE0312M. Barry Glotfelty (former MDE Division Chief - Onsite Systems Division) recommended 25 gallons per minute which yields 2.39 feet per second. This is only minor difference but it is spraying against a baffle in a distribution box. This has been revised and the following comment created more head so the Model WE0512H has been selected.

4. *In keeping with proper system design, raise trench inverts to a minimum depth of 18 inches.*

In our telephone conversation on 2019-03-21 you stated you wanted the invert of the pipe to be at a minimum depth of 18 inches which will leave only 12 inches of cover. I would ask what you would require of this was a typical standard trench with MDE standard depth of 1 foot of stone from 2-3 feet and the pipe invert at 2.5 feet. We do not have a lot of experience working in Howard County, however this seems in conflict with standards used in recent projects, below is some recent projects in the county. We have revised the plans per your request, 12 inches minimum depth of coverage and 18 inches minimum depth of pipe invert.

**HOWARD COUNTY HEALTH DEPARTMENT
DEEP TRENCH DEPTHS PER REVIEWER**

Project Name	Project Number	Reviewer Name	Pipe Inv	Stone Range	Stone Depth	Eff. Depth
Kittleman	03217-97674	J. Williams	2.0'	1.5'-7.0'	5.5'	2.0'
Kittleman	03217-97450	R. Bricker	2.0'	1.5'-6.0'	4.5'	2.0'
H.J Lilien.	03227-97654	R. Freeman	3.5'	3.0'-5.0'	2.0'	1.5'
Woodmark	03303-97499	H. Oswald	Project has not yet been completed			2.5'
Saunders	03304-97498	R. Freeman	4.0'	3.5'-8.0'	4.5'	4.0'
Kang	03328-97453	R. Bricker	4.0'	3.5'-6.0'	2.5'	2.0'
W@Trid.	03371-97372	R. Freeman	5.0'	4.5'-8.0'	3.5'	3.0'
Kane	03355-97396	H. Oswald	1.5'	1.0'-8.0'	7.0'	5.0'

Thank for your comments and your continuing attention to this project. Should you have any questions or additional comments, please feel free to contact us.

Sincerely,



Daniel Staley

DRS/mah

- c: Cary Cumberland
Dan Moore
Brian Kane
Jeff Williams

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

MEMORANDUM

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52 Winters Street
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Well & Septic Program

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Date: March 11, 2019

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- 3.) At TDH of 17.306, the line intersects the curve at 35 GPM. The pump run time should be 3 minutes to achieve dose volume.
- 4.) In keeping with proper system design, raise trench inverts to a minimum depth of 18 inches.



DRS & ASSOCIATES
LAND DESIGN CONSULTANTS

2019 February 28

Howard County Health Department
Bureau of Environmental Health
8930 Stanford Boulevard
Columbia, MD 21045
Attn: Hank Oswald

Re: KANE PROPERTY - OSDS Plan
10380 Cavey Lane, Woodstock, MD 21163
Tax Map 011 Block 13 Parcel 0039

Dear Mr. Oswald:

This letter is to address your comments in a letter dated February 7, 2019 for Kane Property located at 10380 Cavey Lane, which is shown on Howard County Tax Map 011, Block 13, Parcel 0039. The response to those comments are as follows:

1. Swale is within 50 feet of well sites.

After examination of COMAR and Howard County Code, I cannot find any reference to a restriction or setback to a swale. The proposed swale along the driveway is required to divert stormwater runoff from an ESD treatment and shifting to the west would require clearing on forest resources. The depth of flow in the swale of a 10 year event closest to the existing well is less than 0.48 feet at 2.08 feet per second which doesn't include any onsite impervious surface runoff.

2. Swale is within 25 feet of the Sewage Disposal Area.

The house has been moved and the runoff diverted to the south side of the house. There is a high point near the east side of the house and grading supports sheet flow around the north side of the house.

3. Tanks are within direct path of swale.

Swale being moved has invalidated this comment.

4. Add additional elevation labels to plan.

As directed, we have revised the plan with additional contour tags and spot elevations.

Thank for your comments and your continuing attention to this project. Should you have any questions or additional comments, please feel free to contact us.

Sincerely,



Daniel Staley

DRS/mah

c: Cary Cumberland

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

MEMORANDUM

TO: D.R.S. & Associates
52 Winters Street
Westminster, MD 21157

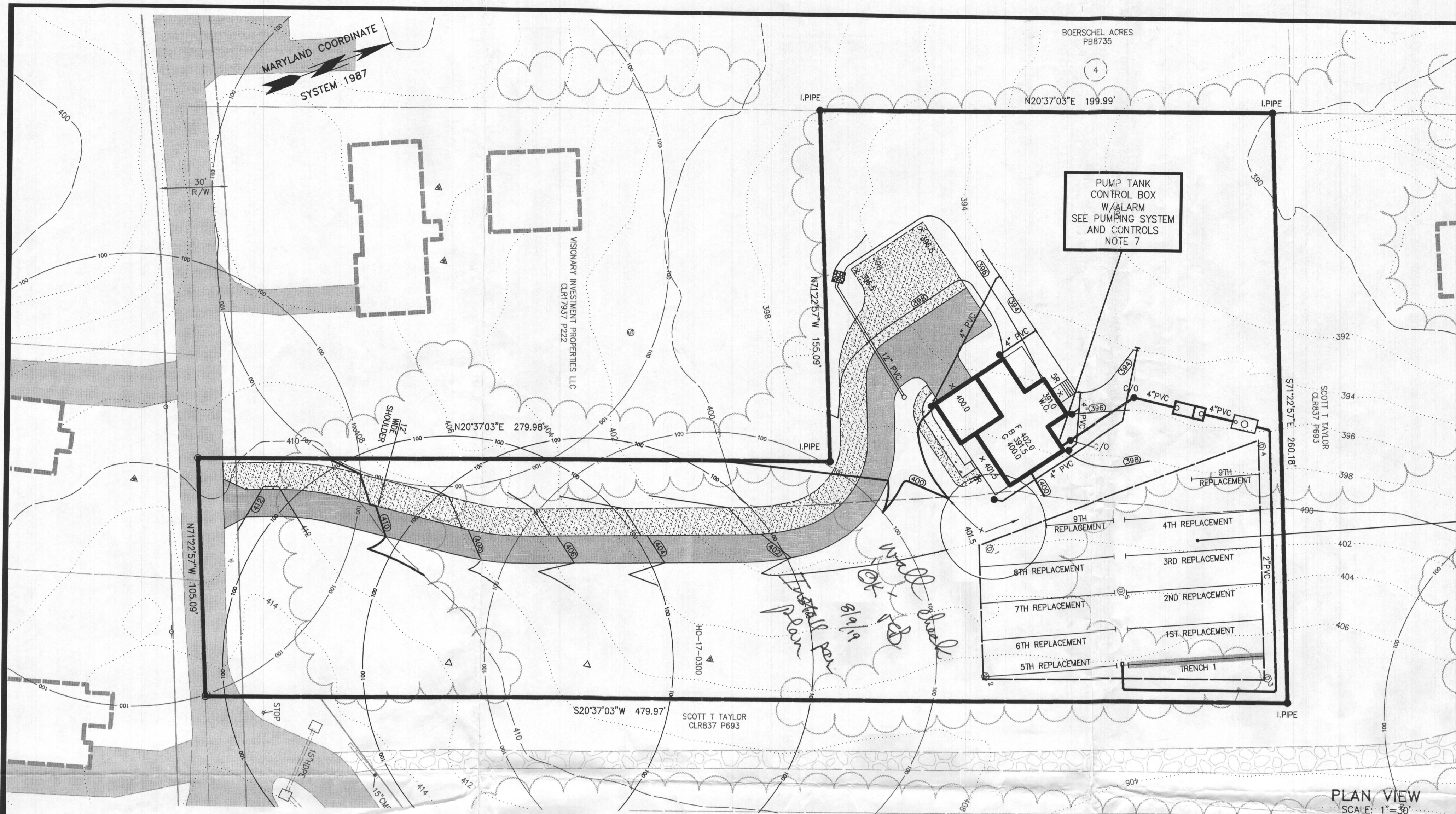
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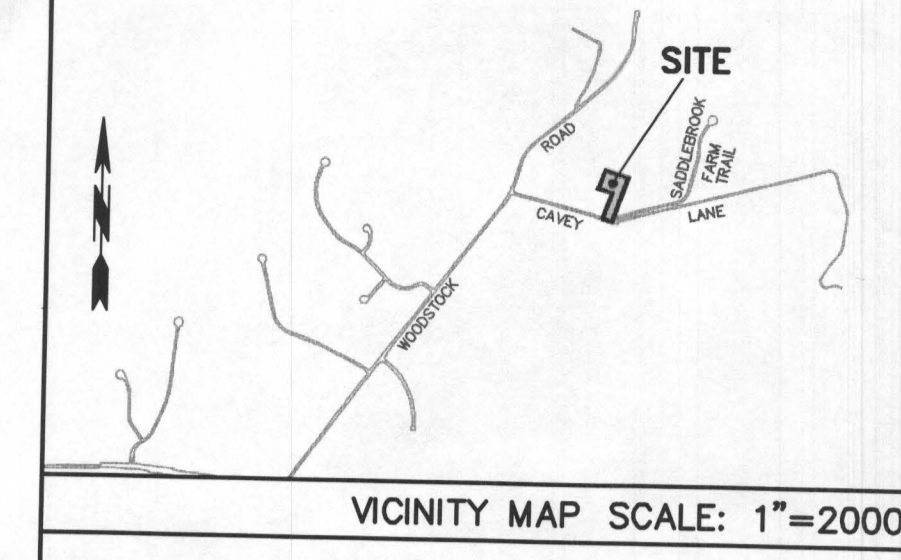


4 BEDROOM: 600 GPD 1500 Gallon Top Seam 2 Compartment Septic Tank

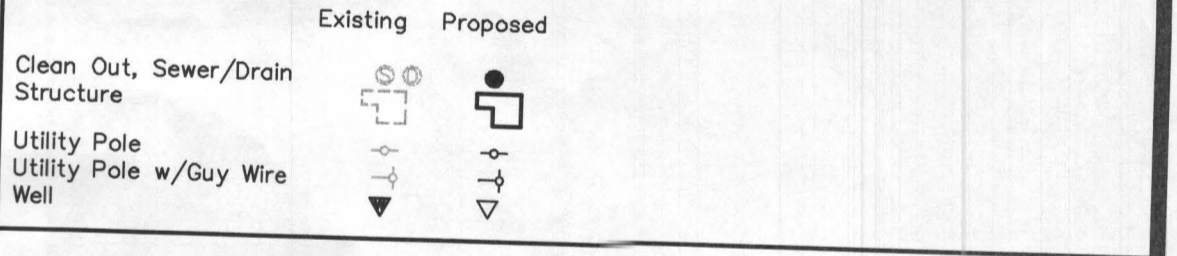
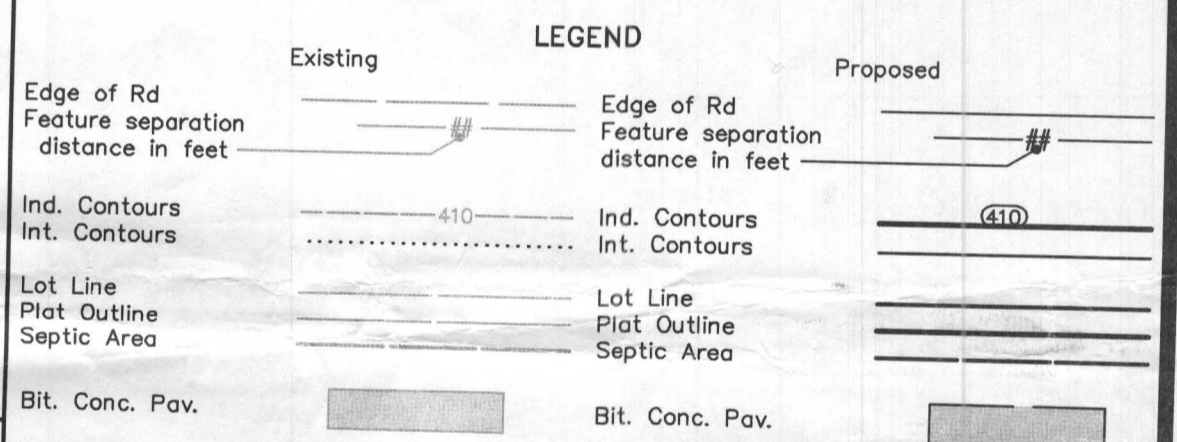
INITIAL SYSTEM:
 Loading Rate: 1.2 GPD per Square Foot
 Effective Area Depth: 3.0' to 8.0'
 3' Wide Trench
 Deep Trench: 1 Line 60.00'

FIRST THROUGH EIGHTH REPLACEMENT
 Loading Rate: 1.2 GPD per Square Foot
 Effective Area Depth: 3.0' to 8.0'
 3' Wide Trench
 Deep Trench: 1 Line 60.00'

NINTH REPLACEMENT:
 Loading Rate: 1.2 GPD per Square Foot
 Effective Area Depth: 3.0' to 8.0'
 3' Wide Trench
 Deep Trench: 2 Lines @ 30.00'



- GENERAL NOTES**
- Current Title Reference:
 Owner: Brian Kane
 County Land Record 18253 Page 145
 Grantor: Scott T Taylor
 - Subject Property Zoned: RR-DEO.
 - Total area of property: 61,407 sq.ft.
 - Septic easement subject to Howard County Health Department review.
 - Contractor/Builder to verify elevation in the field before beginning any construction.
 - The topography shown hereon was taken from data by Howard County and based on Bare Earth LIDAR Data U.S. Feet supplemented with field run data by DRS & Associates and is verified to accurately represent the relative changes on the subject property by DRS & Associates.
 - No wetlands currently exist on the property.
 - This area designates a private sewage area as required by the Maryland Department of the Environment for individual sewage disposal. For lots created prior to March of 1972 it provides at least enough area to accommodate an initial on two replacement septic systems as required by the Howard County Health Department. Improvements of any nature in this area are restricted until public sewerage is available. This area shall become null and void upon connection to a public sewerage system. The County Health Officer shall have the authority to grant adjustments to the private sewage area. Recordation of a modified sewage area shall not be necessary.
 - Existing wells and/or sewerage easements within 100 feet of the property have been shown from the best available information.
 - The existing well shown on this plan identified with the attached well tag number "H0-17-030" has been field located by DRS & Associates professional land surveyor and is accurately shown.
 - Any change to the locations or depths to any components must be approved by the engineer and the Howard County Health Department prior to installation. A revised site plan may be required.
 - The maximum earth cover over the tank is 3 feet. Greater earth cover will require a heavy load bearing tank.
 - Electrical work for the installation must be performed by a licensed electrician.
 - 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.



