

**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](http://www.hchealth.org)  
 Facebook: [www.facebook.com/hocohealth](http://www.facebook.com/hocohealth)

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

RECEIPT DATE: 3/31/23 **ONSITE SEWAGE DISPOSAL SYSTEM** P 574070

APPROVAL DATE: 6/4/23 **PERMIT: NEW CONSTRUCTION** A \_\_\_\_\_

PROPERTY ADDRESS: 13783 Frederick Road

SUBDIVISION: Renfro Property LOT: 2 TAX ID: \_\_\_\_\_

CONTRACTOR: WTC Contractors EMAIL: \_\_\_\_\_

CONTRACTOR ADDRESS: 3033 Salem Bottom Road, Westminster, MD 21157 PHONE: 410-875-9771

PROPERTY OWNER: Harold Renfro EMAIL: \_\_\_\_\_

OWNER ADDRESS: 13765 Frederick Road, West Friendship, MD 21794 PHONE: \_\_\_\_\_

SEPTIC TANK SIZE (GALLONS): 1500 TANK MANUFACTURER: Mayer Bros

PUMP MODEL: Gould's pump PUMP SIZE Series WE-07H PUMP TANK CAPACITY: 1500

DISTRIBUTION SYSTEM:  GRAVITY  PRESSURE DOSED BEDROOMS: 3 APPLICATION RATE: 0.8

TRENCHES:	LINEAR FEET REQUIRED: <u>186</u>	INLET DEPTH: <u>4.7'</u>
	TRENCH WIDTH: <u>2</u>	MAXIMUM BOTTOM DEPTH: <u>8</u>
	MINIMUM SPACE BETWEEN TRENCHES: <u>5.5'</u>	EFFECTIVE AREA BEGINNING DEPTH: <u>6.56</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: \_\_\_\_\_ ISSUE DATE: 6-23-23 EXPIRATION DATE: 3-31-24

- 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 N/A
- 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.**

NOT TO SCALE

**TRENCH/DRAINFIELD DATA**

WIDTH	INLET	BOTTOM
2'	2'	8"
NUMBER OF TRENCHES		3
TOTAL LENGTH		190'
ABSORPTION AREA		380 ft <sup>2</sup>
DISTRIBUTION BOX LEVEL		—
DISTRIBUTION BOX BAFFLE		—
DISTRIBUTION BOX PORT		—

**SEPTIC TANK DATA**

SEPTIC TANK 1 LEVEL \_\_\_\_\_

MANUFACTURER \_\_\_\_\_

CAPACITY \_\_\_\_\_ GAL

SEAM LOC \_\_\_\_\_

TANK LID DEPTH 2.5-3'

BAFFLES 6" Front

BAFFLE FILTER \_\_\_\_\_

MANHOLE LOC \_\_\_\_\_

6" PORT LOC \_\_\_\_\_

WATERTIGHT TEST \_\_\_\_\_

SLOTTED \_\_\_\_\_

DATE ON LID 4/14/2023

PUMP/SEPTIC TANK LEVEL \_\_\_\_\_

MANUFACTURER \_\_\_\_\_

CAPACITY \_\_\_\_\_ GAL

SEAM LOC \_\_\_\_\_

TANK LID DEPTH 2.5-3'

BAFFLES \_\_\_\_\_

BAFFLE FILTER \_\_\_\_\_

MANHOLE LOC \_\_\_\_\_

6" PORT LOC \_\_\_\_\_

WATERTIGHT TEST \_\_\_\_\_

SLOTTED \_\_\_\_\_

DATE ON LID \_\_\_\_\_

ROAD NAME \_\_\_\_\_

**PRE-CONSTRUCTION:**

6/30/2022 met w/ CLSE & contractor. Shd abstract, corrections made on site. Adjusted trenches as such. CLSE said they would submit soil test OSOS plan (RM)

**INSTALLATION:**

7/6/2023 - septic & pump tank installed. Tank lid depth @ 2.5-3' for both tanks. Front line installed. Saw FM from tank to beginning of driveway. Contractor finishing 1<sup>st</sup> trench, lateral holes per plan. weather conditions, windy & about to storm. Gave contractor ok to backfill 50' of FM from tank, tanks, & front line. Reinspect for beginning & ends of 1<sup>st</sup> trench & other 2 trenches. (RM)

