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: **12/9/21**   **ONSITE SEWAGE DISPOSAL SYSTEM**   P   570875

APPROVAL DATE: _____   **PERMIT:**   **Upgrade**   A _____

PROPERTY ADDRESS: **2605 Roxbury Mills Road (Route 97)**

SUBDIVISION: **Green Meadows**   LOT: **1**   TAX ID: _____

CONTRACTOR: **Fogles Septic Clean Inc.**   EMAIL: **kim@foglesinc.com**

CONTRACTOR ADDRESS: **580 Obrecht Road, Sykesville, MD 21784**   PHONE: **410-795-5670**

PROPERTY OWNER: **Kevin and Dolores Garvey**   EMAIL: _____

OWNER ADDRESS: **2605 Roxbury Mills Road, Glenwood, MD 21738**   PHONE: _____

SEPTIC TANK SIZE (GALLONS): **1500 TB**   PUMP CHAMBER CAPACITY (GALLONS): **1500 TB**   PUMP SIZE: **WE0511H**

NUMBER OF BEDROOMS: **4**   HOUSE SQ. FT. _____   APPLICATION RATE: **0.8**

DISTRIBUTION SYSTEM: GRAVITY FED ☒   LOW PRESSURE DOSED ☐

TRENCHES:	LINEAR FEET REQUIRED: **150'**	INLET DEPTH: **2'**	
	TRENCH WIDTH: **2'**	MAXIMUM BOTTOM DEPTH: **7.5'**	
	MINIMUM SPACE BETWEEN TRENCHES: **10'**	EFFECTIVE AREA BEGINNING DEPTH:	
LOCATION:	**TO BE STAKED BY SANITARIAN DURING PRE-CONSTRUCTION INSPECTION.**		
NOTES:	INSTALL 3 x 50' TRS		

ISSUED BY: **CABAHUG 001997**   ISSUE DATE: **01/18/2022**   EXPIRATION DATE: **01/18/2023**

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 SEPTIC 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 _____

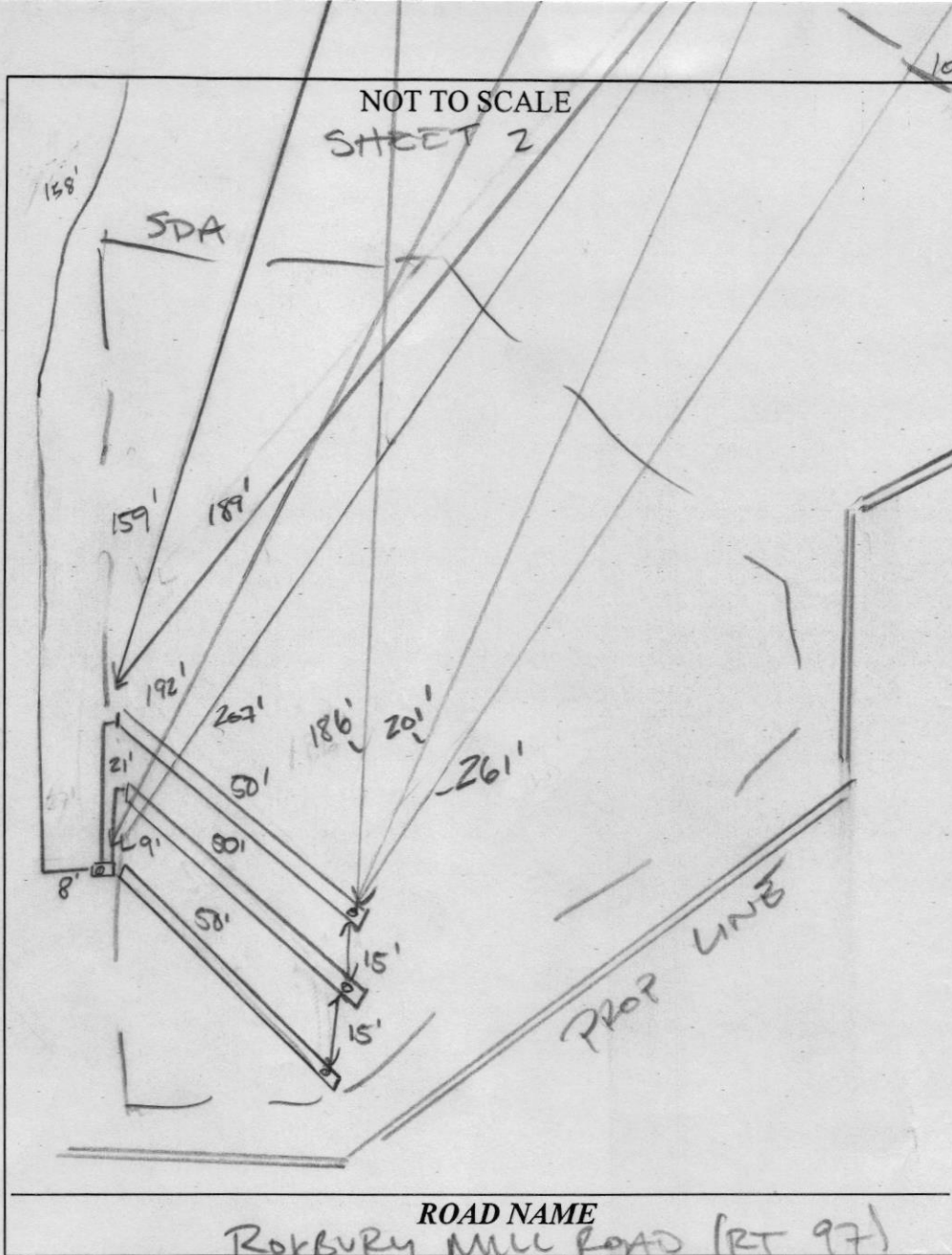**NOTE:**   **THE HCHD DOES NOT WARRANTY ANY SYSTEM AND CANNOT GUARANTEE THE PERFORMANCE OF THIS SYSTEM AS DESIGNED. BY ACCEPTING THIS PERMIT, THE OWNER AND/OR APPLICANT ACKOWLEDGE THAT THE SPECIFICATIONS DETAILED IN THIS DESIGN ARE ONE POSSIBLE OPTION AND THAT THE HCHD WILL REVIEW OTHER PROPOSALS. YOU HAVE THE OPTION TO SEEK THE ADVICE OF A QUALIFIED DESIGN CONSULTANT OR PROFESSIONAL ENGINEER FOR FURTHER GUIADNCE.**

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.

JW 5/2015

NOT TO SCALE

SHEET 2

100' WELL ARE

158'

SDA

159' 189'

192'

207' 186' 201'

261'

21' 50'

9' 80'

8' 58'

15'

15'

15'

PROP LINE

PROP LINE

TRENCH/DRAINFIELD DATA		
WIDTH	INLET	BOTTOM
2'	2'	7.5'
NUMBER OF TRENCHES		3
TOTAL LENGTH		150 F
ABSORPTION AREA		450 SF +
DISTRIBUTION BOX LEVEL		PUMP
DISTRIBUTION BOX BAFFLE		90 TURN
DISTRIBUTION BOX PORT		YES

SIDE WALL

+ DBOX RISER

SEPTIC TANK DATA	
SEPTIC TANK 1 LEVEL	YES
MANUFACTURER	BABYLON
CAPACITY	1500 GAL
SEAM LOC	TOP
TANK LID DEPTH	3.5 - 3'
BAFFLES	YES
BAFFLE FILTER	
MANHOLE LOC	FRONT/BACK
6" PORT LOC	-
WATERTIGHT TEST	-
SLOTTED	YES
DATE ON LID	12/16/2021
PUMP/SEPTIC TANK LEVEL	YES
MANUFACTURER	BABYLON
CAPACITY	1500 GAL
SEAM LOC	TOP
TANK LID DEPTH	3.5' - 3'
BAFFLES	-
BAFFLE FILTER	
MANHOLE LOC	
6" PORT LOC	-
WATERTIGHT TEST	-
SLOTTED	TB
DATE ON LID	12/16/2021

TB

ROAD NAME

ROXBURY MILL ROAD (RT 97)

PRE-CONSTRUCTION:
01/18/2022 LAID OUT 3 x 50' TRS ON CONTOUR. 12' CTC. RR CONFIRMED
SYSTEM SPEC 7.5 TR BOTTOM 2' INLET 6' STONE RR

INSTALLATION: 01/19/2022 TRENCHES COMPLETE; D BOX SET COR OF LID
KNICKED OFF TO FIT RISER ; 35' FM INSTALLED RR
1/21/22 FM installed. RR 01/24/2022 SL TIED INTO EX LINE , TANKS
SET, FORCE MAIN COMPLETE. RR 2/16/22 - p & A ok, floats look good, pump working
and water flow observed @ dbox. Alarm operational & circuit boxes for p & A are on the
outside of the house - ok to continue w/ backfilling - RR

FINAL INSPECTOR   R. Rappaport   . DATE OF APPROVAL   2/16/22   .

FORCE MAIN
KIRTEC PVC
2" SCH 40 280PSI @ 73°F
ASTM D 1785

PROP LINE

3' 6.5'

6.5'
1.5'

EX TR

13'

88'

11'

c/o

100' WELL ARE

10'

60'

108'

102'

123'

61'

POOL

c/o

10.5'

30'

18'

40'

DRIVE

HOUSE

W

36'

158'