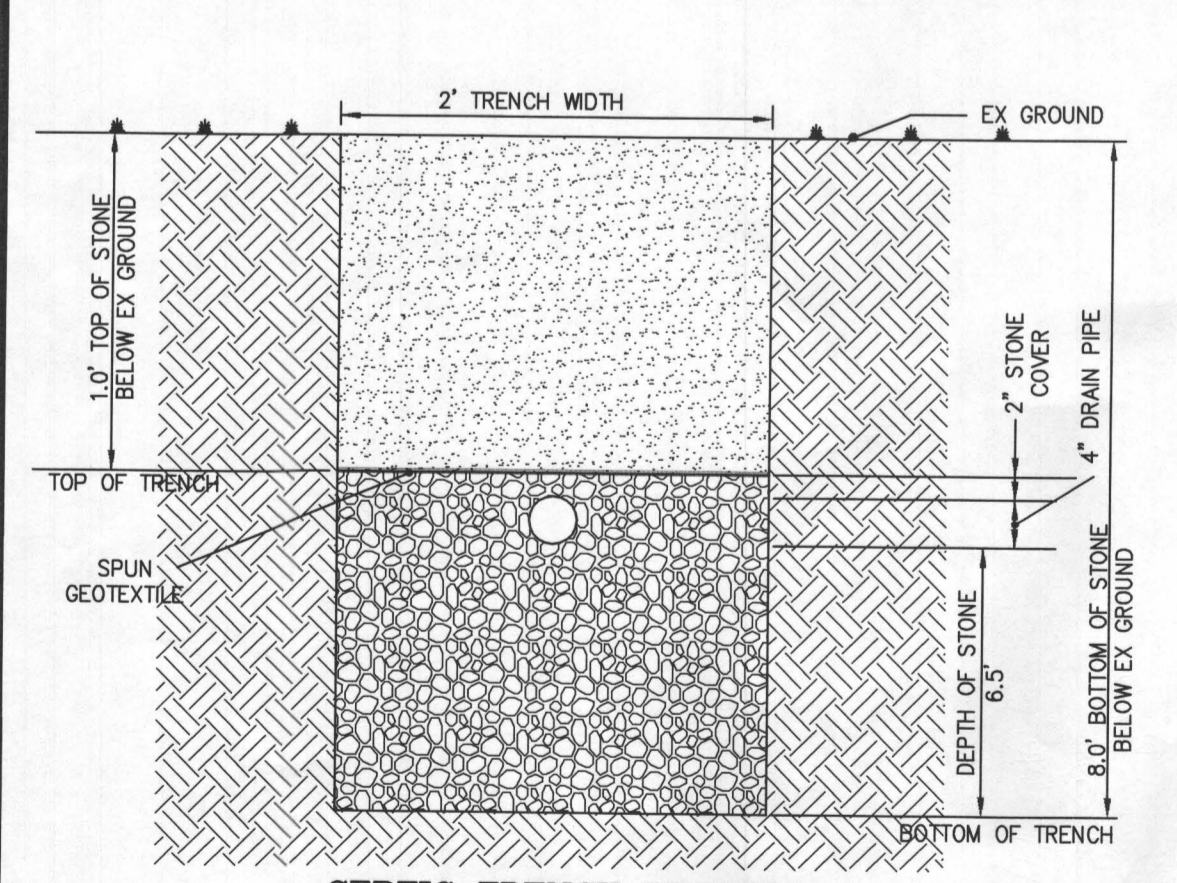
Approved Septic System Plan
 Howard County Health Department
 Mark O'Connell 5/6/19
 Signature Date

SEPTIC TEST LEGEND

⊙ Perc Test Pass

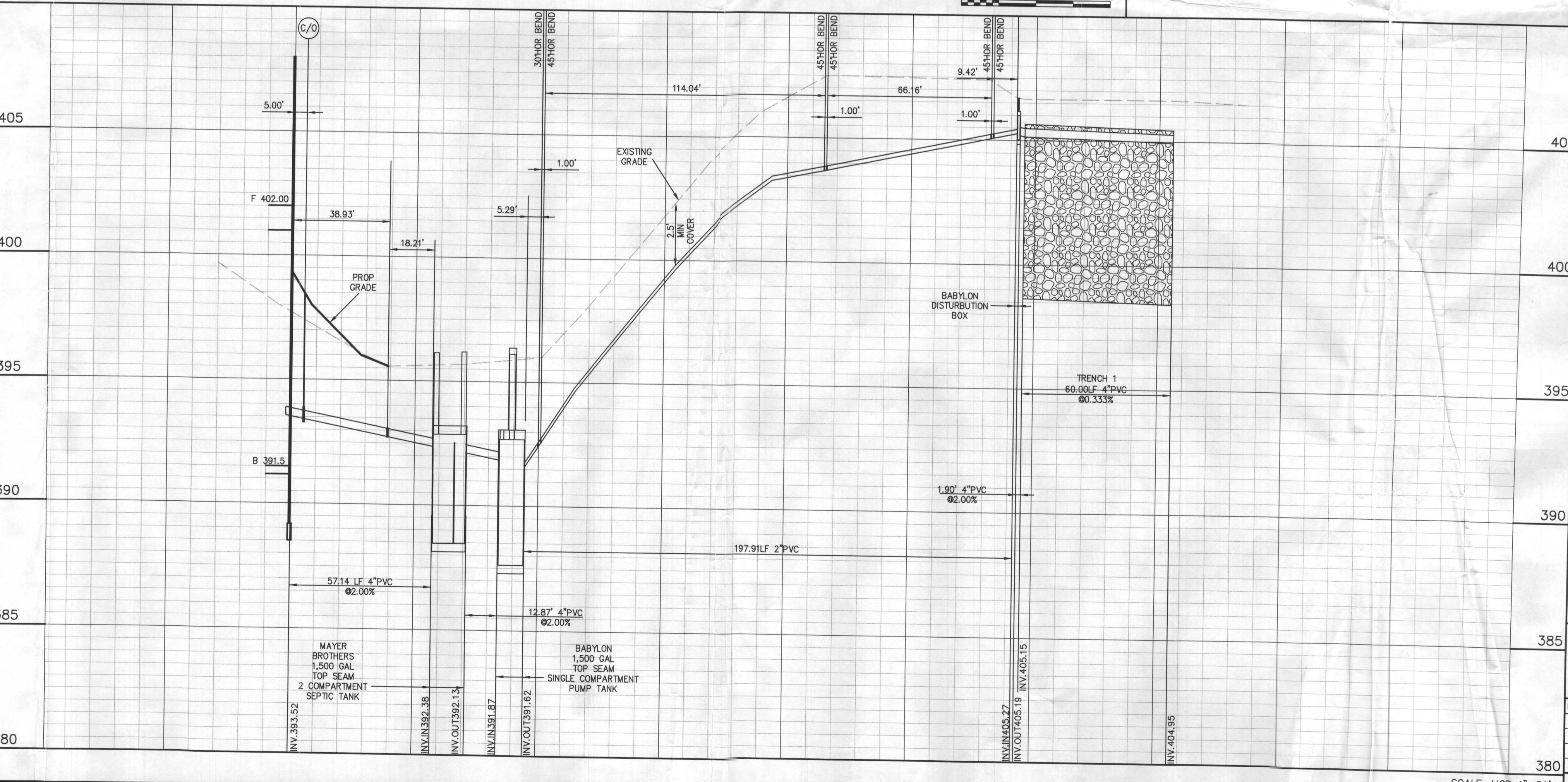
SEPTIC TEST RESULTS

TEST ID	TEST TYPE	TEST COMMENTS	SAN	TEST DATE
1	⊙	2m@4', excavated to 13.0'	HO	2017-11-02
2	⊙	2m@4', excavated to 12.0'	HO	2017-11-02
3	⊙	1m@4', excavated to 12.3', too fast	HO	2017-11-02
3	⊙	2m@4', excavated to 12.3', repaired	HO	2017-11-02
4	⊙	2m@4', excavated to 12.0'	HO	2017-11-02
5	⊙	2m@4', excavated to 13.0'	HO	2017-11-02



INVERT CHART FOR TRENCHES
 NOT TO SCALE

TRENCH NUMBER	BEGINNING EX GRD EL	BEGINNING INV	BEGINNING TRENCH BOT	END EX GRD EL	END INV	END TRENCH BOT
1	406.65	405.15	398.65	406.65	404.95	398.45



Onsite Sewage Disposal System Design Plan

KANE PROPERTY
 10380 CAVEY LANE WOODSTOCK
 HOWARD COUNTY, MARYLAND 21163

OWNER
 Brian Kane
 355 Whitfield Road
 Catonsville, MD 21228

MAY 11 BLOCK 13 PARCEL 39
 Account Number 288137
 ZONED RC-DEO COUNTY LAND RECORD 18253 Page 145
 3RD ELECTION DISTRICT

D.R.S. & ASSOCIATES
 LAND DESIGN CONSULTANTS
 52 WINTERS STREET WESTMINSTER, MARYLAND 21157
 410-848-4060 410-876-6040 F. 410-848-8818

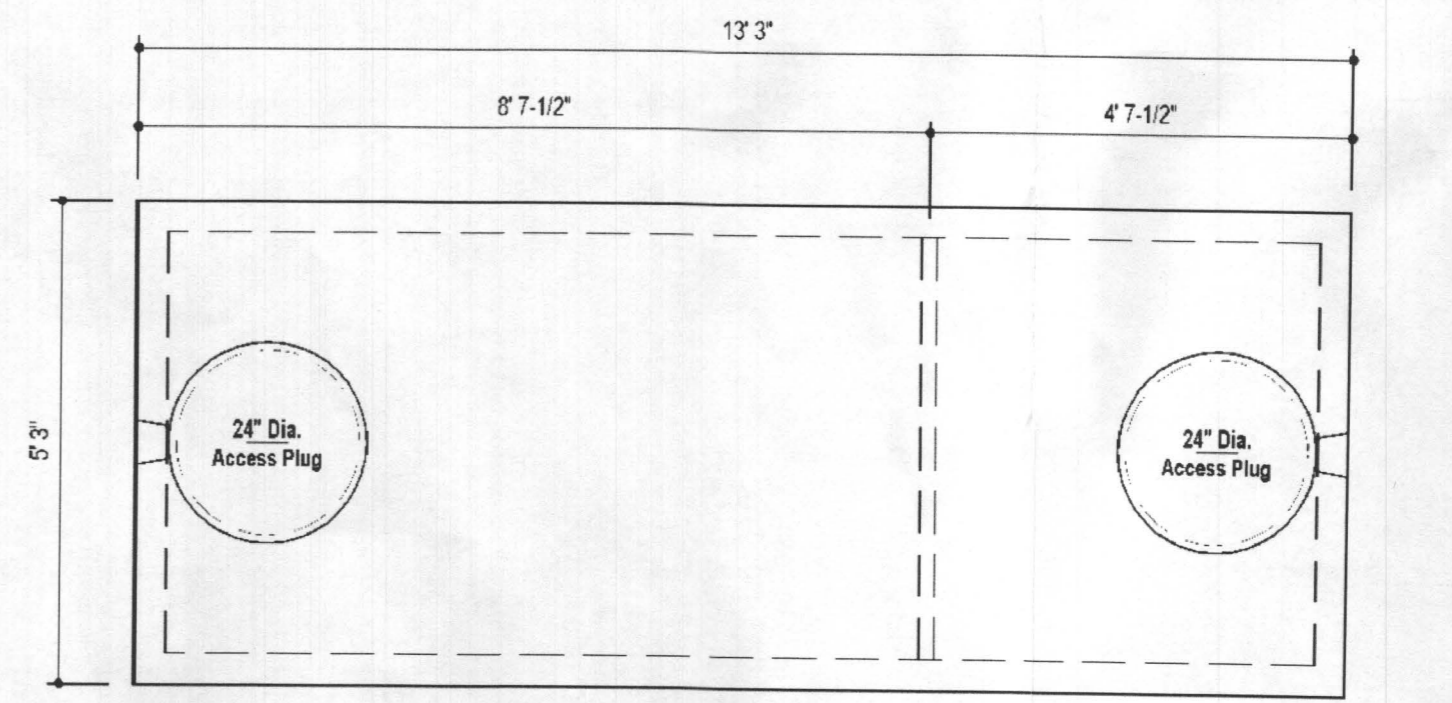
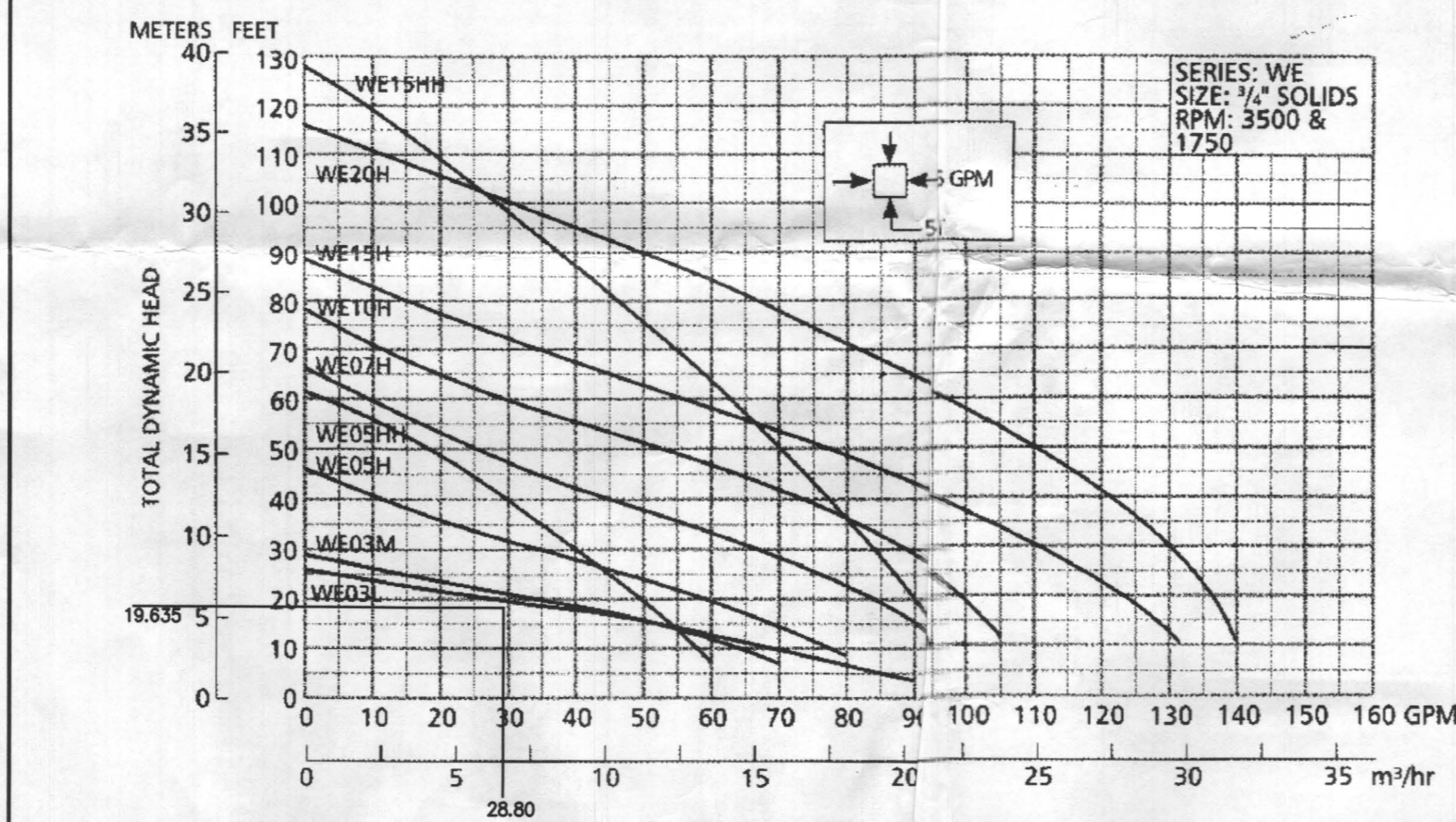
REV. NO.	DATE	BY	DESCRIPTION	DATE: 2019-01-15
1	2019-02-28	DRS/ebp	PER HCHD 2019-02-07	SCALE: 1"=30'
2	2019-03-19	DRS/ebp	PER HCHD 2019-03-11	SHT. NO. :1 OF 2
3	2019-04-10	DRS/ebp	PER HCHD 2019-04-08	DWG.: WS01-01
4	2019-04-22	DRS/jfs	PER HCHD 2019-04-12	

SCALE: HOR 1"=30'
 VERT 1"=3'

