

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: 1/18/2019 **ONSITE SEWAGE DISPOSAL SYSTEM** P 564734
 APPROVAL DATE: 4/22/19 KM **PERMIT: CONSTRUCTION** A _____
 PROPERTY ADDRESS: 13825 Mill Creek Court Clarksville, MD 21029
 SUBDIVISION: Crawford LOT: 21 TAX ID: _____
 CONTRACTOR: South Carroll EMAIL: _____
4410 Salem Bottom Rd
 CONTRACTOR ADDRESS: Westminster, MD 21157 PHONE: 410 875 4197
 PROPERTY OWNER: NVR Inc EMAIL: _____
 OWNER ADDRESS: 9720 Patuxent Drive Columbia PHONE: 410-379-5956
 SEPTIC TANK SIZE (GALLONS): 1500gal TANK MANUFACTURER: Mayer Brothers
 PUMP MODEL: Hoot 600 BNR PUMP SIZE E152 PUMP TANK CAPACITY: 1500gal

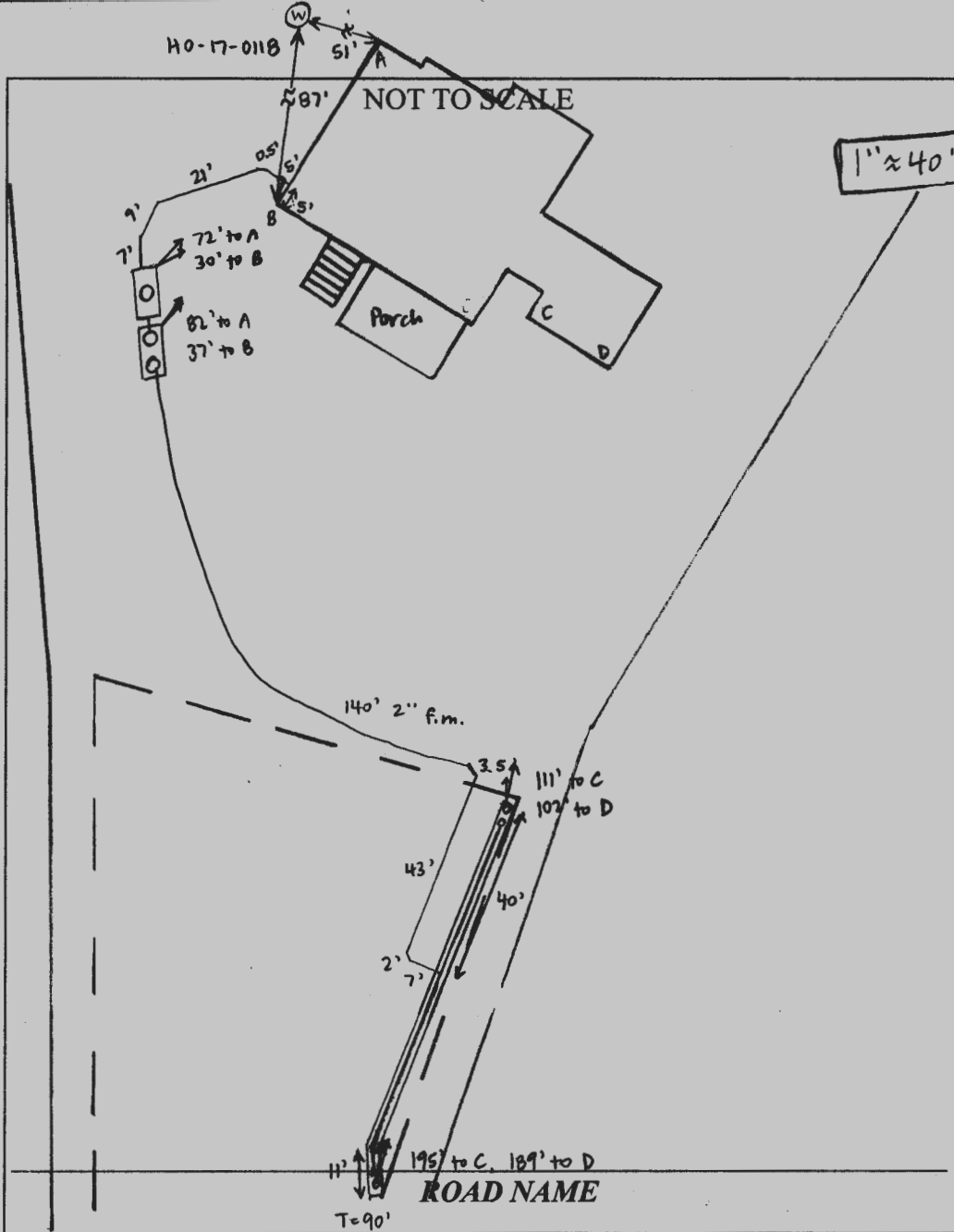
DISTRIBUTION SYSTEM: GRAVITY PRESSURE DOSED BEDROOMS: 5 APPLICATION RATE: 1.2

TRENCHES:	LINEAR FEET REQUIRED: <u>86.8</u>	INLET DEPTH: <u>2</u>
	TRENCH WIDTH: <u>3</u>	MAXIMUM BOTTOM DEPTH: <u>8</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>11</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>4</u>
LOCATION:	PER APPROVED SITE PLAN. SEWAGE DISPOSAL AREA AND TANK LOCATIONS MUST BE STAKED BY LICENSED SURVEYOR PRIOR TO PRE-CONSTRUCTION INSPECTION.	
NOTES:		

ISSUED BY: Robert Freemon ISSUE DATE: 1/18/2019 EXPIRATION DATE: 1/18/2020

- 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 19000042
- 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'	2'	8'
NUMBER OF TRENCHES		1
TOTAL LENGTH		90'
ABSORPTION AREA		270' + SIDEWALL
DISTRIBUTION BOX LEVEL		---
DISTRIBUTION BOX BAFFLE		---
DISTRIBUTION BOX PORT		---

SEPTIC TANK DATA	
SEPTIC TANK 1 LEVEL	YES
MANUFACTURER	MAYER BROS./Hoot
CAPACITY	1000 GAL
SEAM LOC	TOP
TANK LID DEPTH	2-2.5'
BAFFLES	YES
BAFFLE FILTER	NO
MANHOLE LOC	MIDDLE
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	---
PUMP/SEPTIC TANK LEVEL YES	
MANUFACTURER	MAYER BROS.
CAPACITY	1500 GAL
SEAM LOC	TOP
TANK LID DEPTH	2.5-3'
BAFFLES	YES
BAFFLE FILTER	NO
MANHOLE LOC	FRONT + REAR
6" PORT LOC	NONE
WATERTIGHT TEST	NO
SLOTTED	NO
DATE ON LID	---
Pump: Gould's 1/2 hp	

PRE-CONSTRUCTION:

2/14/19 Met S. Carroll on site for layout. Tanks + SDA corners staked. Need trench staked - DK to set tanks. Must check elevations of trench ends prior to trench install. (SC)
 2/15/19 Trench staked. Shot elevations at ends, within 1". (SC)

* no leaks in tank

INSTALLATION: 2/15/19 Tank set while on site. Tank has patches, painted black - S Carroll will fill w/ 1000 gal water to test for cracks. (SC) 2/19/19 Pump tank set. Trench dungs filled w/ stone + lateral installed - perforations 3.5' apart. Ran water through f.m., 2' + lateral head at each turnup. Need house sewer connection, pump + alarm test, 1-day storage above alarm float (=21"), + BAT startup certification. (SC) 2/21/19 House connection made, pipe run from house to septic tank. (SC) 4/12/19 On site for Hoot startup w/ S. Carroll + Mike Sample. Electric connected incorrectly - can't do Hoot startup today. Alarm sounds, lateral heads 26-27" (overflow) when pump runs. Need Hoot startup + turf boxes over turnups. (SC) 4/22/19 Contractor explained 4" slope only laterals, only. Turf boxes to be installed by builder.

FINAL INSPECTOR [Signature] DATE OF APPROVAL 4/22/19
 after final grading. (KRW)

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

**OPERATION AND MAINTENANCE AGREEMENT
FOR AN ON-SITE SEWAGE DISPOSAL SYSTEM
HAVING AN ADVANCED PRE-TREATMENT SYSTEM**

MC-0021

THIS AGREEMENT is made this 15 day of MARCH 2018, among NVR & Andrew Dolloph, hereinafter collectively referred to as "Owner", and the Howard County Health Department hereinafter referred to as the "County".

WHEREAS, Owner is the owner or contract owner of a parcel of land located at 13825 Mill Creek Court, Clarksville, MD 21029 in the 5 Election District of Howard County, Maryland, and the deed and subdivision plat of the property is recorded among the Land Records of Howard County, Maryland, Tax Map # 34, Block # 19, Parcel # 52, Deed Reference # 08967/00532 and Tax Account # Plot # 24602 ("the Property").

WHEREAS, The Property is suitable for the installation of a conventional on-site sewage disposal system with an advanced pre-treatment system, utilizing best available technology to perform nitrogen reduction, in accordance with the Code of Maryland Regulations 26.04.02.07, effective November 24, 2016. The pre-treatment device being installed is Host 600.

NOW, THEREFORE, the parties hereto agree as follows:

- A. Owner hereby grants to the County the right to enter upon the Property at any reasonable time with prior notice for access to the system to make periodic inspections and the Owner agrees to provide any information and data in Owner's possession reasonably requested and needed by the County.
- B. Owner acknowledges and agrees that neither the County nor any of its agents or employees, either officially or individually, underwrites the operation of any system approved by them.
- C. The Owner will devote reasonable care and effort to the operation and maintenance of the system in perpetuity or until a public sewer connection is made so that a system malfunction is not the result of poor maintenance, faulty operation, or neglect.
- D. The Owner agrees to enter into a contract reasonably acceptable to the Owner and the County with a private entity to operate and maintain on a regularly scheduled basis an approved advanced pre-treatment system. The owner shall supply a copy of the contract to the County when it is renewed or altered.
- E. This agreement shall run with the land and upon Owner's taking title to the Property shall bind the Owner, their heirs, successors, and assigns to the provisions of the agreement as long as

the property is in existence and after installation of the system. Owner further agrees that they shall inform in writing any subsequent purchaser or lessee of the Property that the system shall require maintenance or other attention. Upon taking title to the Property, the Owner agrees to cause this agreement to be recorded in the Land Records of Howard County and assure that it becomes part of the Deed for the subject property in order that prospective buyers may be aware of the special conditions affecting this property.