SDA

VICINITY MAP

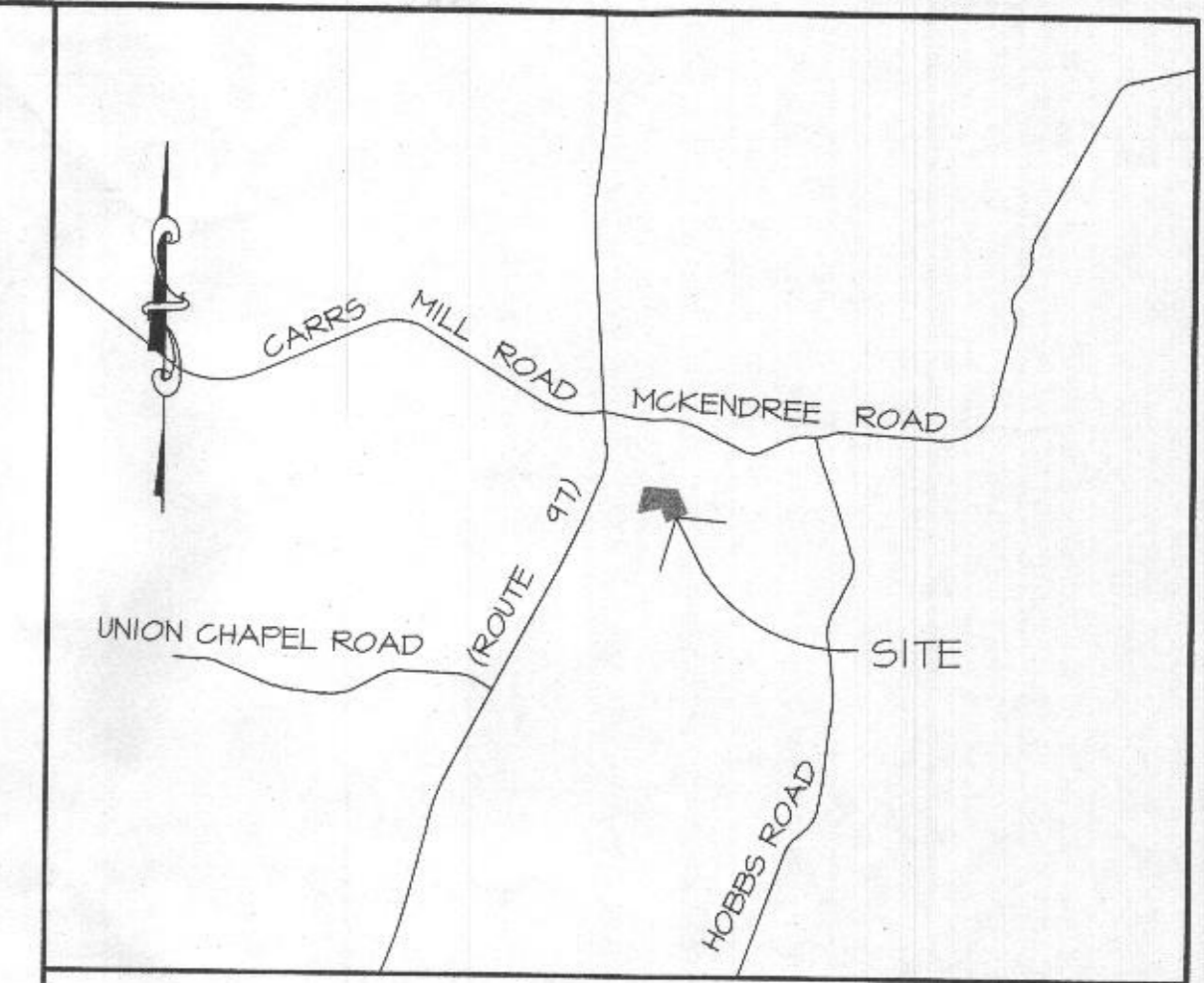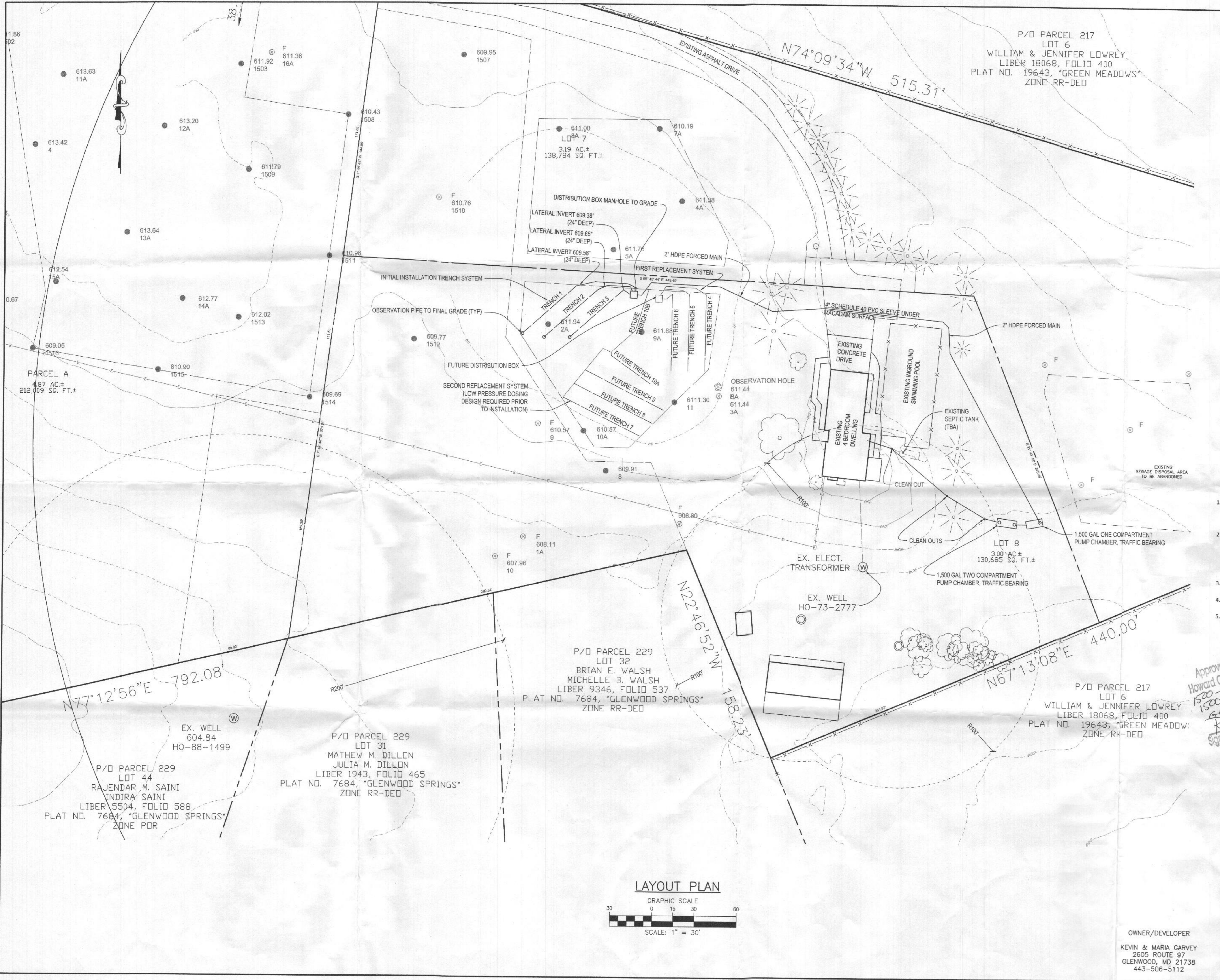CARRS MILL ROAD
MCKENDREE ROAD
UNION CHAPEL ROAD
HOBBS ROAD
ROUTE 97
SITE
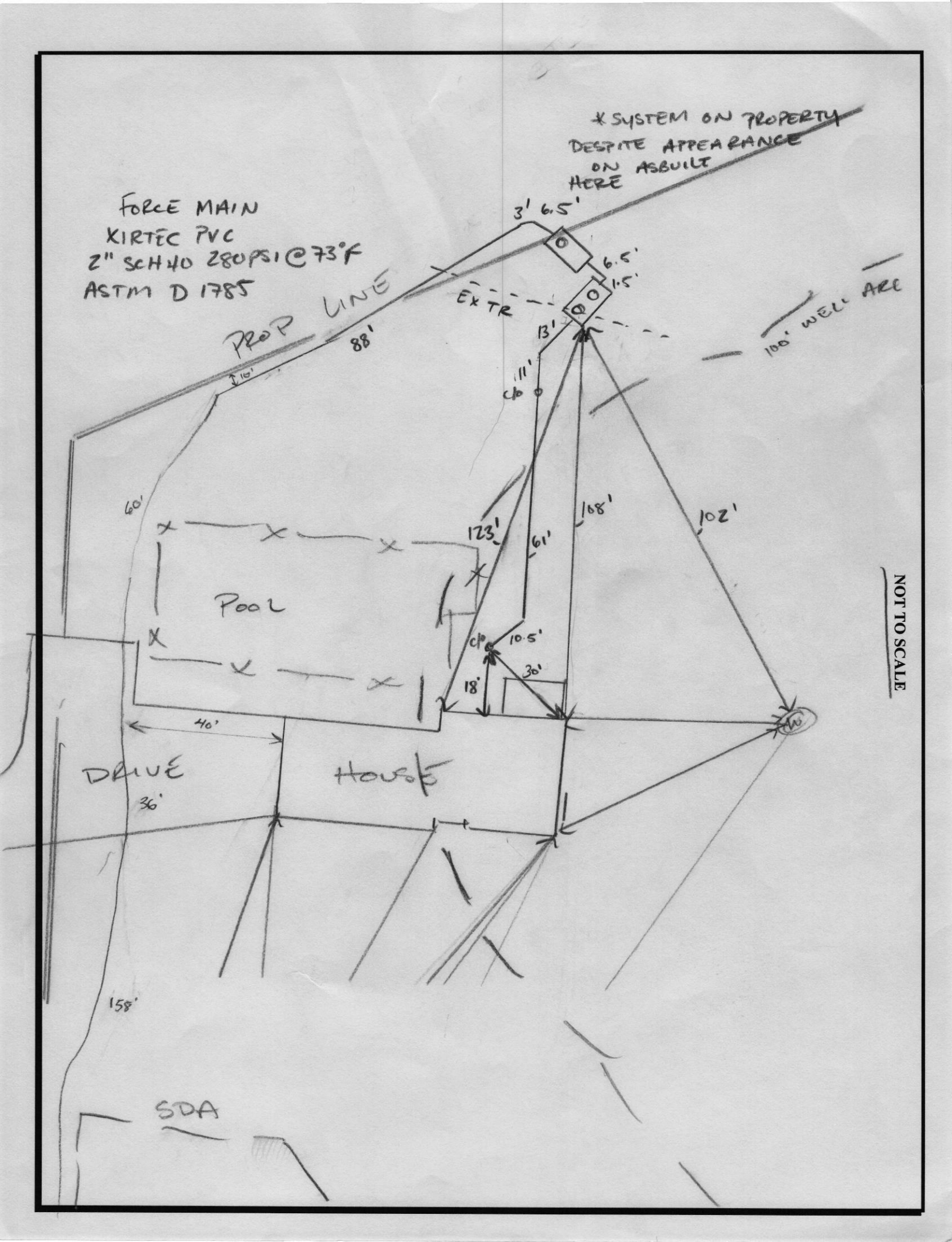
VICINITY MAP   ADC MAP: 9C3   SCALE: 1"=2000'

BENCHMARKS (HORIZONTAL: NAD83, VERTICAL: NAVD88)

STA.	NORTHING	EASTING	ELEVATION
14FC	595630.340	1306560.213	619.264
14CB	598079.749	1306428.279	590.999

LEGEND

―――――	BOUNDARY LINE
	LOT LINE
	EASEMENT
	EXISTING CONTOUR MAJOR
	EXISTING CONTOUR MINOR
	EXISTING TREE LINE
GaB	SOIL LINE
—x—x—x—	EXISTING FENCE
W	EXISTING WELL
○	PROPOSED ALTERNATE WELL LOCATION

GENERAL NOTES

1. Any change to the locations of 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.

2. The cover over the proposed septic tank will be 2.35 ft and pump chamber will be 2.69 ft. Both tanks are rated as traffic bearing tanks. See attached drawings for additional detail. These depths of cover are predicated on 1% fall on the sewer line from the inlet side of the existing septic tank (to be abandoned) to the location of the proposed septic tank.

3. Electrical work for the installation must be performed by a licensed electrician.

4. The well (Tag # HO 73-2777) has been field located and is accurately shown.

5. All wells and septic systems located within 100 ft. of the property boundaries and 200 ft. down gradient of any wells and/or septic systems have been shown.