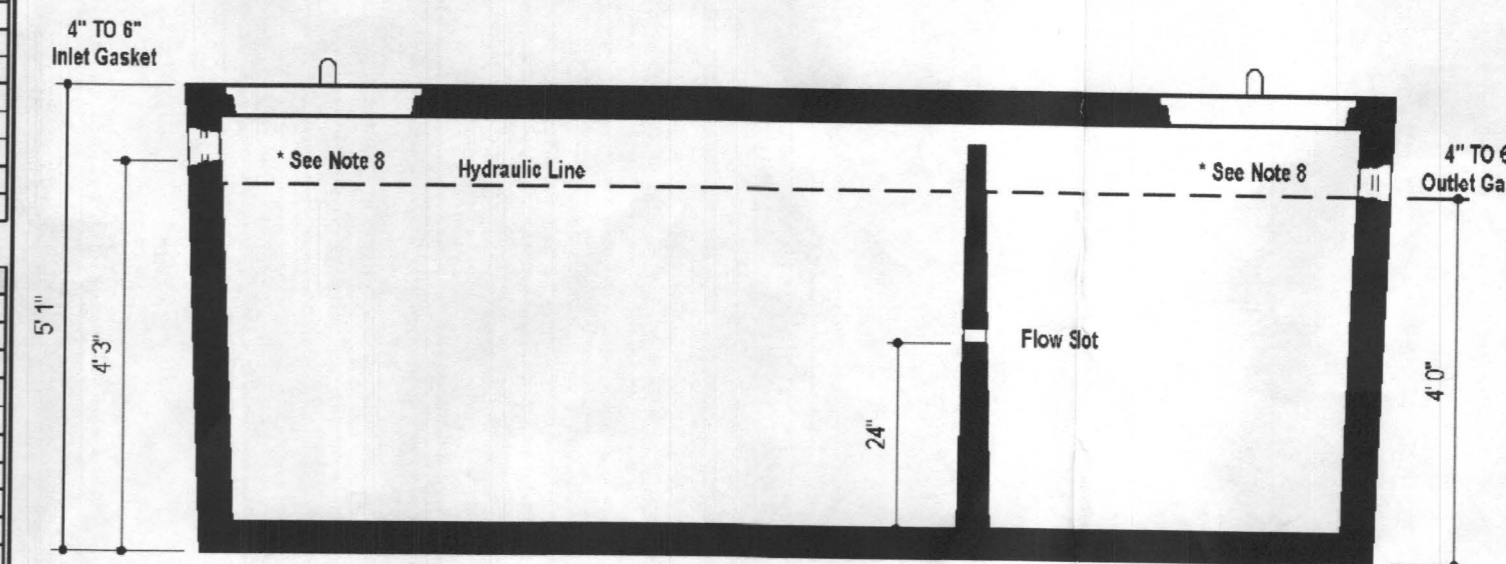
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KBE - 03355-97396 - WS01-01-Rev4.plt - 04-24-2019 - 09:18
 I:\CAD\03355\97396\WS01-01.DWG, Rev4, 2019-04-23 9:16:52 AM, jfs

SEPTIC TANK DESIGN		PRESSURE TO GRAVITY SEPTIC SYSTEM	
NUMBER OF BEDROOMS		4.000	
DESIGN FLOW = (150 GAL X NUMBER OF BEDROOMS)		600.000 GPD	
MINIMUM SEPTIC TANK SIZE = (DESIGN FLOW X 1.5)		900.000 Gal.	
SEPTIC TANK SIZE		1500.000 Gal.	
DISTANCE & ELEVATION DATA			
INVERT ELEVATION DISTRIBUTION BOX		405.270 FL.	
LENGTH OF FORCE MAIN BETWEEN TOP OF PUMP TO DISTRIBUTION BOX		205.490 FL.	
INVERT ELEVATION IN OF PUMP TANK		391.870 FL.	
FORCE MAIN PIPE SPECIFICATION			
SCHEDULE 40 PVC		2.000 In.	
INSIDE DIAMETER		2.067 In. (S)	
DOSE VOLUME			
LENGTH OF FORCE MAIN		205.490 FL.	
VOLUME OF FORCE MAIN = (PI x (D/2) ² x LENGTH OF FORCE MAIN x 7.48 / C.F.I.)		35.821 Gal.	
DOSE VOLUME = (FORCE MAIN x 15 DESIGN FLOW OR 100 GAL.)		160.000 Gal.	
DOSE VOLUME IN C.F.T. = (DOSE VOLUME / 7.48)		13.358 Cu.Ft.	
PUMP TANK SIZING			
PUMP TANK SIZING (AUTOMATIC SIZING CALCULATION IF BLANK)			Gal.
PUMP TANK DESIGN USING 1500 GALLON TANK			
PUMP TANK DESIGN			
BOTTOM OF PUMP TANK ELEVATION		387.820 FL. (U)	
6" RISER BLOCK ELEVATION		0.500 FL.	
PUMP HEIGHT (FEET)		388.120 FL.	
PUMP OFF ELEVATION		1.250 FL.	
DISTANCE BETWEEN PUMP ON & PUMP OFF ELEV. (DOSE / AREA OF PUMP TANK)		389.370 FL. (V)	
PUMP ON ELEVATION		0.247 FL.	
PER MDE PUMP ON TO HIGH WATER ALARM		389.617 FL. (W)	
HIGH WATER ALARM ELEVATION		0.500 FL.	
DIST. BETWEEN HIGH WATER ALARM & PUMP TANK INLET (DESIGN FLOW / 7.48 / AREA OF PUMP TANK)		390.117 FL. (X)	
DESIGN PUMP TANK INLET ELEVATION		1.481 FL.	
ACTUAL PUMP TANK INLET ELEVATION > DESIGN PUMP TANK INLET ELEVATION		391.587 FL.	
PUMP DESIGN			
PEAK FLOWS		28.800 GPM.	
LENGTH OF 2" FORCE MAIN		205.740 FL.	
INCREASERS (@ 2.0 FT. EACH)		0	0.000 FL.
90 BEND (@ 1.0 FT. EACH)		4	28.000 FL.
90 BEND (@ 5.0 FT. EACH)		0	0.000 FL.
45 BEND (@ 4.0 FT. EACH)		5	20.000 FL.
30 BEND (@ 3.0 FT. EACH)		1	3.000 FL.
22 1/2 BEND (@ 2.0 FT. EACH)		0	0.000 FL.
15 BEND (@ 2.0 FT. EACH)		0	0.000 FL.
11 1/4 BEND (@ 1.0 FT. EACH)		0	0.000 FL.
TEE (@ 10 FT. EACH)		0	0.000 FL.
TOTAL LENGTH		257.740 FL.	
FRICITION LOSS PER 100 FEET		1.489 FL.	
PUMP OFF FLOAT ELEVATION		389.370 FL.	
INVERT ELEVATION DISTRIBUTION BOX		405.270 FL.	
HEAD LOSS		15.900 FL.	
TOTAL FRICTION LOSS		37.35 FL.	
DYNAMIC HEAD		19.635 FL.	
Cauids Submersible Effluent Pump			
Model		WE0312L (Z)	
Phase		1.000	
H.P.		1/3	
Amp.		4.900	
Vol.		230.000	
R.P.M.		1750.000	



PLAN VIEW



SECTION A-A

DESIGN DATA & GENERAL NOTES

- Concrete strength f'c=4,000 p.s.i. @ 28 days. Dens by = 150 pcf.
- Cement - Portland Type III per ASTM C 150-82.
- Admixtures & plasticizers per ASTM C 200-85 & C 484-82.
- Reinforcing per ASTM A 198. Min. 1-02" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall base, & top thickness.
- Max 3-1/2" of cover

[8] Depending on use of tank, Inlet & Outlet baffles may be required by code.

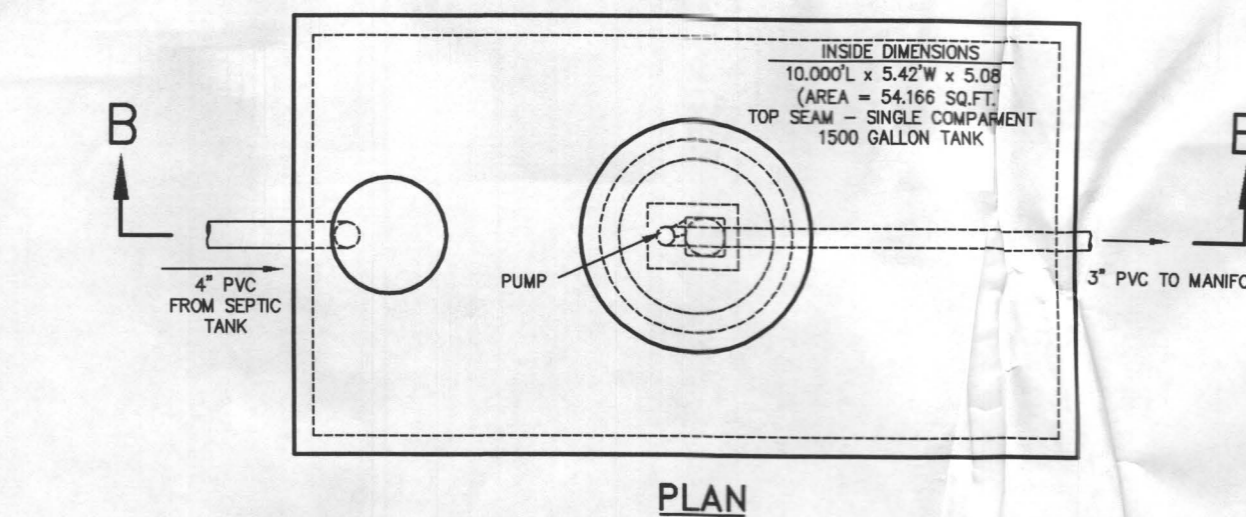
WEIGHT = 16,750 lbs.

Mayer Bros., Inc. 6264 Race Road, Ellicott City, Maryland 21075, Tel: 410.796.1434, Fax: 410.796.1438, www.mayerbrosprecast.com

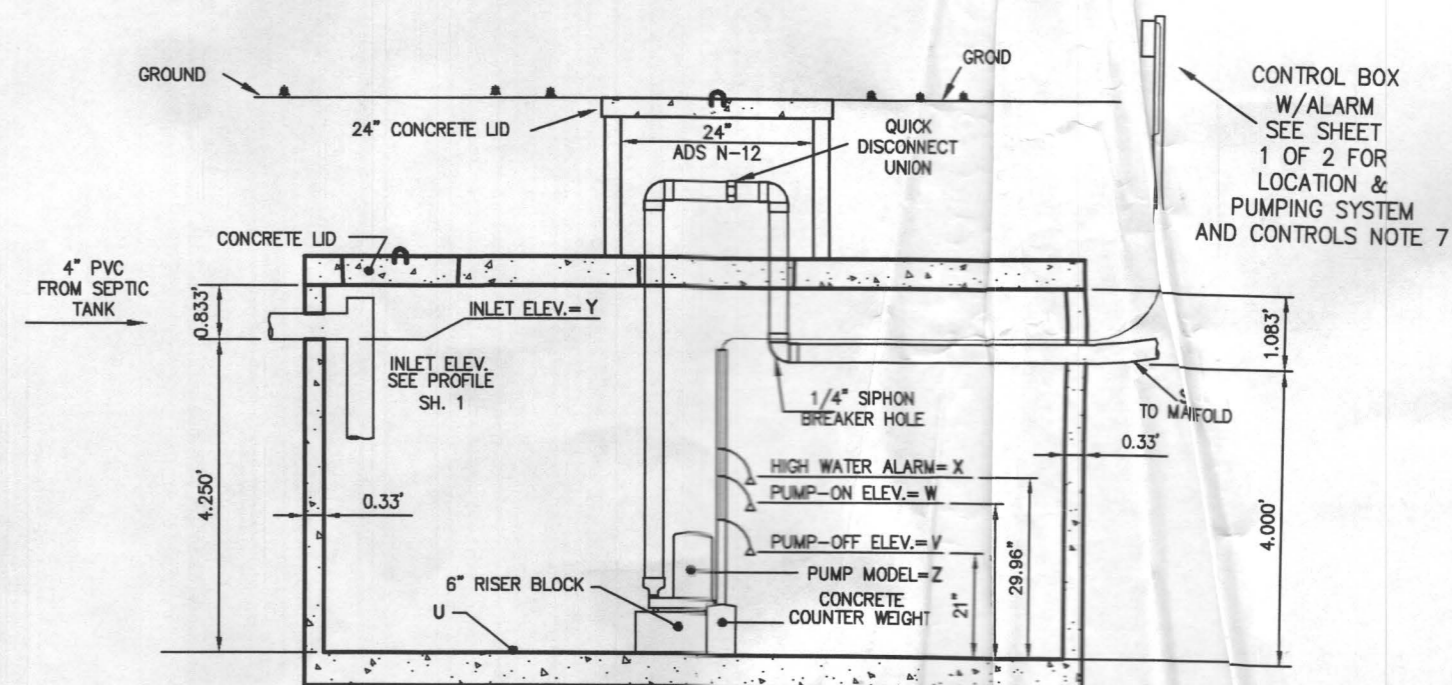
1,500 GALLON TANK (Non-Traffic) 2-Compartment

Stock Item

Dwg. No. 1500-2C No Scale Aug. 11, 2008



PLAN



SECTION B-B
BABYLON VAULT COMPANY, INC.
PUMP TANK DETAIL
NO SCALE

- CONSTRUCTION SPECIFICATIONS**
- All piping to be schedule 40 PVC.
 - Supply line from pump to tee to be 2 inches in diameter.
 - The pump is to be of submersible construction, mounted 6 inches above the pumping station floor, capable of delivering 28.80 gpm at 19.635 ft. Total Dynamic Head.
 - The supply line is to be installed with a uniform slope back to the pump tank to assure complete drainage of effluent from the supply line following each pumping cycle.
 - Each pump cycle will remove approximately 100.00 gallons of effluent at the approximate rate of 28.80 gpm. Measurements shown on the drawing for pump-on, pump-off and alarm are based upon inside tank dimensions of 10.00 ft. long by 5.42 ft. wide.
 - The high level alarm is to be on a separate electrical circuit.
 - An event counter or elapsed time meter is required.
 - Pump pit tank to be top seam tank manufactured by Babylon Vault Co.

- SEPTIC TANK**
- All tanks must be watertight and meet all horizontal separation distances specified in State and County regulations.
 - Tanks that are constructed with seams and joints must be above the high water table.
 - A 24-hour leakage test may be conducted to demonstrate water tightness prior to final construction approval.

- PUMPING SYSTEM AND CONTROLS**
- The pump chamber must provide sufficient capacity to allow for storage of the dose and one day design flow between the high water alarm and the inlet of the first septic tank. It is also recommended that sufficient capacity be provided so that the pump can be set on a block and remain submerged at all times.
 - The pump chamber must be watertight, protected against buoyant forces and meet all horizontal separation distances in State and County regulations.
 - Chambers that are constructed with seams and joints must be above the high water table.
 - A 24-hour leakage test may be conducted to demonstrate water tightness prior to final construction approval.
 - The pump shall be capable of delivering 28.80 g.p.m. at the design head.
 - The use of a three float system to control pump on, pump off and the high water alarm is Recommended. The float system must be capable of delivering the specified dose.
 - The control box or panel should be mounted outside the building at least 30" above final grade, not more than 48" above final grade, in line of sight of the pump tank and in an accessible location.
 - All electrical connections should be located outside the chamber.
 - The high water alarm must be wired on a separate electrical circuit.
 - A test of the pumping system and distribution network will be required prior to covering the system. The force main can be partially covered as long as all joints, elbows, tees, etc. are visible. The test will require sufficient water onsite to activate the pump through several pumping cycles. Provisions to protect the pumping system and distribution network from erosion and sedimentation should be made by the contractor.
 - The pump is to be made of submersible construction, mounted 6" above the pumping station floor.
 - The supply line is to be installed with a uniform slope back to the pump tank to assure complete drainage of effluent from the manifold and supply line following each pumping cycle.