F. This agreement shall not be construed to limit any authority of the County to protect the public health, safety or comfort or to issue any other orders to take any other action which is now or may hereafter be within its authority.

G. This agreement may be voided at any time at the discretion of the County.

H. This agreement contains the entire agreement and understanding between the County and the Owner. There are no additional terms other than as contained in this agreement. This agreement may not be modified, except in writing signed by each of the parties or by their authorized representatives.

I. The laws of the State of Maryland govern the provisions of all transactions pursuant to this agreement.

J. Owner acknowledges and agrees that interior renovations to increase the number of bedrooms or an increase in living space shall not be permitted without approval from the County.

IN WITNESS WHEREOF, the parties have signed this agreement on the date indicated above.

Beit Nifan 3/15/2019
Howard County Health Department

Phil An 3/5/19
Owner #1 Signature Date

NVR INC.
Owner #1 Print Name

Owner#2 Signature Date

Owner #2 Print Name

[Signature] 3/8/19
Buyer #1 Signature Date

Buyer #2 Signature Date

Lisa Dallah
Buyer #1 Print Name

Buyer #2 Print Name



MAYER BROS., INC.

Precast Concrete Products

6264 Race Rd. Elkridge, MD 21075

Letter of Satisfaction Hoot System Installation

Address of Property: 13825 Mill Creek Dr.
Highland, MD, 20777

Date of Final Inspection: 4/16/19

Installer: South Carroll Backhoe Service

Hoot Technician/Inspector: Mike Sample

I hereby certify that the Hoot system installed at the property listed above has been installed according to proper Hoot installation practices. I have also verified the startup of the system and it is in proper working order.

Sincerely,

H. Michel Day
Name of Inspector
Mayer Bros., Inc.

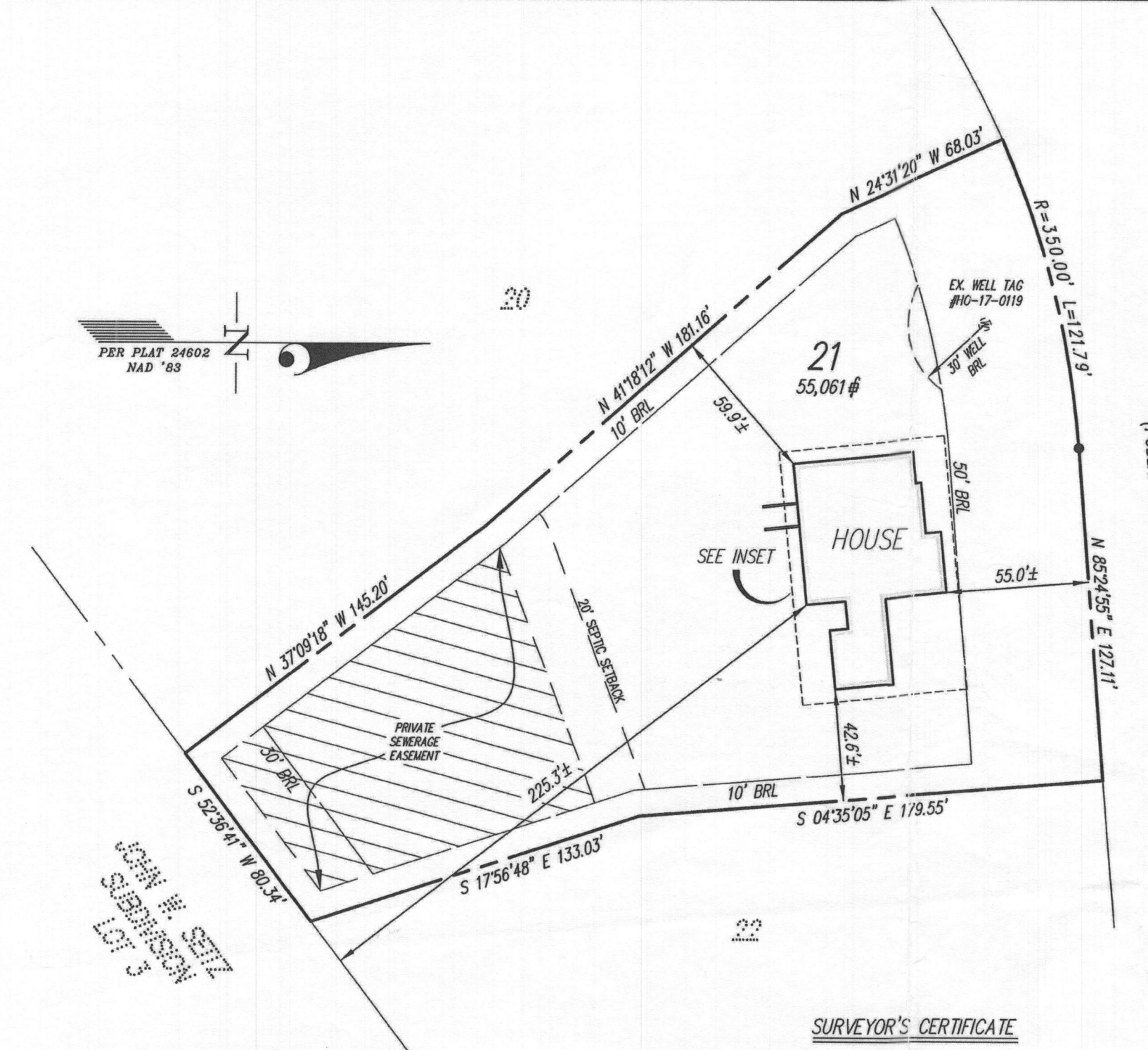
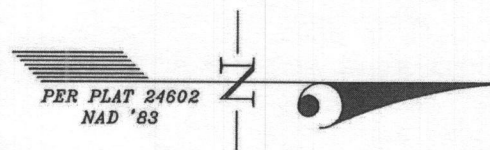
PH: 410-796-1434

WBE

FX: 410-796-1438

www.mayerbrosprecast.com

Grease Interceptors, Grease Solutions, Aerobic Treatment Units, Septic Tanks, Holding Tanks, Storm Water Structures, Hydroceptors,
Bench Barrier, Water Meter Vaults, Sectional Valve Vaults, Top Slabs, Curb Heads, Curb Bumpers,
Custom Precast Products



JOHN W. SETTZ
 SUBDIVISION
 LOT 21


MILL CREEK COURT
 (PUBLIC ACCESS STREET)

Wall
 Check
 OK R/E
 1/18/2019

SURVEYOR'S CERTIFICATE

THIS IS TO CERTIFY TO:
NVR, INC.;

THAT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF,
 THE POSITION OF THIS BUILDING FOUNDATION
 HAS BEEN ESTABLISHED BY ACCEPTED FIELD PRACTICES.


 For Gutschick, Little and Weber, P.A.
 Thomas C. O'Connor, Jr.,
 Professional Land Surveyor, No. 10954 (EXP. DATE: 07/03/2020)

THIS WALLCHECK IS VALID ONLY WITH AN ORIGINAL SIGNATURE AND EMBOSSED SEAL OF THE ABOVE SURVEYOR.

NOTES:

THIS WALLCHECK WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT.
 THIS PROPERTY IS SUBJECT TO ANY AND ALL EASEMENTS, RIGHTS-OF-WAY, COVENANTS,
 AND RESTRICTIONS, ETC. OF RECORD, SOME OR ALL OF WHICH MAY OR MAY NOT BE
 SHOWN AND/OR REFERENCED HEREON. BEARINGS AND DISTANCES OF THE PROPERTY
 BOUNDARY LINES SHOWN HEREON ARE PER AVAILABLE RECORDS AND HAVE NOT BEEN
 FIELD VERIFIED.

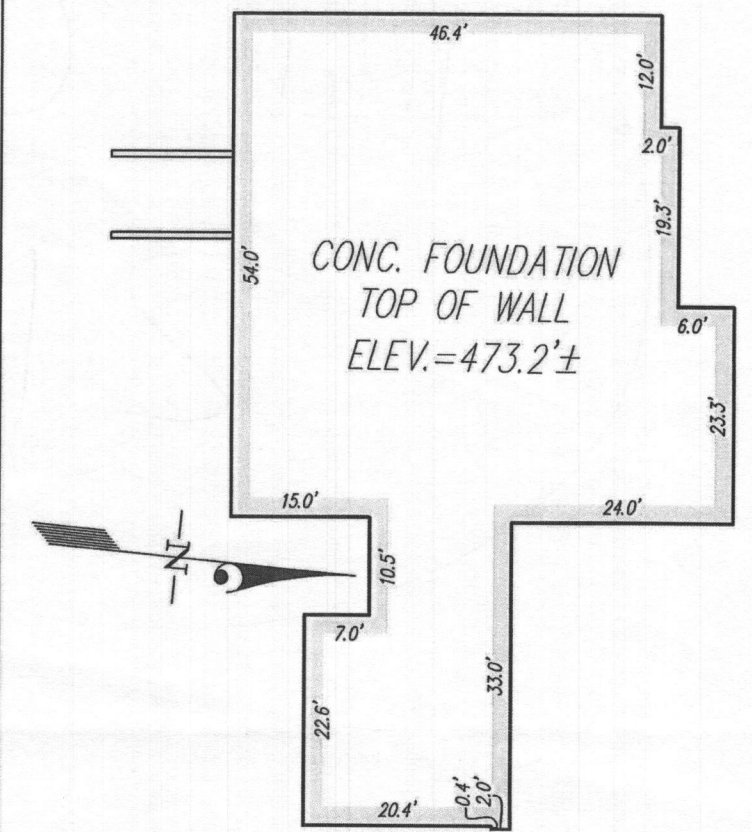
THIS IS NOT A "LOCATION DRAWING" AND IS NOT TO BE USED FOR SETTLEMENT PURPOSES.

THE PROPERTY SHOWN HEREON LIES WITHIN ZONE X (AREAS DETERMINED TO BE OUTSIDE
 THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SHOWN ON THE F.E.M.A. FLOOD INSURANCE
 RATE MAP, MAP NUMBER 24027C0140D, EFFECTIVE DATE NOVEMBER 6, 2013.

BUILDING SETBACKS (B.R.L.'S) SHOWN HEREON PER PLOT PLAN.

SETBACK DISTANCES SHOWN HEREON ARE TO THE OUTERMOST FACE OF THE FOUNDATION WALLS AND HAVE AN ACCURACY OF ± 0.1' FOOT.