7/7/2023 - FM SCHED 40 260 PSI. All 3 trenches done, inlet @ 2' per plan & width @ 2' per plan. Space between trenches edge to edge 8' & center to center 10'. Saw 6" front baffle @ septic tank. 1, length 63, 2, length 64, 3, length 67. Reinspect for P-10

FINAL INSPECTOR

R. Rappaport

DATE OF APPROVAL

8/4/23

8/4/23 - pump and alarm ok, septic pump, septic alarm on separate circuits, all 3 lateral heads ok on the 3 trenches (RM)



## Silvast, Zackary

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**From:** Silvast, Zackary  
**Sent:** Wednesday, June 28, 2023 9:38 AM  
**To:** Matt Shipley; Linda D. Alexander  
**Cc:** Williams, Jeffrey; Bernard, Dana; Wolf, Kevin  
**Subject:** regarding 13783 Frederick Road OSDS/LPD design

Good Morning,

We have some issues with a previously approved LPD plan for OSDS at 13783 Frederick Road as we are now trying to install this system through an active septic permit. Please see the following comments and please resubmit a new/re-designed plan for redline revision.

1. **The designed trenches cannot be installed as shown.**
  - a. **We need straight, linear lines while being on contour.**
  - b. **We would like to see 10' spacing between trenches. (end to end)**
  - c. **It will help to add end to end elevation points for all laterals, we do not think the topography is as severe as shown.**
    1. **Add to chart on left.**
  - d. **Normally, we do not want to see laterals longer than 50' with an LPD design. Should look at center-feed design.**
2. **We believe system 2 could be slid over to the left side of the SDA freeing up more linear space for initial system.**
  - a. **All proposed systems should look more like system 2's design. (the most linear proposal)**
3. **The septic tanks cannot be less than 20' from the house.**
  - a. **Currently, they are shown 10' feet away.**
4. **The chosen pump is way too large for the current dosage proposals.**
  - a. **Please re-adjust accordingly.**
5. **There is a dry well being proposed that may need to move further away from the septic tanks.**
  - a. **Especially when the tanks are moved, we want to maintain 25' distance minimum.**
  - b. **Right now it is encroaching on the pump chamber.**
  - c. **We typically do not like to see stormwater management right above an SDA if it can be avoided.**
6. **Typically we would like to see a larger scaled plan for an LPD design with larger charts for our septic contractors to follow.**
  - a. **Feels like everything was fit to one page when trench details, tank details, and chart should have been larger.**
  - b. **Probably should have been 2 pages.**

We would be willing to meet on-site if difficulties arise meeting these corrective requests. We think a plan can be re-submitted for approval prior to lateral stake out. We look forward to your resubmission. Thank you.

