

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: 3-22-21 **ONSITE SEWAGE DISPOSAL SYSTEM** P 58806
 APPROVAL DATE: 5/25/21 **PERMIT: CONSTRUCTION** A _____
 PROPERTY ADDRESS: 18411 Hidden Creek Road
 SUBDIVISION: Windsor Forest Knolls LOT: _____ TAX ID: _____
 CONTRACTOR: Farm + Home Excavating EMAIL: _____
 CONTRACTOR ADDRESS: 901 Drive Road, Marriottsville, MD 21104 PHONE: 410-984-0189
 PROPERTY OWNER: Keystone Custom Homes EMAIL: _____
 OWNER ADDRESS: 227 Granite Run Drive, Lancaster PHONE: _____
 SEPTIC TANK SIZE (GALLONS): 2000 TANK MANUFACTURER: Mayor Bros
 PUMP MODEL: Zoeller PUMP SIZE: 0.3 PUMP TANK CAPACITY: 2000

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

TRENCHES:	LINEAR FEET REQUIRED: <u>174 LF</u>	INLET DEPTH: <u>2 FT</u>
	TRENCH WIDTH: <u>3 FT</u>	MAXIMUM BOTTOM DEPTH: <u>6 FT</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>10 FT</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>5 FT</u>
LOCATION:	PER APPROVED SITE PLAN. SEWAGE DISPOSAL AREA AND TANK LOCATIONS MUST BE STAKED BY LICENSED SURVEYOR PRIOR TO PRE-CONSTRUCTION INSPECTION.	
NOTES:	Install according to OSDS Plan	

ISSUED BY: _____ ISSUE DATE: 3-23-21 EXPIRATION DATE: 3-22-22

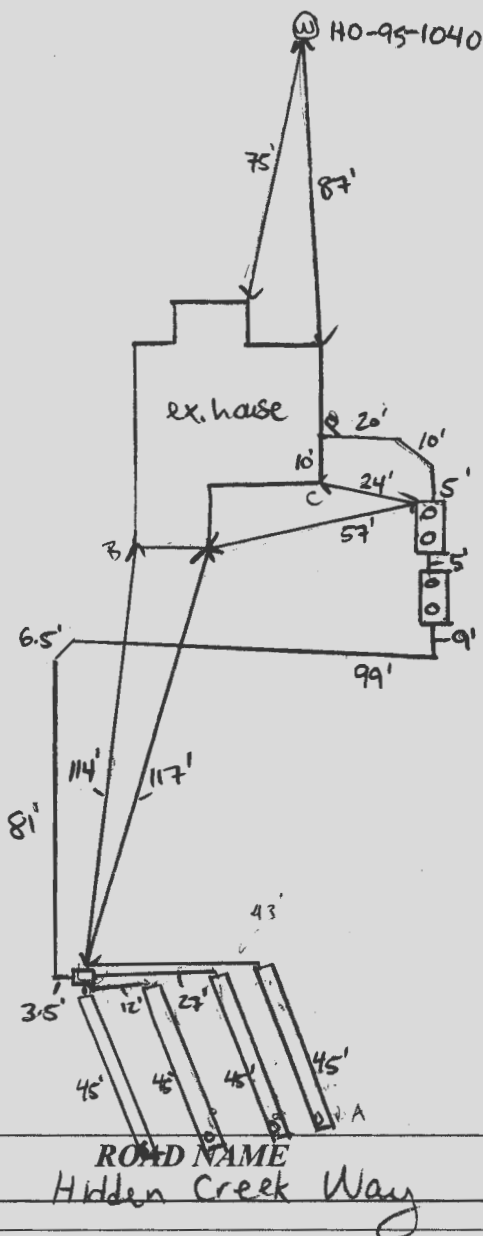
- NOTE: CONTRACTOR MUST SCHEDULE A PRE-CONSTRUCTION INSPECTION PRIOR TO BEGINNING ANY INSTALLATION
- NOTE: CONTRACTOR MUST SCHEDULE AN INSPECTION AND GAIN APPROVAL OF ALL COMPONENTS PRIOR TO COVERING
- NOTE: STONE MUST BE APPROVED BY HEALTH DEPARTMENT AND GRAVEL TICKET MUST BE AVAILABLE FOR REVIEW.
- 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 20005787
- 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.**

18411 Hidden Creek Way

279189279189

NOT TO SCALE 1" ≈ 50'



A-B 162'
A-C 165'

TRENCH/DRAINFIELD DATA

WIDTH	INLET	BOTTOM
3'	2'	6'
NUMBER OF TRENCHES		4'
TOTAL LENGTH		180 F
ABSORPTION AREA		SHOSE + SIDE WALL
DISTRIBUTION BOX LEVEL		PUMP
DISTRIBUTION BOX BAFFLE		YES
DISTRIBUTION BOX PORT		YES

PRE-CONSTRUCTION:

SEPTIC TANK DATA

SEPTIC TANK I LEVEL	7
MANUFACTURER	BABYLON
CAPACITY	2000 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	04/12/2021

PUMP/SEPTIC TANK LEVEL 7

MANUFACTURER	BABYLON
CAPACITY	2000 GAL
SEAM LOC	TOP
TANK LID DEPTH	3'
BAFFLES	-
BAFFLE FILTER	-
MANHOLE LOC	FRONT/BACK
6" PORT LOC	-
WATERTIGHT TEST	-
SLOTTED	-
DATE ON LID	12/14/2021

INSTALLATION: 05/21/2021 SHC AND TANKS SET. 05/24/2021 FM AND TWO UPPER TRENCH COMPLETE. 5/25/21 last two trenches complete. 05/28/2021 PUMP AND ALARM INSPECTION, FUNCTIONS. SEPTIC PUMP ON RIGHT BREAKER, SEPTIC ALARM ON LEFT BREAKER w/ "LIGHTS BASEMENT" (P)

FINAL INSPECTOR

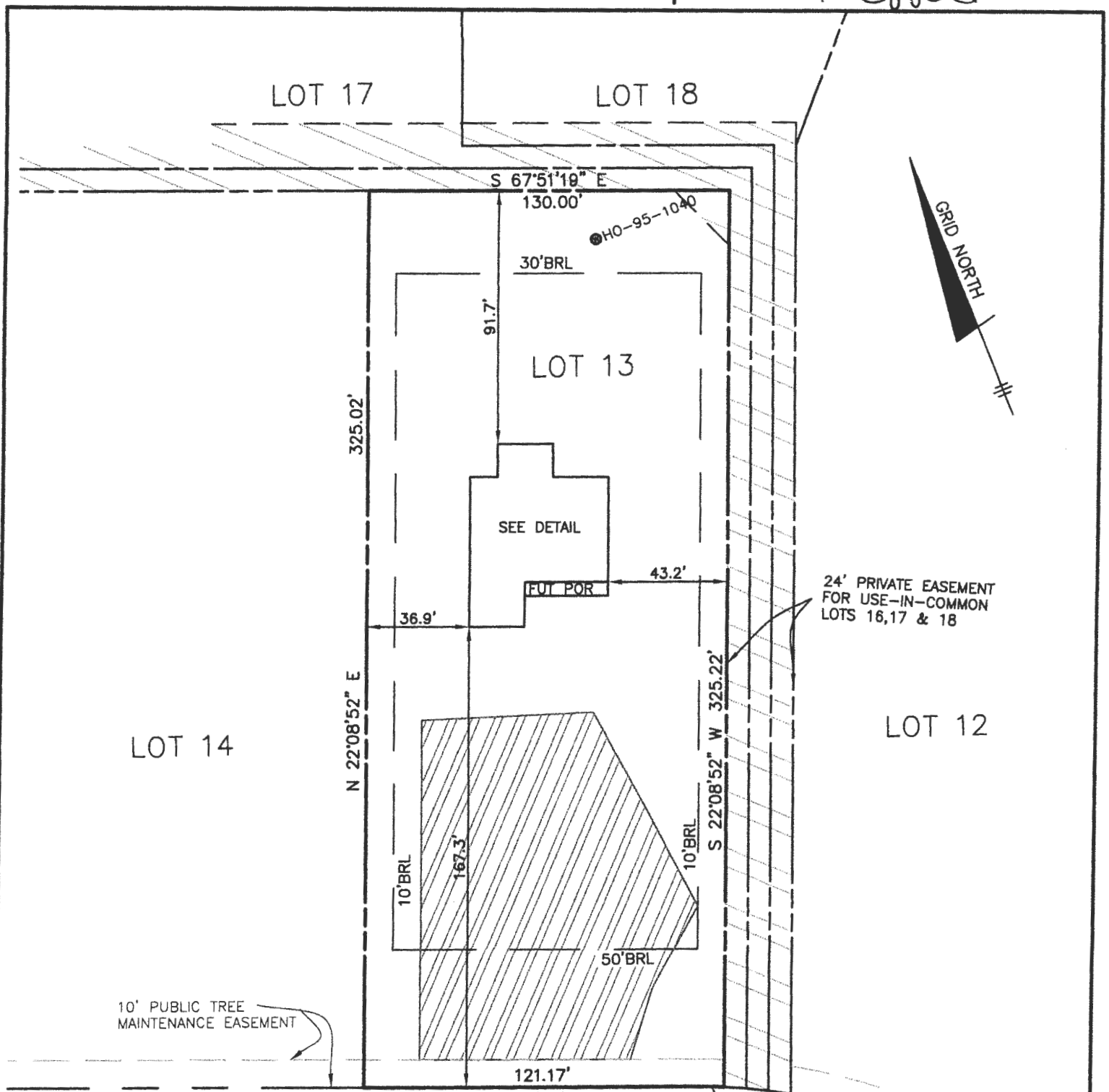
Susan Thomas

DATE OF APPROVAL

5/29/21

3-22-21

P568806



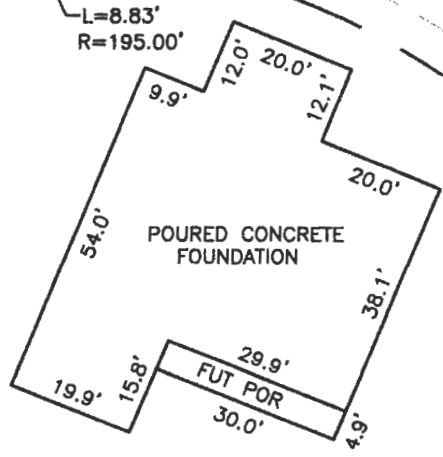
HIDDEN CREEK WAY
 (Public Access Place)
 (R/W 40')

TOP OF FOUNDATION WALL = 800.2'
 OFFSET DIMENSIONS TO PROPERTY LINES ARE ± 0.1'

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS, WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21320, EXPIRATION DATE 1-7-2023 AND TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION AND BELIEF, THAT THE DIMENSIONS OF THE BUILDING WALLS SHOWN HEREON ARE CORRECT; THAT THEY ARE BASED ON A FIELD RUN SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. ON 01/19/2021.