INSET 1"=20'



WALLCHECK
(SPECIAL PURPOSE SURVEY)

CRAWFORD SUBDIVISION

LOT 21
 13825 MILL CREEK COURT

HOWARD COUNTY, MARYLAND

DATE OF LATEST FIELD WORK: 1/7/2019

G.L.W. FILE No. 17071

REFERENCE: PLAT No.: 24602

SCALE: 1"=50'



DES.	PREPARED FOR: NVR, INC. 9720 PATUXENT WOODS DRIVE COLUMBIA, MD 21046
DRN. MAB	
CHK.	

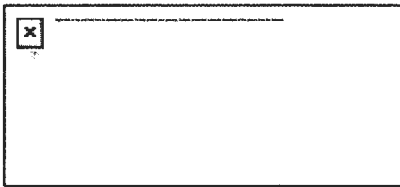
Collins, Sarah

From: Kristy Pierce <kpierce@glwpa.com>
Sent: Thursday, February 14, 2019 4:09 PM
To: Collins, Sarah
Subject: Re: Mill Creek lot 21 septic

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

Yes, they could use the Zoeller Model N153 (115volts, 1/2 hp) or Zoeller Model E153 (230volts, 1/2 hp), depending on what they have the electric set up for.

Kristy Pierce



3909 National Drive, Suite 250 | Burtonsville, MD 20866
PH: 301-421-4024 | PH (Baltimore): 410-880-1820
PH (Northern VA): 301-989-2524 | FAX: 301-421-4186

Check out our new website: WWW.GLWPA.COM

The information transmitted is intended only for the addressee shown above.

Any design information (calculations, drawings, etc.) included in this transmission is intended for the sole purpose agreed upon with Gutschick, Little & Weber, P.A. (GLW). If this information is to be used for any other purpose or transmitted to any other persons, prior consent must be received from GLW.

On Thu, Feb 14, 2019 at 3:33 PM Collins, Sarah <SCollins@howardcountymd.gov> wrote:

Got it- the contractor can use a ½ hp pump if adding the 2x 45 degree bends?

Thank,

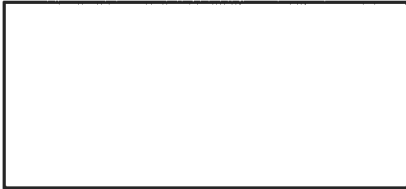
Sarah

From: Kristy Pierce <kpierce@glwpa.com>
Sent: Thursday, February 14, 2019 2:00 PM
To: Collins, Sarah <SCollins@howardcountymd.gov>
Subject: Re: Mill Creek lot 21 septic

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

Yes, with the 2-45 bends TDH goes to 22.0, see attached pdf. It is slightly over the curve for the pump selected.

Kristy Pierce



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On Thu, Feb 14, 2019 at 1:33 PM Collins, Sarah <SCollins@howardcountymd.gov> wrote:

Hi Kristy,

Thanks for your email. Would you be able to run the calculations adding in the 2x 45 degree bends? Ideally we want to keep the force main close to the septic area to avoid it being hit during any future digging in the yard.

Thank you,

Sarah

Sarah Collins, L.E.H.S.

Howard County Health Department

Bureau of Environmental Health

8930 Stanford Blvd.

Columbia, MD 21045

SCollins@howardcountymd.gov

410-313-6287

CONFIDENTIALITY NOTICE

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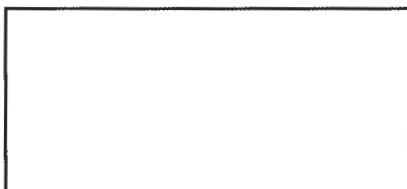
On Feb 14, 2019, at 1:07 PM, Kristy Pierce <kpierce@glwpa.com> wrote:

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

Hi Sarah,

Adding the 2-45 degree bends will increase friction enough to require a different pump. They can use a larger radius if they are cold bending and this would not effect the pump size.

Kristy Pierce



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On Thu, Feb 14, 2019 at 12:35 PM Collins, Sarah <SCollins@howardcountymd.gov> wrote:

Hi Kristy,

I saw that you had some correspondence with Dana Bernard regarding the septic plan for Mill Creek lot 21 and I have a couple of questions.

The force main shows a large bend before it reaches the 90 degree bend at the trench. The contractor cannot bend the pipe so sharply- can they put in 2x 45 degree bends? Does this change the friction enough to require a different pump?

Thanks for your help,

Sarah

Sarah Collins, L.E.H.S.

Howard County Health Department

Bureau of Environmental Health

8930 Stanford Blvd.

Columbia, MD 21045

SCollins@howardcountymd.gov

410-313-6287

CONFIDENTIALITY NOTICE

LOW PRESSURE DISTRIBUTION SYSTEM CALCULATIONS

Per MDE BASIC LPD DESIGN - Draft Version 1 - Date July 3, 2014

ADDRESS: **13825 Mill Creek Court**

SUBDIVISION: **Crawford (Mill Creek)**

DATE: **December 2018**

LOT: **21**

Number of Manifolds:

Design Flow: 750 gpd

Pump Off Elevation: 457.25

Inv. Out of Pump Tank: 460.50

Pump Bottom Elevation: 456.25

Type: **Center Feed**

Trench **1** Elev: **469.4** Length: **87.0**
 Trench Elev: Length:
 Trench Elev: Length:

0' Elev. Range, Single Manifold OK

Manifold Length 0 ft Type: SCH 40

Hoiz. Force Main Length 195.0 ft Type: SCH 40

Trench	Trench Length (ft)	Feed	Pipe Inv. Elev (ft)	Head (ft)	Hole Diam. (in)	Hole Flow Rate (gpm)	Hole Spacing (ft)	Number of Holes	Trench Flow Rate (gpm)	Lateral Length (ft)	Flow (gpm) per LF Trench	Gal. per LF Trench	Lateral Diam. (in)*	Type
1	87	Center	469.4	2.0	5/16	1.63	3.48	25	40.71	83.52	0.468	1.437	1.5	SCH 40

Max/Min Flow Ratio (should be <1.10) : 1.00 * Min. Per Figure 4.4

Min. System Discharge Rate: 40.7 gpm

Force Main Diam. 2.0 in Vel. 4.2 fps Friction Loss (Table 4.4) 2.712

Minimum Dose: 125.0 gal (Vol. in FM, Man, 5x Lat. = 78.2 gal. < 1/6 Design Flow = 750/6 = 125 gal.)

Calculate Total Design Head

1. Friction Loss in FM & Mnfold: 5.4 ft

Friction Loss from Fittings: 34 ft X 2.712 = 0.9 ft

No.	Type	Equ. Length	No.	Type	Equ. Length
2	90 Deg. Std Ell	7.0	0	Gate Valve	1.3
2	45 Deg. Std Ell	4.0		Globe Valve	55
1	90 Deg. Side Tee	10.0		Angle Valve	28
1	Coupling or Str. Run of Tee	2.0			

Friction Loss from Laterals: 1.5 ft

2. Static Head: 12.15 ft

3. Min. Distal (discharge) head 2 ft

TDH= 22.0 ft

Note #1: The minimum dose is the greater value of either 1/6 the Design Flow or [(5 x lateral volume)+ one volume the manifold + one volume of the force main]



Kristy Pierce <kpierce@glwpa.com>

Crawford Subdivision (Mill Creek Court)

Kristy Pierce <kpierce@glwpa.com>
To: Kristy Pierce <kpierce@glwpa.com>

Tue, Dec 4, 2018 at 10:31 AM

----- Forwarded message -----

From: **Bernard, Dana** <dbernard@howardcountymd.gov>
Date: Mon, Dec 3, 2018 at 12:22 PM
Subject: RE: Crawford Subdivision (Mill Creek Court)
To: Kristy Pierce <kpierce@glwpa.com>

Hello Kristy everything looks good. However, we have a few minor changes on your OSDS plans. They must be revised and resubmitted for review. Your building permits will not receive building permit approval until the OSDS plans have been approved. I will list them in order of lot.

Lot #19

1. The pipe invert on your septic trench detail should be at 2 feet. We are recommending using 2 feet to obtain the most efficient design. Please make calculation adjustments needed. Revised pipe invert to 2 feet. Updated Trench Detail, LPD Calculations, Profile & Plan accordingly.
2. There is a 45 degree bend at the end of your trench. Please show the perforations at this point in the trench detail. We don't want the perforation to be covered by the connection of the two pipes. Added a note to the typical trench detail "make sure holes in bends & fittings are not covered during assembly"
3. We need to add an observation pipe at the end of your trench. Please show in trench detail on OSDS. The observation pipes are shown in the typical trench detail. We added a turf box to detail.
4. Also we need to show the friction head loss for the union disconnect. This "coupling" is accounted for in the LPD Distribution System Calculations (highlighted on attached 11x17)
5. Please recalculate and make sure calculations are correct. Updated spreadsheets.
6. Please state the time dose setup for the pump tank . This number (6 doses at 125 gallon/dose) is shown in the Pump Chamber Volume Calculations (highlighted on the attached 11x17)

Lot #21

1. The pipe invert on your septic trench detail should be at 2 feet. We are recommending using 2 feet to obtain the most efficient design. Please make calculation adjustments needed. Revised pipe invert to 2 feet. Updated Trench Detail, LPD Calculations, Profile & Plan accordingly.
2. There is a 45 degree bend at the end of your trench. Please show the perforations at this point in the trench detail. We don't want the perforation to be covered by the connection of the two pipes.

Added a note to the typical trench detail "make sure holes in bends & fittings are not covered during assembly"

3. We need to add an observation pipe at the end of your trench. Please show in trench detail on OSDS. The observation pipes are shown in the typical trench detail. We added a turf box to detail.

4. Also we need to show the friction head loss for the union disconnect. This "coupling" is accounted for in the LPD Distribution System Calculations (highlighted on attached 11x17)

5. Please recalculate and make sure all calculations are correct. Updated spreadsheets.

6. Please state the time dose setup for the pump tank. This number (6 doses at 125 gallon/dose) is shown in the Pump Chamber Volume Calculations (highlighted on the attached 11x17)

Lot #22

1. The pipe invert on your septic trench detail should be at 2 feet. We are recommending using 2 feet to obtain the most efficient design. Please make any calculation adjustments needed. Revised pipe invert to 2 feet. Updated Trench Detail, LPD Calculations, Profile & Plan accordingly.

2. We need to add an observation pipe at the end of your trench. Please show in trench detail on OSDS. The observation pipes are shown in the typical trench detail. We added a turf box to detail.