LAYOUT PLAN

P/O PARCEL 217
LOT 6
WILLIAM & JENNIFER LOWREY
LIBER 18068, FOLIO 400
PLAT NO. 19643, 'GREEN MEADOWS'
ZONE RR-DEO

N74°09'34"W 515.31'

EXISTING ASPHALT DRIVE

LOT 7
3.19 AC.±
138,784 SQ. FT.±

DISTRIBUTION BOX MANHOLE TO GRADE
LATERAL INVERT 609.38" (24" DEEP)
LATERAL INVERT 609.65" (24" DEEP)
LATERAL INVERT 609.58" (24" DEEP)
FIRST REPLACEMENT SYSTEM
2" HDPE FORCED MAIN

INITIAL INSTALLATION TRENCH SYSTEM

TRENCH 1
TRENCH 2
TRENCH 3
FUTURE TRENCH 6
FUTURE TRENCH 5
FUTURE TRENCH 4

OBSERVATION PIPE TO FINAL GRADE (TYP)

FUTURE DISTRIBUTION BOX

SECOND REPLACEMENT SYSTEM
(LOW PRESSURE DOSING DESIGN REQUIRED PRIOR TO INSTALLATION)

FUTURE TRENCH 10A
FUTURE TRENCH 9
FUTURE TRENCH 8
FUTURE TRENCH 7

OBSERVATION HOLE

4" SCHEDULE 40 PVC SLEEVE UNDER MACADAM SURFACE
2" HDPE FORCED MAIN

EXISTING CONCRETE DRIVE

EXISTING INGROUND SWIMMING POOL

EXISTING SEPTIC TANK (TBA)

EXISTING 4 BEDROOM DWELLING

CLEAN OUT

CLEAN OUTS

EXISTING SEWAGE DISPOSAL AREA TO BE ABANDONED

1,500 GAL ONE COMPARTMENT PUMP CHAMBER, TRAFFIC BEARING

1,500 GAL TWO COMPARTMENT PUMP CHAMBER, TRAFFIC BEARING

EX. ELECT. TRANSFORMER

EX. WELL
HO-73-2777

LOT 8
3.00 AC.±
130,685 SQ. FT.±

PARCEL A
4.87 AC.±
212,409 SQ. FT.±

N22°46'52"W 158.23'

N77°12'56"E 792.08'

EX. WELL
604.84
HO-88-1499

P/O PARCEL 229
LOT 44
RAJENDAR M. SAINI
INDIRA SAINI
LIBER 5504, FOLIO 588
PLAT NO. 7684, 'GLENWOOD SPRINGS'
ZONE POR

P/O PARCEL 229
LOT 31
MATHEW M. DILLON
JULIA M. DILLON
LIBER 1943, FOLIO 465
PLAT NO. 7684, 'GLENWOOD SPRINGS'
ZONE RR-DEO

P/O PARCEL 229
LOT 32
BRIAN E. WALSH
MICHELLE B. WALSH
LIBER 9346, FOLIO 537
PLAT NO. 7684, 'GLENWOOD SPRINGS'
ZONE RR-DEO

N67°13'08"E 440.00'

P/O PARCEL 217
LOT 6
WILLIAM & JENNIFER LOWREY
LIBER 18068, FOLIO 400
PLAT NO. 19643, 'GREEN MEADOWS'
ZONE RR-DEO

'Approved Septic System Plan'
Howard County Health Department
1500 gal septic tank with
1500 gal pump tank and GOULD's WE05TH pump
Gravity Distribution for 4-bedroom SFD or equiv.
Signature   1/24/2020

LAYOUT PLAN

GRAPHIC SCALE
30 0 15 30 60
SCALE: 1" = 30'

OWNER/DEVELOPER
KEVIN & MARIA GARVEY
2605 ROUTE 97
GLENWOOD, MD 21738
443-506-5112

SEWAGE DISPOSAL SYSTEM DESIGN PREPARED BY
JAMES R. POWELL
421 ROCKWAY ROAD
CATONSVILLE, MARYLAND 21228
443-900-3169
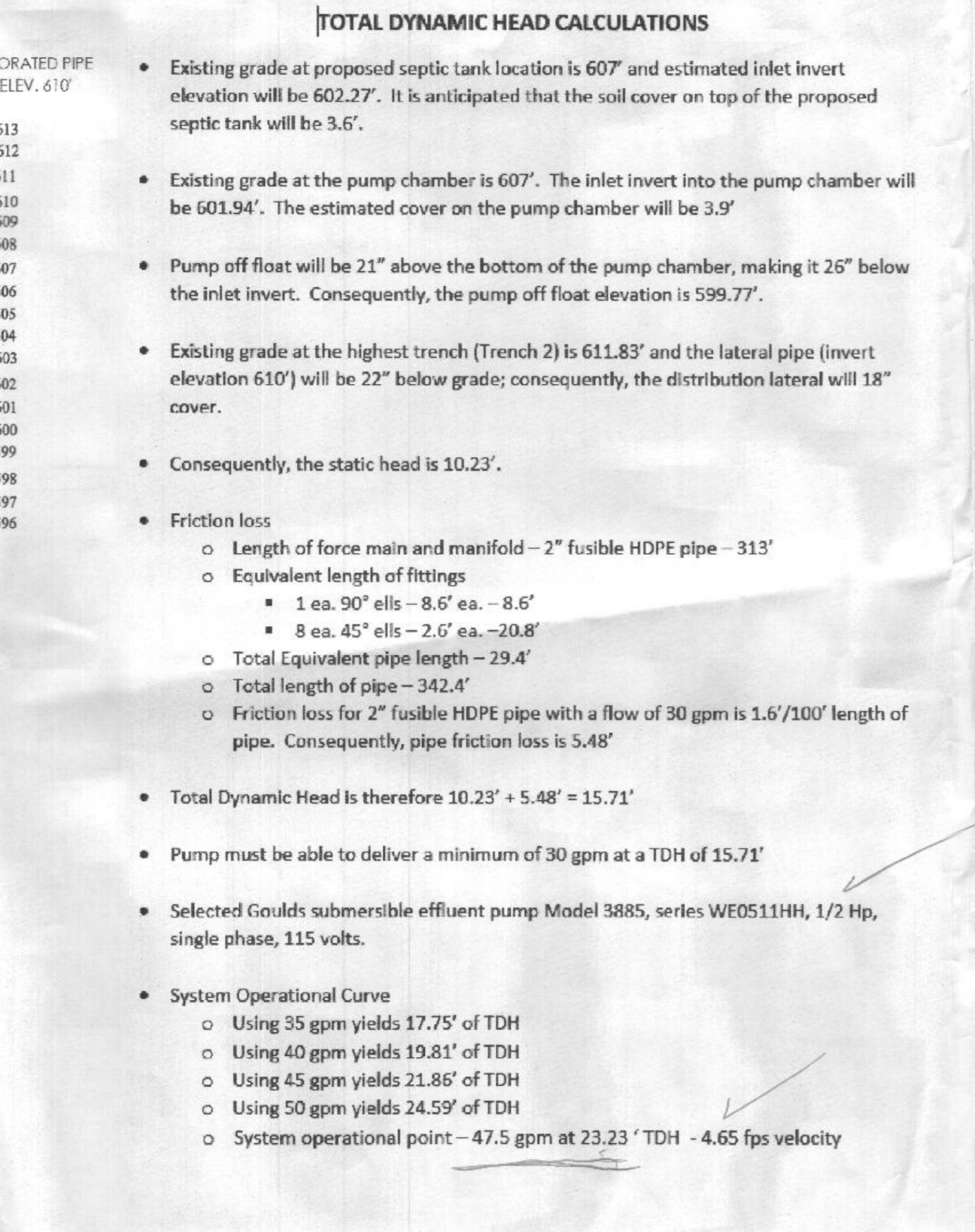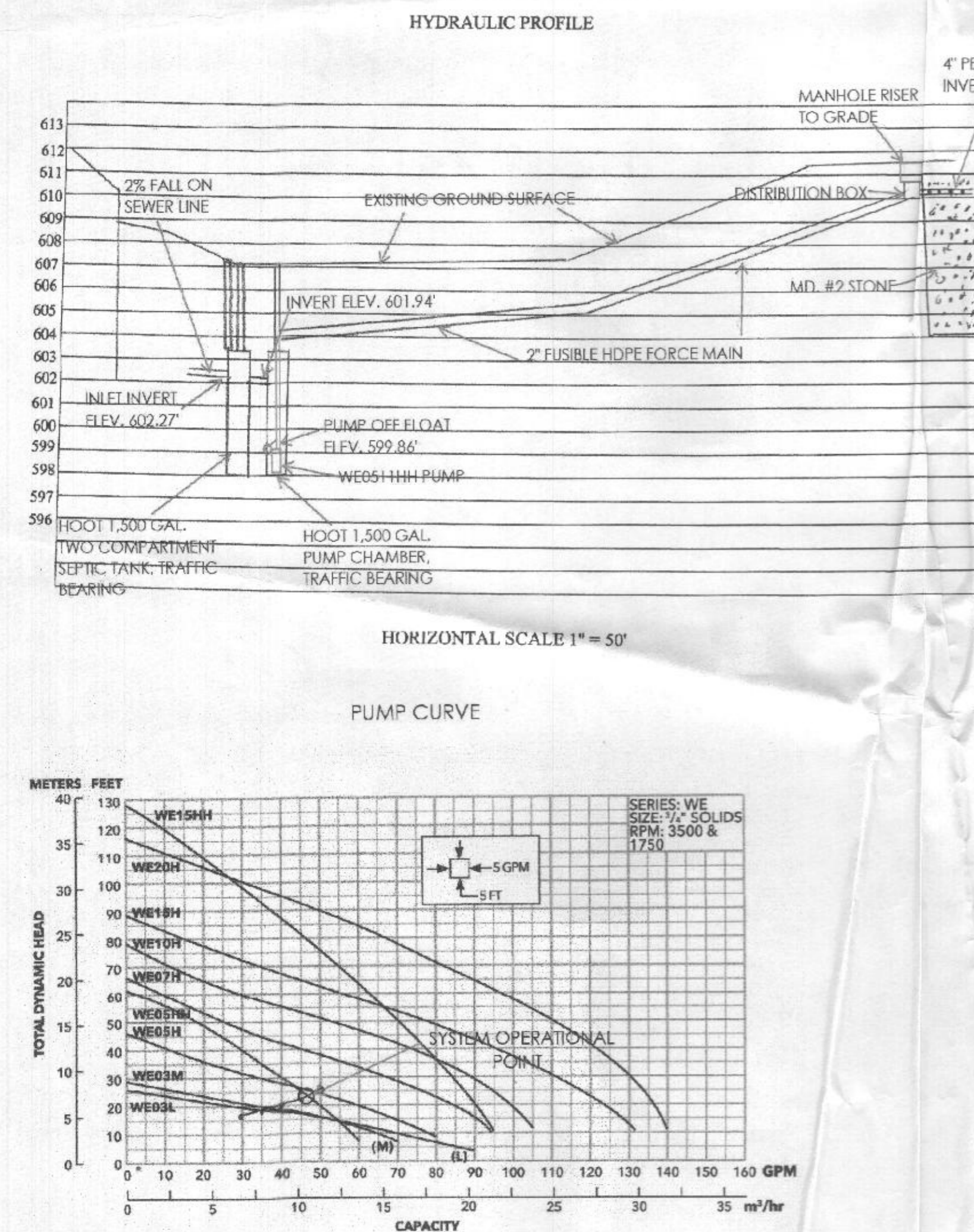
REPAIR OF SEWAGE DISPOSAL PLAN
2605 ROUTE 97
GREEN MEADOWS SUBDIVISION - LOT 8
ZONE: RR-DEO

TAX MAP: 14, GRID: 11
ELECTION DISTRICT: 4
PARCEL: 217
HOWARD COUNTY, MARYLAND

PROJECT NO.:	4177
DESIGNED BY:	JRP
DRAWN BY:	KTG
CHECKED BY:	JRP
SCALE:	AS SHOWN
DATE:	JAN. 2, 2020

SHEET: 1 OF 2

NO.	REVISION	DATE

SIGNATURE   1-8-20

Left drawings

PLAN VIEW

13' 11"

24" Dia. Opening   24" Dia. Opening

SECTION VIEW

4 to 6" Inlet Gasket   4 to 6" Outlet Gasket

Hydraulic Line   * See Note 7   Flow Slot

DESIGN DATA & GENERAL NOTES

[1] Concrete strength Fc=5,000 p.s.i. @ 28 days. Density = 150 pcf.
[2] Cement - Portland Type I/II per ASTM C 150-92.
[3] Admixtures & plasticizers per ASTM D 200-86 & C 494-92.
[4] Reinforcing per ASTM A816, Grade 60, domestic. Min. 1-1/2" cover.
[5] Top slab sealed with butyl rope mastic.
[6] Maximum 6" of earth cover over top slab.
[7] Depending on use of tank, inlet & outlet baffle may be required by code.