Onsite Sewage Disposal System Design Plan

KANE PROPERTY
10380 CAVEY LANE WOODSTOCK
HOWARD COUNTY, MARYLAND 21163

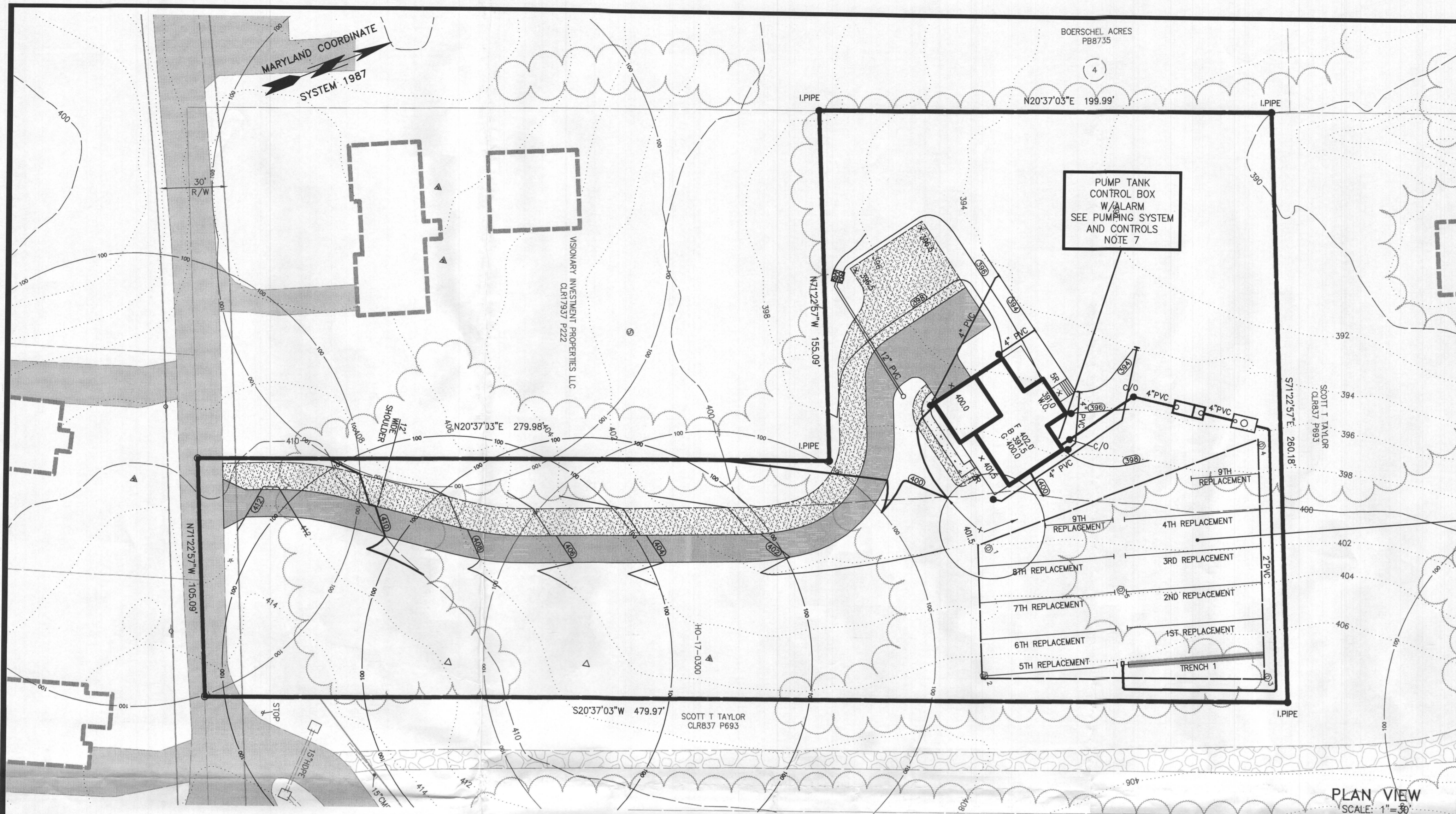
OWNER
Brian Kane
355 Whitfield Road
Catonsville, MD 21228

MAP 11 BLOCK 13 PARCEL 39
Account Number 288137
ZONED RC-DEO COUNTY LAND RECORD 18253 Page 145
3RD ELECTION DISTRICT

D.R.S. & ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410-848-4060 410-876-6040 F. 410-848-8818

REV.No	DATE	BY	DESCRIPTION	DATE: 2019-01-15
1	2019-02-28	DRS/ebp	PER HCHD 2019-02-07	SCALE: 1"=30'
2	2019-03-19	DRS/ebp	PER HCHD 2019-03-11	SHT.NO. : 2 OF 2
3	2019-04-22	DRS/jfs	PER HCHD 2019-04-12	DWG.: WS01-02

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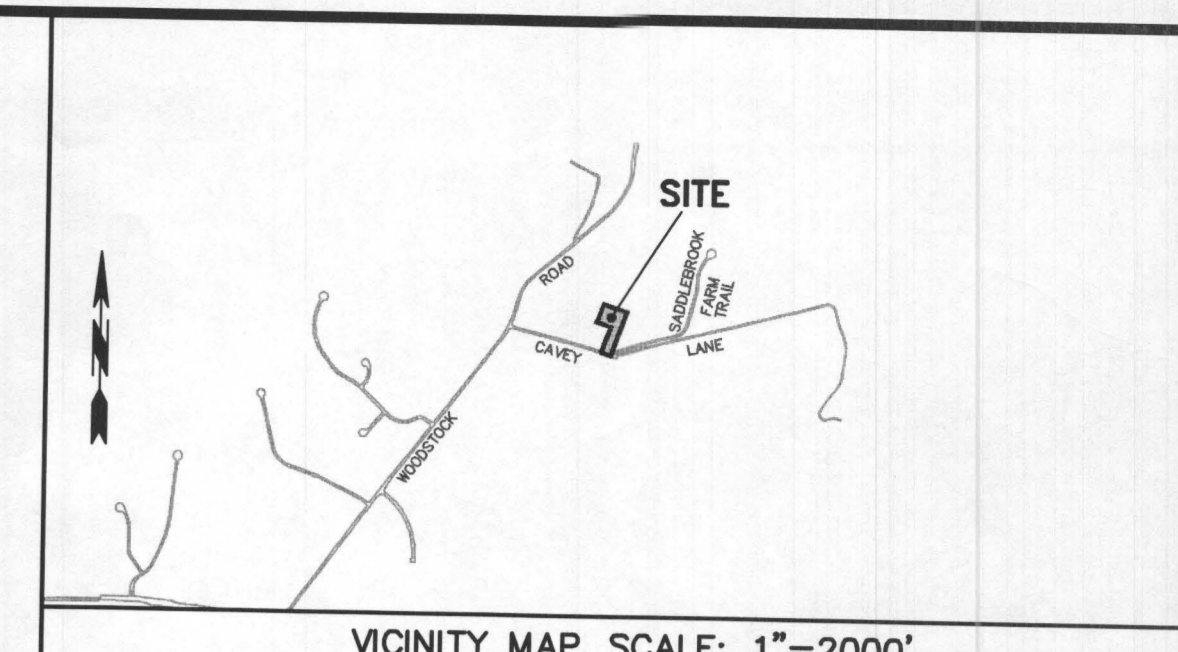


4 BEDROOM: 600 GPD 1500 Gallon Top Seam 2 Compartment Septic Tank

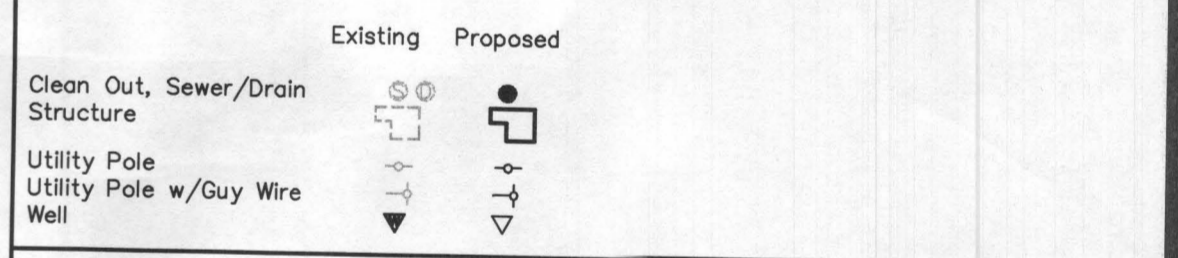
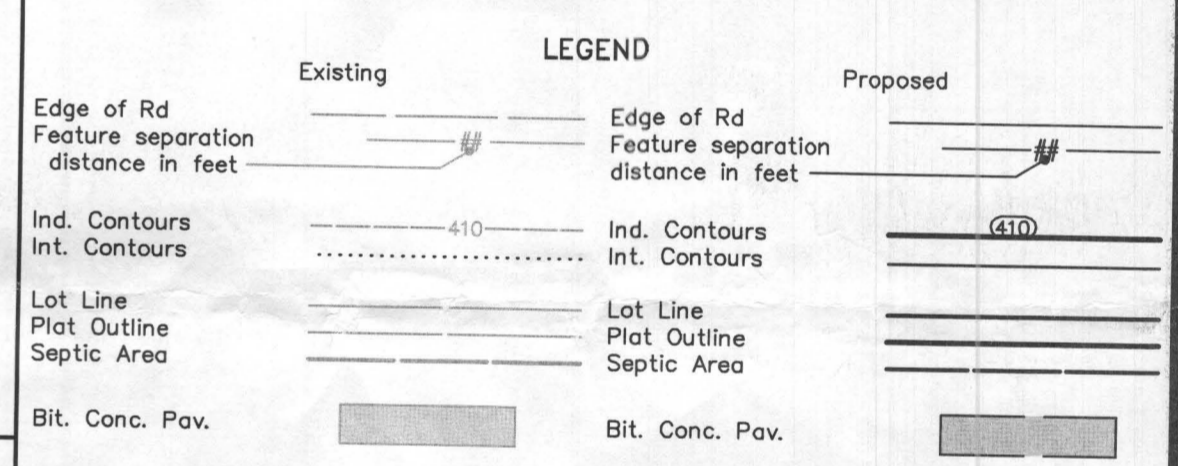
INITIAL SYSTEM:
 Loading Rate: 1.2 GPD per Square Foot
 Effective Area Depth: 3.0' to 8.0'
 3' Wide Trench
 Deep Trench: 1 Line 60.00'

FIRST THROUGH EIGHTH REPLACEMENT
 Loading Rate: 1.2 GPD per Square Foot
 Effective Area Depth: 3.0' to 8.0'
 3' Wide Trench
 Deep Trench: 1 Line 60.00'

NINTH REPLACEMENT:
 Loading Rate: 1.2 GPD per Square Foot
 Effective Area Depth: 3.0' to 8.0'
 3' Wide Trench
 Deep Trench: 2 Lines @ 30.00'



- GENERAL NOTES**
- Current Title Reference:
 Owner: Brian B Kane
 County Land Record 18253 Page 145
 Grantor: Scott T Taylor
 - Subject Property Zoned: RR-DEO.
 - Total area of property: 81,407 sq.ft.
 - Septic easement subject to Howard County Health Department review.
 - Contractor/Builder to verify elevation in the field before beginning any construction.
 - The topography shown hereon was taken from data by Howard County and based on Bare Earth LIDAR Data U.S. Feet supplemented with field run data by DRS & Associates and is verified to accurately represent the relative changes on the subject property by DRS & Associates.
 - No wetlands currently exist on the property.
 - This area designates a private sewage area as required by the Maryland Department of the Environment for individual sewage disposal. For lots created prior to March of 1972 it provides at least enough area to accommodate an initial on two replacement septic systems as required by the Howard County Health Department. Improvements of any nature in this area are restricted until public sewerage is available. This area shall become null and void upon connection to a public sewerage system. The County Health Officer shall have the authority to grant adjustments to the private sewage area. Recordation of a modified sewage area shall not be necessary.
 - Existing wells and/or sewerage easements within 100 feet of the property have been shown from the best available information.
 - The existing well shown on this plan identified with the attached well tag number "HO-17-0300" has been field located by DRS & Associates professional land surveyor and is accurately shown.
 - Any change to the locations or depths to any components must be approved by the engineer and the Howard County Health Department prior to installation. A revised site plan may be required.
 - The maximum earth cover over the tank is 3 feet. Greater earth cover will require a heavy load bearing tank.
 - Electrical work for the installation must be performed by a licensed electrician.
 - 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.



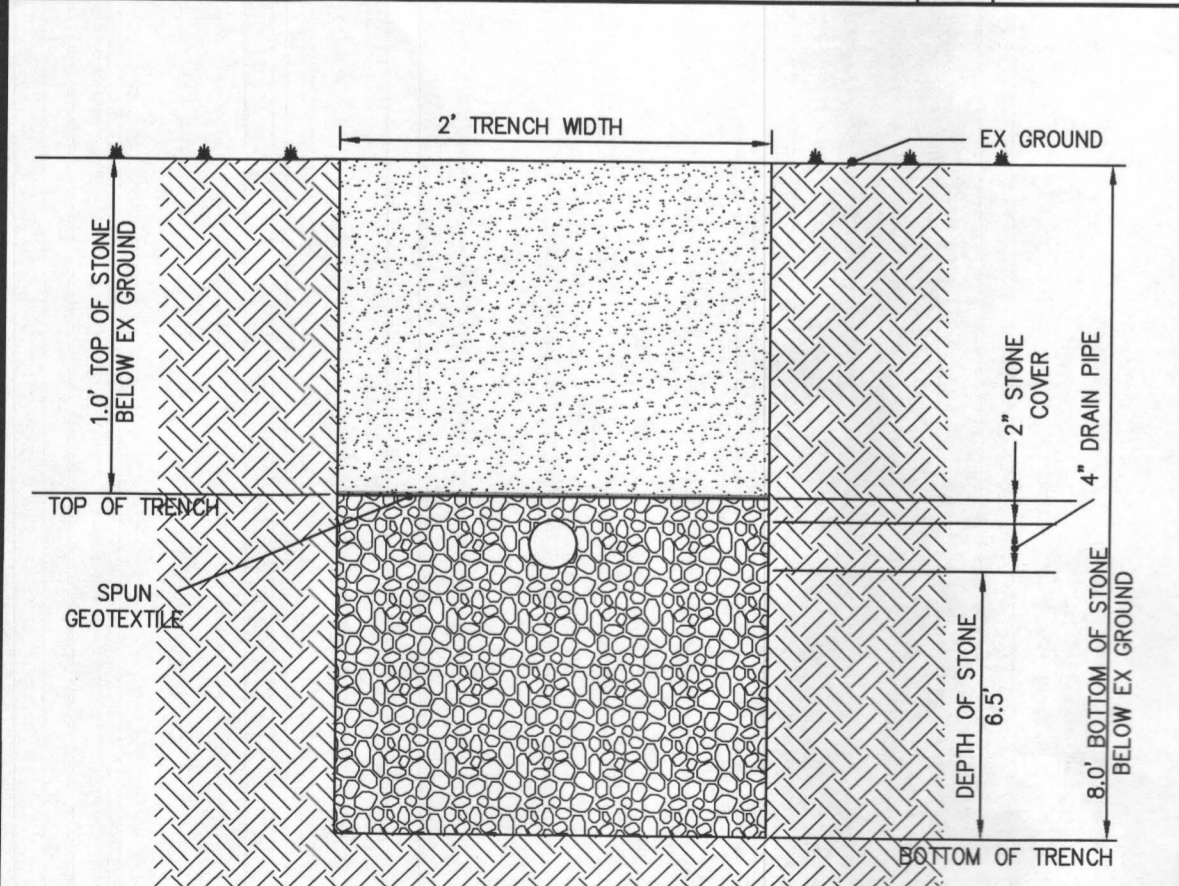
Approved Septic System Plan
 Howard County Health Department
 Hans Oswald 5/6/19
 Signature Date