3. Also we need to show the friction head loss for the union disconnect. This "coupling" is accounted for in the LPD Distribution System Calculations (highlighted on attached 11x17)

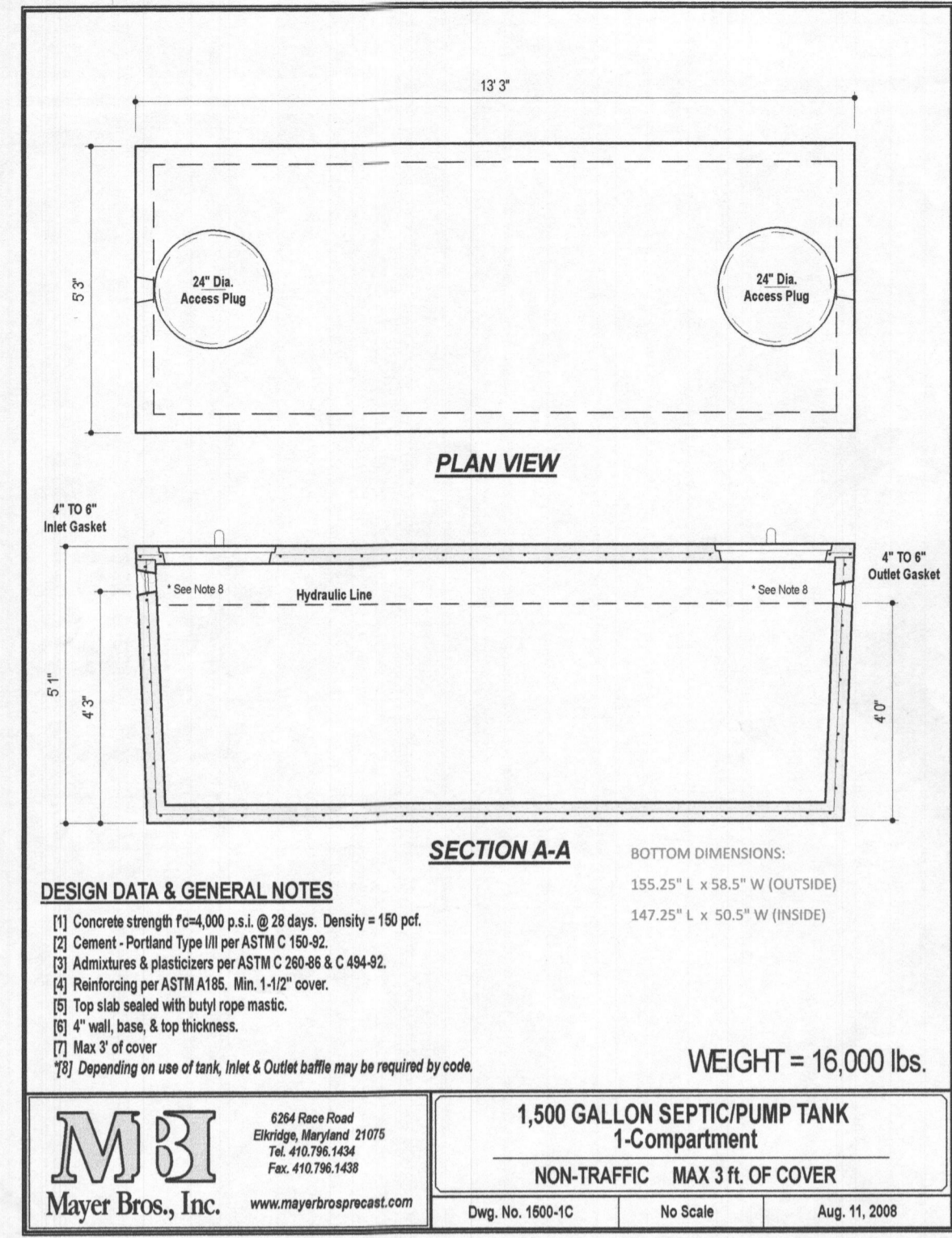
4. Please recalculate and make sure all calculations are correct in the low pressure distribution system calculations. Updated spreadsheets.

5. Please state the time dose setup for the pump tank. This number (6 doses at 125 gallon/dose) is shown in the Pump Chamber Volume Calculations (highlighted on the attached 11x17)

If you have any questions don't hesitate to email me.

Thanks

Dana



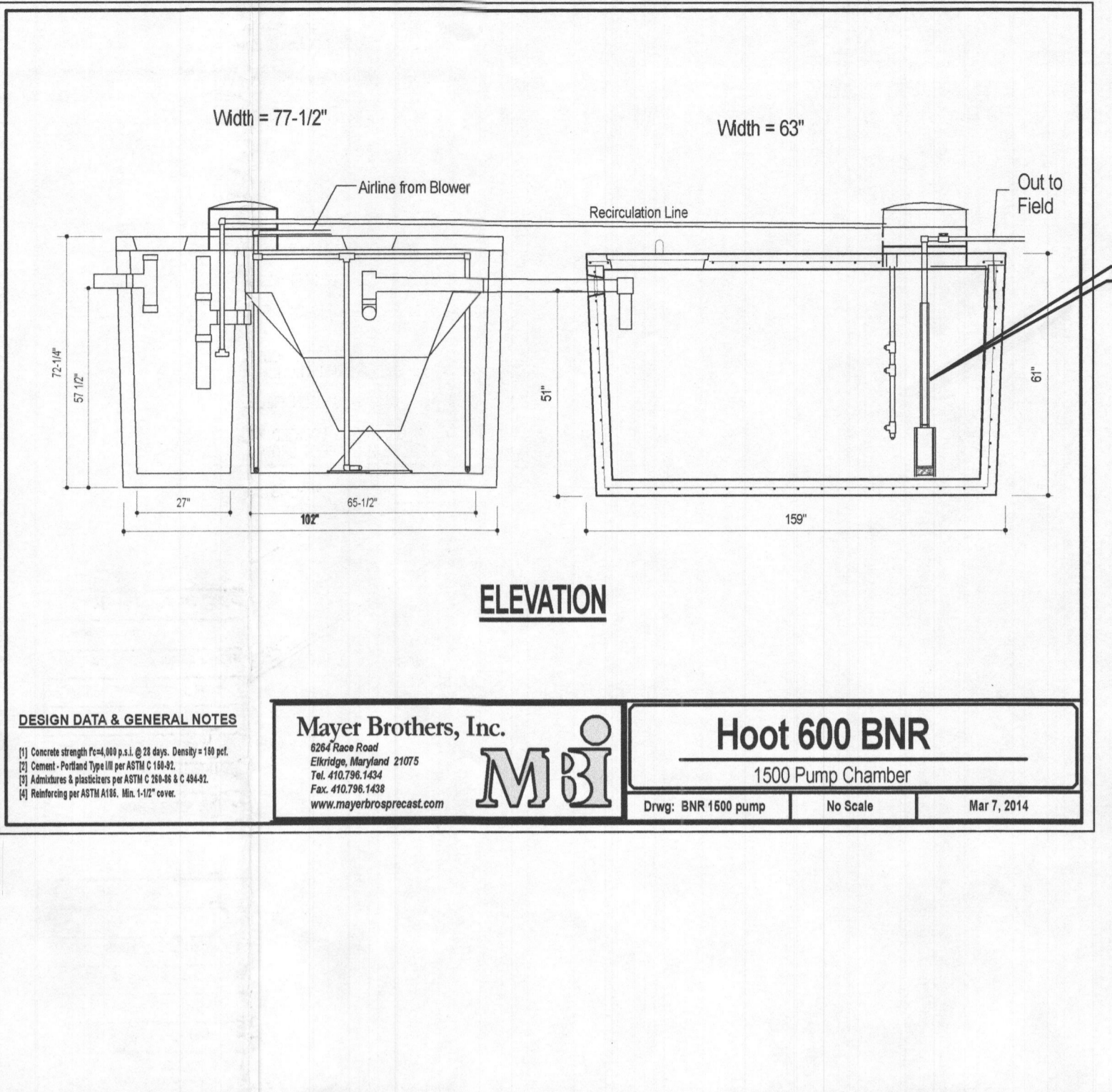
DESIGN DATA & GENERAL NOTES

- Concrete strength $f_{cm} = 4,000$ p.s.i. @ 28 days. Density = 150 p.c.
- Concrete - Portland Type III per ASTM C 150-02.
- Admixtures & plasticizers per ASTM C 209-08 & C 494-02.
- Reinforcing per ASTM A165. Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, base, & top thickness.
- Max 2" of cover.
- Depending on use of tank, Inlet & Outlet baffles may be required by code.

WEIGHT = 16,000 lbs.

1,500 GALLON SEPTIC/PUMP TANK
1-Compartment
NON-Traffic MAX 3 ft. OF COVER

Dep. No. 1600-1C No Scale Aug. 11, 2008



DESIGN DATA & GENERAL NOTES

- Concrete strength $f_{cm} = 4,000$ p.s.i. @ 28 days. Density = 150 p.c.
- Concrete - Portland Type III per ASTM C 150-02.
- Admixtures & plasticizers per ASTM C 209-08 & C 494-02.
- Reinforcing per ASTM A165. Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, base, & top thickness.
- Max 2" of cover.
- Depending on use of tank, Inlet & Outlet baffles may be required by code.

WEIGHT = 16,000 lbs.