MBI — Mayer Bros., Inc.
5264 Race Road, Elkridge, Maryland 21075
Tel. 410.796.1434
Fax. 410.796.1438
www.mayerbrosprecast.com

1500 GALLON TANK
Heavy Traffic Rated
Stock Item [Approx. Wt. - 16,000 lbs.]
Dwg. No. 1500TR   No Scale   Aug. 11, 2008

Middle-left drawings

PLAN VIEW

13' 11"

24" Dia. Opening   24" Dia. Opening

2" FUSIBLE HDPE FORCE MAIN
EXISTING GRADE

SECTION VIEW

4-6 Inlet Gasket
MANHOLE RISER TO GRADE
4-6 Outlet Gasket (TO BE SEALED)
FLOAT TREE
HIGH WATER ALARM FLOAT
PUMP ON FLOAT
12" X 12" FLOW EQUALIZATION SLOT
PUMP OFF FLOAT
WE0511HH PUMP
6" CONCRETE BLOCK
Hydraulic Line

DESIGN DATA & GENERAL NOTES

[1] Concrete strength Fc=5,000 p.s.i. @ 28 days. Density = 150 pcf.
[2] Cement - Portland Type I/II per ASTM C 150-92.
[3] Admixtures & plasticizers per ASTM C 200-86 & C 494-92.
[4] Reinforcing per ASTM A816, Grade 60, domestic. Min. 1-1/2" cover.
[5] Walls, base, & top slab designed for HS-20 loading.
[6] Top slab tested with butyl rope mastic.
[7] Maximum 6" of earth cover over top slab.
[7] Depending on use of tank, inlet & Outlet baffle may be required by code.

REINFORCING DESIGN
Reinforcing per ASTM A185. Min. 1-1/2" cover.
Walls and Base Slab:
#4 (1/2") Rebar Per the following:
36 pieces 135" long bend @ 34"
52 pieces 108" long bend @ 34"
12 pieces 146" long bend @ 54"
Top Slab:
#5 (5/8") Rebar Per the following:
23 pieces 60" long   3 pieces 162" long
8 pieces 18" long   1 pieces 156" long
8 pieces 30" long
Baffle Wall:
#4 Bars @ 6" Centers Each Way

MBI — Mayer Bros., Inc.
5264 Race Road, Elkridge, Maryland 21075
Tel. 410.796.1434
Fax. 410.796.1438
www.mayerbrosprecast.com

1500 GALLON TANK 2-Compartment with EQ Opening
Heavy Traffic Rated
Stock Item [Approx. Wt. - 16,000 lbs.]
Dwg. No. 1500TREQ   No Scale   March 22, 2017

HYDRAULIC PROFILE

MANHOLE RISER TO GRADE
4" PERFORATED PIPE INVERT ELEV. 610'
2% FALL ON SEWER LINE
EXISTING GROUND SURFACE
DISTRIBUTION BOX
MD. #2 STONE
INVERT ELEV. 601.94'
2" FUSIBLE HDPE FORCE MAIN
INLET INVERT ELEV. 602.27'
PUMP OFF FLOAT ELEV. 599.86'
WE0511HH PUMP
HOOT 1,500 GAL. TWO COMPARTMENT SEPTIC TANK, TRAFFIC BEARING
HOOT 1,500 GAL. PUMP CHAMBER, TRAFFIC BEARING

HORIZONTAL SCALE 1" = 50'

PUMP CURVE

METERS FEET — TOTAL DYNAMIC HEAD vs CAPACITY (GPM)
SERIES: WE   SIZE: 1/2" SOLIDS
RPM: 3500 & 1750
WE15HH, WE20H, WE10H, WE05HH, WE07H, WE05H, WE05HH, WE03H
SYSTEM OPERATIONAL CURVE
SYSTEM OPERATIONAL POINT

CONTROL PANEL INFORMATION AND DOSE CALCULATIONS

- Control panel will be an SJE Rhombus Installer Friendly Series (IFS), simplex pump, single phase, 115-volt, demand dose. The panel will include an event counter and an elapsed time meter for the pump run. Float system must include: Pump Off, Pump On and High-Water Alarm.

- The high-water alarm must be on a separate electrical circuit.

- The effluent will be pumped to a distribution box, equipped with a surge baffle. The effluent will then proceed via gravity flow to the three separate deep trench systems comprising the initial installation area. The trenches will be demand dosed.

- Install quick disconnect for the pump (Goulds series 3885, WE 05HH, 1/2 Hp, 1 phase, 115 volts)

- Dose Calculations – peak daily design flow is 600 gpd (based on four bedrooms x 150 gal./bedroom/day)
  - Total length of force main (2" fusible HDPE pipe) is 313'
  - Volume of force main – 313' x 17.4 gal./100 ft. = 54.5 gal.
  - Average flow estimated to be 60% of peak flow – therefore 600 gpd x 0.6 = 360 gpd. It is desirable to have the pump operate a minimum of 3 times/24-hour period. Consequently, the minimum dose to be delivered to the deep trench systems is 360 gpd avg flow ÷ 3 = 120 gal. delivered to trench system
  - 120 gal. + 54.5 gal. storage in force main = 174.5 gal.

- The pump chamber is manufactured by Mayer Bros., Inc.
  - Storage calculations – inside dimensions of tank – 4.58' x 12.92' (excluding 4" width for center wall) x 7.48 gal./cu. Ft. = 442.6 gal./ft. of sewage in tank
  - 442.6 gal./ft. of sewage in tank ÷ 12" = 36.88 gal./inch storage
  - 174.5 gal ÷ 36.88 gal./inch = 4.7" – use 5" between pump on and off float
  - 5" between pump on and pump off float x 36.88 gal./inch = dose flow of 184.4 gal.

- Storage capacity above the high-water alarm float
  - There is 17" of storage in the pump chamber between the high-water alarm float and the invert of the inlet pipe. Using the calculation above there is 36.88 gal./inch of storage in the tank – providing 627 gal. storage.

SEWAGE DISPOSAL SYSTEM DESIGN CALCULATIONS FOR ONE INITIAL AND TWO FUTURE REPLACEMENT SYSTEMS

- **INITIAL SYSTEM INSTALLATION** – for an existing four-bedroom dwelling
  - Design on Soil Percolation Test 2A – soil loading rate 0.8 gal./sq. ft./day
  - Effective area beginning depth – 4'
  - Total trench depth 7.5'
  - 4 bedrooms x 150 gal/day/bedroom = 600 gpd peak design flow
  - 600 gpd ÷ 0.8 gal./sq. ft./day soil loading rate = 750 sq. ft. effective area
  - 750 sq. ft. effective area ÷ 2 ft. shallow trench width = 375 ft. shallow trench
  - 375 ft. shallow trench x deep trench conversion factor (2 + 2/2 + 1 + 2 (3.5) or 0.4) = 150 ft. of 7.5' deep
  - Elect to use three 50' long trenches, 2 ft. wide, 7.5' deep – separation distance is 10 ft. measured edge to edge or 12' on center (shown as Trenches 1, 2, 3 on site plan)

- **FIRST REPLACEMENT SYSTEM** – for an existing four-bedroom dwelling
  - Design on Soil Percolation Test 9A – soil loading rate 0.8 gal./sq. ft./day
  - Effective area beginning depth 4'
  - Total trench depth 7'
  - 4 bedrooms x 150 gal/day/bedroom = 600 gpd peak design flow
  - 600 gpd ÷ 0.8 gal./sq. ft./day soil loading rate = 750 sq. ft. effective area
  - 750 sq. ft. effective area ÷ 2 ft. shallow trench width = 375 ft. shallow trench
  - 375 ft. shallow trench x deep trench conversion factor (2 + 2/2 + 1 + 2 (3) or 0.44) = 165 ft. of 7' deep
  - Elect to use three 55' long trenches, 2 ft. wide, 7' deep – separation distance is 10 ft. measured edge to edge or 12' on center (shown as Trenches 4, 5, 6 on site plan)

- **SECOND REPLACEMENT SYSTEM** – for an existing four-bedroom dwelling
  - Design on Soil Percolation Tests 10A, 11 – soil loading rate 0.6 gal./sq. ft./day
  - Effective area beginning depth 3.5'
  - Total trench depth 6'
  - 4 bedrooms x 150 gal/day/bedroom = 600 gpd peak design flow
  - 600 gpd ÷ 0.6 gal./sq. ft./day soil loading rate = 1,000 sq. ft. effective area
  - 1,000 sq. ft. effective area ÷ 2 ft. shallow trench width = 500 ft. shallow trench
  - 500 ft. shallow trench x deep trench conversion factor (2 + 2/2 + 1 + 2 (2.5) or 0.5) = 250 ft. of 6' deep
  - Elect to use three 63' long trenches (shown as Trenches 7, 8, 9 on site plan); and one trench being split into two 32' lengths of run (shown as Trenches # 10A and #10B on the site plan). The trenches for 10A and 10B will be connected via end feed on each end of the 32 ft. long runs as shown on the site plan. These trenches will be 2 ft. wide, 6' deep – separation distance is 10 ft. measured edge to edge or 12' on center

TOTAL DYNAMIC HEAD CALCULATIONS

- Existing grade at proposed septic tank location is 607' and estimated inlet invert elevation will be 602.27'. It is anticipated that the soil cover on top of the proposed septic tank will be 3.6'.

- Existing grade at the pump chamber is 607'. The inlet invert into the pump chamber will be 601.94'. The estimated cover on the pump chamber will be 3.9'

- Pump off float will be 21" above the bottom of the pump chamber, making it 26" below the inlet invert. Consequently, the pump off float elevation is 599.77'.

- Existing grade at the highest trench (Trench 2) is 611.83' and the lateral pipe (invert elevation 610') will be 22" below grade; consequently, the distribution lateral with 18" cover.

- Consequently, the static head is 10.23'.

- Friction loss
  - Length of force main and manifold – 2" fusible HDPE pipe – 313'
  - Equivalent length of fittings
    - 1 ea. 90° ells – 8.6' ea. – 8.6'
    - 8 ea. 45° ells – 2.6' ea. – 20.8'
  - Total Equivalent pipe length – 29.4'
  - Total length of pipe – 342.4'
  - Friction loss for 2" fusible HDPE pipe with a flow of 30 gpm is 1.6'/100' length of pipe. Consequently, pipe friction loss is 5.48'

- Total Dynamic Head is therefore 10.23' + 5.48' = 15.71'

- Pump must be able to deliver a minimum of 30 gpm at a TDH of 15.71'

- Selected Goulds submersible effluent pump Model 3885, series WE0511HH, 1/2 Hp, single phase, 115 volts.