SEPTIC TEST LEGEND

⊙ Perc Test Pass

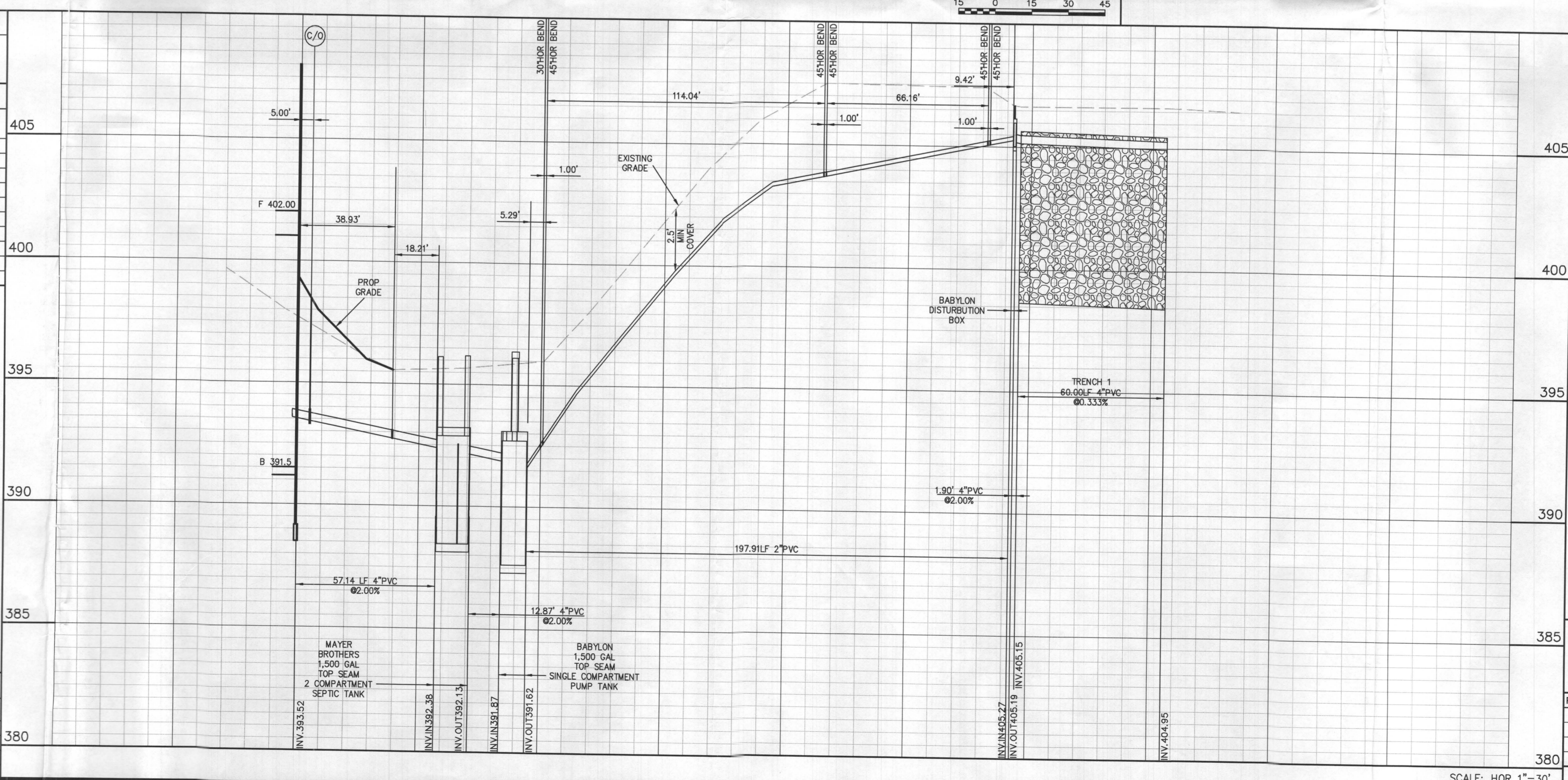
SEPTIC TEST RESULTS

TEST ID	TEST TYPE	TEST COMMENTS	SAN	TEST DATE
1	⊙	2m@4', excavated to 13.0'	HO	2017-11-02
2	⊙	2m@4', excavated to 12.0'	HO	2017-11-02
3	⊙	1m@4', excavated to 12.3', too fast	HO	2017-11-02
3	⊙	2m@4', excavated to 12.3', repaired	HO	2017-11-02
4	⊙	2m@4', excavated to 12.0'	HO	2017-11-02
5	⊙	2m@4', excavated to 13.0'	HO	2017-11-02



INVERT CHART FOR TRENCHES

TRENCH NUMBER	BEGINNING EX. GRD. EL.	BEGINNING INV.	BEGINNING TRENCH BOT.	END EX. GRD. EL.	END INV.	END TRENCH BOT.
1	406.65	405.15	398.65	406.65	404.95	398.45



Onsite Sewage Disposal System Design Plan

KANE PROPERTY
 10380 CAVEY LANE WOODSTOCK
 HOWARD COUNTY, MARYLAND 21163

OWNER
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 355 Whitfield Road
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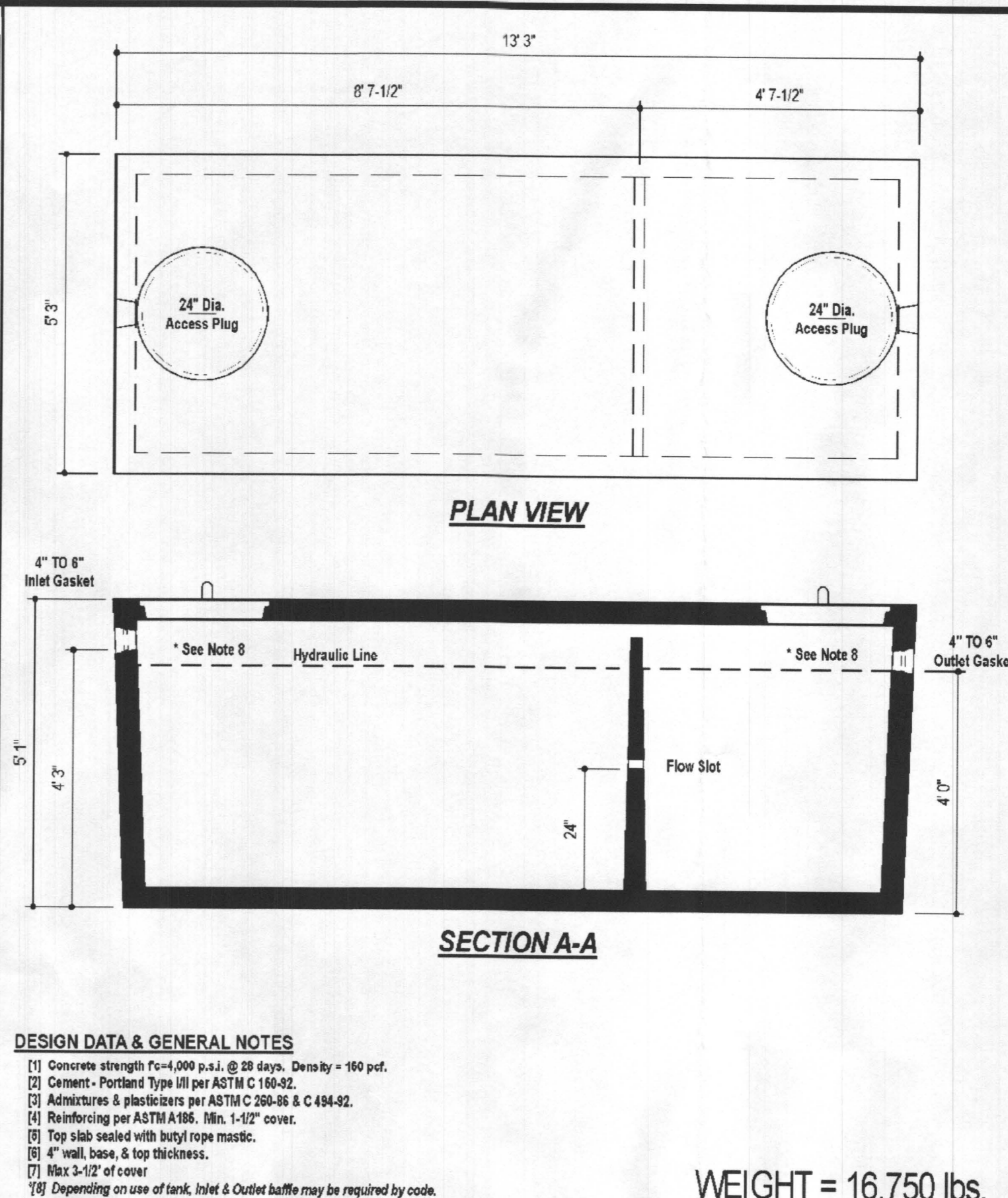
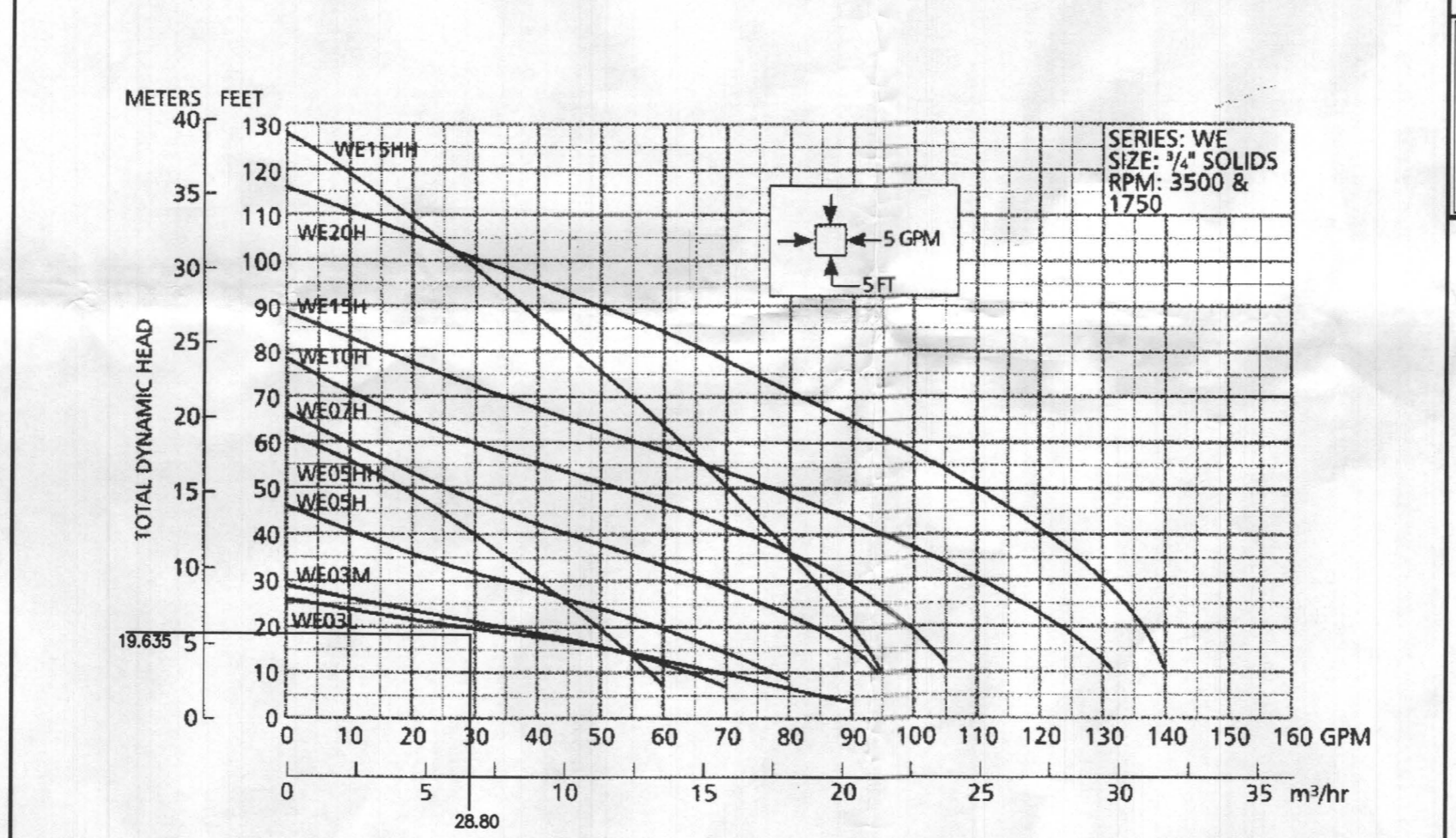
REV. No.	DATE	BY	DESCRIPTION	DATE: 2019-01-15
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SCALE: HOR 1"=30'
 VERT 1"=3'

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SEPTIC TANK DESIGN		PRESSURE TO GRAVITY SEPTIC SYSTEM	
NUMBER OF BEDROOMS	4,000	DESIGN FLOW = (150 GAL X NUMBER OF BEDROOMS)	600,000 GPD
MINIMUM SEPTIC TANK SIZE = (DESIGN FLOW X 1.5)	900,000 Gal.	SEPTIC TANK SIZE	1500,000 Gal.
DISTANCE & ELEVATION DATA			
INVERT ELEVATION DISTRIBUTION BOX	405.270 FL.	LENGTH OF FORCE MAIN BETWEEN TOP OF PUMP TO DISTRIBUTION BOX	205.490 FL.
INVERT ELEVATION IN OF PUMP TANK	391.870 FL.		
FORCE MAIN PIPE SPECIFICATION			
SCHEDULE 40 PVC	2,000 In.	INSIDE DIAMETER	2,067 In. (S)
DOSE VOLUME			
LENGTH OF FORCE MAIN	205.490 FL.	VOLUME OF FORCE MAIN = (D x (D/2)² x LENGTH OF FORCE MAIN x 7.48 / C.F.L.)	33,851 Gal.
DOSE VOLUME = (FORCE MAIN + 1/8 DESIGN FLOW OR 100 GAL.)		DOSE VOLUME IN C.F.T. = (DOSE VOLUME / 7.48)	13,368 Cu.Ft.
PUMP TANK SIZING			
PUMP TANK SIZING (AUTOMATIC SIZING CALCULATION IF BLANK)			
PUMP TANK DESIGN USING 1500 GALLON TANK			
BOTTOM OF PUMP TANK ELEVATION	387.520 FL. (U)	6" RISER BLOCK ELEVATION	0.500 FL.
ELEVATION	388.120 FL.	PUMP HEIGHT (FEET)	2.90 FL.
PUMP OFF ELEVATION	389.370 FL. (V)	DISTANCE BETWEEN PUMP ON & PUMP OFF ELEV. (DOSE / AREA OF PUMP TANK)	0.247 FL.
PUMP ON ELEVATION	389.517 FL. (W)	PER INCH PUMP ON TO HIGH WATER ALARM	0.500 FL.
HIGH WATER ALARM ELEVATION	390.117 FL. (X)	DIST. BETWEEN HIGH WATER ALARM & PUMP TANK INLET (DESIGN FLOW / 7.48 / AREA OF PUMP TANK)	1.481 FL.
DESIGN PUMP TANK INLET ELEVATION	391.597 FL.	ACTUAL PUMP TANK INLET ELEVATION > DESIGN PUMP TANK INLET ELEVATION	391.870 FL.
PUMP DESIGN			
PEAK FLOWS	28,800 GPM.	LENGTH OF 2" FORCE MAIN	205.740 FL.
INCREASERS (@ 2.0 FT. EACH)	0	0 BEND (@ 7.0 FT. EACH)	0
90 BEND (@ 6.0 FT. EACH)	4	45 BEND (@ 4.0 FT. EACH)	5
45 BEND (@ 4.0 FT. EACH)	5	30 BEND (@ 3.0 FT. EACH)	1
30 BEND (@ 3.0 FT. EACH)	1	22 1/2 BEND (@ 2.0 FT. EACH)	0
15 BEND (@ 2.0 FT. EACH)	0	11 1/4 BEND (@ 1.0 FT. EACH)	0
TEE (@ 10 FT. EACH)	0	TOTAL LENGTH	257.740 FL.
FRICITION LOSS PER 100 FEET	1.449 FL.	PUMP OFF FLOAT ELEVATION	389.370 FL.
INVERT ELEVATION DISTRIBUTION BOX	405.270 FL.	HEAD LOSS	15.900 FL.
TOTAL FRICTION LOSS	37.35 FL.	DYNAMIC HEAD	19.635 FL.
Goolds Submersible Effluent Pump			
Model	WE0312L (Z)	H.P.	1/3
Amp.	4.900	Volt	230,000
R.P.M.	1750,000		