1,500 GALLON SEPTIC/PUMP TANK
1-Compartment
NON-Traffic MAX 3 ft. OF COVER

Dep. No. 1600-1C No Scale Aug. 11, 2008

LPD PUMP TANK NO SCALE

PUMP CHAMBER FLOAT SWITCH INFORMATION:

- ALARM HIGH WATER LEVEL @ 25.0"
- PUMP-ON WATER LEVEL @ 21.75"
- PUMP-OFF @ 18.0"

NOTES:

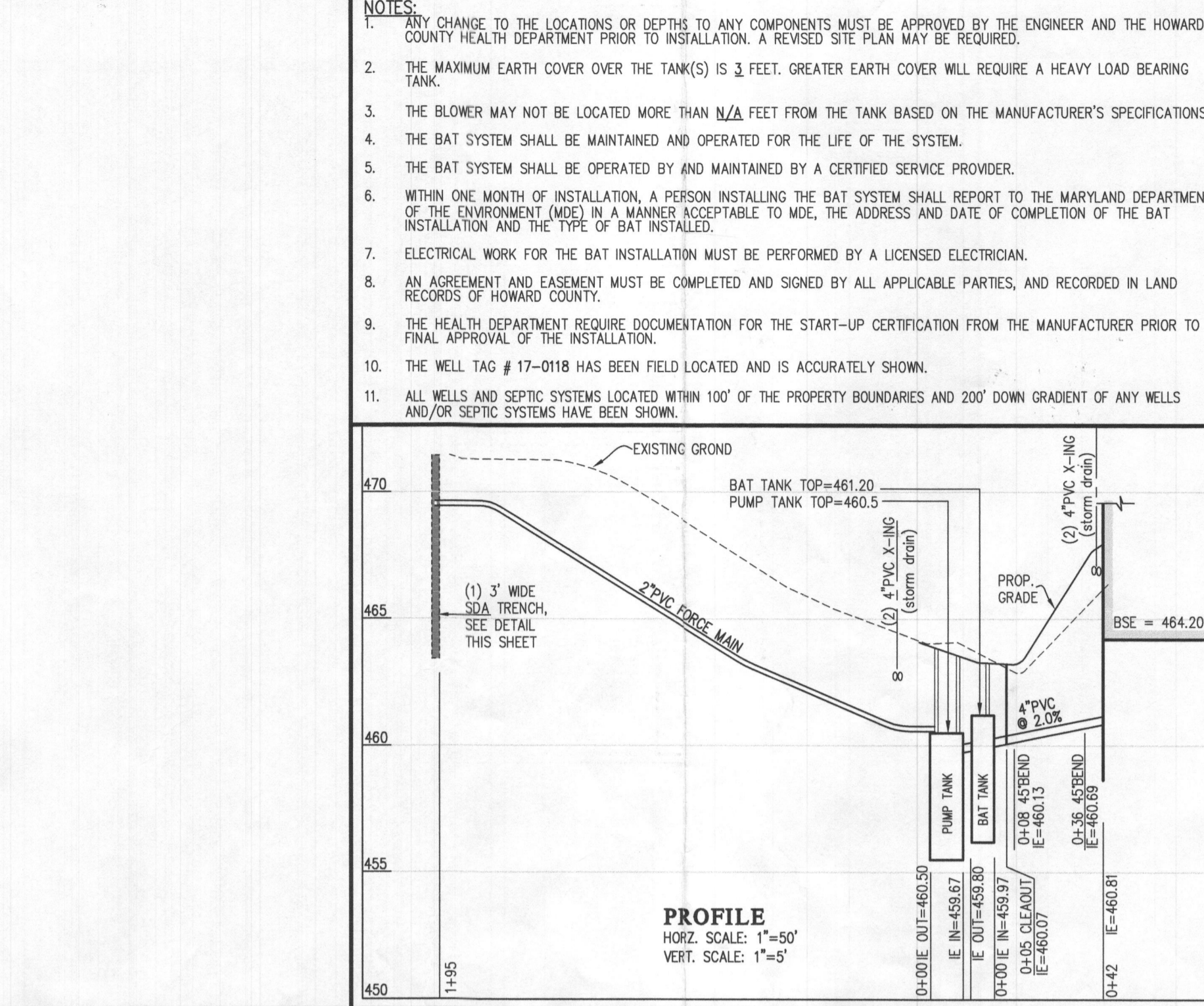
- SWITCH WATER LEVELS ARE MEASURED FROM THE BOTTOM OF THE TANK CHAMBER.
- TANK SHALL BE INSTALLED SO THAT THE BOTTOM OF THE CHAMBER IS ABSOLUTELY LEVEL.
- SWITCH LEVELS ARE CALCULATED FOR THE TANK CHAMBER DIMENSIONS SHOWN. IF A CHAMBER DIMENSION CHANGES, THEN THE SWITCH WATER LEVEL MUST BE RECALCULATED.
- PROVIDE A 1/4" SIPHON BREAKER HOLE @ THE TOP END OF THE DISCHARGE PIPE INSIDE THE TANK. IF THE INVERT OF THE LOWEST SDA LATERAL IS BELOW THE PUMP TANK INVERT, USE A UNION DISCONNECT TO FACILITATE PUMP REPLACEMENT.

Rectangular Trapezoidal Pump Chamber Volume Calculations (MBI 1500 Gal. Tank)

H: Height (inside dimension from bottom of chamber to top seam)	53.0 in.
W: Top Width (inside dimension)	55.0 in.
L: Top Length (inside dimension)	151.0 in.
a: Bottom Width (inside dimension)	50.5 in.
b: Bottom Length (inside dimension)	147.25 in.
Chamber Bottom Area (a x b)	7436.1 sq. in.
Height from bottom of chamber to inlet level (Si)	47.0 in.
Chamber width at inlet level (Ci)	54.49 in.
Chamber length at inlet level (Di)	150.58 in.
Chamber Sectional Area at inlet level (Ci x Di)	8204.9 sq. in.
Chamber Volume at inlet level (Vi)	367461 cu. in. 1591 gal.

Float Switch Setting Parameters & Volume Calculations

Design Flow per day (min. reserved capacity to set alarm level)	750 gal.
Dosing frequency per day & volume per dose	6 doses at 125.0 gal./dose
Water level (Sa) to switch on alarm	25.00 in.
Chamber width at alarm level (Ca)	52.02 in.
Chamber length at alarm level (Da)	149.02 in.
Chamber Sectional Area at alarm level (Ca x Da)	7841.8 sq. in.
Water volume at alarm level (Va)	130958 cu. in. 826.7 gal.
Reserved capacity provided at alarm setting (Vi - Va)	178503 cu. in. 784.1 gal.
Back check reserved capacity: $(S_i - S_a) / (C_i \times D_i) + (C_i \times D_i) \times (D_i - D_a) \times C_a \times D_a$	276503 cu. in. 1215.1 gal.
Alarm High water level (from bottom of pump chamber)	25.00 in.
Pump on water level (O, from bottom of pump chamber)	21.75 in.
Chamber width at this level (Co)	52.35 in.
Chamber length at this level (Do)	148.79 in.
Chamber Sectional Area at this level (Co x Do)	7788.61 sq. in.
Water volume (Vo) to switch pump on:	165559 cu. in. 716.7 gal.
Pump off water level (F, from bottom of pump chamber)	18.00 in.
Chamber width at this level (Cf)	52.03 in.
Chamber length at this level (Df)	148.52 in.
Chamber Sectional Area at this level (Cf x Df)	7727.43 sq. in.
Water volume (Vf) to switch pump off:	136466 cu. in. 590.9 gal.
Volume between on-off switches: $(O - F) / (C_o \times D_o) \times (C_o \times D_o) \times (D_o - D_f) \times C_f \times D_f$	29093 cu. in. 125.9 gal.
Back Check dosing volume switch setting: $V_o - V_f$	29093 cu. in. 125.9 gal.



VICINITY MAP
SCALE: 1" = 2,000'

BENCHMARKS

34GC	ELEV. 482.873	N = 554,882.960	E = 1,314,248.688
34GD	ELEV. 465.288	N = 553,733.762	E = 1,313,736.594

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- FIRST FLOOR ELEVATION
- TOP OF FOUNDATION WALL
- BASEMENT SLAB ELEVATION
- FFE
- TOW
- BSE
- DW
- PRIVATE SEWAGE DISPOSAL AREA
- EXISTING WELL LOCATION
- INITIAL SYSTEM 3' WIDE TRENCH
- 1st REPLACEMENT SYSTEM TRENCH
- 2nd REPLACEMENT SYSTEM TRENCH
- PERCOLATION TEST HOLES (PASSED)
- PERCOLATION TEST HOLES (FAILED)

LOW PRESSURE DISTRIBUTION SYSTEM CALCULATIONS

Per MDE BASIC LPD DESIGN - Draft Version 1 - Date July 3, 2014

ADDRESS: 13825 Mill Creek Court
SUBDIVISION: Crawford (Mill Creek)
DATE: December 2018

LOT: 21

Design Flow: 750 gpd
Pump Off Elevation: 457.25
Inv. Out of Pump Tank: 460.50
Pump Bottom Elevation: 456.25

Number of Manifolds: 1

Type: Center Feed

Trench 1 Elev: 469.4 Length: 87.0
Trench Elev: Length: 87.0
Trench Elev: Length: 87.0

0' Elev. Range, Single Manifold OK
Manifold Length 0 ft Type: SCH 40
Hole Force Main Length 195.0 ft Type: SCH 40

Trench	Trench Length (ft)	Feed	Pipe Inv. Elev (ft)	Head (ft)	Hole Diam. (in)	Hole Flow Rate (gpm)	Hole Spacing (ft)	Number of Holes	Trench Flow Rate (gpm)	Lateral Length (ft)	Flow per ft Trench (gpm)	Gal. per ft Trench (in ³)	Lateral Diam. (in)	Type
1	87	Center	469.4	2.0	5/16	1.63	3.48	25	40.71	83.52	0.468	1.437	1.5	SCH 40

Min. System Discharge Rate: 40.7 gpm
Force Main Diam. 2.0 in Vel. 4.2 fps Friction Loss (Table 4.4) 2.712
Minimum Dose: 125.0 gal (Vol. in FM, Min. 5x Lot = 78.2 gal + 1/6 Design Flow = 750/6 = 125 gal)

Max./Min Flow Ratio (should be <1.10): 1.00 * Min. Per Figure 4.4

Calculate Total Design Head

1. Friction Loss in FM & Mh/fold:	5.4 ft		
Friction Loss from Fittings:	16 ft		
Eq. Length	No. Type	Eq. Length	
2. 90 Deg. Std El.	0	Gate Valve	1.3
0 45 Deg. Std El.	4.0	Globe Valve	55
1 90 Deg. Side Tee	10.0	Angle Valve	28
1 Run of Tee	2.0		
Friction Loss from Laterals:	1.5 ft		
2. Static Head:	12.15 ft		
3. Min. Distal (discharge) head	2 ft		
TDH =	21.5 ft		