- System Operational Curve
  - Using 35 gpm yields 17.75' of TDH
  - Using 40 gpm yields 19.81' of TDH
  - Using 45 gpm yields 21.86' of TDH
  - Using 50 gpm yields 24.59' of TDH
  - System operational point – 47.5 gpm at 23.23' TDH - 4.65 fps velocity

CONSTRUCTION DETAIL

1. The existing dwelling consists of four bedrooms.

2. The existing sewage disposal system currently serving the dwelling will be abandoned; with the septic tank being pumped by a licensed septic waste hauler, crushed and filled with clean soil.

3. The proposed replacement system will consist of a 1,500-gallon two compartment septic tank, 1,500-gallon pump chamber and three deep absorption trenches. The trenches will be demand dosed.

4. The septic tank will be traffic bearing as the cover on the tank will be 3.56' and will be manufactured by Mayer Brothers, Inc. The 1,500-gallon pump chamber will have 3.89' of cover and will also be traffic bearing. The pump chamber will be manufactured by Mayer Brothers, Inc. and will have a center wall on the interior of the tank for structural support. There will be a 12" x 12" opening at the bottom of the center wall to allow for flow equalization during pump operation. NOTE: THE PUMP CHAMBER IS NOT NORMALLY A STOCKED ITEM. PLEASE ALLOW FOUR (4) WEEKS BETWEEN ORDERING THE TANK AND DELIVERY.

5. The deep absorption trench design will consist of three trenches; each trench to be 50 ft. long, 2 ft. wide and 7.5 ft. deep. The perforated pipe will be installed 18" below grade with 6 ft. of Md. #2 stone below the trenches and the separation distance between the trenches will be 10 ft., measured edge to edge (12 ft. on center). Two inches of stone will be placed over the lateral piping, with geotextile fabric (spun, not woven) on top and the remaining 16" being soil backfill to the ground surface.

6. The force main from the pump chamber to the distribution box shall be 2" fusible HDPE pipe.

7. A distribution box will be installed and shall have a surge baffle installed directly opposite the force main influent line. The distribution box shall be equipped with a concrete manhole riser to grade with a concrete lid.

8. Observation pipes shall be installed at the end of each trench. The observation pipes shall be 4" Sch. 40 pvc pipes and shall have ½" perforations drilled on one side at 6" intervals from the bottom of the stone trench to the top of the lateral distribution pipe. The remainder of the observation pipe from that point to the cap (top) will be solid Sch. 40 pvc pipe. The observation pipe caps will be placed below grade in a plastic turf box, with the lids at final grade. The plastic turf box will be Rain Bird round boxes, 10" in diameter, 10" high, Model PVB 10 RND and be supported by bricks at the bottom.

9. A Goulds submersible effluent pump Model 3885, series WE0511HH, 1/2 Hp, single phase, 115 volts will be installed in the pump chamber.

10. A "float tree" shall be placed in the pump chamber with the floats attached to it as shown. The float tree shall be 4" Sch. 40 pvc pipe.

11. The high-water alarm will be wired to separate circuit breaker from that of the pump.

DEEP TRENCH PROFILE AND OBSERVATION PIPE DETAIL

EXISTING GROUND SURFACE
2" MD. #2 STONE OVER PERFORATED PIPE
GEOTEXTILE FABRIC (SPUN - NOT WOVEN)
SOLID 4" PVC PIPE WITH SLIDE ON CAP
16" SOIL BACKFILL
4" PERFORATED PIPE
RAIN BIRD ROUND MODEL PVB 10RND (10" DIAM) VALVE BOX, SUPPORT BOX BY PLACING BRICKS ON BOTTOM OF BOX
5.67' MD. #2 STONE UNDER PERFORATED PIPE
7.5'
4" SCH. 40 PVC OBSERVATION PIPE - WITH 1/2" PERFORATIONS DRILLED ON ONE SIDE EVERY 6" FROM BOTTOM OF STONE TRENCH TO TOP OF LATERAL PIPE

PLAN NOT TO SCALE

SEWAGE DISPOSAL SYSTEM DESIGN PREPARED BY
JAMES R. POWELL
421 RIDGWAY ROAD
CATONSVILLE, MARYLAND 21228
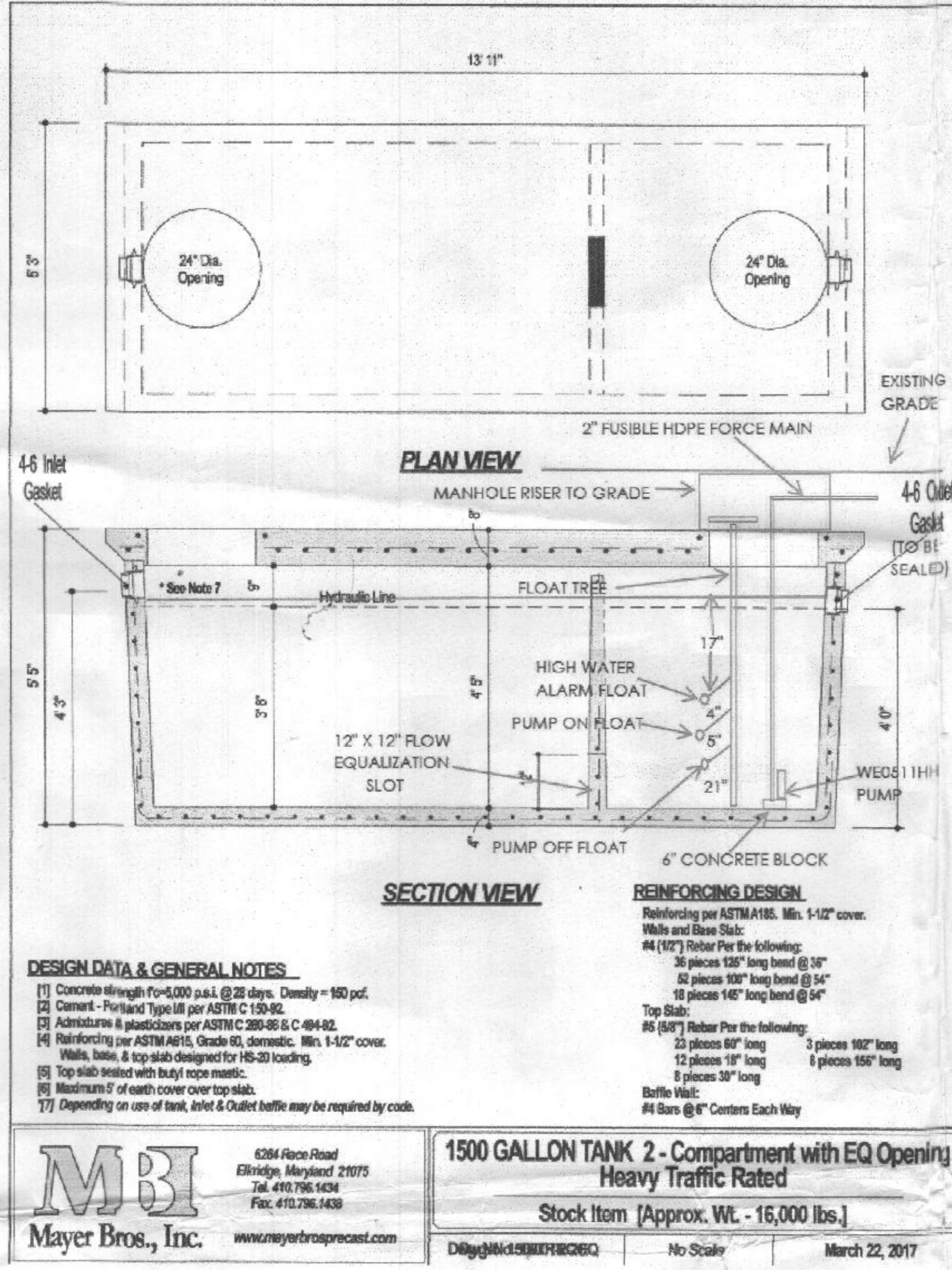443-9503199