DESIGN DATA & GENERAL NOTES

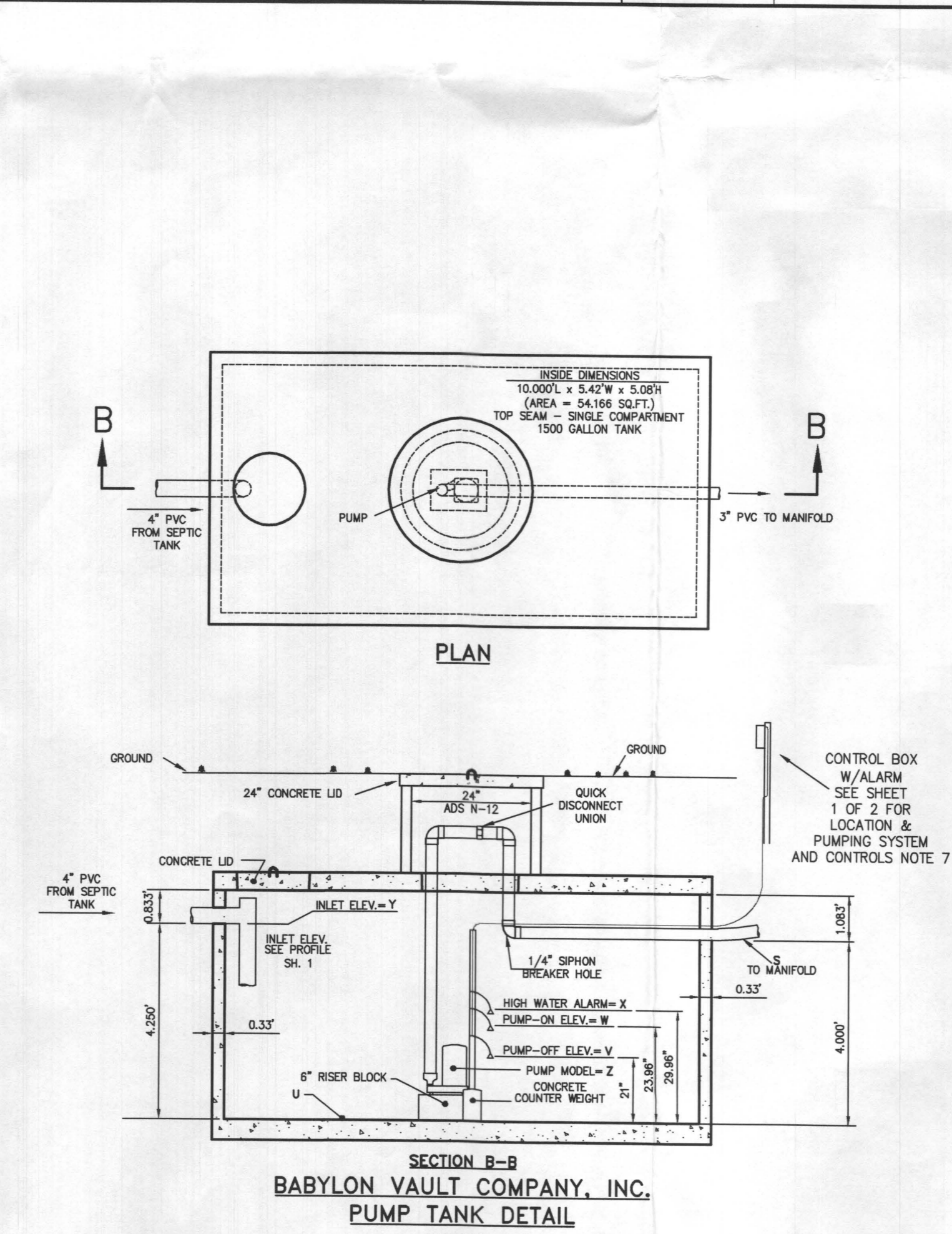
- Concrete strength $f'c = 4,000$ p.s.i. @ 28 days. Density = 150 pcf.
- Concrete - Portland Type III per ASTM C 150-02.
- Admixtures & plasticizers per ASTM C 260-06 & C 494-02.
- Reinforcing per ASTM A196, Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, base, & top thickness.
- Max 3-1/2" of cover.
- Depending on use of tank, inlet & outlet baffles may be required by code.

WEIGHT = 16,750 lbs.

1,500 GALLON TANK (Non-Traffic) 2-Compartment

Stock Item

Dwg. No. 1500-2C No Scale Aug. 11, 2008



- CONSTRUCTION SPECIFICATIONS**
- All piping to be schedule 40 PVC.
 - Supply line from pump to tee to be 2 inches in diameter.
 - The pump is to be of submersible construction, mounted 6 inches above the pumping station floor, capable of delivering 28.80 gpm at 19.635 ft. Total Dynamic Head.
 - The supply line is to be installed with a uniform slope back to the pump tank to assure complete drainage of effluent from the supply line following each pumping cycle.
 - Each pump cycle will remove approximately 100.00 gallons of effluent at the approximate rate of 28.80 gpm. Measurements shown on the drawing for pump-on, pump-off and alarm are based upon inside tank dimensions of 10.00 ft. long by 5.42 ft. wide.
 - The high level alarm is to be on a separate electrical circuit.
 - An event counter or elapsed time meter is required.
 - Pump pit tank to be top seam tank manufactured by Babylon Vault Co.
- SEPTIC TANK**
- All tanks must be watertight and meet all horizontal separation distances specified in State and County regulations.
 - Tanks that are constructed with seams and joints must be above the high water table.
 - A 24-hour leakage test may be conducted to demonstrate water tightness prior to final construction approval.
- PUMPING SYSTEM AND CONTROLS**
- The pump chamber must provide sufficient capacity to allow for storage of the dose and one day design flow between the high water alarm and the inlet of the first septic tank. It is also recommended that sufficient capacity be provided so that the pump can be set on a block and remain submerged at all times.
 - The pump chamber must be watertight, protected against buoyant forces and meet all horizontal separation distances in State and County regulations.
 - Chambers that are constructed with seams and joints must be above the high water table.
 - A 24-hour leakage test may be conducted to demonstrate water tightness prior to final construction approval.
 - The pump shall be capable of delivering 28.80 g.p.m. at the design head.
 - The use of a three float system to control pump on, pump off and the high water alarm is Recommended. The float system must be capable of delivering the specified dose.
 - The control box or panel should be mounted outside the building at least 30" above final grade, not more than 48" above final grade, in line of sight of the pump tank and in a accessible location.
 - All electrical connections should be located outside the chamber.
 - The high water alarm must be wired on a separate electrical circuit.
 - A test of the pumping system and distribution network will be required prior to covering the system. The force main can be partially covered as long as all joints, elbows, tees, etc. are visible. The test will require sufficient water onsite to activate the pump through several pumping cycles. Provisions to protect the pumping system and distribution network from erosion and sedimentation should be made by the contractor.
 - The pump is to be made of submersible construction, mounted 6" above the pumping station floor.
 - The supply line is to be installed with a uniform slope back to the pump tank to assure complete drainage of effluent from the manifold and supply line following each pumping cycle.

Onsite Sewage Disposal System Design Plan

KANE PROPERTY
 10380 CAVEY LANE WOODSTOCK
 HOWARD COUNTY, MARYLAND 21163

OWNER
 Brian Kane
 355 Whitfield Road
 Catonsville, MD 21228

MAP 11 BLOCK 13 PARCEL 39
 Account Number 288137
 COUNTY LAND RECORD 18253 Page 145
 3RD ELECTION DISTRICT

D.R.S. & ASSOCIATES
 LAND DESIGN CONSULTANTS
 52 WINTERS STREET WESTMINSTER, MARYLAND 21157
 410-848-4060 410-876-6040 F. 410-848-8818

REV. No.	DATE	BY	DESCRIPTION	DATE: 2019-01-15
1	2019-02-28	DRS/ebp	PER HCHD 2019-02-07	SCALE: 1"=30'
2	2019-03-19	DRS/ebp	PER HCHD 2019-03-11	SHT. NO. : 2 OF 2
3	2019-04-22	DRS/jfs	PER HCHD 2019-04-12	DWG.: WS01-02

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Storm Drain Calculations

Hydrology

Drainage Area = 1.0625 Acres
 Intensity = 7.00(10yr), 9.50(100yr), for TC of 5.00 min.
 $C = 0.26(<25yr), 0.34(>25yr)$ for 1 Ac Lots, >6% Slope and B Soils

$Q_{10} = 1.0625 \times 7.00 \times 0.26 = 1.93 \text{ cfs}$
 $Q_{100} = 1.0625 \times 9.50 \times 0.34 = 3.43 \text{ cfs}$

Pipe Calculations

FlowTool Version 3.0.7.0 Copyright 1991-2009 By RAMSS Inc.
 Sewer Flow 2019-02-25 11:58:53 AM Page 1
 Comments: 60 foot long Plastic Pipe at 1.00% Slope

Q (cfs)	Veloc. (fps)	Area (sf)	Perim (ft)	Radius (ft)	n	Slope (ft/ft)	Depth (ft)	Top Wt. (ft)	Diam. (ft)
1.9300	5.2445	0.3680	1.5214	0.2419	0.0110	0.0100	0.4753	0.9988	1.0000

FlowTool Version 3.0.7.0 Copyright 1991-2009 By RAMSS Inc.
 Sewer Flow 2019-02-25 11:59:10 AM Page 1
 Comments: 60 foot long Plastic Pipe at 1.00% Slope (Pipe Full Computation)

Q (cfs)	Veloc. (fps)	Area (sf)	Perim (ft)	Radius (ft)	n	Slope (ft/ft)	Depth (ft)	Top Wt. (ft)	Diam. (ft)
4.2106	5.3611	0.7854	3.1416	0.2500	0.0110	0.0100	1.0000	0.0090	1.0000

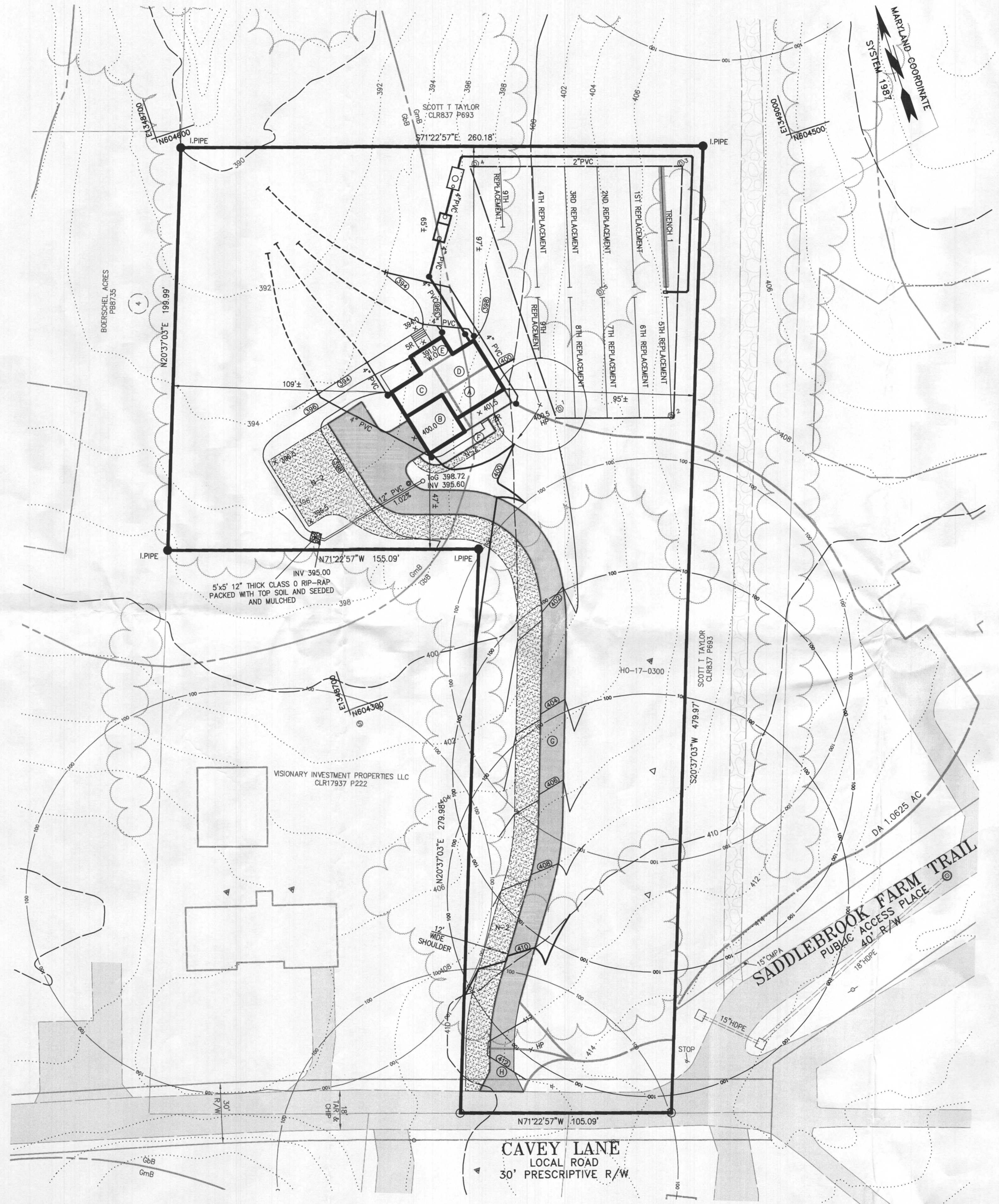
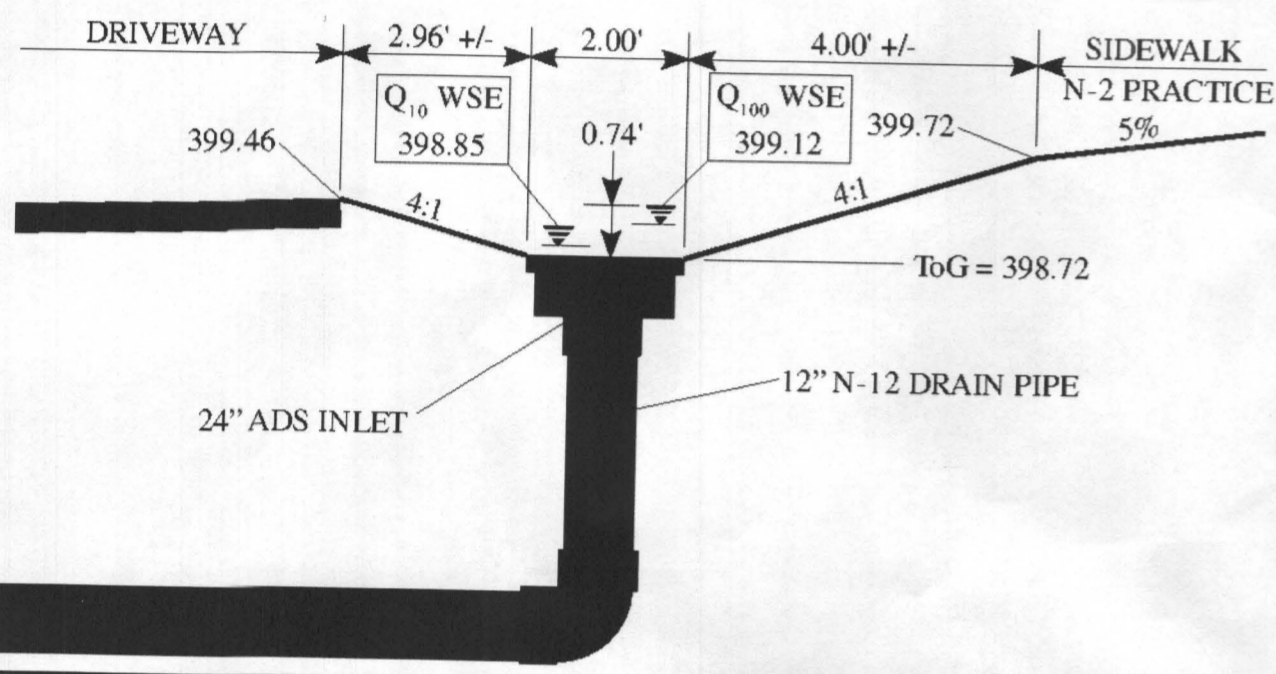
Inlet Capture