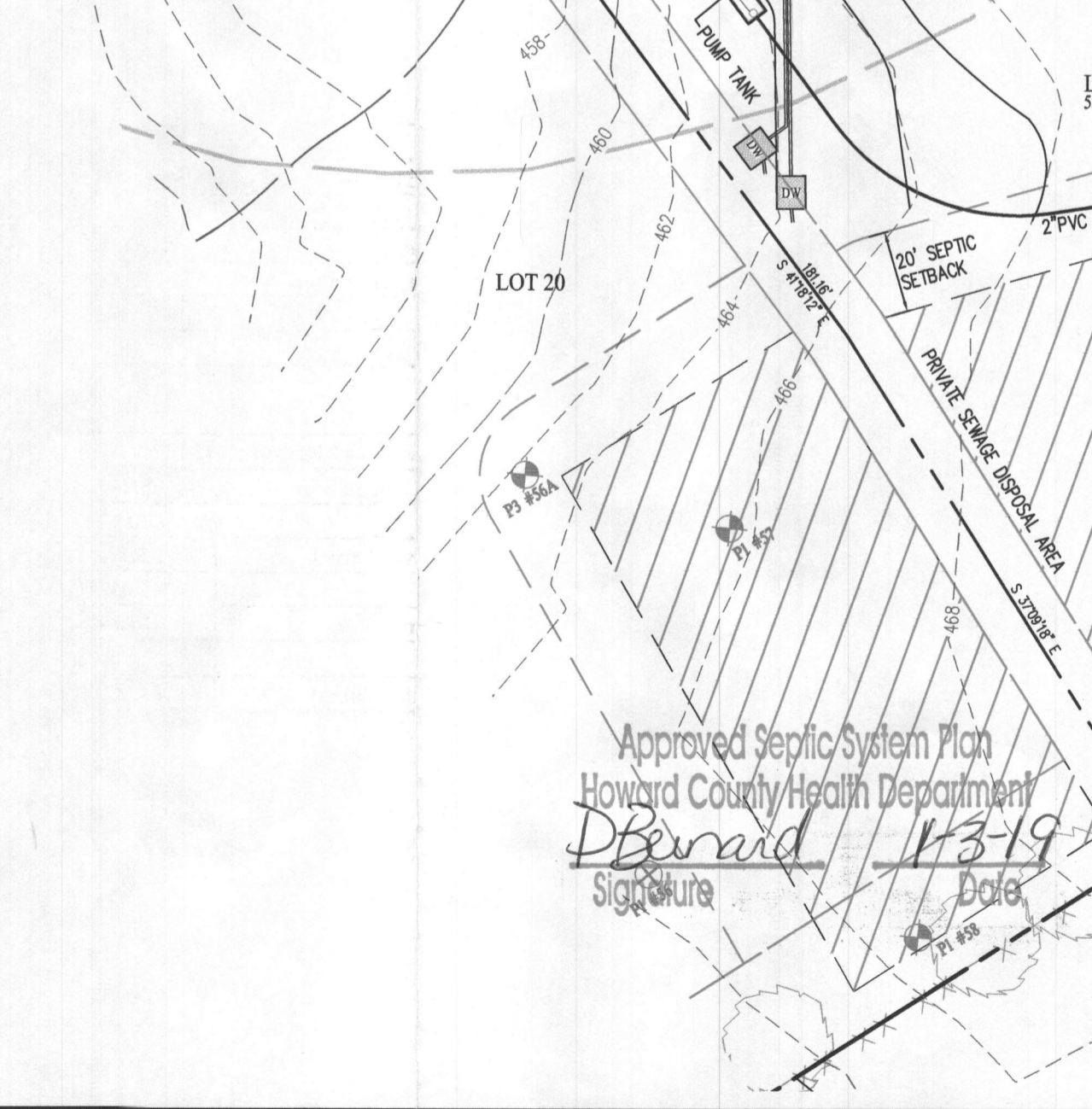
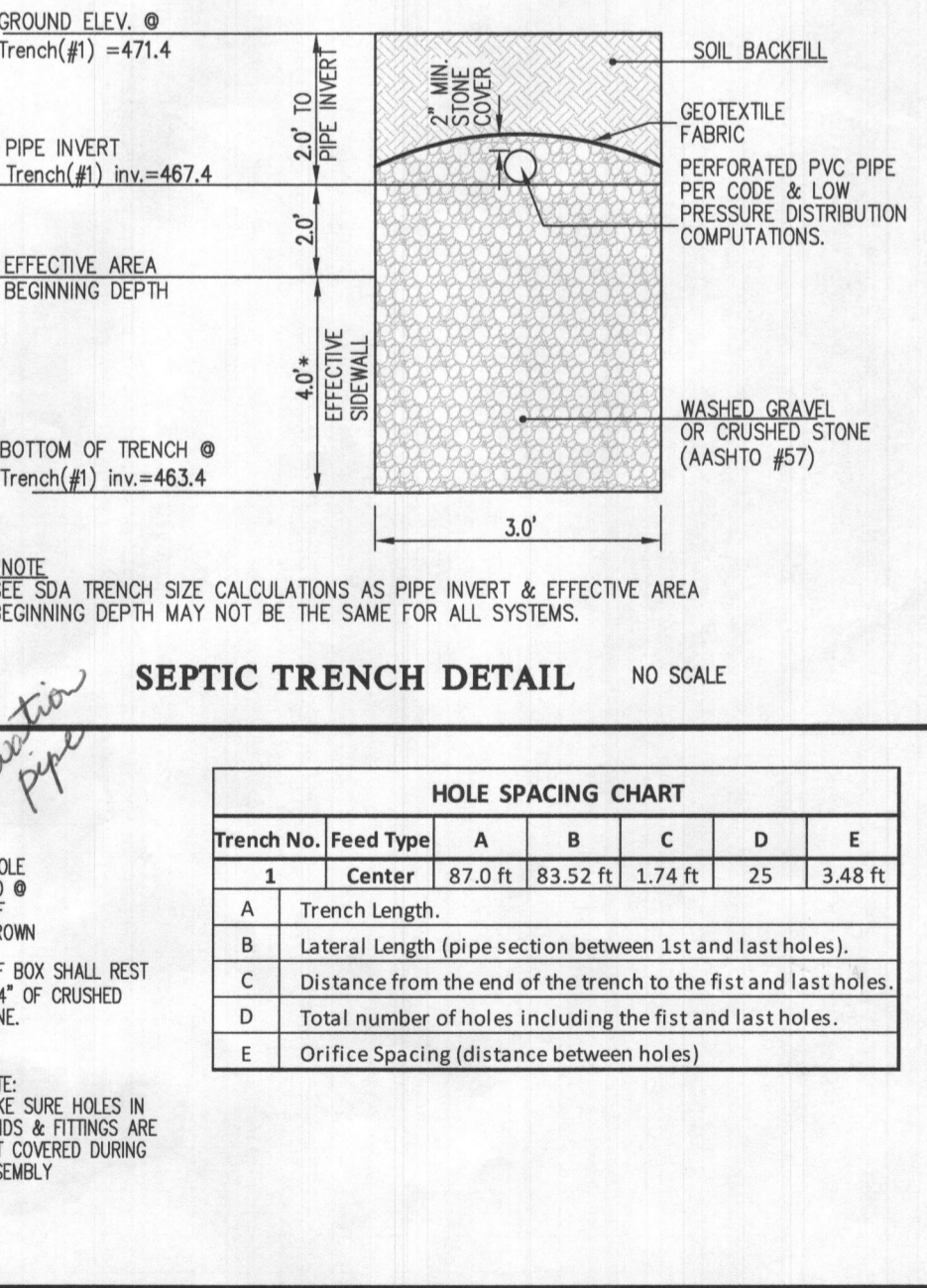
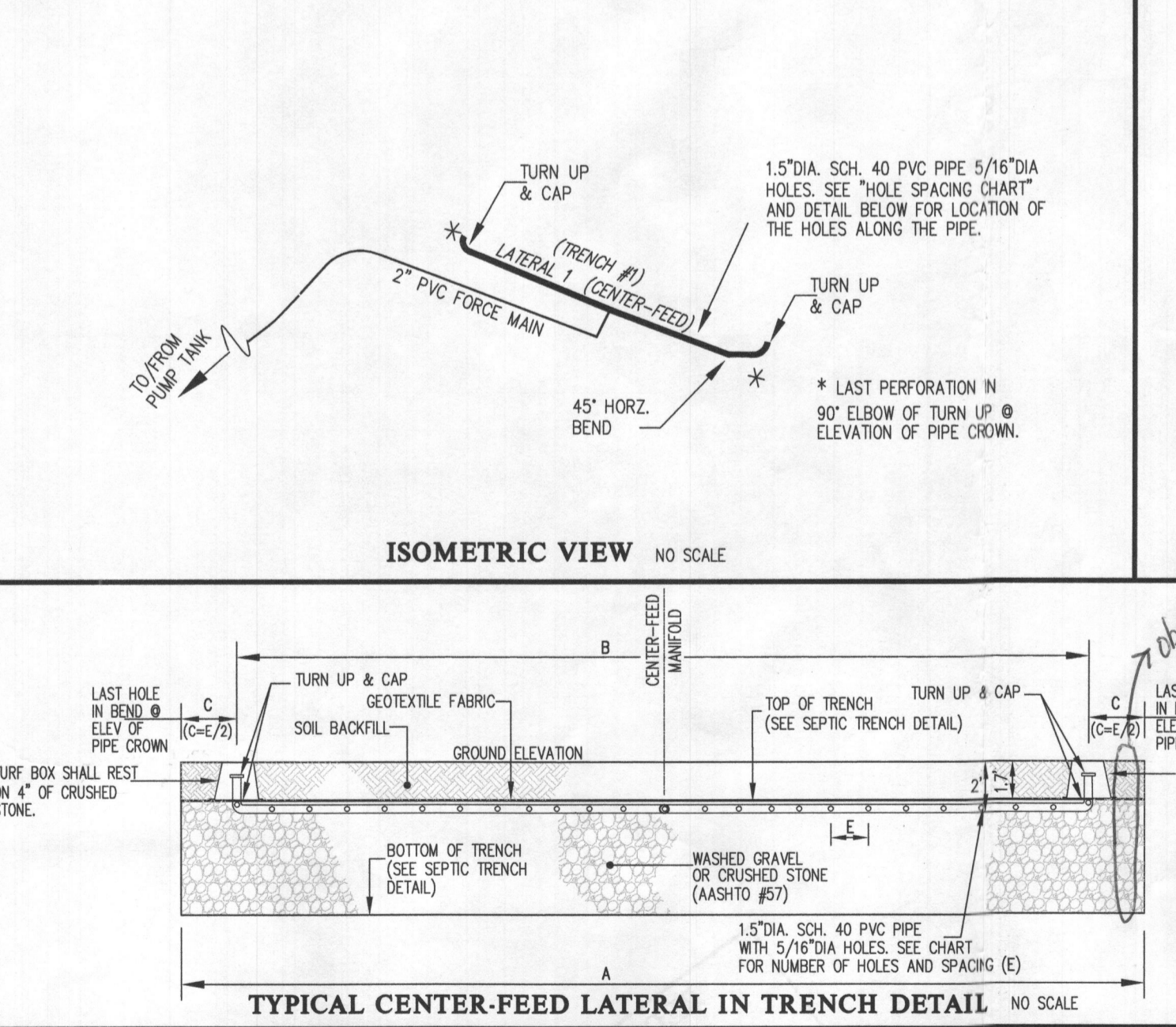
Note #1: The minimum dose is the greater value of either 1/6 the Design Flow or [5 x lateral volume] one volume the manifold + one volume of the force main.