SIGNATURE   DATE

Title Block

NO.   REVISION   DATE

REPAIR OF SEWAGE DISPOSAL PLAN

2605 ROUTE 97

GREEN MEADOWS SUBDIVISION – LOT 8

ZONE: RR-DEO

TAX MAP: 14, GRID: 11   PARCEL: 217
ELECTION DISTRICT: 4   HOWARD COUNTY, MARYLAND

PROJECT NO.: 4177
DESIGNED BY: JP
DRAWN BY: KTG
CHECKED BY: JP
SCALE: AS SHOWN
DATE: NOV. 26, 2019
SHEET: 2 OF 2

OWNER/DEVELOPER
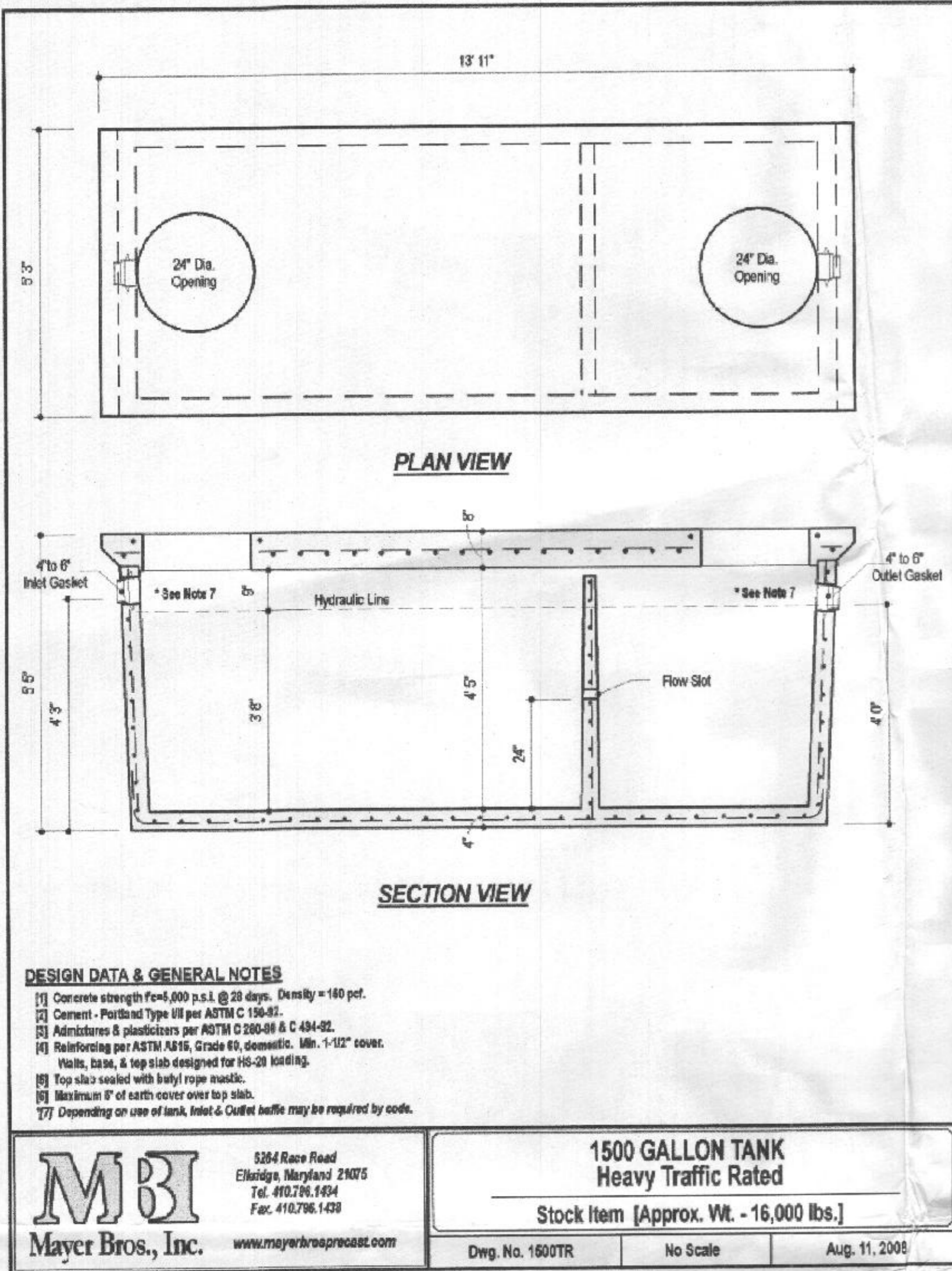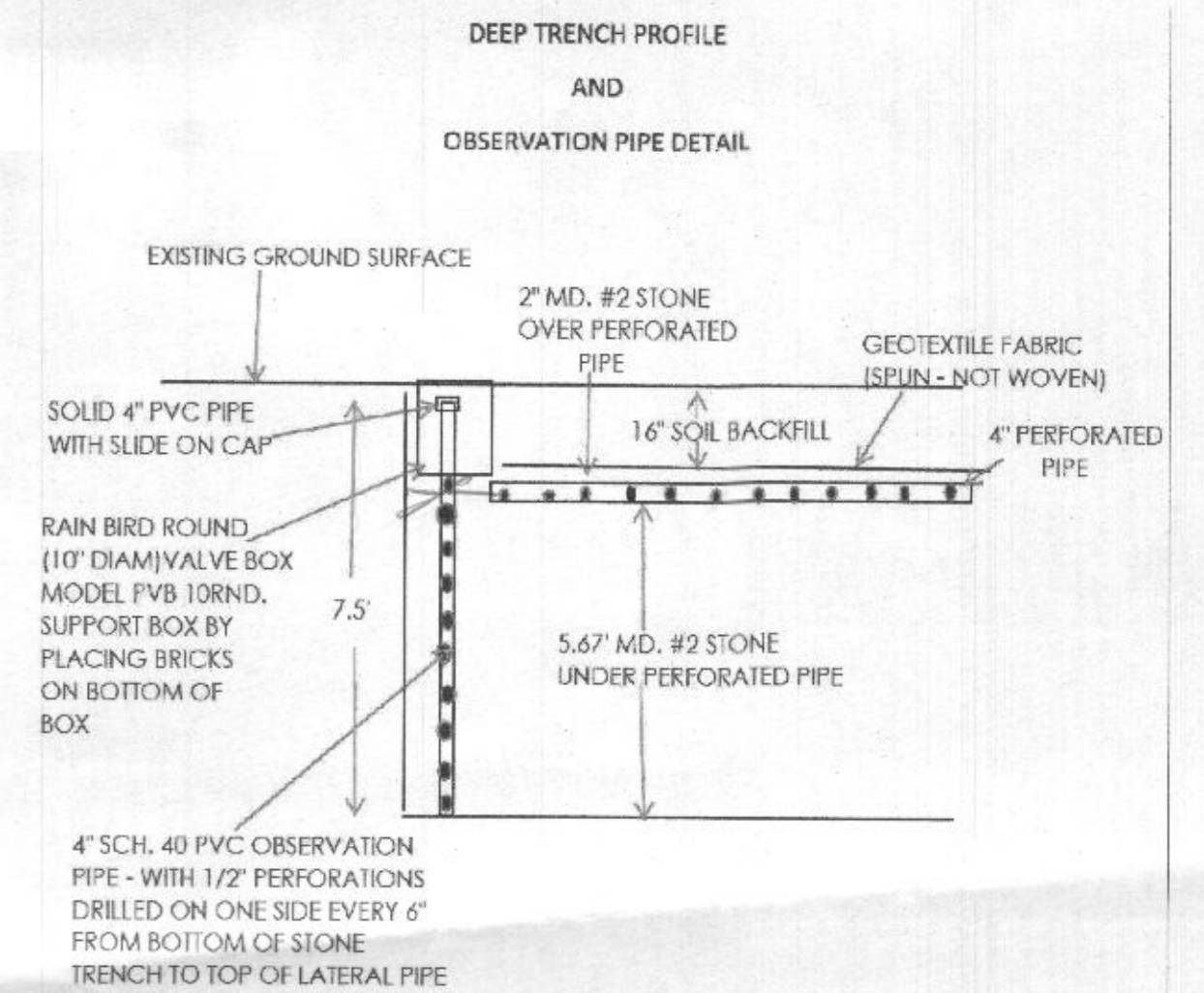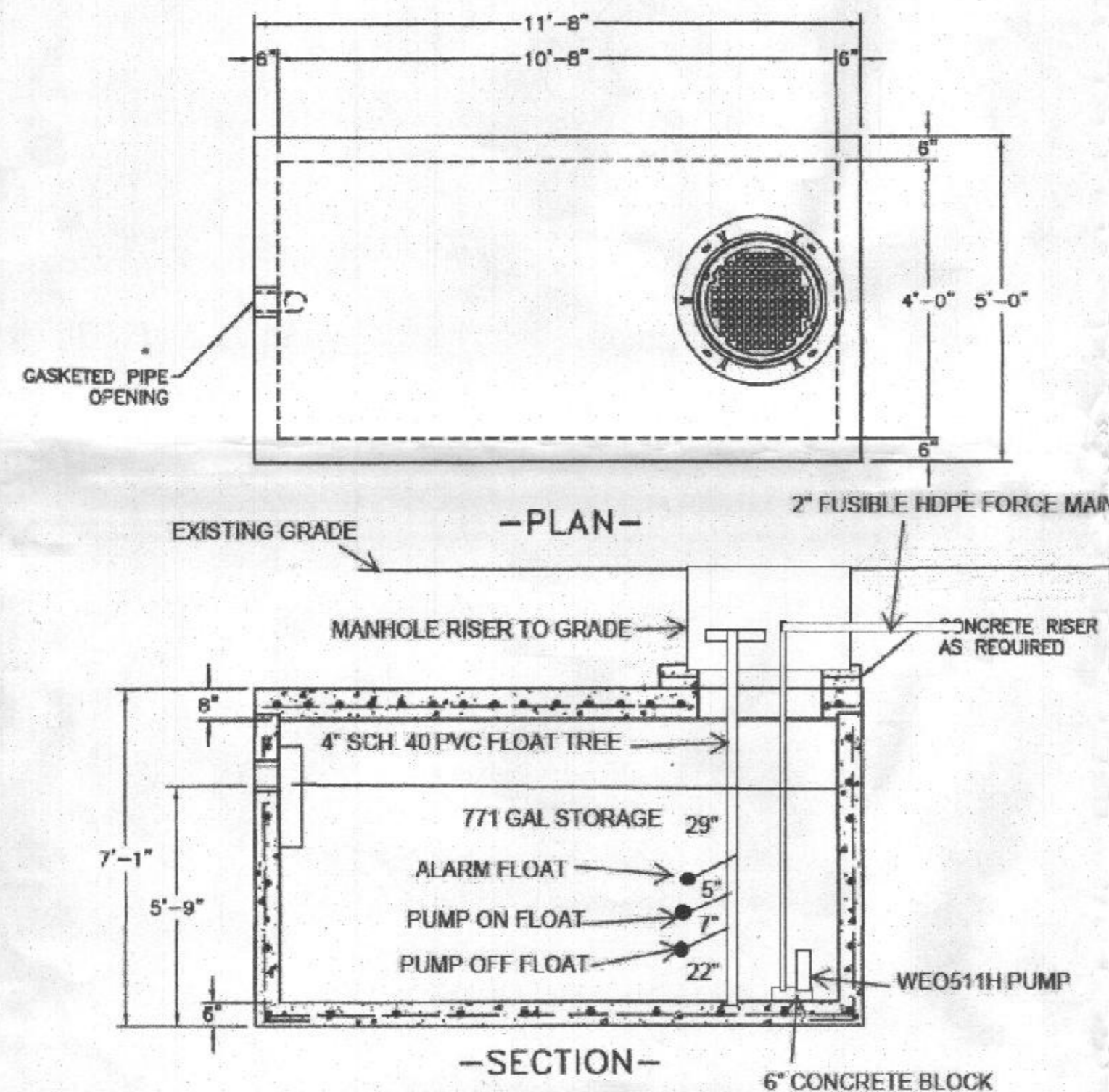KEVIN & MARIA GARVEY
2605 ROUTE 97
GLENWOOD, MD 21738
443-506-5112

PLAN VIEW

13' 11"

24" Dia. Opening   24" Dia. Opening

SECTION VIEW

4'x 6" Inlet Gasket   * See Note 7   * See Note 7   4'x 6" Outlet Gasket

Hydraulic Line

Flow Slot

DESIGN DATA & GENERAL NOTES
[1] Concrete strength f=4,000 p.s.i. @ 28 days. Density = 150 pcf.
[2] Cement - Portland Type I/II per ASTM C 150-82.
[3] Admixtures & plasticizers per ASTM D 260-86 & C 494-82.
[4] Reinforcing per ASTM A615, Grade 40, domestic. Min. 1-1/2" cover.
[5] Walls, base, & top slab designed for HS-20 loading.
[6] Top slab sealed with butyl rope mastic.
[7] Minimum 8" of earth cover over top slab.
[8] Depending on use of tank, inlet & Outlet baffle may be required by code.

Mayer Bros., Inc.
5264 Race Road
Elkridge, Maryland 21075
Tel. 410.794.1494
Fax. 410.794.1429
www.mayerbrosprecast.com

1500 GALLON TANK
Heavy Traffic Rated
Stock Item (Approx. Wt. - 16,000 lbs.)

Dwg. No. 1600TR | No Scale | Aug. 11, 2005

MONARCH PRODUCTS COMPANY, INC.
YORK HAVEN, PA.

NOTES:
1. H-20 TRAFFIC RATED FOR 1' TO 5' OF EARTH COVER.
2. CONCRETE TO BE 5000 PSI MIN. @ 28 DAYS.
3. REINFORCING STEEL TO BE PER ASTM A615, GRADE 60.
4. BOX WT. (W/BAFFLES)=19,400#, LID WT.=5,800#.