FlowTool Version 3.0.7.0 Copyright 1991-2009 By RAMSS Inc.
 Orifice Flow 2019-03-12 02:41:22 PM Page 1
 Comments: ADS Standard H-20 Grate with 161.4 Sq. In. opening

Q (cfs)	Velocity (fps)	Area (sf)	Head (ft)	Coefficient	Diameter (ft)
1.9300	2.8700	1.1208	0.1280	0.6000	0.0000

FlowTool Version 3.0.7.0 Copyright 1991-2009 By RAMSS Inc.
 Orifice Flow 2019-03-12 02:41:22 PM Page 1
 Comments: ADS Standard H-20 Grate with 161.4 Sq. In. opening

Q (cfs)	Velocity (fps)	Area (sf)	Head (ft)	Coefficient	Diameter (ft)
3.4300	5.1005	1.1208	0.4043	0.6000	0.0000



DEVELOPER'S / LANDOWNER'S CERTIFICATION
 I/We hereby certify that all proposed work shown in these construction drawing(s) will be conducted in strict accordance with these plans. I/We also understand that it is my/our responsibility to have registered Professional Engineer with in thirty (30) days of completion of work on the stormwater management facility/facilities. I/We also certify that this/these stormwater management facility/facilities will be inspected during construction by a Registered Professional Engineer, in accordance with Howard County Code.
 Signed: _____ Date: 4-25-19

ENGINEER'S DESIGN CERTIFICATION
 I hereby certify that these plans have been designed according to Howard County Code and I hereby certify that these documents were prepared or approved by me, and I am a duly licensed professional engineer under the laws of the State of Maryland.
 Signed: _____ Date: 2019-04-25
 License No. 21112
 Expiration Date: 2022-12-31

ENGINEER'S "AS-BUILT" CERTIFICATION
 I/We hereby certify that the facility shown on these plan(s) was constructed as shown on the "As-Built" plans and meets the approved plans and specifications. I also certify that this/these documents were prepared or approved by me, and I am a duly licensed professional engineer under the laws of the State of Maryland.
 Signed: _____ Date: _____
 License No. _____
 Expiration Date: _____

STORMWATER MANAGEMENT CALCULATIONS

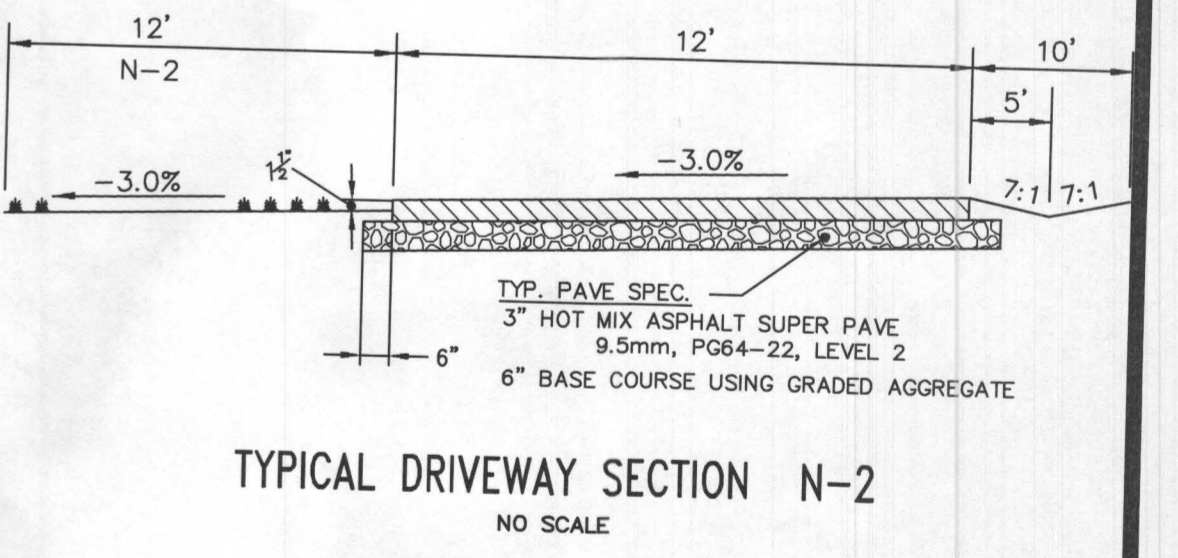
Site Area: Lot = 81,407 sf (1.86885 Acres)
 ImperVIOUS Area: House = 1,931 sf
 Driveway = 5,572 sf
 Sidewalks = 181 sf
 Cavey Lane = 1,141 sf
 No SWM Provided = 8,825 sf

Percent ImperVIOUS: $8,825 / 81,407 = 10.84\%$
 PE: B & C soils with 10.84% ImperVIOUS = 1.00 in (Table 5.3)

Required Site (ESD) Stormwater Management
 ImperVIOUS Surface: AREA IMP x TREATMENT = Req. SWM
 $7,684 \text{ sf} \times (1.0"/12") = 640.33 \text{ cf}$

Provided Site (ESD) Stormwater Management

Item	Description	Volume Provided (cf)
A	ImperVIOUS Rooftop Runoff to N-1 Practice (AI)	529.5 sf
	Drainage Area: 529.5 sf / Disc. Path 75 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 44.13 cf	
B	ImperVIOUS Rooftop Runoff to N-1 Practice (AI)	529.5 sf
	Drainage Area: 529.5 sf / Disc. Path 75 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 44.13 cf	
C	ImperVIOUS Rooftop Runoff to N-1 Practice (AI)	343.5 sf
	Drainage Area: 343.5 sf / Disc. Path 75 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 28.63 cf	
D	ImperVIOUS Rooftop Runoff to N-1 Practice (AI)	343.5 sf
	Drainage Area: 343.5 sf / Disc. Path 75 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 28.63 cf	
E	ImperVIOUS Rooftop Runoff to N-1 Practice (AI)	185 sf
	Drainage Area: 185 sf / Disc. Path 75 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 15.42 cf	
F	ImperVIOUS Non-Rooftop Runoff to N-2 Practice (AI)	181 sf
	Drainage Area: 293 sf / Disc. Path: 4 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 15.08 cf	
G	ImperVIOUS Non-Rooftop Runoff to N-2 Practice (AI)	5,262 sf
	DA: 5,582 sf / Disc. Path: Varies 12-35 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 438.50 cf	
H	ImperVIOUS Non-Rooftop Runoff to N-2 Practice (AI)	310 sf
	Drainage Area: 526 sf / Disc. Path: 12 ft / PE: 1.0 in	
	Volume Provided: AI x (PE / 12") = 25.83 cf	
Total Provided:		640.35 cf



SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT PLAN
KANE PROPERTY
 10380 CAVEY LANE WOODSTOCK
 HOWARD COUNTY, MARYLAND 21163

BUILDER
 Viking Custom Homes
 815 Windriver Drive
 Sykesville, MD 21157
 410-977-2168

OWNER
 Brian Kane
 355 Whitfield Road
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MAP 11 BLOCK 13 PARCEL 39
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 ZONED RC-DEO COUNTY LAND RECORD 18253 Page 145

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REV. No.	DATE	BY	DESCRIPTION	DATE: 2018-12-03
1	2019-02-28	DRS/ebp	PER HCDD 2019-02-05	SCALE: 1"=30'
2	2019-03-20	DRS/ebp	PER HCDD 2019-03-13	SHT. NO. : 2 OF 4
3	2019-04-10	DRS/ebp	PER HCDD 2019-04-08	DWG.: ST01-02

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PLAN VIEW
 SCALE: 1"=30'



SEDIMENT AND EROSION CONTROL NOTES

- All erosion/sediment control measures shall comply with the "Maryland Standards and Specifications for Soil Erosion and Sediment Control" by the Maryland Department of the Environment, Water Management Administration in association with the Natural Resources Conservation Service and the Maryland Association of Soil Conservation Districts (referenced as the 2011 Standards and Specs).
- Areas that have been cleared and/or graded, but will not be constructed on or permanently vegetated for more than 7 days (3 days for sediment control measures and for steep slopes) must be stabilized with mulch or temporary stabilization. Any areas that are in temporary vegetation for over 6 months will need to be permanently vegetated.
- For specifications on permanent or temporary stabilization, see B-4-4 and B-4-5.
- Mulching only is restricted to use on a disturbed area as a temporary cover where vegetation is not feasible or where seeding germination cannot be completed because of weather conditions. For specifications see B-4-3, A.1.B.
- For specifications on the stabilization of cut and fill slopes steeper than 3 horizontal to 1 vertical, see Incremental Stabilization B-4-1.
- The existing topsoil from an on or off site that is used must meet the minimum specification in B-4-2.
- The required sequence of construction must be followed during site development. Any changes in the sequence of construction must be approved by the Soil Conservation District.
- Any revisions to the sediment control plan, not covered under the list of plan modifications that can be approved by the sediment control inspector, need to be submitted to the Soil Conservation District for approval.
- No proposed slope that is required to be seeded and/or mulched shall be steeper than 2:1. Slopes steeper than 2:1 shall require an engineered design for stabilization.
- All sediment control structures will be inspected once a week and after each rainfall and will be repaired, as needed, so that the structure meets the minimum specifications as shown in the 2011 Standards and Specs.
- The contractor is responsible for maintaining all sediment and erosion control measures until the disturbed areas are permanently stabilized.
- The district approval for this sediment control plan is good for 3 years. At the end of 3 years, if construction of the plan has not started, the plan will need to be resubmitted to the Soil Conservation District for review and re-approval. Any plans that are currently under construction after 3 years may be required to be resubmitted to the Soil Conservation District by the sediment control inspector.

TEMPORARY SEEDING NOTES

Scope: Planting short term (no more than 6 months) vegetation to temporarily stabilize any areas where soil disturbance has occurred, until the area can be permanently stabilized with vegetative or non-vegetative practices.

Standards: The following notes shall conform to Section B-4 of the "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" published jointly by the Maryland Department of Environment - Water Management Administration, the National Resource Conservation Service and the Maryland Association of Soil Conservation Districts.

The seed bed shall be prepared by loosening the soil to a depth of 3 to 5 inches and incorporating the lime and fertilizer into this loosened layer of soil. See section B-4-2.

For temporary stabilization, fertilizer shall consist of a mixture of 10-20-20 and be applied at a rate of 436 lb. per acre (10 lb. per 1000 sq. ft.) and will meet the requirements in section B-4-2. Lime shall be applied at a rate of 2 tons per acre (90 lb. per sq. ft.) and shall meet the requirements in section B-4-2 and B-4-4.

Seed type and application shall meet the requirements in section B-4-3. Seed tags shall be made available to the inspector to verify the type and rate of seed used. Mulch type and its application will meet the requirements in section B-4-3 a, b and c and will be applied along with the seed or immediately after seeding.

Seeding mixtures shall be selected from or will be equal to those on Table B.1 (page B.20).

Temporary Seeding Summary
The seeding chart below will need to be placed on and filled in on the sediment control plan.

TEMPORARY SEEDING SUMMARY
(C-20 Figure 5)

No.	Species	Application Rate (lb./ac)	Seeding Dates	Seeding Depth
1	Barley or Rye & Foxtail Millet	150lbs/acre	3/1-11/15	1"

PERMANENT SEEDING NOTES

Scope: Planting permanent, long lived vegetative cover on graded and/or cleared areas and areas that have been in temporary vegetation for more than 6 months.

Standards: The following notes shall conform to Section B-4 of the "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" published jointly by the Maryland Department of Environment - Water Management Administration, the National Resource Conservation Service and the Maryland Association of Soil Conservation Districts.

The seed bed shall be prepared by loosening the soil to a depth of 3 to 5 inches and incorporating the lime and fertilizer into this loosened layer of soil. See section B-4-2.

For sites over 5 ac. soil tests will be performed. Soil tests will be conducted by the University of Maryland or a recognized commercial laboratory. Minimum soil conditions shall meet the requirements of section B-4-2-A-2-a, otherwise soil amendments or topsoil will need to be applied. Topsoiling may occur when soil conditions meet the minimum requirements as stated in section B-4-2-B. Soil amendments must meet the requirements as set forth in section B-4-2-C and must be applied as indicated by the soils tests.

For sites of 5 ac. or less of disturbance, the following fertilizer and lime rates shall apply. Fertilizer shall consist of a mixture of 10-20-20 and be applied at the following rates:
N = 45 lb. per acre (1 lb. per 1000 sq.ft.) P205 = 90 lb. per acre (2 lb. per 1000 sq.ft.) K2O = 90 lb. per acre (2 lb. per 1000 sq.ft.)
Lime shall be applied at a rate of 2 tons per acre (90 lb. per 1000 sq.ft.)

Seed type, turfgrass or sod application shall meet the requirements in section B-4-5. Seed tags shall be made available to the inspector to verify the type and application rate of seed used. Mulch type and its application will meet the requirements in section B-4-3 a, b and c, and will be applied along with seed or immediately after seeding.

Seeding mixtures shall be selected from or will be equal to those on Table B-3. The seeding chart below will need to be placed on and filled in on the sediment control plan.