Approved
 3/23/21 (S)

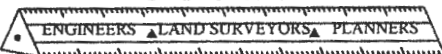


FOUNDATION DETAIL
 SCALE: 1" = 30'

Donald A. Mason
 DONALD A. MASON
 PROFESSIONAL LAND SURVEYOR
 MARYLAND REG. No. 21320

FEMA FIRM No. 24027C0010D
 ZONE: X
 DATED: 11/6/2013

BENCHMARK



ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 315
 ELLICOTT CITY, MARYLAND 21043
 (P) 410-485-6105 ▲ (F) 410-485-6644

WALL CHECK

WINDSOR FOREST KNOLLS
 LOTS 1 THRU 18
 PLAT No. 19396
 LOT No. 13

18411 HIDDEN CREEK WAY

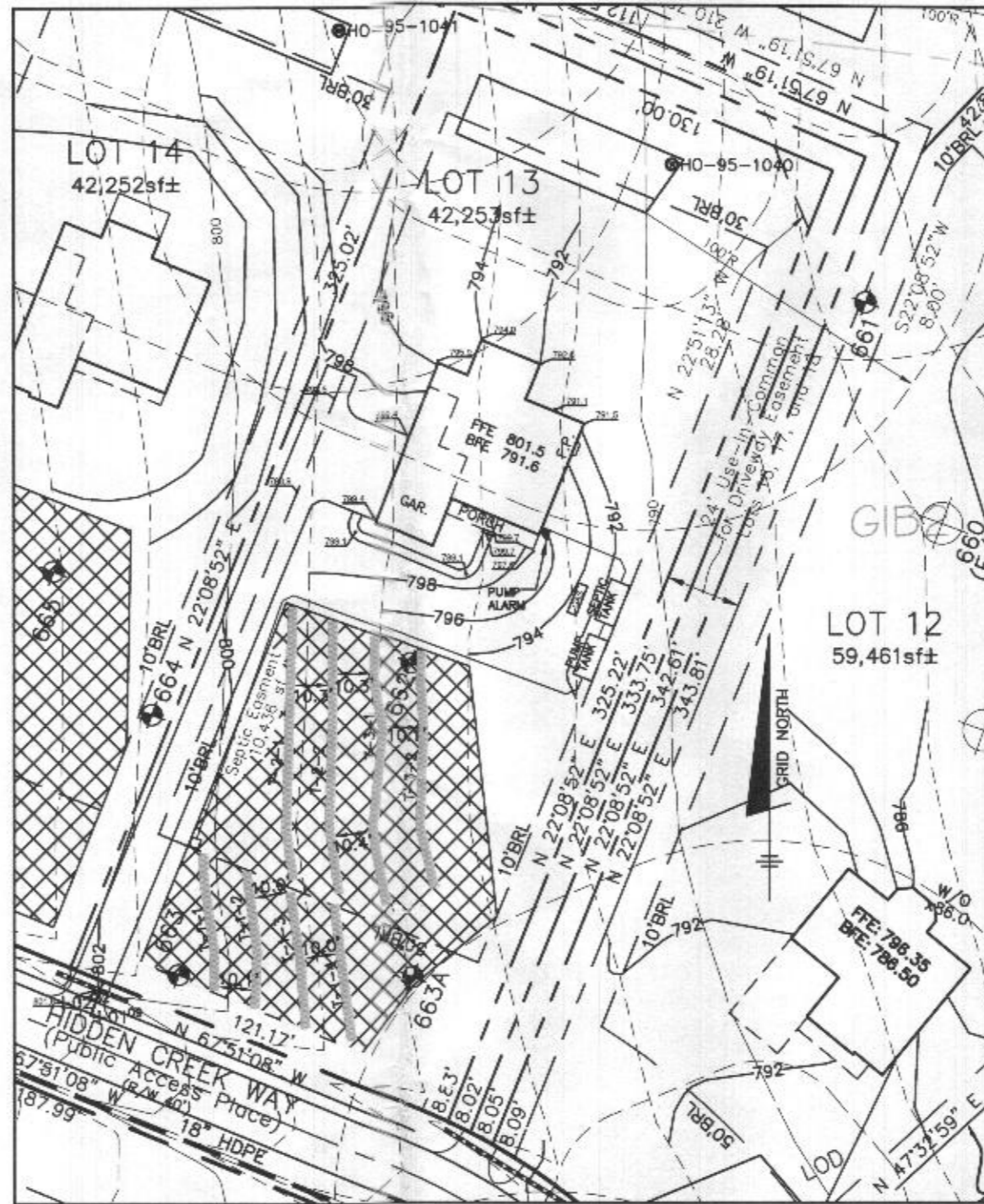
FIELD OBS. BY ML
 COMP. BY EWF
 DRAWN BY EWF
 SCALE: 1" = 50' DATE: 01/19/2021

GENERAL NOTES

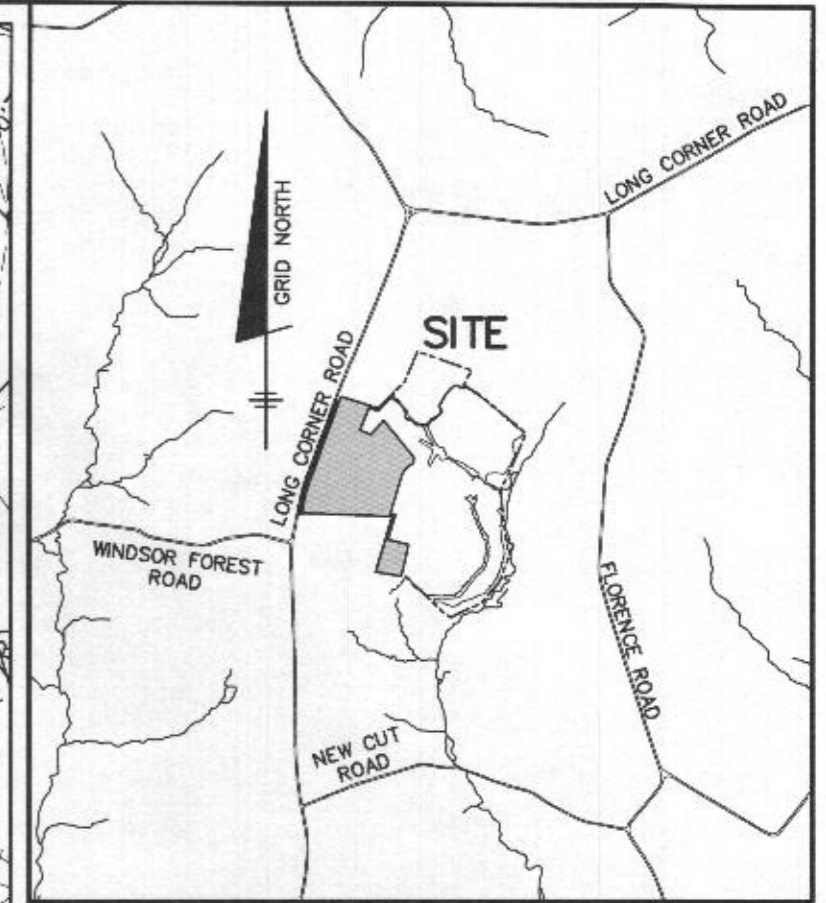
1. THE LOT SHOWN HEREON WAS RECORDED ON THE PLAT FOR WINDSOR FOREST KNOLLS, PLAT NUMBER 19395. REFER TO THE PLAT FOR LOT DIMENSIONS, LOT AREA, ALL EASEMENTS AND CONDITIONS.
2. THE EXISTING WELL SHOWN ON THIS PLAN (HO-95-1040) HAS BEEN FIELD LOCATED BY BENCHMARK ENGINEERING INC. JULY 2020 AND IS ACCURATELY SHOWN.
3. THERE ARE NO EXISTING WELLS OR SEPTIC SYSTEMS WITHIN 100' OF THIS PROJECT'S BOUNDARY EXCEPT AS NOTED.
4. TOPOGRAPHY SHOWN WAS BASED ON FIELD RUN TOPOGRAPHY BY C.B. MILLER & ASSOCIATES IN APRIL, 2002, AND WAS SUPPLEMENTED BY FIELD RUN TOPOGRAPHY BY BENCHMARK ENGINEERING, INC. JULY 2020.
5. SEDIMENT AND EROSION CONTROLS WILL BE SUBMITTED BY HOWARD SOILS CONSERVATION DISTRICT AS A CUSTOM GRADING PLAN.
6. ALL DRAINAGE AND STORMWATER MANAGEMENT FEATURES USED ON THIS SITE MUST COMPLY WITH THE APPROVED BUILDING PERMIT AND CUSTOM GRADING PLANS.
7. ANY CHANGES TO A PRIVATE SEWAGE DISPOSAL AREA OR WELL BOX SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
8. ANY CHANGES 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.
9. ANY ELECTRICAL WORK FOR THE INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
10. THE SEPTIC TANK WILL BE A 2000 GALLON TWO COMPARTMENT TANK. THE PUMP TANK WILL BE A 2000 GALLON ONE COMPARTMENT TANK.
11. THE MAXIMUM EARTH COVER OVER THE TANK IS 3 FEET. GREATER EARTH COVER WILL REQUIRE A HEAVY LOAD BEARING TANK.
12. ALL WELLS AND SEPTIC SYSTEMS LOCATED WITHIN 100' OF THE PROPERTY BOUNDARIES AND 200' DOWN GRADIENT OF ANY WELLS/OR SEPTIC SYSTEM HAVE BEEN SHOWN.

Approved Septic System Plan
Howard County Health Department

Mark Oswald 8/27/2020
Signature Date



PLAN VIEW
1" = 50'



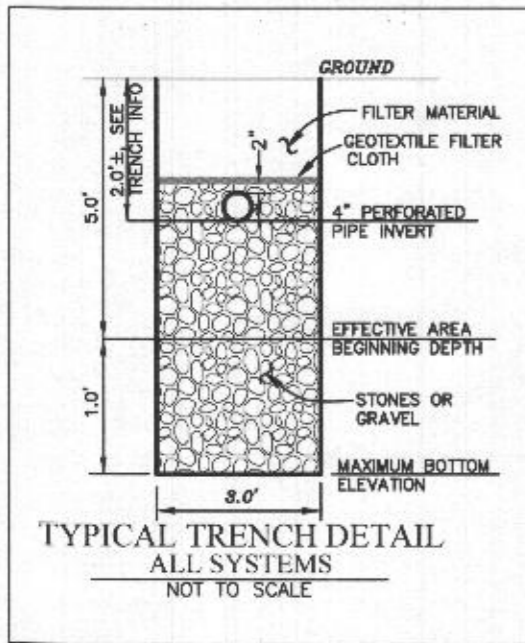
VICINITY MAP

SCALE: 1" = 2000'

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 28376, Expiration Date: 01-01-2021.



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LEGEND

- 400 PROPOSED CONTOURS
- 398 EXISTING CONTOURS
- 400 EXISTING CONTOURS
- EXISTING PRIVATE SEWAGE DISPOSAL AREA
- EXISTING WELL BOX
- SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- PERC TEST PASSED
- PERC TEST FAILED

OWNER/BUILDER:
KEYSTONE CUSTOM HOMES, INC.
227 GRANITE RUN DR.
SUITE 100
LANCASTER, PA 17601
717-464-9060

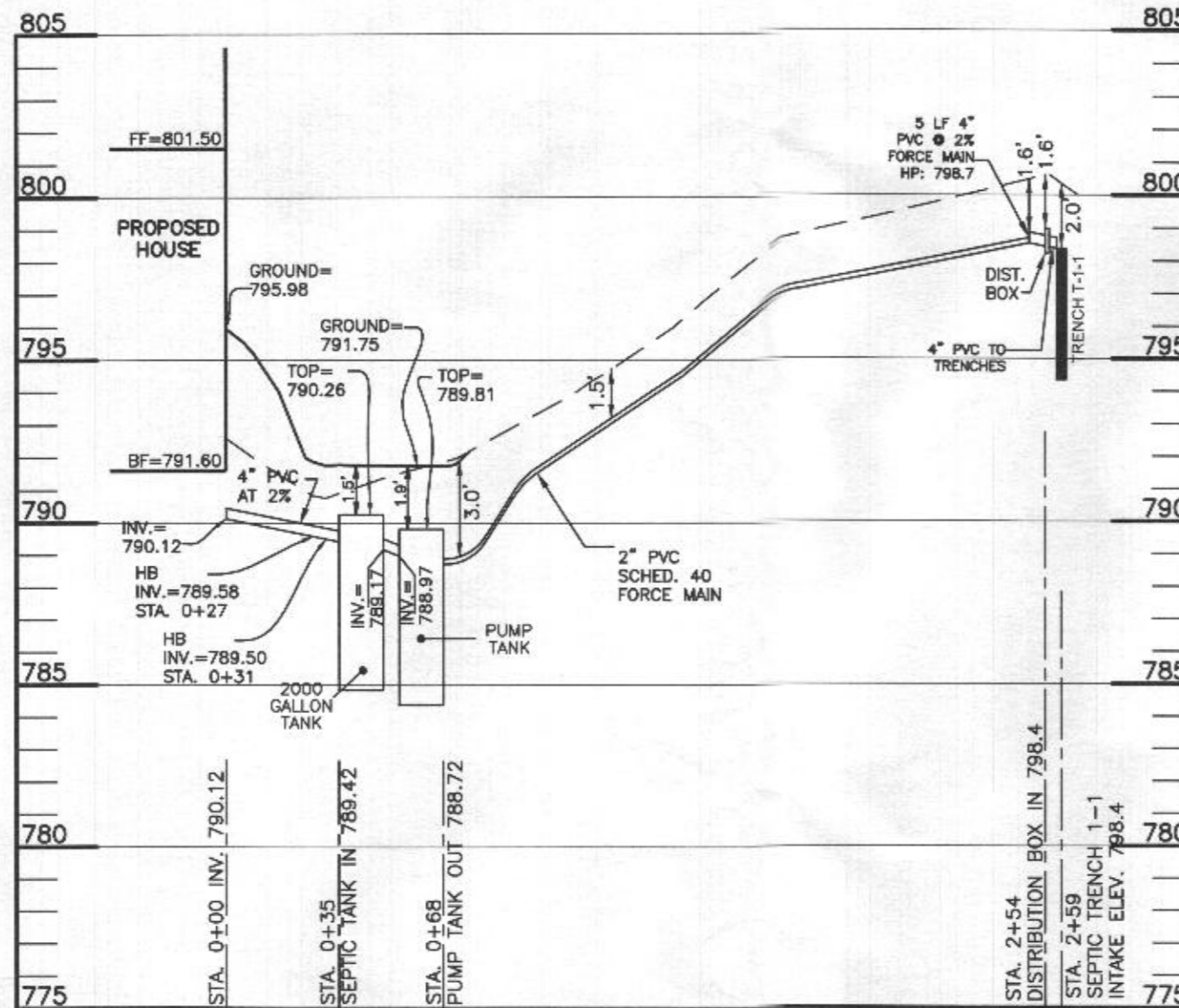
BENCHMARK
ENGINEERS • LAND SURVEYORS • PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE SUITE 315
ELLCOTT CITY, MARYLAND 21043
(P) 410-465-6105 • (F) 410-465-6644
WWW.BEI-CIVLENGINEERING.COM