Hoot 600 BNR BAT Tank Elevations - Lot 21

Top of tank high finished grade	463.40
Top of tank elevation	461.20
Delta (cover above tank, 3" max.)	2.20 ft.
Outside bottom of BAT tank elevation	455.18
Invert in	459.97
Invert out	459.80

MBI 1500 Gal. Pump Tank Elevations - Lot 21

Top of tank high finished grade	463.40
Top of tank elevation	460.50
Delta (cover above tank, 3" max.)	2.90 ft.
Outside bottom of tank	455.42
Bottom of chamber elevation	457.75
Invert in	459.67
Bottom of Pump (set on 6" block)	456.25



GLW
PLANNING | ENGINEERING | SURVEYING

3909 NATIONAL DRIVE | SUITE 250 | BURTONSVILLE, MD 20896 | GLWPA.COM
PHONE: 301-421-4024 | BAL: 410-880-1820 | DCVA: 301-899-2524 | FAX: 301-421-4186

DESIGNED BY: MBT
DRAWN BY: KLP
CHECKED BY: CKX

PREPARED FOR:

NVR INC.
9720 PATUXENT WOODS DRIVE
COLUMBIA, MARYLAND 21046
PH: 410-379-5956

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 19272.

EXPIRATION DATE: MAY 28, 2020

12/5/18

BAT INSTALLATION SITE PLAN

CRAWFORD SUBDIVISION
LOT 21 (13825 MILL CREEK COURT)
PLAT No. 24600-24607

SCALE: 1" = 40'

ZONING: RR-DEO

G. L. W. FILE NO. 17071

DATE: DEC. 2018

TAX MAP - GRID: 34&39-19&6

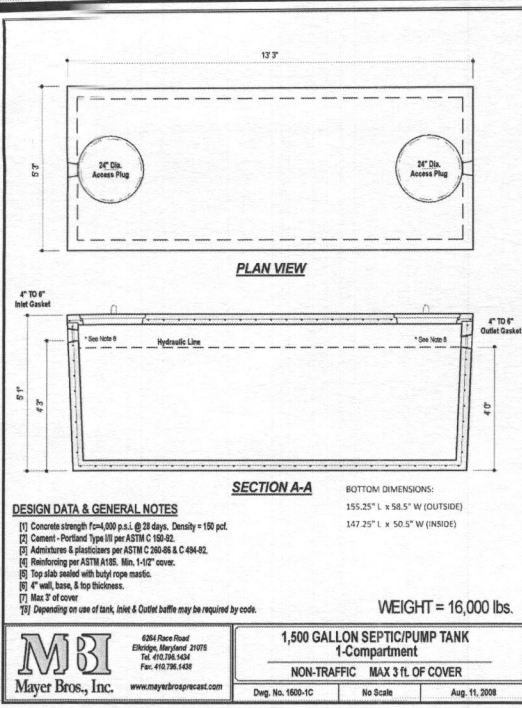
SHEET: 1 OF 1

ELECTION DISTRICT No. 5

HOWARD COUNTY, MARYLAND

GRAPHIC SCALE

0 20 40 80



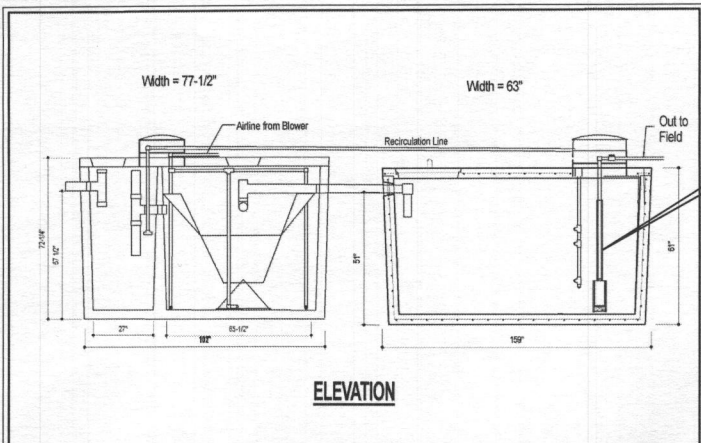
DESIGN DATA & GENERAL NOTES

- Concrete strength F_{ck} 4000 p.s.i. @ 28 days. Density = 150 p.c.f.
- Concrete - Portland Type III per ASTM C 150-92.
- Admixtures & plasticizers per ASTM C 260-99 & C 494-02.
- Reinforcing per ASTM A631. Size: 1/4" cover.
- Top slab shall be reinforced with 1/4" rebar.
- 4" wall, base, & top thickness.
- Max 2' of cover.
- Depending on use of tank, inlet & outlet baffles may be required by code.

WEIGHT = 16,000 lbs.

1,500 GALLON SEPTIC PUMP TANK
1-Compartment
NON-Traffic MAX 3 ft. OF COVER

Mayer Bros., Inc. 4264 Rice Road, Elkhart, Maryland 20753
Tel: 410.736.1424 Fax: 410.736.1428



Rectangular Trapezoidal Pump Chamber Volume Calculations (MBI 1500 Gal. Tank)

H: Height (inside dimension from bottom of chamber to top seam) 55.0 in.
W: Top Width (inside dimension) 151.0 in.
L: Top Length (inside dimension) 50.5 in.
a: Bottom Width (inside dimension) 147.25 in.
b: Bottom Length (inside dimension) 147.25 in.
Chamber Bottom Area (a x b) 7436.1 sq. in.
Height from bottom of chamber to inlet level (S1) 54.49 in.
Chamber length at inlet level (D1) 150.58 in.
Chamber Sectional Area at inlet level (C1 x D1) 8204.9 sq. in.
Chamber Volume at inlet level (V1) 867461 cu. in. 1591 gal.

Float Switch Setting Parameters & Volume Calculations

Design Flow per day (min. reserved capacity to set alarm level) 6 doses at 125.0 gal./dose
Dosing frequency per day & volume per dose 25.00 in.
Water level (S2) to switch on alarm 52.62 in.
Chamber width at alarm level (Ca) 149.02 in.
Chamber length at alarm level (Da) 784.8 sq. in.
Chamber Sectional Area at alarm level (Ca x Da) 190958 cu. in. 826.7 gal.
Water volume at alarm level (Va) 176503 cu. in. 764.1 gal.
Reserved Capacity provided at alarm setting (V1-Va) 176503 cu. in. 764.1 gal.
Back check reserved capacity: ((S1-S2)/C1)*D1*(C1+Ca)*(D1+Da)+Ca*Da

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LPD PUMP TANK NO SCALE

PUMP CHAMBER FLOAT SWITCH INFORMATION:

- ALARM HIGH WATER LEVEL @ 25.0"
- PUMP-ON WATER LEVEL @ 21.75"
- PUMP-OFF @ 18.0"

NOTES:

- SWITCH WATER LEVELS ARE MEASURED FROM THE BOTTOM OF THE TANK CHAMBER.
- TANK SHALL BE INSTALLED SO THAT THE BOTTOM OF THE CHAMBER IS ABSOLUTELY LEVEL.
- SWITCH LEVELS ARE CALCULATED FOR THE TANK CHAMBER DIMENSIONS SHOWN. IF A CHAMBER DIMENSION CHANGES, THEN THE SWITCH WATER LEVEL MUST BE RECALCULATED.
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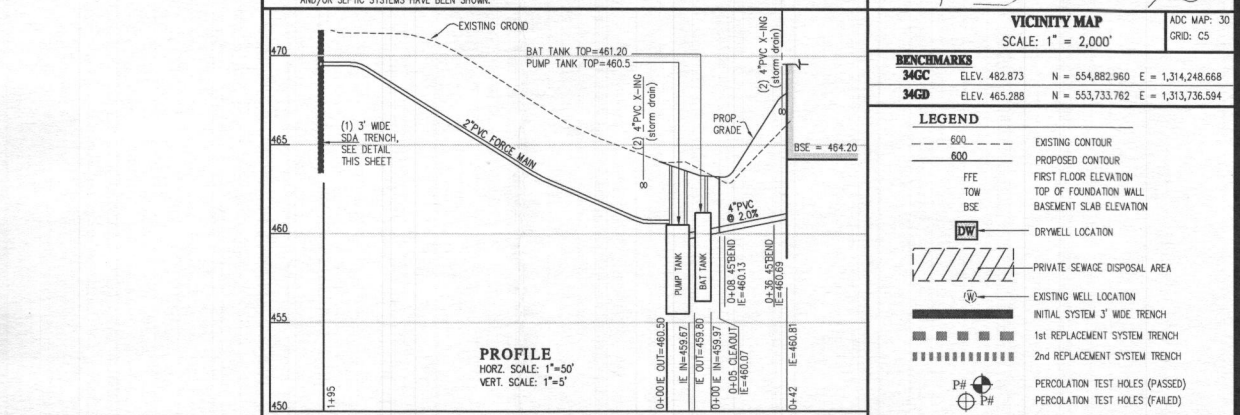
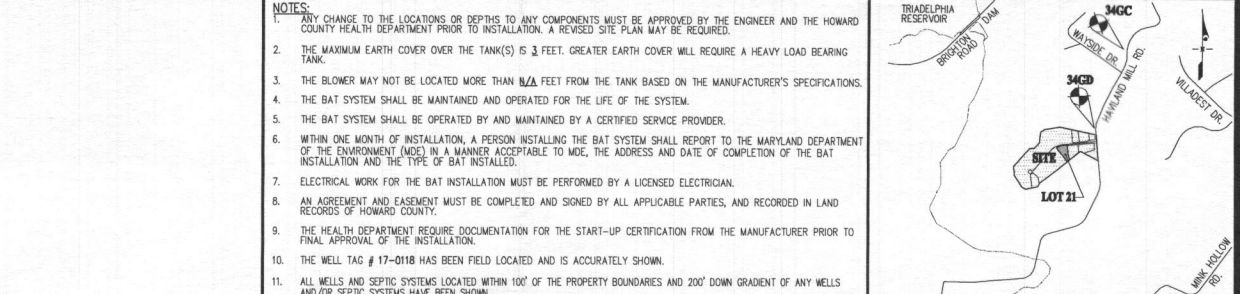
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LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- FIRST FLOOR ELEVATION
- TOP OF FOUNDATION WALL
- BASEMENT SLAB ELEVATION
- DRYWELL LOCATION
- PRIVATE SEWAGE DISPOSAL AREA
- EXISTING WELL LOCATION
- INITIAL SYSTEM 3' WIDE TRENCH
- 1st REPLACEMENT SYSTEM TRENCH
- 2nd REPLACEMENT SYSTEM TRENCH
- PERCOLATION TEST HOLES (PASSED)
- PERCOLATION TEST HOLES (FAILED)