PERMANENT SEEDING SUMMARY

No.	Species	Application Rate (lb./ac)	Seeding Dates	Seeding Depth
1	Tall Fescue(75%) Canada Bluegrass(10%) Kentucky Bluegrass(10%) Redtop(5%)	150 lbs/acre	3/1 - 5/15 8/15 - 10/15	1/4" - 1/2"
3	Tall Fescue(85%) Perennial Ryegrass(10%) Kentucky Bluegrass(5%)	125 lbs/acre 15 lbs/acre 10 lbs/acre	3/1 - 5/15 8/15 - 10/15	1/4" - 1/2"

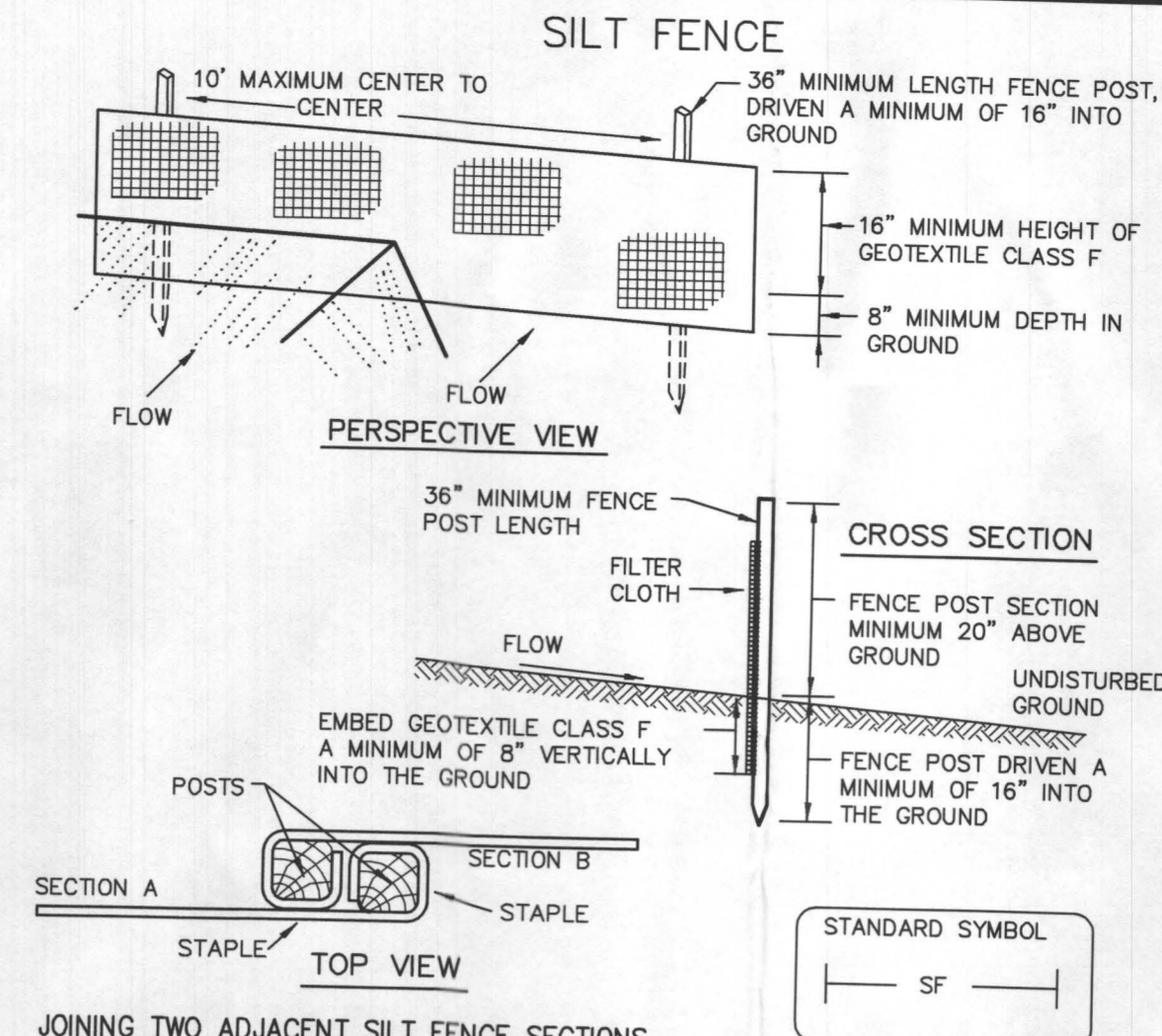
REMARKS: Use mix No. 1 on steep slopes greater than 3:1.
Use mix No. 3 on areas less than 3:1 slope.

TOPSOIL SPECIFICATIONS

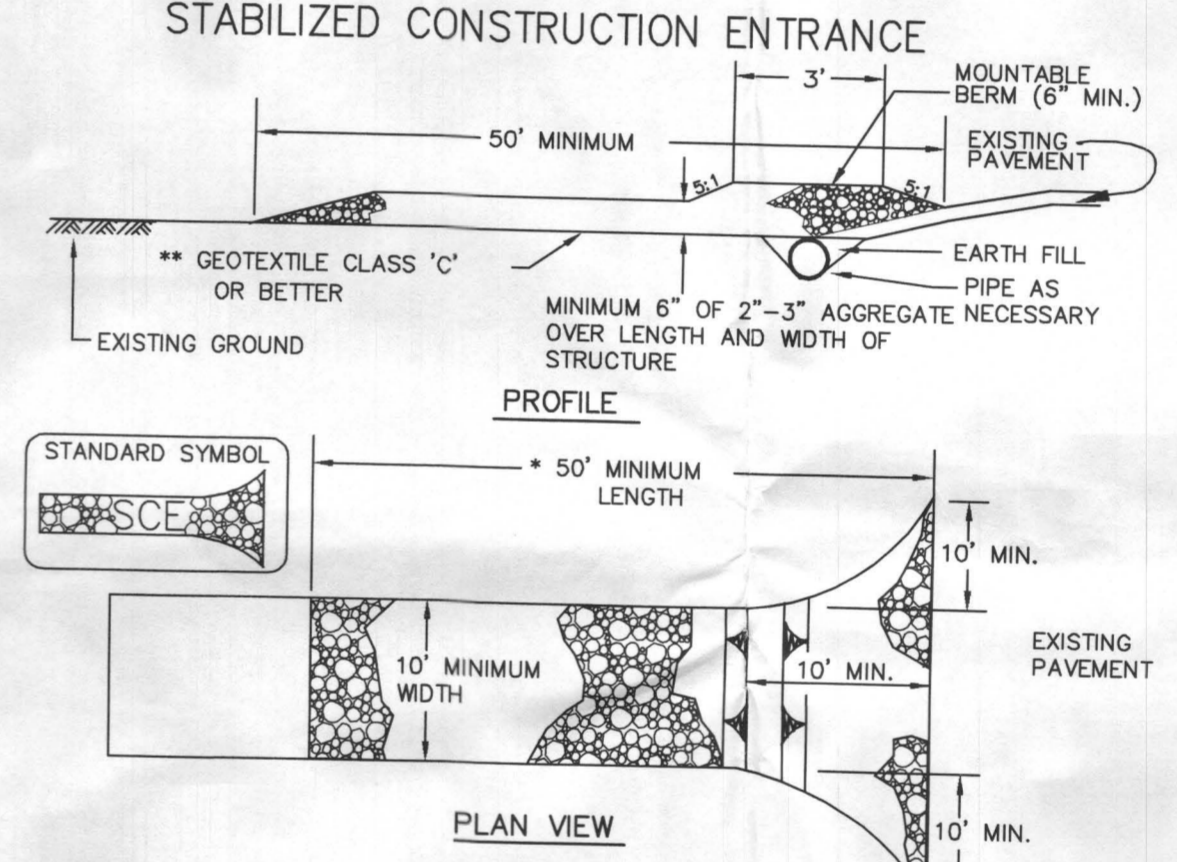
Soil to be used as topsoil must meet the following:
Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting texture subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash or other materials larger than 1 1/2" in diameter.

Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, johnsongrass, nutsedge, poison ivy, thistle or others as specified.

Where the topsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (800-400 lbs./1000 sq. ft.) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations.



JOINING TWO ADJACENT SILT FENCE SECTIONS
Construction Specifications
1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:
Tensile Strength 50 lbs./in. (min.) Test: MSMT 509
Tensile Modulus 20 lbs./in. (min.) Test: MSMT 322
Flow Rate 0.3 gal./ft. (min.) (max.) Test: MSMT 322
Filtering Efficiency 75% (min.) Test: MSMT 322
3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.
E153 - 5/14/96



Construction Specification
1. Length - minimum of 50' (*30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. *The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and according to the amount of runoff to be conveyed, a 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.
F173 - 5/14/96

SEDIMENT CONTROL NOTES

- A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-313-1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hour notice to CID must be given at the following stages:
 - Prior to the start of earth disturbance.
 - Prior to the start of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading.
 - Prior to the start of another phase of construction or opening of another grading unit.
 - Prior to the removal or modification of sediment control practices.
 Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made. Other related state and federal permits shall be referenced, to ensure coordination and to avoid conflicts with this plan.
- All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.
- All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-3), temporary seeding (Sec. B-4-4) and fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) in excess of 20 ft. must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).
- All sediment control structures are to remain in place, and are to be maintained in operative condition until permission for their removal has been obtained from the CID.
- Site Analysis:

Total Area of Site:	1.8685 Acres
Area Disturbed:	0.65001 Acres
Area to be roofed or paved:	0.19612 Acres
Area to be vegetatively stabilized:	0.45389 Acres
Total Cut:	233 Cu. Yds.
Total Fill:	233 Cu. Yds.
- Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the OD. The site and all controls shall be inspected by the contractor weekly, and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:
 - Inspection date
 - Inspection type (routine, pre-storm event, during rain event)
 - Name and title of inspector
 - Weather information (current conditions as well as time and amount of last recorded precipitation)
 - Brief description of project's status (e.g., percent complete) and/or current activities
 - Evidence of sediment discharges
 - Identification of plan deficiencies
 - Identification of sediment controls that require maintenance
 - Identification of missing or improperly installed sediment controls
 - Compliance status regarding the sequence of construction and stabilization requirements
 - Photographs
 - Monitoring/sampling
 - Maintenance and/or corrective action performed
 - Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).
- Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back-filled and stabilized by the end of each workday, whichever is shorter.
- Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may be allowed by the HSCD per the list of HSCD-approved field changes.
- Disturbance shall not occur outside the L.O.D. A project is to be sequenced so that grading activities begin on one grading unit (maximum acreage of 20 ac. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has been stabilized and approved by the CID. Unless otherwise specified and approved by the HSCD, no more than 30 acres cumulatively may be disturbed at a given time.
- Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.
- Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade. For specifications refer to section B-4-8 from the 2011 MD Standards and Specifications for Soil Erosion and Sediment Control.
- All Silt Fence and Super Silt Fence shall be placed on-the-contour, and be imbricated at 25' minimum intervals, with lower ends curved uphill by 2' in elevation.
- Stream channels must not be disturbed during the following restricted time periods (inclusive):
 - Use I and II: March 1 - June 15
 - Use III: March 1 - May 31
 - Use IV: March 1 - April 30
- A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN DETAILS

KANE PROPERTY
10380 CAVEY LANE WOODSTOCK
HOWARD COUNTY, MARYLAND 21163

BUILDER Viking Custom Homes
815 Windward Drive
Sykesville, MD 21157
410-977-2188

OWNER Brian Kane
355 Whitfield Road
Cotonsville, MD 21228

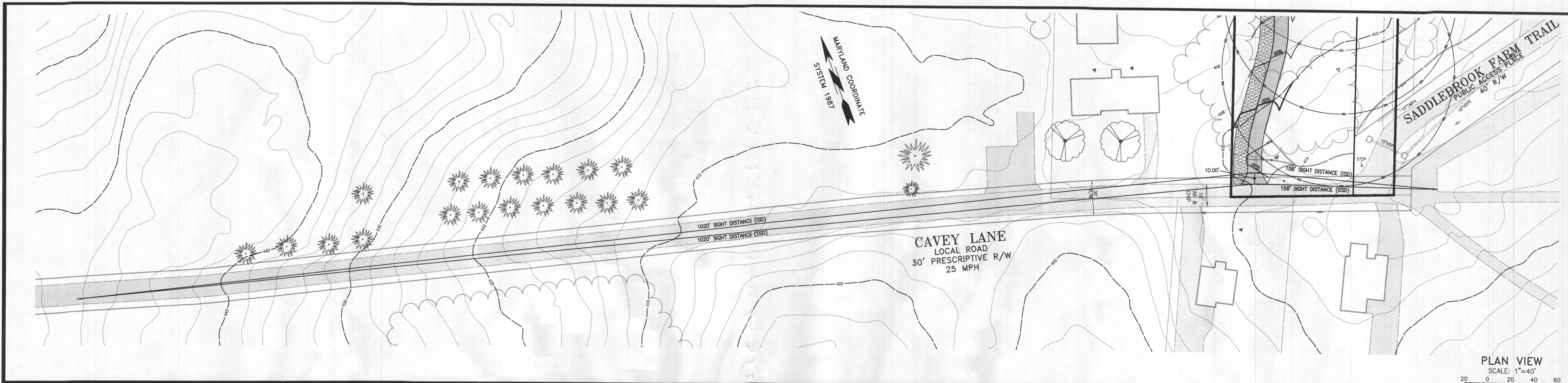
MAP 11 BLOCK 13 PARCEL 39
Account Number 288137
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ZONED RC-DEO COUNTY LAND RECORD 18253 Page 145

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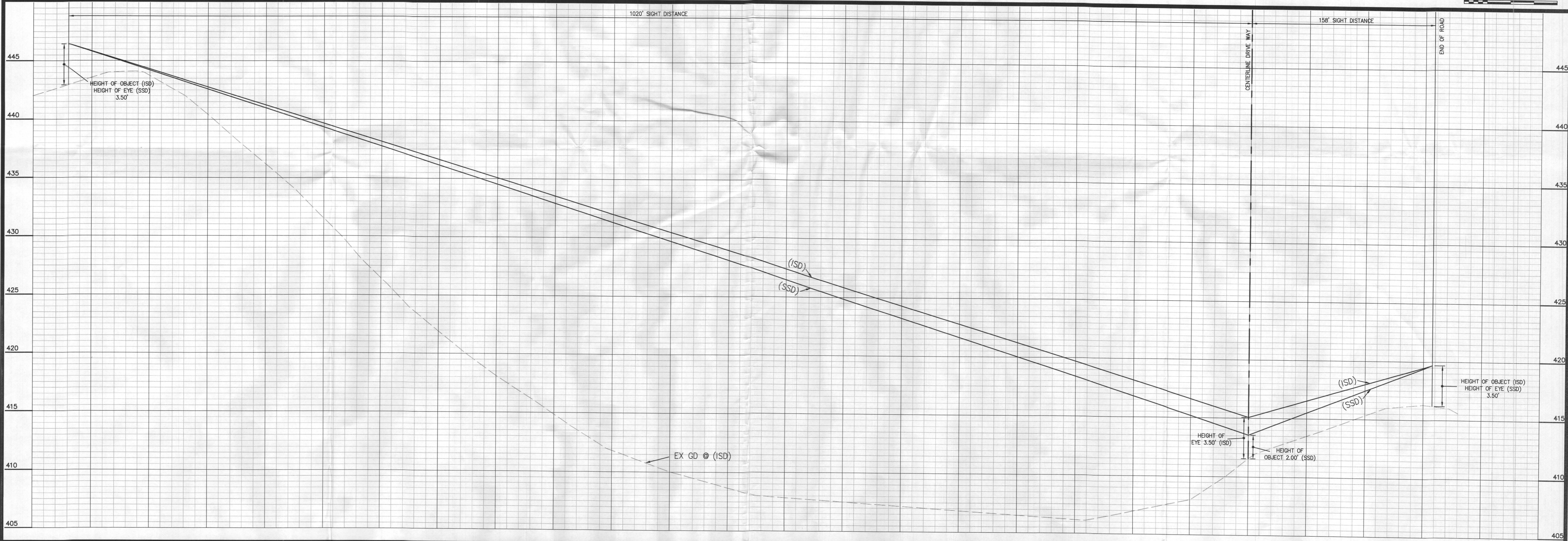
REV. NO.	DATE	BY	DESCRIPTION	DATE: 2018-12-03
1	2019-02-28	DRS/ebp	PER HCDED 2019-02-05	SCALE: N/A
2	2019-03-20	DRS/ebp	PER DRS	SHT. NO. : 3 OF 4
				DWG.: ST01-03

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PLAN VIEW
SCALE: 1"=40'
20 0 20 40 60



ABBREVIATIONS

EX	Existing
GD	Ground
ISD	Intersection Sight Distance
SSD	Stopping Sight Distance

SCALE: HOR. 1"=40'
VERT. 1"=4'



**SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN
SIGHT DISTANCE ANALYSIS
KANE PROPERTY**
10380 CAVEY LANE WOODSTOCK
HOWARD COUNTY, MARYLAND 21163

BUILDER Viking Custom Homes 815 Windriver Drive Sykesville, MD 21157 410-977-2188	OWNER Brian Kane 355 Whitfield Road Catoonsville, MD 21228
--	--

MAP 11 BLOCK 13 PARCEL 39
Account Number 286137
3RD ELECTION DISTRICT
ZONED RC-DEO COUNTY LAND RECORD 18253 Page 145

D.R.S. & ASSOCIATES
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REV.No.	DATE	BY	DESCRIPTION	DATE: 2019-03-20
				SCALE: 1"=40'
				SHT.NO. :4 OF 4
				DWG.: ST01-02

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