PROJECT: WINDSOR FOREST KNOLLS	
LOT 13	
LOCATION:	TAX MAP: 10 - GRID: 24 - PARCEL: 225 18411 HIDDEN CREEK WAY - TAX ID: 04-373294 ELECTION DISTRICT NO. 6 - HOWARD COUNTY, MARYLAND
TITLE:	ONSITE SEWAGE DISPOSAL PLAN
HOUSE TYPE:	CUSTOM - KEYSTONE HOMES
DATE:	AUGUST, 2020
PROJECT NO.	2986
SCALE:	AS SHOWN
DRAWING	1 OF 4

INITIAL SYSTEM		
Number of Bedrooms	5	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	6.0	ft
Design Flow	750	gpd
Drainage Field square footage	625	sf
Sidewall Reduction Credit	0.83	
Trench width	3	ft
Effective Area Depth	1	ft
Trench Spacing	10	ft
Trench Length Required	174	lf

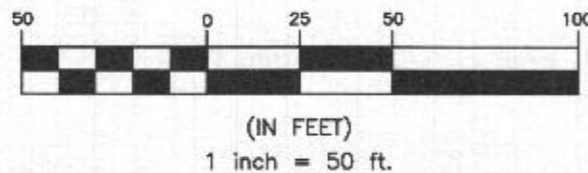
1ST REPLACEMENT SYSTEM		
Number of Bedrooms	5	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	6.0	ft
Design Flow	750	gpd
Drainage Field square footage	625	sf
Sidewall Reduction Credit	0.83	
Trench width	3	ft
Effective Area Depth	1	ft
Trench Spacing	10	ft
Trench Length Required	174	lf

2ND REPLACEMENT SYSTEM		
Number of Bedrooms	5	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	6.0	ft
Design Flow	750	gpd
Drainage Field square footage	625	sf
Sidewall Reduction Credit	0.83	
Trench width	3	ft
Effective Area Depth	1	ft
Trench Spacing	10	ft
Trench Length Required	174	lf



LOT 13 SEPTIC PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

SEPTIC INVERT CHART - Lot 13	
INV @ HOUSE	790.12
GROUND @ HOUSE	795.98
INV IN SEPTIC TANK	789.42
INV OUT SEPTIC TANK	789.17
TOP OF SEPTIC TANK	790.26
GROUND OVER SEPTIC TANK	791.76
INV IN PUMP TANK	788.97
INV OUT PUMP TANK	788.72
TOP OF PUMP TANK	789.81
GROUND OVER PUMP TANK	791.75
INV IN DIST BOX	798.40
INV OUT DIST BOX	798.30
GROUND AT DIST BOX	800.64



HEALTH DEPARTMENT SPEC SHEET INFORMATION - Lot 13

System	Application Rate	Effective Depth	Bottom Depth
1st System	1.2	5.0	6.0
2nd system	1.2	5.0	6.0
3rd System	1.2	5.0	6.0

OWNER/BUILDER:
KEYSTONE CUSTOM HOMES, INC.
227 GRANITE RUN DR.
SUITE 100
LANCASTER, PA 17601
717-464-9060

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WWW.BEI-CIVILENGINEERING.COM

TRENCH DESIGN - Lot 13					
INITIAL SYSTEM					
T-1-1	LENGTH	43.5 ft	T-1-2	LENGTH	43.5 ft
	GROUND ELEVATION	800.4		GROUND ELEVATION	799.3
	INVERT ELEVATION	798.4		INVERT ELEVATION	797.3
	MAX BOTTOM ELEVATION	794.4		MAX BOTTOM ELEVATION	793.3
T-1-3	LENGTH	43.5 ft	T-1-4	LENGTH	43.5 ft
	GROUND ELEVATION	798.3		GROUND ELEVATION	797.2
	INVERT ELEVATION	796.3		INVERT ELEVATION	795.2
	MAX BOTTOM ELEVATION	792.3		MAX BOTTOM ELEVATION	791.2
1ST REPLACEMENT SYSTEM					
T-2-1	LENGTH	86.9 ft	T-2-2	LENGTH	86.9 ft
	GROUND ELEVATION	798.2		GROUND ELEVATION	797.1
	INVERT ELEVATION	796.2		INVERT ELEVATION	795.1
	MAX BOTTOM ELEVATION	792.2		MAX BOTTOM ELEVATION	791.1
2ND REPLACEMENT SYSTEM					
T-3-1	LENGTH	86.9 ft	T-3-3	LENGTH	86.9 ft
	GROUND ELEVATION	796.1		GROUND ELEVATION	795.0
	INVERT ELEVATION	794.1		INVERT ELEVATION	793.0
	MAX BOTTOM ELEVATION	790.1		MAX BOTTOM ELEVATION	789.0

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 01-01-2021.



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PROJECT:	WINDSOR FOREST KNOLLS LOT 13		
LOCATION:	TAX MAP: 10 - GRID: 24 - PARCEL: 225 18411 HIDDEN CREEK WAY - TAX ID: 04-373294 ELECTION DISTRICT NO. 6 - HOWARD COUNTY, MARYLAND		
TITLE:	ONSITE SEWAGE DISPOSAL PLAN		
HOUSE TYPE:	CUSTOM - KEYSTONE HOMES		
DATE:	AUGUST, 2020	PROJECT NO.	2986
SCALE:	AS SHOWN	DRAWING	2 OF 4

Pumping Station

Diameter of Force Main and Manifold = 2" PVC SCH. 40
 Length of Force Main = 184 feet SCH.40 gallons/100 feet = 17.4 Table 4.2

Volume of Main = 32.0 gallons

Total Volume = 32.0 gallons

Minimum Dose must be greater than 1/5 of the design flow 125 gallons

Minimum Dose must be greater than the volume of the main 32 gallons

Use minimum dose of 140 gallons okay Doses per Day = 5,357/143

Size Pump Chamber

Pump chamber must be able to hold one dose and one days design flow

One day Capacity = 750 gallons
 Dose = 140 gallons
 Totals = 890 gallons

Use 2,000 gallon pump tank

Tank Dimensions:	Exterior	Interior	Walls:	Bottom:	Inlet:
Length:	13.75 feet	13.09 feet	0.33 feet	0.33 feet	4.58 feet
Width:	6.25 feet	5.58 feet	0.33 feet	0.33 feet	
Height:	5.42 feet	4.67 feet	0.42 feet	0.42 feet	
Area:		73.05 sq ft			
Volume:		340.89 cf			

Sizing the Pump

Flow: runtime = 7.000 minutes
 rate = 20.00 gallons/minute

Design Head:
 Design Head = Static Head + Friction Head
 Static Head = highest elevation of main - pump off elevation
 Highest component of system = 798.7 Main HP
 Pump off elevation = 786.65
 Static Head = 12.05 feet
 Friction Head = Head loss due to pipe friction
 2.0" pipe = 184 feet
 45° bends = 6 loss for bend 24 feet per table 4.3
 Gate Valve = 0 loss for tee 0 feet per table 4.3
 Friction loss per table 4.4 = 0.74 (ft/100 ft)
 Equivalent Length = 208 Friction loss 1.54 feet
 Total Friction Head = 1.54
 Design Head = 13.59 feet

Pump Requirements:

Performance = 20.00 gpm
 Head of Water = 13.59 feet of head

Pump Selection: Zoeller Pump Company, Model 371
 1/3 horse power

Pump Flow Rate = 23.30 gallons/minute per rating curve. Run time: 6.01 Minutes
 TDH analysis 14.08 ft
 Between design and curve? Yes

Design Pump Chamber

Ground over Tank = 791.75 Cover = 1.94 ft
 Top of Tank = 789.81
 Invert of Tank = 784.72
 8" Riser = 0.75 feet
 Pump Height = 1.01 feet

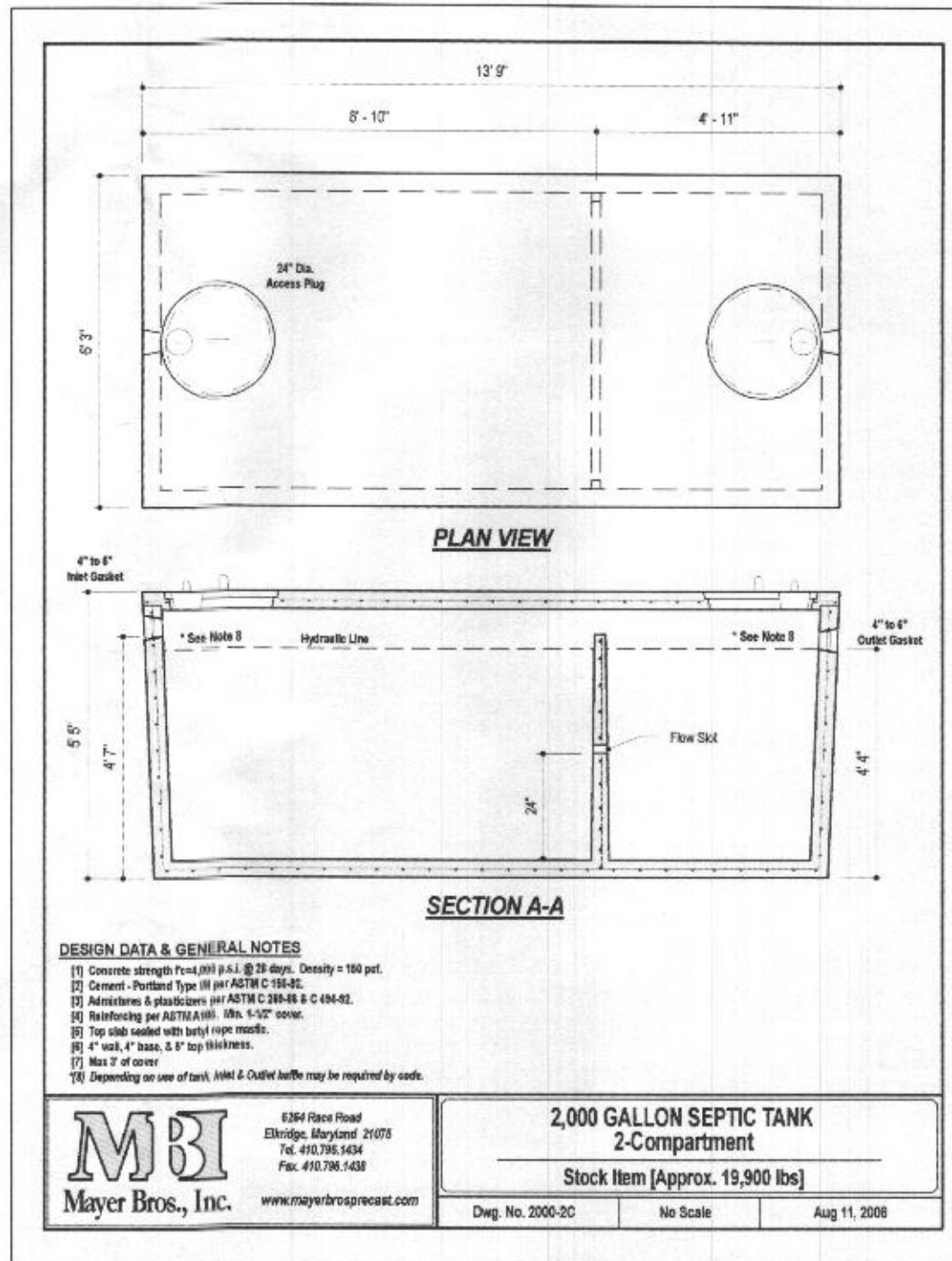
Min. Pump off = 786.48
 Selected Pump off = 786.65