11'-8"
10'-8"

—PLAN—

GASKETED PIPE OPENING

2" FUSIBLE HDPE FORCE MAIN

EXISTING GRADE

MANHOLE RISER TO GRADE

CONCRETE RISER AS REQUIRED

4" SCH. 40 PVC FLOAT TREE

771 GAL STORAGE   29"

ALARM FLOAT   5'

PUMP ON FLOAT   7'

PUMP OFF FLOAT   22"

WE0511H PUMP

6" CONCRETE BLOCK

—SECTION—

1500 GALLON 1 COMPARTMENT TRAFFIC RATED PUMP TANK   PT-1500-1TR

HYDRAULIC PROFILE

MANHOLE RISER TO GRADE

4" PERFORATED PIPE 24" BELOW GRADE

1% FALL ON SEWER LINE

EXISTING GROUND SURFACE

DISTRIBUTION BOX

INVERT ELEVATION   602'

INLET INVERT 602.4'

2" FUSIBLE HDPE FORCE MAIN

MD #2 STONE

PUMP OFF FLOAT ELEV. 598.56'

WE 0511 H EFFLUENT PUMP

MAYER BROTHERS 1,500 GAL. TWO COMPARTMENT SEPTIC TANK TRAFFIC BEARING

MONARCH PRODUCTS CO., INC. 1,500 GAL. SINGLE COMPARTMENT PUMP CHAMBER TRAFFIC BEARING

HORIZONTAL SCALE 1" = 60'

PUMP PERFORMANCE CURVE

METERS FEET

SERIES: WE
SIZE: ½" SOLIDS
RPM: 3500 & 1750

WE15HH
WE20H
WE15H
WE07H
WE05H
WE03H
WE05H
WE03L

SYSTEM OPERATIONAL POINT

5GPM
5FT

CAPACITY GPM / m³/hr

CONTROL PANEL INFORMATION
AND DOSE CALCULATIONS

- Control panel will be an SJE Rhombus Installer Friendly Series (IFS), simplex pump, single phase, 115-volt, demand dose. The panel will include an event counter and an elapsed time meter for the pump run. Float system must include: Pump Off, Pump On and High-Water Alarm.

- The high-water alarm must be on a separate electrical circuit.

- The effluent will be pumped to a distribution box, equipped with a surge baffle. The effluent will then proceed via gravity flow to the three separate deep trench systems comprising the initial installation area. The trenches will be demand dosed.

- Install quick disconnect for the pump (Goulds series 3885, WE 05H, 1/2 Hp, 1 phase, 115 volts)

- Dose Calculations – peak daily design flow is 600 gpd (based on four bedrooms x 150 gal./bedroom/day)
  - Total length of force main (2" fusible HDPE pipe) is 388'
  - Volume of force main – 388' x 17.4 gal./100 ft. = 67.5 gal.
  - Average flow estimated to be 60% of peak flow – therefore 600 gpd x 0.6 = 360 gpd. It is desirable to have the pump operate a minimum of 3 times/24-hour period. Consequently, the minimum dose to be delivered to the deep trench systems is 360 gpd avg flow ÷ 3= 120 gal. delivered to trench system
  - 120 gal. + 67.5 gal. storage in force main = 187.5 gal.

- The pump chamber is manufactured by Monarch Products Co., Inc.
  - Storage calculations – inside dimensions of tank – 4' x 10.67' x 7.48 gal./cu. Ft. = 319.2 gal./ft. of sewage in tank
  - 319.2 gal./ft. of sewage in tank ÷ 12" = 26.6 gal./inch storage
  - 187.5 gal. ÷ 26.6 gal./inch = 7" – use 7" between pump on and off float

- Storage capacity above the high-water alarm float
  - There is 29" of storage in the pump chamber between the high-water alarm float and the invert of the inlet pipe. Using the calculation above there is 26.6 gal./inch of storage in the tank – providing 771 gal. storage.

TOTAL DYNAMIC HEAD CALCULATIONS

- Existing grade at proposed septic tank location is 606' and estimated inlet invert elevation will be 602.4'. The Inlet invert elevation is based on 1% fall on the proposed sewer line between the inlet of the existing septic tank (TBA) and the inlet into the proposed septic tank. It is anticipated that the soil cover on top of the proposed septic tank will be 2.35'.

- Existing grade at the pump chamber is 606'. The inlet invert into the pump chamber will be 601.98'. The estimated cover on the pump chamber will be 2.7'

- Pump off float will be 22" above the bottom of the pump chamber, making it 41" below the Inlet invert. Consequently, the pump off float elevation is 598.56'.

- Existing grade at the highest trench (Trench 2) is 611.83' and the lateral pipe (invert elevation 609.83') will be 24" below grade; consequently, the distribution lateral will have 24" cover.

- Consequently, the static head is 11.27'.

- Friction loss
  - Length of force main and manifold – 2" fusible HDPE pipe – 388'
  - Equivalent length of fittings
    - 1 ea. 90° ells – 8.6' ea. – 8.6'
    - 8 ea. 45° ells – 2.6' ea. – 20.8'
  - Total Equivalent pipe length – 29.4'
  - Total length of pipe – 417.4'
  - Friction loss for 2" fusible HDPE pipe with a flow of 30 gpm is 1.6'/100' length of pipe. Consequently, pipe friction loss is 6.68'

- Total Dynamic Head is therefore 11.27' + 6.68' = 17.95'

- Pump must be able to deliver a minimum of 30 gpm at a TDH of 17.95'

- Selected Goulds submersible effluent pump Model 3885, series WE0511H, 1/2 Hp, single phase, 115 volts.

- System Operational Curve
  - Using 35 gpm yields 20.44' of TDH
  - Using 40 gpm yields 22.95' of TDH
  - Using 45 gpm yields 25.45' of TDH
  - Using 50 gpm yields 28.79' of TDH
  - System operational point – 45 gpm at 25.45' TDH - 4.4 fps velocity

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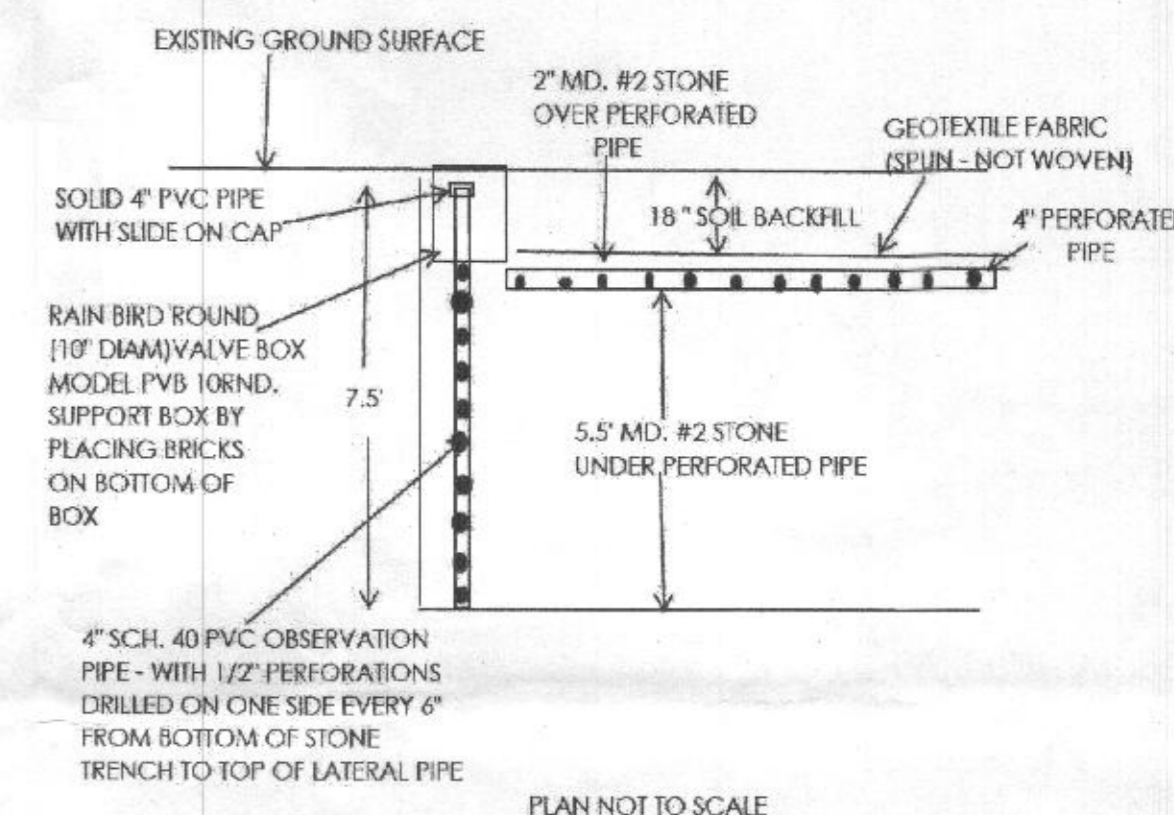### SEWAGE DISPOSAL SYSTEM DESIGN CALCULATIONS
FOR ONE INITIAL AND TWO
FUTURE REPLACEMENT SYSTEMS

- INITIAL SYSTEM INSTALLATION – for an existing four-bedroom dwelling
  - Design on Soil Percolation Test 2A – soil loading rate 0.8 gal./sq./day
  - Effective area beginning depth – 4'
  - Total trench depth 7.5'
  - 4 bedrooms x 150 gal/day/bedroom = 600 gpd peak design flow
  - 600 gpd ÷ 0.8 gal./sq./day soil loading rate = 750 sq. ft. effective area
  - 750 sq. ft. effective area ÷ 2 ft. shallow trench width = 375 ft. shallow trench
  - 375 ft. shallow trench x deep trench conversion factor (2 + 2/2 + 1 ÷ 2 (3.5) or 0.4) = 150 ft. of 7.5' deep
  - Elect to use three 50' long trenches, 2 ft. wide, 7.5' deep – separation distance is 10 ft. measured edge to edge or 12' on center (shown as Trenches 1, 2, 3 on site plan)

- FIRST REPLACEMENT SYSTEM – for an existing four-bedroom dwelling
  - Design on Soil Percolation Test 9A – soil loading rate 0.8 gal./sq./day
  - Effective area beginning depth 4'
  - Total trench depth 7'
  - 4 bedrooms x 150 gal/day/bedroom = 600 gpd peak design flow
  - 600 gpd ÷ 0.8 gal./sq./day soil loading rate = 750 sq. ft. effective area
  - 750 sq. ft. effective area ÷ 2 ft. shallow trench width = 375 ft. shallow trench
  - 375 ft. shallow trench x deep trench conversion factor (2 + 2/2 + 1 ÷ 2 (3) or 0.44) = 165 ft. of 7' deep
  - Elect to use three 55' long trenches, 2 ft. wide, 7' deep – separation distance is 10 ft. measured edge to edge or 12' on center (shown as Trenches 4, 5, 6 on site plan)