PROFILE
HORIZ. SCALE: 1"=50'
VERT. SCALE: 1"=5'

NOTES:

- ANY CHANGE TO THE LOCATIONS OR DEPTHS TO ANY COMPONENTS MUST BE APPROVED BY THE ENGINEER AND THE HOWARD COUNTY HEALTH DEPARTMENT PRIOR TO INSTALLATION. A REVISED SITE PLAN MAY BE REQUIRED.
- THE MAXIMUM EARTH COVER OVER THE TANK(S) IS 3 FEET. GREATER EARTH COVER WILL REQUIRE A HEAVY LOAD BEARING TANK.
- THE BLOWER MAY NOT BE LOCATED MORE THAN 1/4 FEET FROM THE TANK BASED ON THE MANUFACTURER'S SPECIFICATIONS.
- THE BAT SYSTEM SHALL BE MAINTAINED AND OPERATED FOR THE LIFE OF THE SYSTEM.
- THE BAT SYSTEM SHALL BE OPERATED BY AND MAINTAINED BY A CERTIFIED SERVICE PROVIDER.
- WITHIN ONE MONTH OF INSTALLATION, A PERSON INSTALLING THE BAT SYSTEM SHALL REPORT TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) IN A MANNER ACCEPTABLE TO MDE, THE ADDRESS AND DATE OF COMPLETION OF THE BAT INSTALLATION AND THE TYPE OF BAT INSTALLED.
- ELECTRICAL WORK FOR THE BAT INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
- AN AGREEMENT AND EASEMENT MUST BE COMPLETED AND SIGNED BY ALL APPLICABLE PARTIES, AND RECORDED IN LAND RECORDS OF HOWARD COUNTY.
- THE HEALTH DEPARTMENT REQUIRE DOCUMENTATION FOR THE START-UP CERTIFICATION FROM THE MANUFACTURER PRIOR TO FINAL APPROVAL OF THE INSTALLATION.
- THE WELL TAG # 17-0118 HAS BEEN FIELD LOCATED AND IS ACCURATELY SHOWN.
- ALL WELLS AND SEPTIC SYSTEMS LOCATED WITHIN 100' OF THE PROPERTY BOUNDARIES AND 200' DOWN GRADIENT OF ANY WELLS AND/OR SEPTIC SYSTEMS HAVE BEEN SHOWN.

LOW PRESSURE DISTRIBUTION SYSTEM CALCULATIONS

Per MDE BASIC LPD DESIGN, Orig. Version 1, Date July 8, 2014

ADDRESS: 13825 Mill Creek Court
SUBDIVISION: Crawford (Mill Creek)
DATE: December 2018

DESIGN DATA & GENERAL NOTES

Design Flow: 750 gpd
Pump Off Elevation: 457.25
Inv. Out of Pump Tank: 460.50
Pump Bottom Elevation: 456.25

Number of Manifolds:

Type: Center Feed

Trench 1 Elev: 469.4 Length: 87.0
Trench 2 Elev: Length: 87.0
Trench 3 Elev: Length: 87.0

0' Elev. Range, Single Manifold OK

Manifold Length: SCH 40
Hole Force Main Length: 195.0 ft Type: SCH 40

Min. System Discharge Rate: 40.7 gpm
Force Main Diam. 2.0 in Vel. 4.2 fps Friction Loss (Table 4.4) 2.732
Minimum Dose: 125.0 gal (Vol. in FM, Min. 5x Lat. = 78.2 gal < 1/3 Design Flow = 750/6 = 125 gal)

Calculate Total Design Head

1. Friction Loss in FM & Manifold: 5.4 ft
Friction Loss from Fittings: 3.5 ft X 2.712 = 9.4 ft
2. 90 Deg. Std Ell: 0.7 ft
3. 45 Deg. Std Ell: 4.0 ft
4. 90 Deg. Side Tee: 10.0 ft
Run of Tee: 2.0 ft
Friction Loss from Laterals: 1.5 ft
2. Static Head: 12.15 ft
3. Min. Distal (discharge) head: 2 ft
TDH: 21.5 ft

HOLE SPACING CHART

Trench No.	Feed Type	A	B	C	D	E
1	Center	87.0 ft	83.52 ft	1.74 ft	25	3.48 ft
A	Trench Length					
B	Lateral Length (pipe section between 1st and last holes)					
C	Distance from the end of the trench to the first and last holes.					
D	Total number of holes including the first and last holes.					
E	Orifice Spacing (distance between holes)					

SEPTIC TRENCH DETAIL

GROUND ELEV. @ Trench (#) = 471.4
PIPE INVERT Trench (#) = 467.4
EFFECTIVE AREA BEGINNING DEPTH
BOTTOM OF TRENCH @ Trench (#) = 463.4

ISOMETRIC VIEW

TURN UP & CAP
LATERAL 1 (CENTER-FEED)
45' HORIZ. BEND
1.5" DIA. SCH. 40 PVC PIPE 5/16" DIA. HOLES. SEE "HOLE SPACING CHART" AND DETAIL BELOW FOR LOCATION OF THE HOLES ALONG THE PIPE.
LAST PERFORMANCE IN 90° ELBOW OF TURN UP @ ELEVATION OF PIPE CROWN.

TYPICAL CENTER-FEED LATERAL IN TRENCH DETAIL

TURN UP & CAP
SOIL BACKFILL
TOP OF TRENCH TURN UP & CAP (SEE SEPTIC TRENCH DETAIL)
BOTTOM OF TRENCH (SEE SEPTIC TRENCH DETAIL)
WASHED GRAVEL OR CRUSHED STONE (AASHTO #57)
1.5" DIA. SCH. 40 PVC PIPE WITH 5/16" DIA. HOLES. SEE CHART FOR NUMBER OF HOLES AND SPACING (K)

GRAPHIC SCALE

0 20 40 80

BAT INSTALLATION SITE PLAN

SCALE: 1"=40'

ZONING: RR-DEO

G. L. W. FILE No. 17071

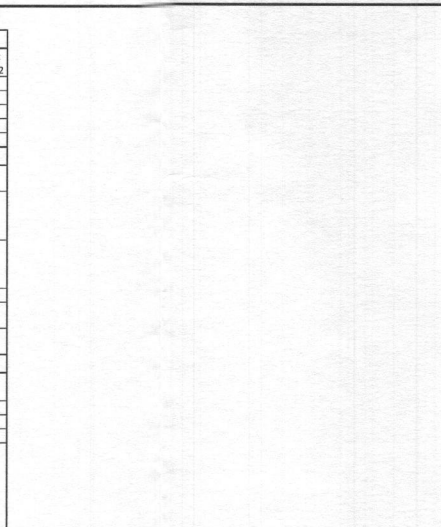
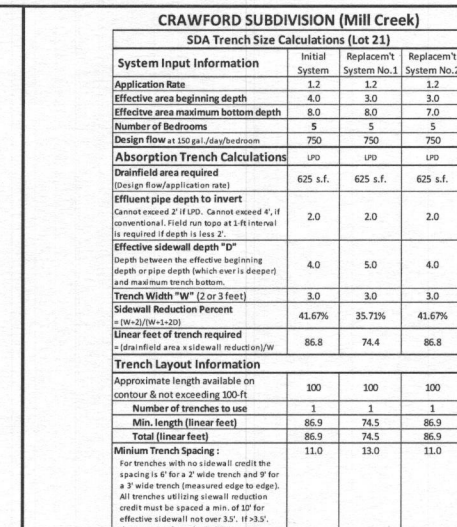
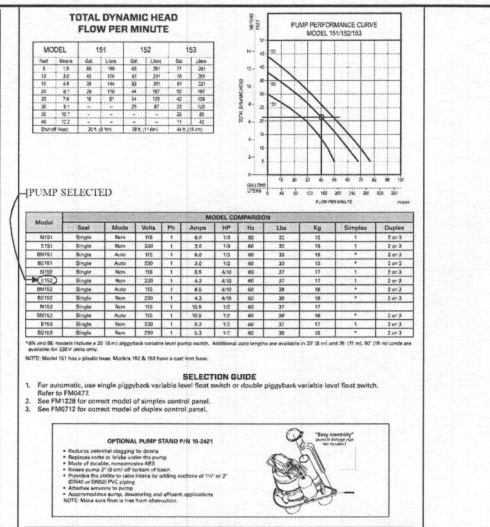
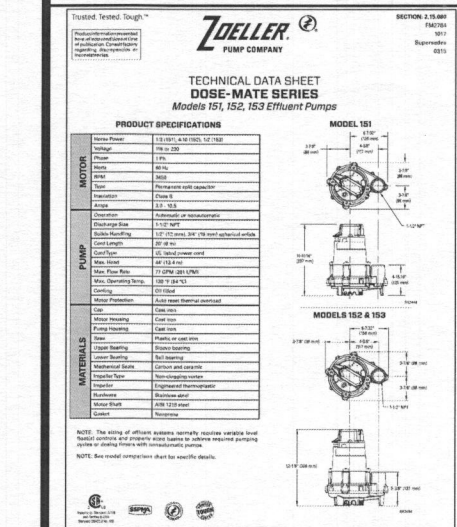
DATE: DEC. 2018

TAX MAP - GRID: 34&39-19&6

SHEET: 1 OF 1

ELECTION DISTRICT No. 5

HOWARD COUNTY, MARYLAND



DESIGNED BY: MBT

DRAWN BY: KLP

CHECKED BY: CIG

PREPARED FOR: NVR INC. 9720 PATUXENT WOODS DRIVE COLUMBIA, MARYLAND 21046 PH: 410-379-5956

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12875, EXPIRATION DATE: MAY 28, 2020.

GLW
PLANNING [ENGINEERING] SURVEYING

3909 NATIONAL DRIVE | SUITE 250 | BURTONSVILLE, MD 20886 | GLWPA.COM
PHONE: 301-421-4024 | BALT: 410-880-1820 | DC/VA: 301-889-2524 | FAX: 301-421-4188

DATE: _____

REVISION: _____

BY: _____

APPR: _____

SCALE: 1"=40'

ZONING: RR-DEO

G. L. W. FILE No.: 17071

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TAX MAP - GRID: 34&39-19&6

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