Dose = 18.7 cf
 Area of Pit = 73.05 sq ft

Pump on dist = 0.26
 Pump on Elev = 706.91

Distance between Pump on and Highwater Alarm = 0.5 feet
 Highwater Alarm Elevation = 787.41

Dist. for day stored above alarm 1.37
 Minimum Inlet Elev. = 788.78
 Tank Inlet = 788.97 Okay
 Dist. Alarm to Inlet = 1.56 Okay



DESIGN DATA & GENERAL NOTES

- Concrete strength Fc=4,000 p.s.i. @ 28 days. Density = 150 pcf.
- Cement - Portland Type III per ASTM C 150-92.
- Admixtures & plasticizers per ASTM C 260-86 & C 494-92.
- Reinforcing per ASTM A 108, Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, 4" base, & 8" top thickness.
- Max 3" of cover
- Depending on use of tank, Inlet & Outlet baffles may be required by code.



6264 Race Road
 Elkridge, Maryland 21075
 Tel. 410.796.1434
 Fax. 410.796.1438
 www.mayerbrosprecast.com

**2,000 GALLON SEPTIC TANK
 2-Compartment**

Stock Item [Approx. 19,900 lbs]

Dwg. No. 2000-2C No Scale Aug 11, 2008

SEPTIC INVERT CHART - Lot 13	
INV @ HOUSE	790.12
GROUND @ HOUSE	795.98
INV IN SEPTIC TANK	789.42
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TOP OF PUMP TANK	789.81
GROUND OVER PUMP TANK	791.75
INV IN DIST BOX	798.40
INV OUT DIST BOX	798.30
GROUND AT DIST BOX	800.64

SIGNATURE AND SEAL ARE FOR SEPTIC PROFILE AND CALCULATIONS ONLY, TANK, PUMP AND DETAILS WERE NOT DESIGNED OR REVIEWED BY THE ENGINEER:

THIS PLAN IS FOR SEPTIC DESIGN ONLY

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 01-01-2021.



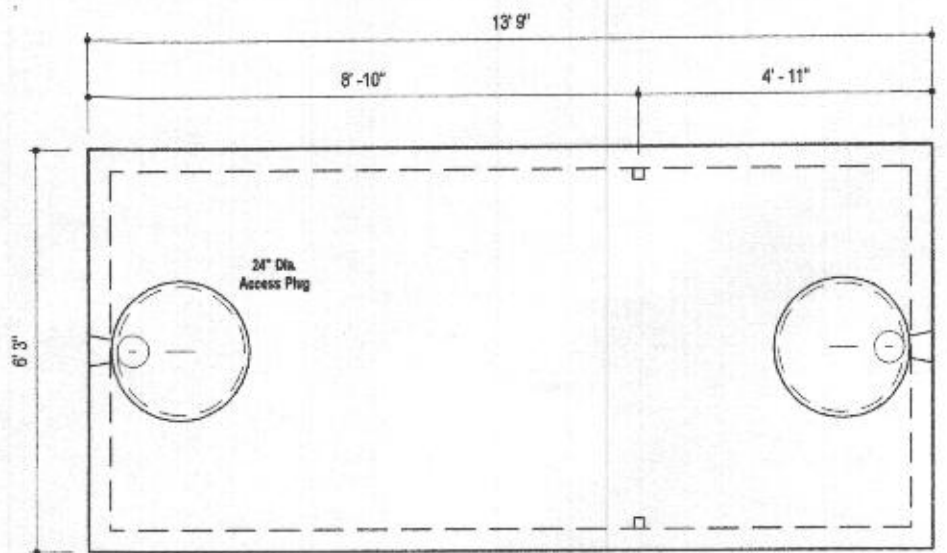
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SEE MANUFACTURER'S SPECIFICATIONS FOR DETAILS. EQUIVALENT FROM OTHER MANUFACTURERS CAN BE SUBSTITUTED.

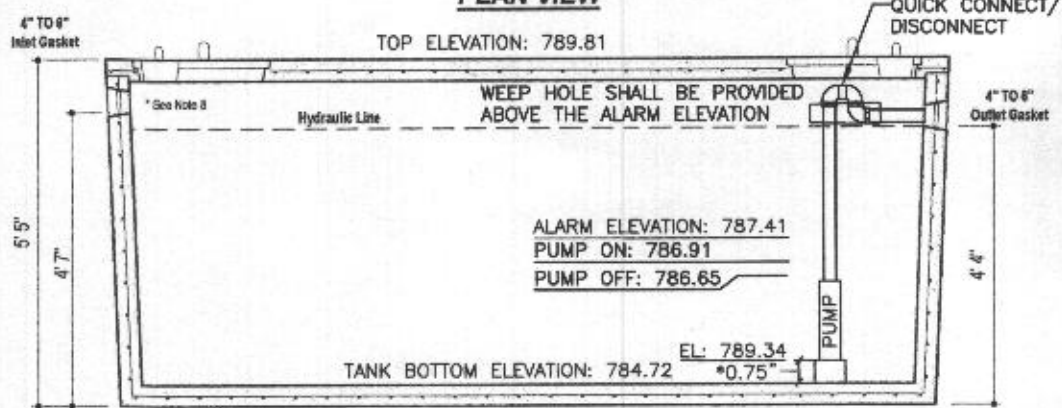
OWNER/BUILDER:
 KEYSTONE CUSTOM HOMES, INC.
 227 GRANITE RUN DR.
 SUITE 100
 LANCASTER, PA 17601
 717-464-9060

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TITLE:	ONSITE SEWAGE DISPOSAL PLAN		
HOUSE TYPE:	CUSTOM - KEYSTONE HOMES		
DATE:	AUGUST, 2020	PROJECT NO.	2986
SCALE:	AS SHOWN	DRAWING	3 OF 4



PLAN VIEW



SECTION A-A

*USE BLOCK OR SUPPORT TO RAISE PUMP INLET A MINIMUM OF 0.75' OFF BOTTOM OF TANK

DESIGN DATA & GENERAL NOTES

- [1] Concrete strength $f_c=4,000$ p.s.i. @ 28 days. Density = 150 pcf.
- [2] Cement - Portland Type III per ASTM C 150-82.
- [3] Admixtures & plasticizers per ASTM C 266-86 & C 494-82.
- [4] Reinforcing per ASTM A195. Min. 1-1/2" cover.
- [5] Top slab sealed with butyl rope mastic.
- [6] 4" wall, 4" base, & 8" top thickness.
- [7] Max. 3" of cover
- [8] Depending on use of tank, inlet & outlet baffle may be required by code.

WEIGHT = 19,000 lbs.

MBI
Mayer Bros., Inc.
6264 Race Road
Elkridge, Maryland 21076
Tel. 410.796.1434
Fax. 410.796.1438
www.mayerbrosprecast.com

2,000 GALLON SEPTIC TANK
1-Compartment
Stock Item [Approx. 19,000 lbs]
Dwg. No. 2000-1C No Scale Aug. 11, 2008

ZOELLER PUMP COMPANY
Zeller Family of Water Solutions

TECHNICAL DATA SHEET
EVAPORATIVE COOLING PUMPS
Models 371, 372, 373 Submersible Effluent/Dewatering Pump

PRODUCT SPECIFICATIONS	
MOTOR	<ul style="list-style-type: none"> Max. Power: 0.364 Voltage: 115 or 230 Phase: 1 Ph Hz: 60 Hz WPI: 1950-2450 Type: Permanent split capacitor or shaded pole Insulation: Class D AFEP: 2.0 - 8.7 Operation: Nonautomatic Discharge Size: 1-1/2" NPT Spac. Handling: 10" (13 mm) optional outside Case Length: 20" (51 mm) standard Case Type: US Subm Max. Head: 38 (11' m) Max. Flow Rate: 69 (200 LPM) Max. Operating Temp: 130° F (54° C) Coating: CR Ecoat Motor Protection: Auto reset thermal overload
PUMP	<ul style="list-style-type: none"> Head Power: 0.364 Capacity: 115 or 230 Phase: 1 Ph Hz: 60 Hz WPI: 1950-2450 Type: Permanent split capacitor or shaded pole Insulation: Class D AFEP: 2.0 - 8.7 Operation: Nonautomatic Discharge Size: 1-1/2" NPT Spac. Handling: 10" (13 mm) optional outside Case Length: 20" (51 mm) standard Case Type: US Subm Max. Head: 38 (11' m) Max. Flow Rate: 69 (200 LPM) Max. Operating Temp: 130° F (54° C) Coating: CR Ecoat Motor Protection: Auto reset thermal overload
MATERIALS	<ul style="list-style-type: none"> Case: Cast iron Motor Housing: Cast iron Pump Housing: Cast iron Base: Cast iron or plastic Upper Bearing: Oil-impregnated ball Lower Bearing: Oil-impregnated ball Mechanical Seal: Carbon and silicon carbide Impeller Type: Non-shrouded, vented Impeller: Impregnated plastic Impeller Screws: Stainless steel Impeller Gasket: 304 stainless steel Gasket: Neoprene

NOTE: See model comparison chart for specific details.

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Item	Elev	Relative to Bottom
Float Tree		
Bottom of Tank	784.72	
Top of Pump	786.48	1' 9 1/8"
Pump Off	786.65	1' 11 1/8"
Pump On	786.91	2' 2 3/16"
High Alarm	787.41	2' 8 3/16"

TOTAL DYNAMIC HEAD
FLOW PER MINUTE

MODEL	371	372	373
Total Head	18.25 ft (5.56 m)	28.92 ft (8.81 m)	30.71 ft (9.36 m)

RECOMMENDED PUMP: 371-0002

Model	Seal	Motor	Volts	Ph	Amps	HP	H ₀	L ₀	W ₀
371-0002	Single	None	115	1	0.7	0.2	40	21.6	8.8
371-0004	Single	None	230	1	0.8	0.2	60	21.6	8.8
372-0002	Single	None	115	1	0.8	0.2	60	32.0	12.5
372-0004	Single	None	230	1	1.0	0.2	60	32.0	12.5
373-0002	Single	None	115	1	0.8	0.1	50	37.0	16.0
373-0004	Single	None	230	1	1.3	0.1	50	37.0	16.0

CAUTION: All warranties of materials, production, design, and workmanship shall be deemed to be voided if used for any purpose other than that intended. It is the user's responsibility to ensure proper installation and use of the pump.