- SECOND REPLACEMENT SYSTEM – for an existing four-bedroom dwelling
  - Design on Soil Percolation Tests 10A, 11 – soil loading rate 0.6 gal./sq. ft./day
  - Effective area beginning depth 3.5'
  - Total trench depth 6'
  - 4 bedrooms x 150 gal/day/bedroom = 600 gpd peak design flow
  - 600 gpd ÷ 0.6 gal./sq. ft./day soil loading rate = 1,000 sq. ft. effective area
  - 1,000 sq. ft. effective area ÷ 2 ft. shallow trench width = 500 ft. shallow trench
  - 500 ft. shallow trench x deep trench conversion factor (2 + 2/2 + 1 ÷ 2 (2.5) or 0.5) = 250 ft. of 6' deep
  - Elect to use three 63' long trenches (shown as Trenches 7, 8, 9 on site plan); and one trench being split into two 32' lengths of run (shown as Trenches # 10A and #10B on the site plan). The trenches for 10A and 10B will be connected via end feed on each end of the 32 ft. long runs as shown on the site plan. The trenches will be 2 ft. wide, 6' deep – separation distance is 10 ft. measured edge to edge or 12' on center.
  - This trench layout will require the system incorporate low-pressure dosing design.
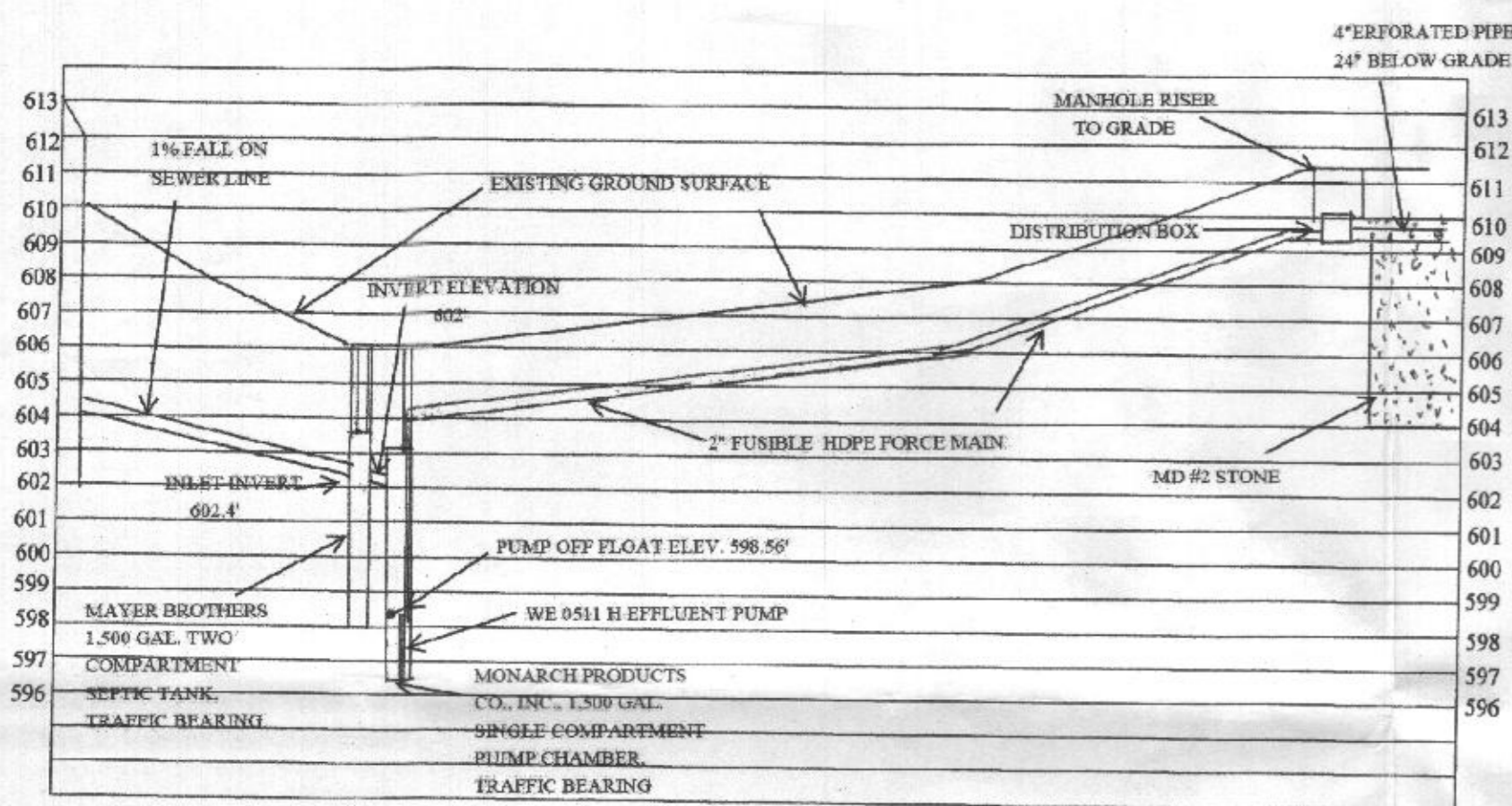

CONSTRUCTION DETAIL

1. The existing dwelling consists of four bedrooms.

2. The existing sewage disposal system currently serving the dwelling will be abandoned; with the septic tank being pumped by a licensed septic waste hauler, crushed and filled with clean soil.

3. The proposed replacement system will consist of a 1,500-gallon two compartment septic tank, 1,500-gallon pump chamber and three deep absorption trenches. The trenches will be demand dosed.

4. The septic tank will be traffic bearing and will be manufactured by Mayer Brothers, Inc. The septic tank will have 2.35' of cover, which is based on the sewer line between the inlet side of the existing septic tank (TBA) and the proposed septic tank being installed with 1% fall. The 1,500-gallon pump chamber will have 2.69' of cover and will also be traffic bearing. The pump chamber will be manufactured by Monarch Products Company, Inc. NOTE: THE PUMP CHAMBER IS NOT NORMALLY A STOCKED ITEM. PLEASE ALLOW SEVERAL WEEKS BETWEEN ORDERING THE TANK AND DELIVERY.

5. The deep absorption trench design will consist of three trenches; each trench to be 50 ft. long, 2 ft. wide and 7.5 ft. deep. The perforated pipe will be installed 24" below grade with 5.5 ft. of Md. #2 stone below the lateral pipe and the separation distance between the trenches will be 10 ft., measured edge to edge (12 ft. on center).

6. The force main from the pump chamber to the distribution box shall be 2" fusible HDPE pipe.

7. A distribution box will be installed and shall have a surge baffle installed directly opposite the force main influent line. The distribution box shall be equipped with a concrete manhole riser to grade with a concrete lid.

8. Observation pipes shall be installed at the end of each trench. The observation pipes shall be 4" Sch. 40 pvc pipes and shall have ½" perforations drilled on one side at 6" intervals from the bottom of the stone trench to the bottom of the lateral distribution pipe. The remainder of the observation pipe from that point to the cap (top) shall be solid Sch. 40 pvc pipe. The observation pipe caps will be placed below grade in a plastic turf box, with the lids at final grade. The plastic turf box will be Rain Bird round boxes, 10" in diameter, 10" high, Model PVB 10 RND and be supported by bricks at the bottom.

9. A Goulds submersible effluent pump Model 3885, series WE0511H, 1/2 Hp, single phase, 115 volts will be installed in the pump chamber.

10. A "float tree" shall be placed in the pump chamber with the floats attached to it as shown. The float tree shall be 4" Sch. 40 pvc pipe.

11. The high-water alarm will be wired to separate circuit breaker from that of the pump.

DEEP TRENCH PROFILE
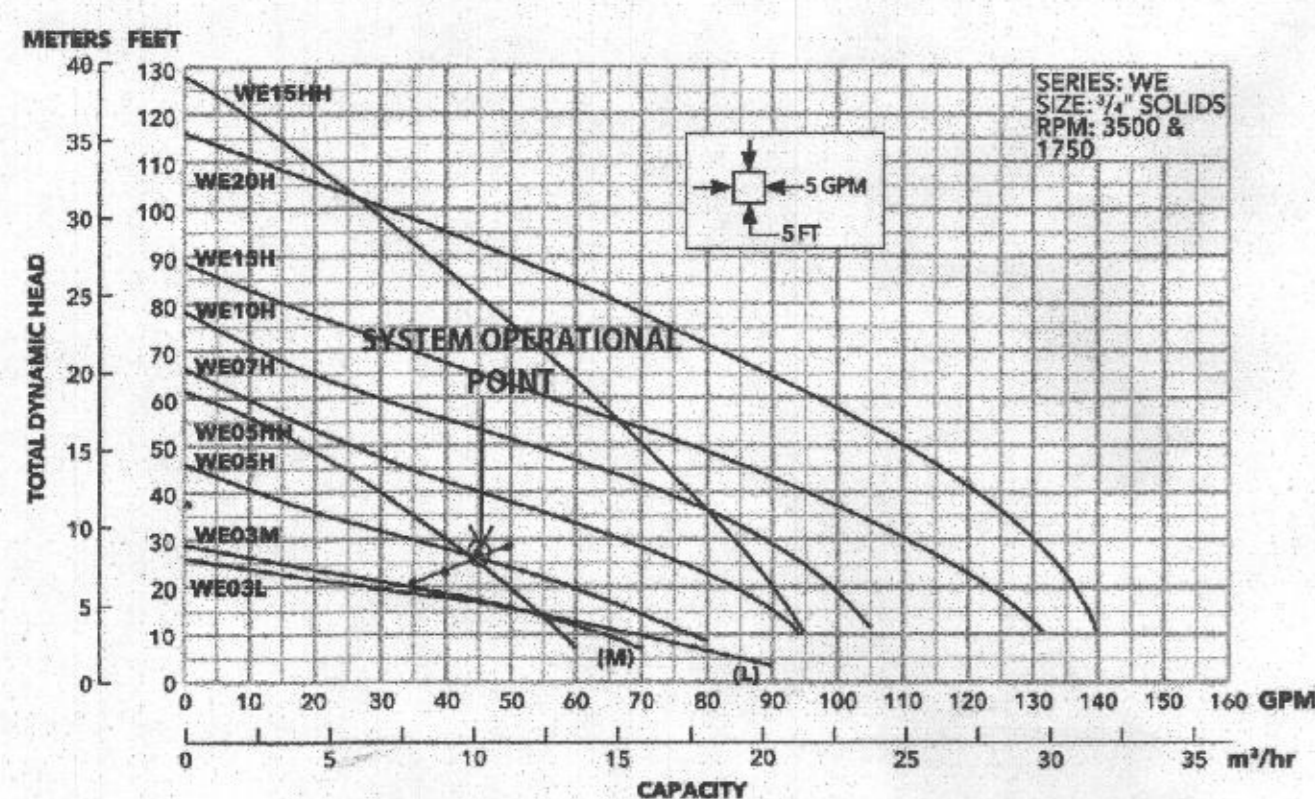### AND
OBSERVATION PIPE DETAIL

EXISTING GROUND SURFACE

2" MD. #2 STONE OVER PERFORATED PIPE

GEOTEXTILE FABRIC (SPUN - NOT WOVEN)

SOLID 4" PVC PIPE WITH SLIDE ON CAP

18" SOIL BACKFILL

4" PERFORATED PIPE

RAIN BIRD 'ROUND' (10" DIAM.) VALVE BOX MODEL PVB 10RND, SUPPORT BOX BY PLACING BRICKS ON BOTTOM OF BOX

7.5'

4" SCH. 40 PVC OBSERVATION PIPE - WITH 1/2" PERFORATIONS DRILLED ON ONE SIDE EVERY 6" FROM BOTTOM OF STONE TRENCH TO TOP OF LATERAL PIPE

5.5' MD. #2 STONE UNDER PERFORATED PIPE

PLAN NOT TO SCALE

REPAIR OF SEWAGE DISPOSAL PLAN
2605 ROUTE 97
GREEN MEADOWS SUBDIVISION - LOT 8
ZONE: RR-DEO

TAX MAP: 14, GRID: 11   PARCEL: 217
ELECTION DISTRICT: 4   HOWARD COUNTY, MARYLAND

SEWAGE DISPOSAL SYSTEM DESIGN PREPARED BY
JAMES R. POWELL
421 ROCKWAY ROAD
CATONSVILLE, MARYLAND 21228
443-900-3169

PROJECT NO.: 4177
DESIGNED BY: JRP
DRAWN BY: KTG
CHECKED BY: JRP
SCALE: AS SHOWN
DATE: JAN. 2, 2020

SHEET: 2 OF 2

NO. | REVISION | DATE

OWNER/DEVELOPER
KEVIN & MARIA GARVEY
2605 ROUTE 97
GLENWOOD, MD 21738
443-506-5112

SIGNATURE   DATE   [signature] 1-8-20