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SIGNATURE AND SEAL ARE FOR SEPTIC PROFILE AND CALCULATIONS ONLY, TANK, PUMP AND DETAILS WERE NOT DESIGNED OR REVIEWED BY THE ENGINEER:

THIS PLAN IS FOR SEPTIC DESIGN ONLY

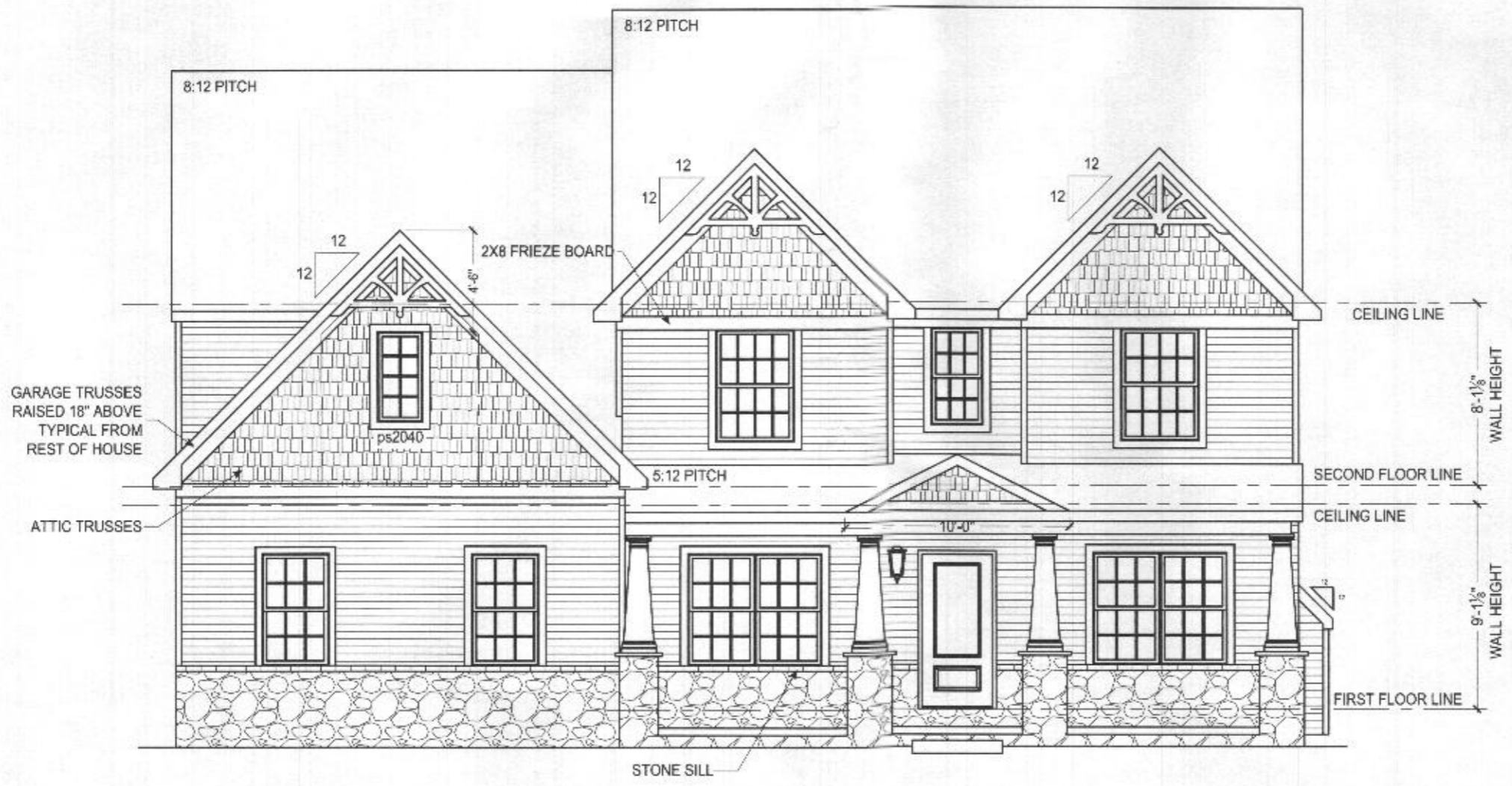
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OWNER/BUILDER:
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717-464-9060

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PROJECT:	WINDSOR FOREST KNOLLS LOT 13	
LOCATION:	TAX MAP: 10 - GRID: 24 - PARCEL: 225 18411 HIDDEN CREEK WAY - TAX ID: 04-373294 ELECTION DISTRICT NO. 6 - HOWARD COUNTY, MARYLAND	
TITLE:	ONSITE SEWAGE DISPOSAL PLAN	
HOUSE TYPE:	CUSTOM - KEYSTONE HOMES	
DATE:	AUGUST, 2020	PROJECT NO. 2986
SCALE:	AS SHOWN	DRAWING 4 OF 4

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FRONT ELEVATION
SCALE: 1/8" = 1'-0"

KEYSTONE
CUSTOM HOMES

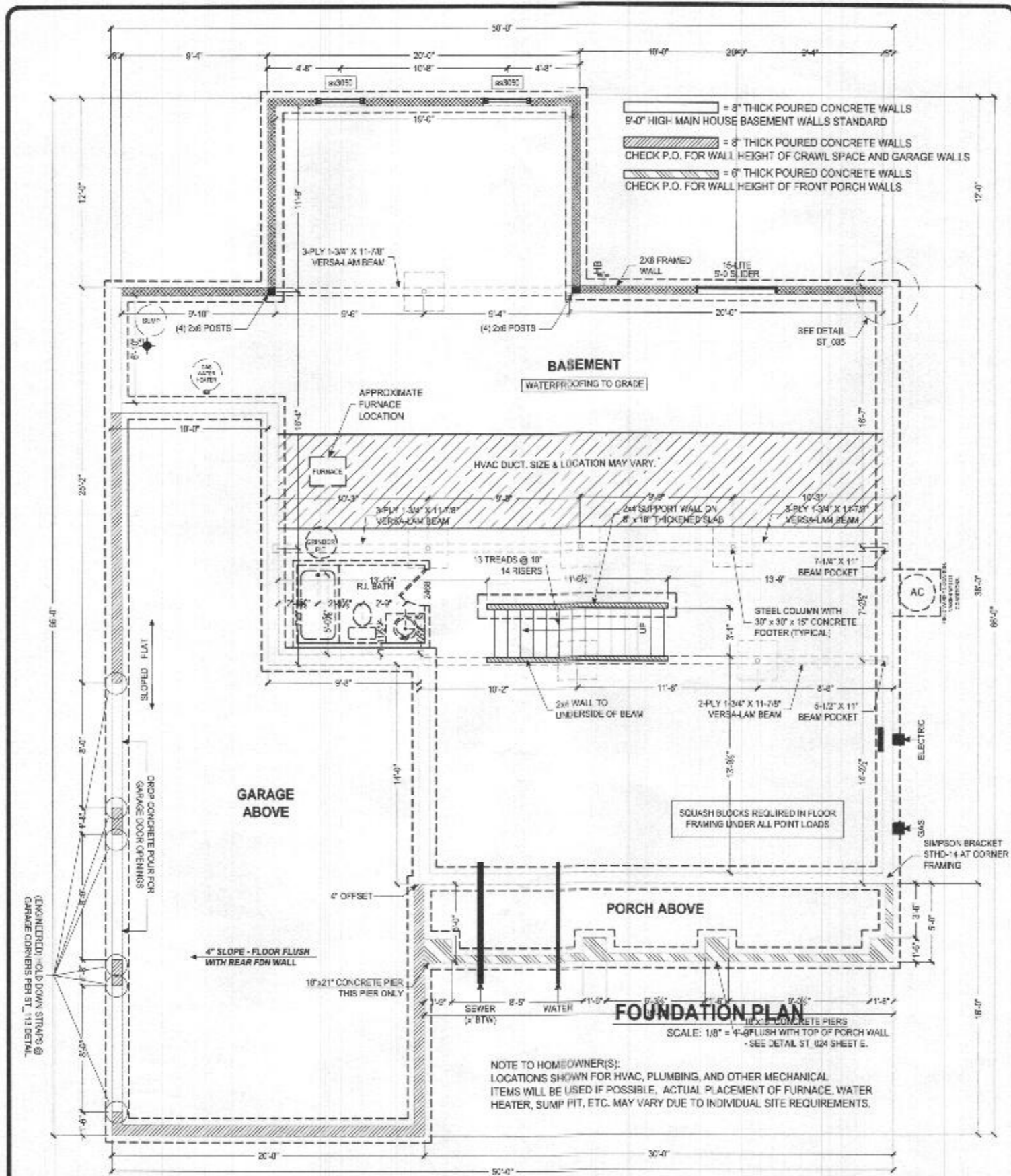
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SHEET DESCRIPTION: FRONT ELEVATION
MODEL: EAs013
ORTANEZ/BOWLINGS

ISSUED: JUL 20 2020
SCALE: AS NOTED
DRAWN BY: N.DEFEO

SHEET NO.
A1.0
PLAN ID:
aet10

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ISSUED: JUL 20 2020
SCALE: AS NOTED
DRAWN BY: NDEFFEO

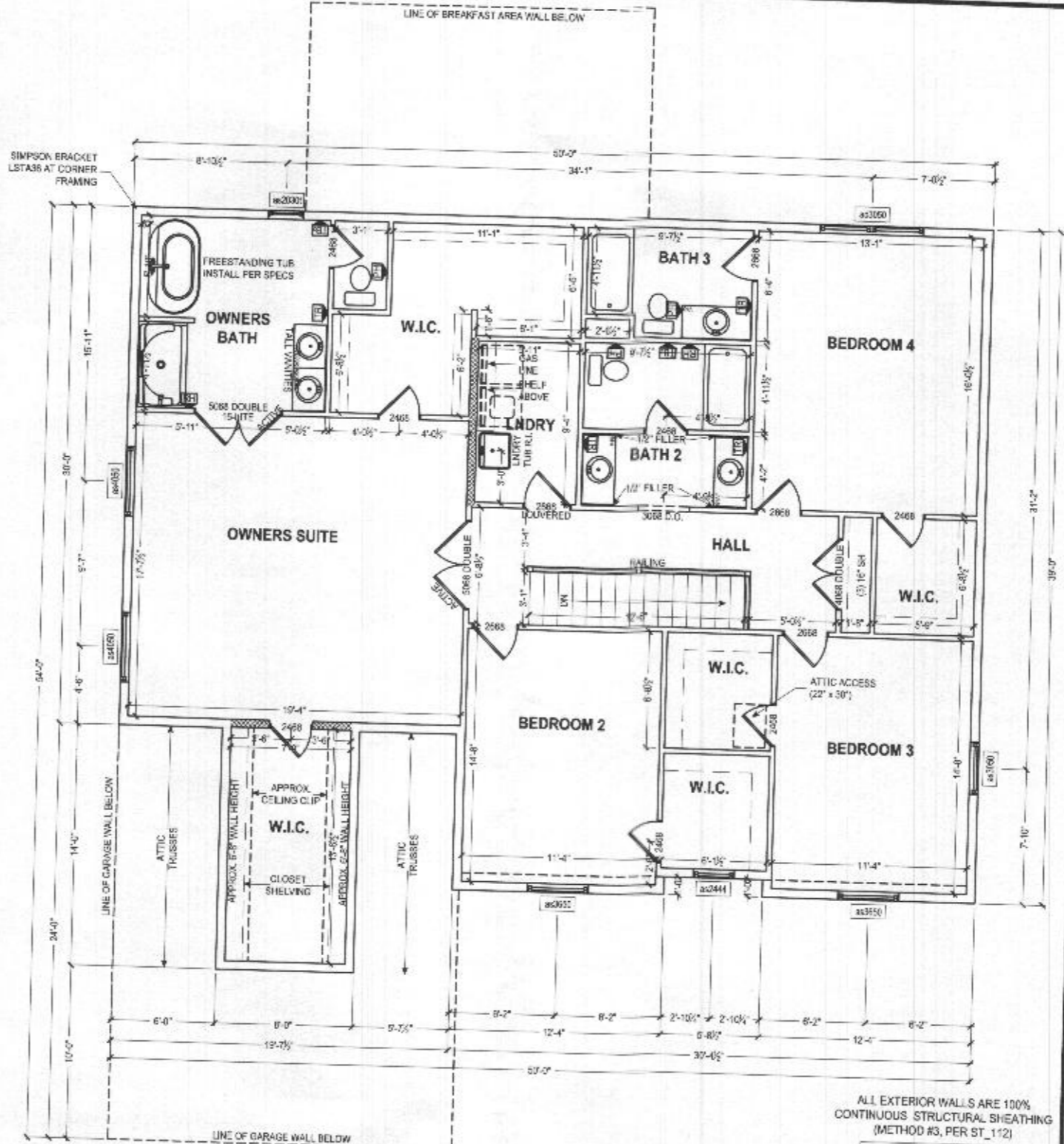
SHEET NO. P1.2
PLAN TO: aet10

SHEET DESCRIPTION:
FOUNDATION PLAN
MODEL: EAs013
ORTANEZ/BOWLINGS

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CUSTOM HOMES

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SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"

ALL EXTERIOR WALLS ARE 100% CONTINUOUS STRUCTURAL SHEATHING (METHOD #3, PER ST_112)



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P1.1
aet10

ISSUED: JUL 20 2020	SHEET DESCRIPTION SECOND FLOOR PLAN
SCALE AS NOTED	MODEL: EAs013 ORTANEZ/BOWLINGS
DRAWN BY NDEFFO	

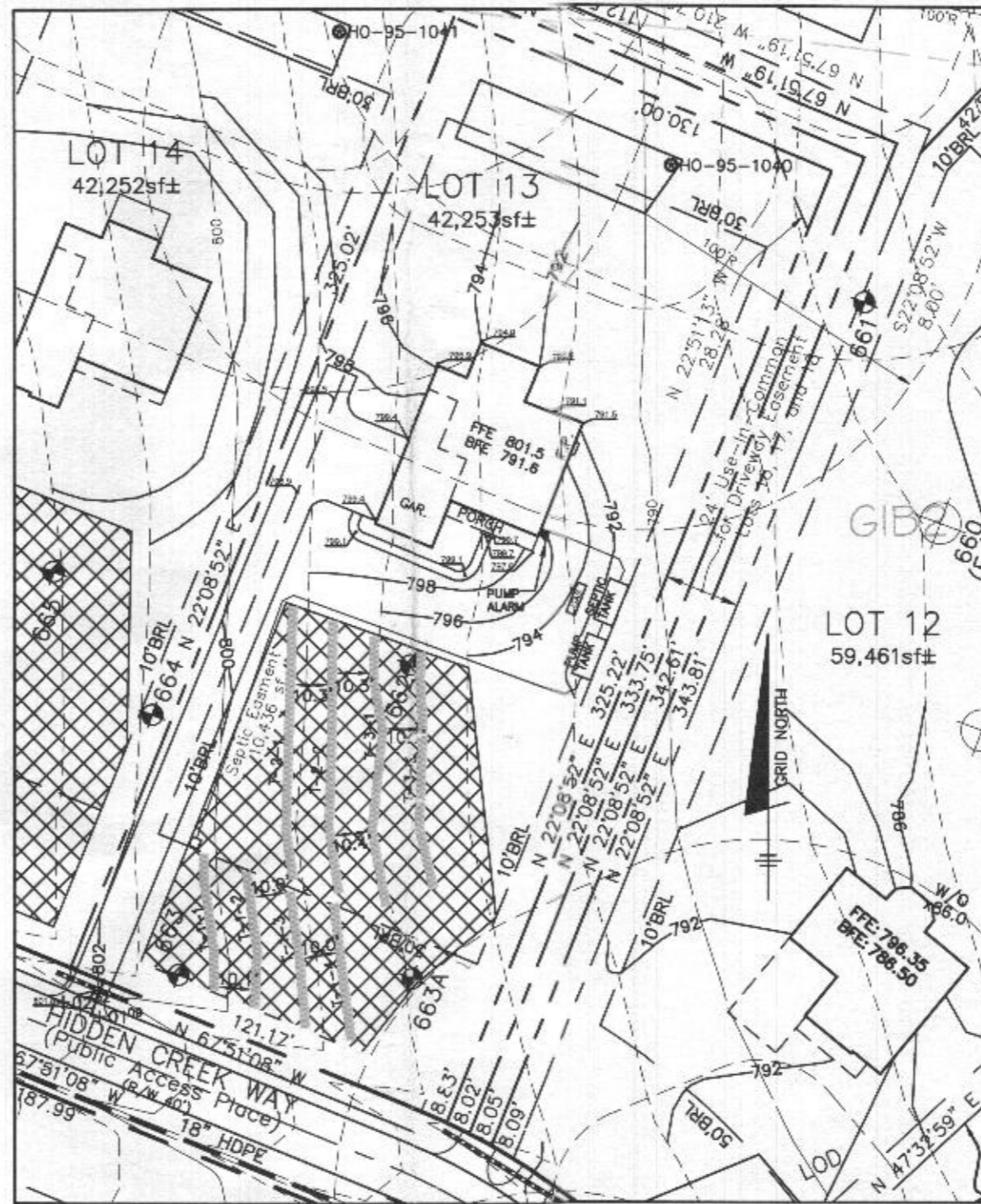
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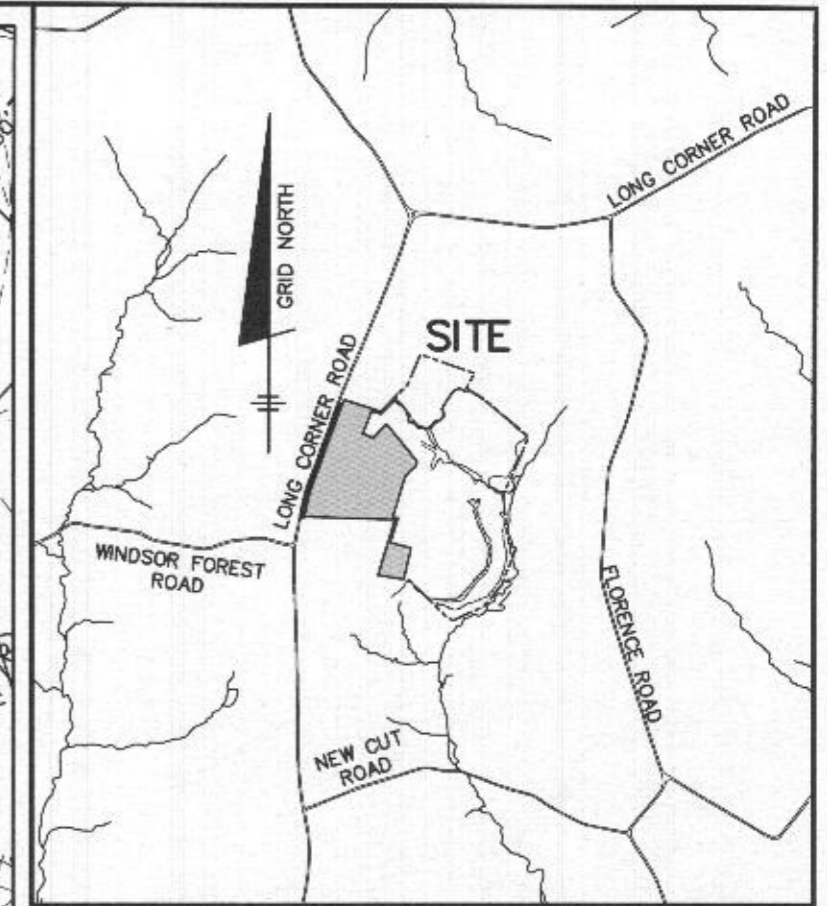
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GENERAL NOTES

1. THE LOT SHOWN HEREON WAS RECORDED ON THE PLAT FOR WINDSOR FOREST KNOLLS, PLAT NUMBER 19395. REFER TO THE PLAT FOR LOT DIMENSIONS, LOT AREA, ALL EASEMENTS AND CONDITIONS.
2. THE EXISTING WELL SHOWN ON THIS PLAN (HO-95-1040) HAS BEEN FIELD LOCATED BY BENCHMARK ENGINEERING INC. JULY 2020 AND IS ACCURATELY SHOWN.
3. THERE ARE NO EXISTING WELLS OR SEPTIC SYSTEMS WITHIN 100' OF THIS PROJECT'S BOUNDARY EXCEPT AS NOTED.
4. TOPOGRAPHY SHOWN WAS BASED ON FIELD RUN TOPOGRAPHY BY C.B. MILLER & ASSOCIATES IN APRIL, 2002, AND WAS SUPPLEMENTED BY FIELD RUN TOPOGRAPHY BY BENCHMARK ENGINEERING, INC. JULY 2020.
5. SEDIMENT AND EROSION CONTROLS WILL BE SUBMITTED BY HOWARD SOILS CONSERVATION DISTRICT AS A CUSTOM GRADING PLAN.
6. ALL DRAINAGE AND STORMWATER MANAGEMENT FEATURES USED ON THIS SITE MUST COMPLY WITH THE APPROVED BUILDING PERMIT AND CUSTOM GRADING PLANS.
7. ANY CHANGES TO A PRIVATE SEWAGE DISPOSAL AREA OR WELL BOX SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.
8. ANY CHANGES 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.
9. ANY ELECTRICAL WORK FOR THE INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
10. THE SEPTIC TANK WILL BE A 2000 GALLON TWO COMPARTMENT TANK. THE PUMP TANK WILL BE A 2000 GALLON ONE COMPARTMENT TANK.
11. THE MAXIMUM EARTH COVER OVER THE TANK IS 3 FEET. GREATER EARTH COVER WILL REQUIRE A HEAVY LOAD BEARING TANK.
12. ALL WELLS AND SEPTIC SYSTEMS LOCATED WITHIN 100' OF THE PROPERTY BOUNDARIES AND 200' DOWN GRADIENT OF ANY WELLS/OR SEPTIC SYSTEM HAVE BEEN SHOWN.



PLAN VIEW
1" = 50'



VICINITY MAP

SCALE: 1" = 2000'

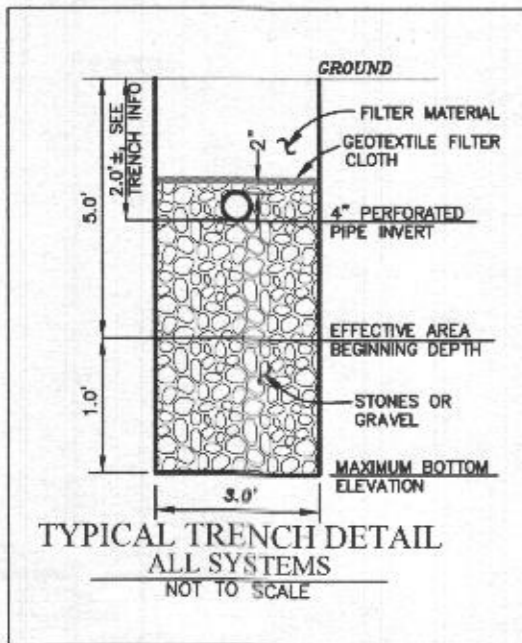
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Approved Septic System Plan
Howard County Health Department

Hank Oswald 8/27/2020
Signature Date



LEGEND

- 400 PROPOSED CONTOURS
- 398 EXISTING CONTOURS
- 400 EXISTING CONTOURS
- EXISTING PRIVATE SEWAGE DISPOSAL AREA
- EXISTING WELL BOX
- SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- PERC TEST PASSED
- PERC TEST FAILED

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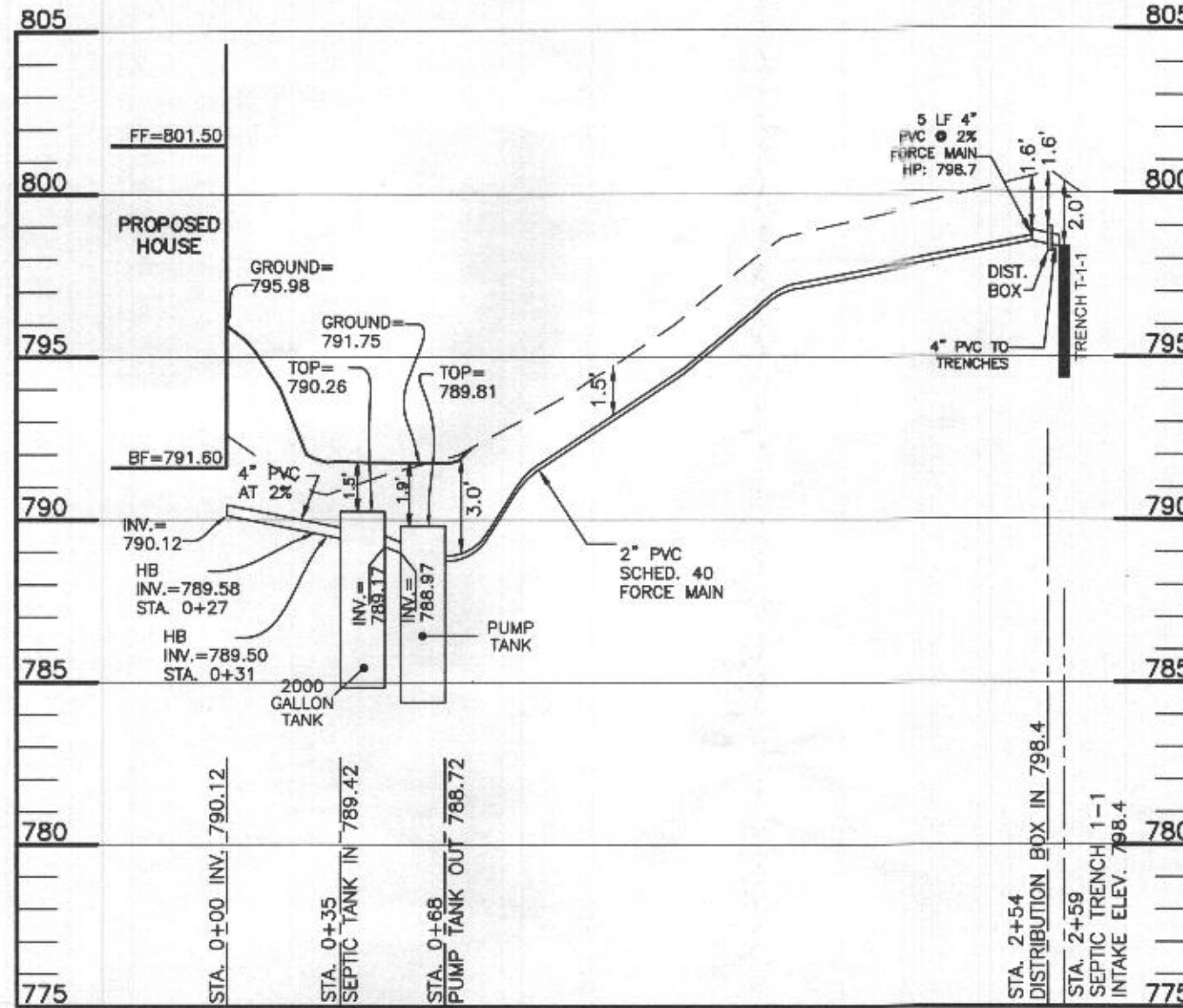
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PROJECT:	WINDSOR FOREST KNOLLS LOT 13		
LOCATION:	TAX MAP: 10 - GRID: 24 - PARCEL: 225 18411 HIDDEN CREEK WAY - TAX ID: 04-373294 ELECTION DISTRICT NO. 6 - HOWARD COUNTY, MARYLAND		
TITLE:	ONSITE SEWAGE DISPOSAL PLAN		
HOUSE TYPE:	CUSTOM - KEYSTONE HOMES		
DATE:	AUGUST, 2020	PROJECT NO.	2986
SCALE:	AS SHOWN	DRAWING	1 OF 4

INITIAL SYSTEM		
Number of Bedrooms	5	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	6.0	ft
Design Flow	750	gpd
Drainage Field square footage	625	sf
Sidewall Reduction Credit	0.83	
Trench width	3	ft
Effective Area Depth	1	ft
Trench Spacing	10	ft
Trench Length Required	174	lf

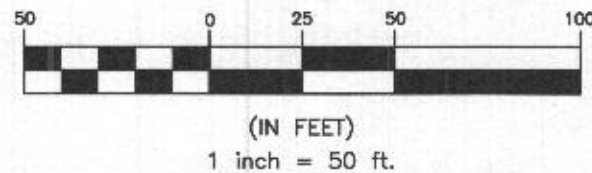
1ST REPLACEMENT SYSTEM		
Number of Bedrooms	5	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	6.0	ft
Design Flow	750	gpd
Drainage Field square footage	625	sf
Sidewall Reduction Credit	0.83	
Trench width	3	ft
Effective Area Depth	1	ft
Trench Spacing	10	ft
Trench Length Required	174	lf

2ND REPLACEMENT SYSTEM		
Number of Bedrooms	5	
Application Rate	1.2	gpd/sf
Effective Area Beginning Depth	5.0	ft
Bottom Max Depth	6.0	ft
Design Flow	750	gpd
Drainage Field square footage	625	sf
Sidewall Reduction Credit	0.83	
Trench width	3	ft
Effective Area Depth	1	ft
Trench Spacing	10	ft
Trench Length Required	174	lf



LOT 13 SEPTIC PROFILE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

SEPTIC INVERT CHART - Lot 13	
INV @ HOUSE	790.12
GROUND @ HOUSE	795.98
INV IN SEPTIC TANK	789.42
INV OUT SEPTIC TANK	789.17
TOP OF SEPTIC TANK	790.26
GROUND OVER SEPTIC TANK	791.76
INV IN PUMP TANK	788.97
INV OUT PUMP TANK	788.72
TOP OF PUMP TANK	789.81
GROUND OVER PUMP TANK	791.75
INV IN DIST BOX	798.40
INV OUT DIST BOX	798.30
GROUND AT DIST BOX	800.64



HEALTH DEPARTMENT SPEC SHEET INFORMATION - Lot 13			
System	Application Rate	Effective Depth	Bottom Depth
1st System	1.2	5.0	6.0
2nd system	1.2	5.0	6.0
3rd System	1.2	5.0	6.0

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TRENCH DESIGN - Lot 13					
INITIAL SYSTEM					
T-1-1	LENGTH	43.5 ft	T-1-2	LENGTH	43.5 ft
	GROUND ELEVATION	800.4		GROUND ELEVATION	799.3
	INVERT ELEVATION	798.4		INVERT ELEVATION	797.3
	MAX BOTTOM ELEVATION	794.4		MAX BOTTOM ELEVATION	793.3
T-1-3	LENGTH	43.5 ft	T-1-4	LENGTH	43.5 ft
	GROUND ELEVATION	798.3		GROUND ELEVATION	797.2
	INVERT ELEVATION	796.3		INVERT ELEVATION	795.2
	MAX BOTTOM ELEVATION	792.3		MAX BOTTOM ELEVATION	791.2
1ST REPLACEMENT SYSTEM					
T-2-1	LENGTH	86.9 ft	T-2-2	LENGTH	86.9 ft
	GROUND ELEVATION	798.2		GROUND ELEVATION	797.1
	INVERT ELEVATION	796.2		INVERT ELEVATION	795.1
	MAX BOTTOM ELEVATION	792.2		MAX BOTTOM ELEVATION	791.1
2ND REPLACEMENT SYSTEM					
T-3-1	LENGTH	86.9 ft	T-3-3	LENGTH	86.9 ft
	GROUND ELEVATION	796.1		GROUND ELEVATION	795.0
	INVERT ELEVATION	794.1		INVERT ELEVATION	793.0
	MAX BOTTOM ELEVATION	790.1		MAX BOTTOM ELEVATION	789.0

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PROJECT:	WINDSOR FOREST KNOLLS LOT 13		
LOCATION:	TAX MAP: 10 - GRID: 24 - PARCEL: 225 18411 HIDDEN CREEK WAY - TAX ID: 04-373294 ELECTION DISTRICT NO. 6 - HOWARD COUNTY, MARYLAND		
TITLE:	ONSITE SEWAGE DISPOSAL PLAN		
HOUSE TYPE:	CUSTOM - KEYSTONE HOMES		
DATE:	AUGUST, 2020	PROJECT NO.	2986
SCALE:	AS SHOWN	DRAWING	2 OF 4

Pumping Station

Diameter of Force Main and Manhole = 2" PVC SCH. 40
 Length of Force Main = 184 feet SCH. 40 gallons/100 feet = 17.4 Table 4.2

Volume of Main = 32.0 gallons

Total Volume = 32.0 gallons

Minimum Dose must be greater than 1/6 of the design flow 125 gallons

Minimum Dose must be greater than the volume of the main 32 gallons

Use minimum dose of 140 gallons okay Doses per Day = 5.357143

Size Pump Chamber

Pump chamber must be able to hold one dose and one days design flow

One day Capacity = 750 gallons
 Dose = 140 gallons
 Totals = 890 gallons

Use 2,000 gallon pump tank

Tank Dimensions:	Exterior	Interior	Walls:	Bottom:	Top:	Bottom to Inlet:
Length:	13.75 feet	13.05 feet	0.33 feet	0.33 feet	0.42 feet	
Width:	6.25 feet	5.55 feet				
Height:	5.42 feet	4.67 feet				
		Area:	73.05 sf			
		Volume:	340.89 cf			

Sizing the Pump

Flow: runtime = 7.000 minutes
 rate = 20.00 gallons/minute

Design Head:
 Design Head = Static Head + Friction Head
 Static Head = highest elevation of main - pump off elevation
 Highest component of system = 798.7 Main HP
 Pump off elevation = 796.65
 Static Head = 12.05 feet
 Friction Head = Head loss due to pipe friction
 2.0" pipe = 184 feet
 45° bends 6 loss for bend 24 feet per table 4.3
 Gate Valve 0 loss for tee 0 feet per table 4.3
 Friction loss per table 4.4 = 0.74 (ft/100 ft)
 Equivalent Length = 208 Friction loss 1.54 feet
 Total Friction Head = 1.54
 Design Head = 13.59 feet

Pump Requirements:

Performance = 20.00 gpm
 Head of Water = 13.59 feet of head

Pump Selection Zoeller Pump Company, Model 371
 1/3 horse power

Pump Flow Rate = 23.30 gallons/minute per rating curve. Run time: 6.01 Minutes
 TDH analysis 14.08 ft
 Between design and curve? Yes

Design Pump Chamber

Ground over Tank = 791.75 Cover = 1.94 ft
 Top of Tank = 789.81
 Invert of Tank = 784.72
 5" Riser = 0.75 feet
 Pump Height = 1.01 feet

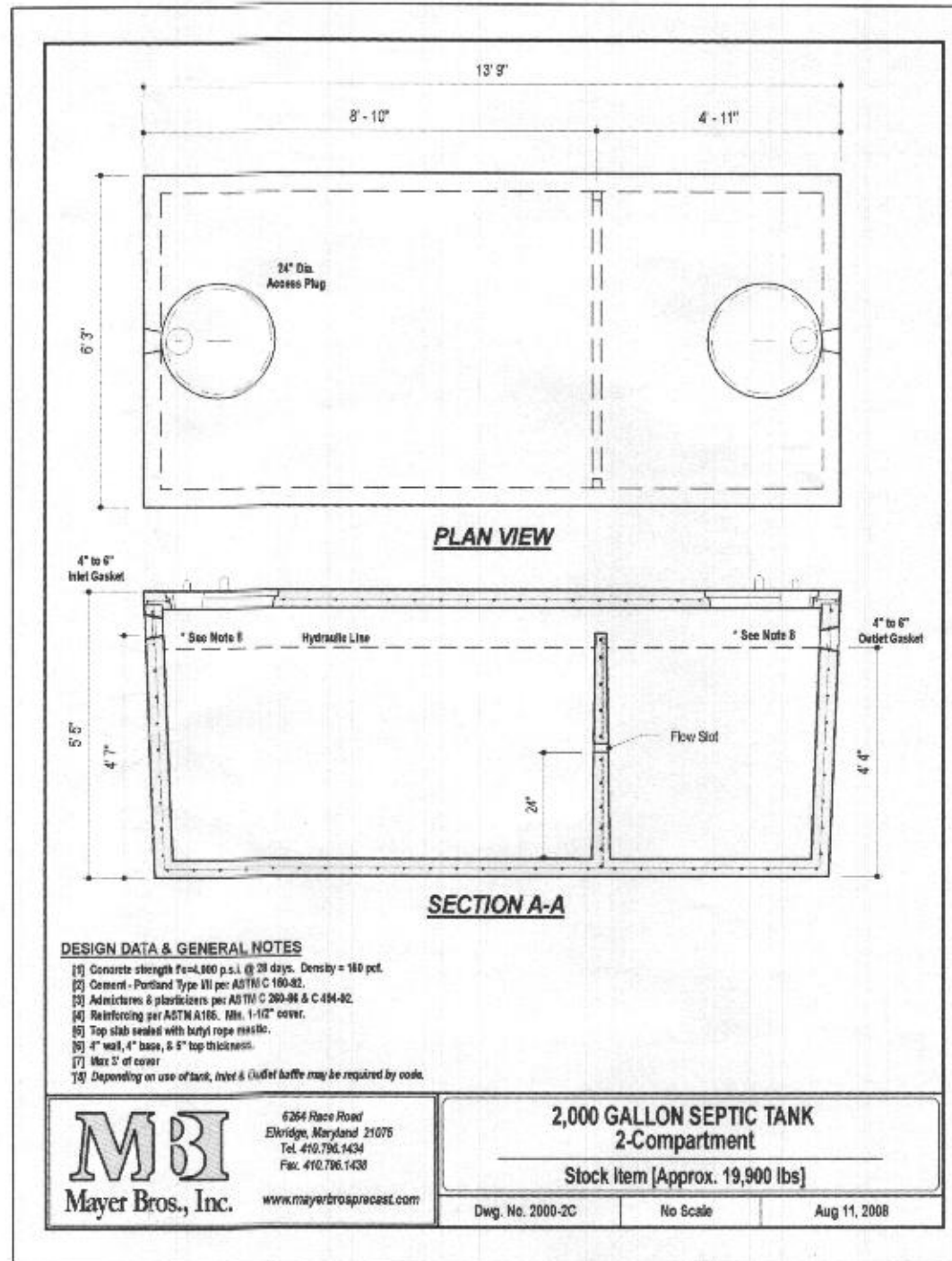
Min. Pump off = 786.48
 Selected Pump off = 786.65

Dose = 18.7 cf
 Area of Pit = 73.05 sf

Pump on dist. = 0.26
 Pump on Elev. = 786.91

Distance between Pump on and Highwater Alarm = 0.5 feet
 Highwater Alarm Elevation = 787.41

Dist. for day stored above alarm 1.37
 Minimum Inlet Elev. = 788.75
 Tank Inlet = 788.97 Okay
 Dist. Alarm to Inlet = 1.56 Okay



DESIGN DATA & GENERAL NOTES

- [1] Concrete strength $f_c = 4,000$ p.s.i. @ 28 days. Density = 140 pcf.
- [2] Cement - Portland Type III per ASTM C 150-82.
- [3] Admixtures & plasticizers per ASTM C 260-98 & C 494-82.
- [4] Reinforcing per ASTM A106. Min. 1-1/2" cover.
- [5] Top slab sealed with butyl rope mastic.
- [6] 4" wall, 4" base, & 5" top thickness.
- [7] Max 3" of cover
- [8] Depending on use of tank, inlet & outlet baffles may be required by code.



**2,000 GALLON SEPTIC TANK
 2-Compartment**
 Stock Item [Approx. 19,900 lbs]

Dwg. No. 2000-2C No Scale Aug 11, 2008

SEE MANUFACTURER'S SPECIFICATIONS FOR DETAILS. EQUIVALENT FROM OTHER MANUFACTURERS CAN BE SUBSTITUTED.

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LOCATION: TAX MAP: 10 - GRID: 24 - PARCEL: 225 18411 HIDDEN CREEK WAY - TAX ID: 04-373294 ELECTION DISTRICT NO. 6 - HOWARD COUNTY, MARYLAND	
TITLE: ONSITE SEWAGE DISPOSAL PLAN	
HOUSE TYPE: CUSTOM - KEYSTONE HOMES	
DATE: AUGUST, 2020	PROJECT NO. 2986
SCALE: AS SHOWN	DRAWING 3 OF 4

SEPTIC INVERT CHART - Lot 13	
INV @ HOUSE	790.12
GROUND @ HOUSE	795.98
INV IN SEPTIC TANK	789.42
INV OUT SEPTIC TANK	789.17
TOP OF SEPTIC TANK	790.26
GROUND OVER SEPTIC TANK	791.76
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TOP OF PUMP TANK	789.81
GROUND OVER PUMP TANK	791.75
INV IN DIST BOX	798.40
INV OUT DIST BOX	798.30
GROUND AT DIST BOX	800.64

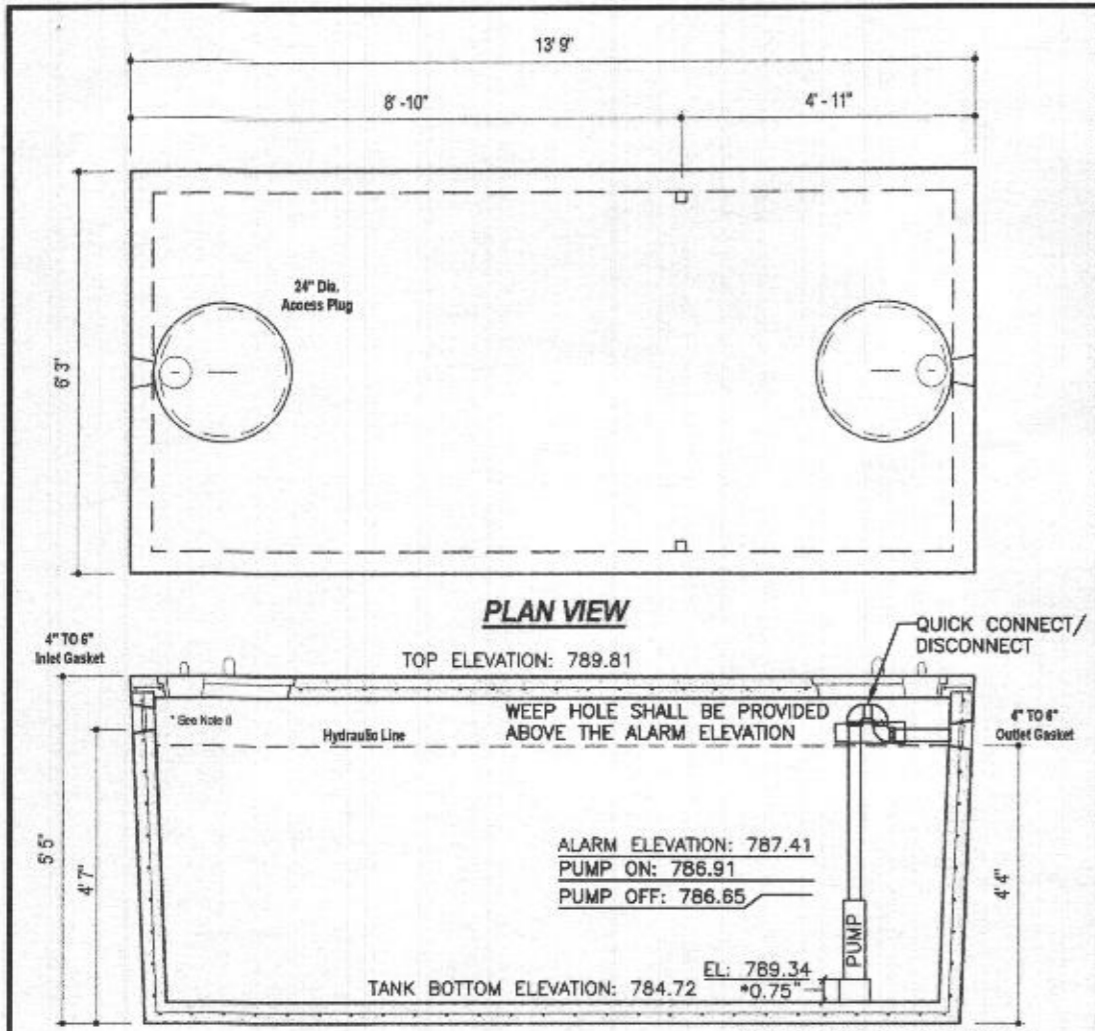
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THIS PLAN IS FOR SEPTIC DESIGN ONLY

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DESIGN DATA & GENERAL NOTES

- Concrete strength $f'c=4,000$ p.s.i. @ 28 days. Density = 150 pcf.
- Cement - Portland Type III per ASTM C 150-92.
- Admixtures & plasticizers per ASTM C 260-86 & C 494-82.
- Reinforcing per ASTM A185. Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, 4" base, & 5" top thickness.
- Max. 3" of cover
- Depending on use of tank, inlet & outlet baffles may be required by code.

WEIGHT = 19,000 lbs.

<p>6264 Race Road Elkridge, Maryland 21075 Tel. 410.796.1434 Fax. 410.796.1438 www.mayerbrosprecast.com</p>	2,000 GALLON SEPTIC TANK 1-Compartment		
	Stock Item [Approx. 19,000 lbs]		
Dwg. No. 2000-1C	No Scale	Aug. 11, 2008	

ZOELLER PUMP COMPANY
Zeller Family of Water Solutions

**TECHNICAL DATA SHEET
EVAPORATIVE COOLING PUMPS**
Models 371, 372, 373 Submersible Effluent/Dewatering Pump

MOTOR	
Horse Power	1/2 H.P.
Voltage	115 or 230
Phase	1 Ph
Hz	60 Hz
WPM	1800 RPM
Type	Permanent split capacitor or shaded pole
Insulation	Class B
Temp	55 - 87

PUMP	
Cyclones	Non-cyclonic
Discharge Size	1 1/2" NPT
Subs. Handling	1/2" (13 mm) splintered sticks
Cord Length	20' (6.1 m) standard
Cord Type	UL listed
Max. Head	38' (11.6 m)
Max. Flow Rate	69 GPM (261 LPM)
Max. Operating Temp	100° F (38° C)
Coating	DRBAC
Motor Protection	Auto re-energize overload

MATERIALS	
Cap	Cast Iron
Motor Housing	Cast Iron
Pump Housing	Cast Iron
Shaft	Cast Iron or Plastic
Upper Bearing	DRBAC Impeller
Lower Bearing	DRBAC Impeller or Ball Bearing
Mechanical Seal	Carbon and Silicon Carbide
Impeller Type	Flow-chugging vortex
Impeller	Engineered plastic
Impeller	Engineered plastic
Motor Shaft	402 1215 cold rolled steel
Cover	Resin

NOTE: See model comparison chart for specific details.

Point	Elev.	Relative to Bottom
Bottom of Tank	784.72	
Top of Pump	786.48	1' 9 1/8"
Pump Off	786.65	1' 11 1/8"
Pump On	786.91	2' 2 3/16"
High Alarm	787.41	2' 8 3/16"

**TOTAL DYNAMIC HEAD
FLOW PER MINUTE**

MODEL	371	372	373
Flow (GPM)	15	45	90
Head (ft)	34	50	40
Flow (L/min)	568	1698	3396
Head (m)	10.4	14.6	11.7

RECOMMENDED PUMP: 371-0002

Model	Size	Material	Volts	PH	Temp	HP	Flow	Head	Weight
371-0002	Single	Non	115	1	8.7	0.3	66	21.3	6.5
371-0004	Single	Non	230	1	4.6	0.2	30	21.2	6.5
372-0002	Single	Non	115	1	6.6	0.2	30	30.4	14.4
372-0004	Single	Non	230	1	3.2	0.2	30	30.4	14.4
373-0002	Single	Non	115	1	6.5	0.4	66	30.0	16.8
373-0004	Single	Non	230	1	4.2	0.4	66	30.0	16.8

CAUTION: All installation of pumps, valves & devices with wiring should be done by a qualified licensed electrician. An electrical safety plan should be prepared for every installation. See the manufacturer's instructions for details. © Copyright 2014 Zoeller Co. All rights reserved.

SIGNATURE AND SEAL ARE FOR SEPTIC PROFILE AND CALCULATIONS ONLY, TANK, PUMP AND DETAILS WERE NOT DESIGNED OR REVIEWED BY THE ENGINEER:

THIS PLAN IS FOR SEPTIC DESIGN ONLY

SEE MANUFACTURER'S SPECIFICATIONS FOR DETAILS. EQUIVALENT FROM OTHER MANUFACTURERS CAN BE SUBSTITUTED.

OWNER/BUILDER:
KEYSTONE CUSTOM HOMES, INC.
227 GRANITE RUN DR.
SUITE 100
LANCASTER, PA 17601
717-464-9060

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PROJECT:	WINDSOR FOREST KNOLLS LOT 13		
LOCATION:	TAX MAP: 10 - GRID: 24 - PARCEL: 225 18411 HIDDEN CREEK WAY - TAX ID: 04-373294 ELECTION DISTRICT NO. 6 - HOWARD COUNTY, MARYLAND		
TITLE:	ONSITE SEWAGE DISPOSAL PLAN		
HOUSE TYPE:	CUSTOM - KEYSTONE HOMES		
DATE:	AUGUST, 2020	PROJECT NO.	2986
SCALE:	AS SHOWN	DRAWING	4 OF 4

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 28376, Expiration Date: 01-01-2021.

Aug 18 2020 12:55 PM DocuSign