- ZS

### **Zack Silvast (LEHS)**

*Plan Review Supervisor - Water & Sewer Division*

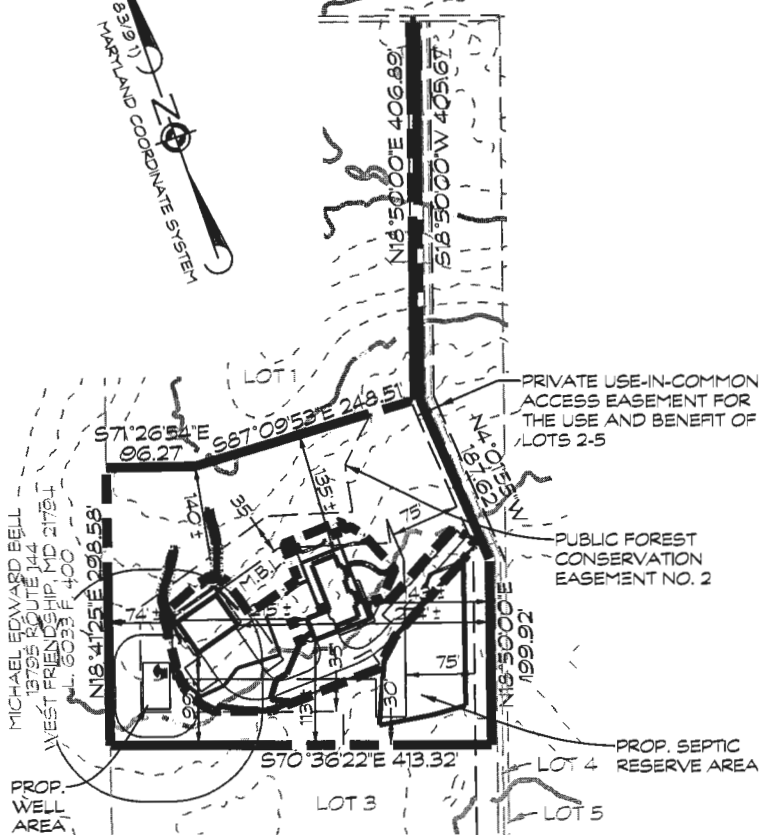
*410-313-1777*

Environmental Health Bureau

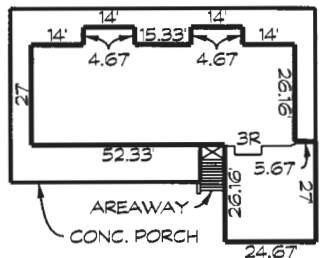
Howard County Health Department



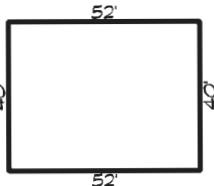
FREDERICK ROAD



**PLAN**  
SCALE: 1"= 200'



**HOUSE PLAN**  
SCALE: 1"= 50'



**POLE BUILDING PLAN**  
SCALE: 1"= 50'

LOD DENOTES LIMIT OF DISTURBANCE  
TOTAL AREA = 36,471 S.F.

SEE ONSITE SEWAGE DISPOSAL PLAN FOR SEPTIC DESIGN

SEE SHEET 2 OF 2 FOR DETAILED GRADING PLAN

BUILDER TO VERIFY AVAILABILITY OF BASEMENT SEWER SERVICE PRIOR TO DWELLING STAKEOUT.

THERE ARE NO WELLS OR SEPTIC SYSTEMS WITHIN 100' OF THE PROPERTY BOUNDARY UNLESS OTHERWISE SHOWN HERE ON.

*[Signature]*

8/15/2022

CARROLL LAND SERVICES, INC.

DATE

EXISTING GRADES SHOULD BE FIELD VERIFIED WHEN HOUSE STAKEOUT IS DONE.

DATE	REVISIONS

**PLOT PLAN - LOT 2**  
**RENFRO PROPERTY**

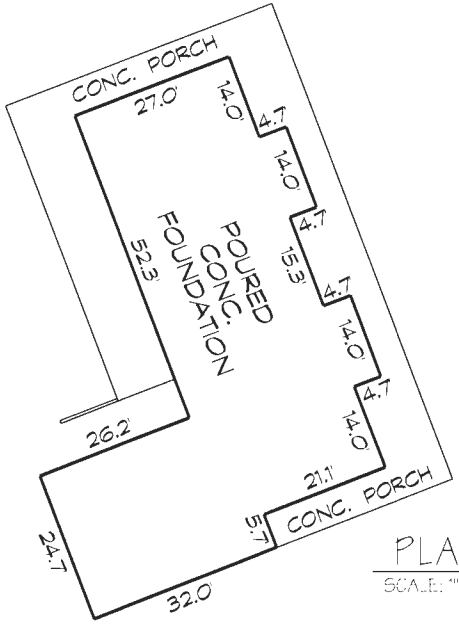
13783 FREDERICK ROAD \* WAR PLAT NO. 22466  
TAX MAP 15 \* GRID: 1 \* PARCEL: 178  
3rd ELECTION DISTRICT \* HOWARD COUNTY, MD



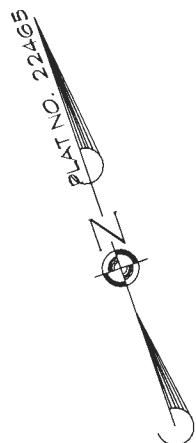
439 East Main Street Westminster, MD 21157-5539  
(410) 848-1790 FAX (410) 848-1790

DRAWN BY: BH
DESIGN BY: BH
REVIEW BY:
DATE: 4/21/22
SCALE: AS SHOWN
JOB NO: 2017052A
SHEET: 1 OF 2





FREDERICK ROAD



LOT 1  
PLAT NO. 22465



*Well check OK DB 5-16-23*

MICHAEL EDWARD BELL  
3755 ROUTE 747  
WEST FRIENDSHIP, MD 21794  
L. 80883 F. 400

LOT 3  
PLAT NO. 22465

LOT 4  
PLAT NO. 22465

LOT 5  
PLAT NO. 22465

- NOTES:
- FOR GENERAL NOTES SEE PLAT NO. 22465
  - THE USE-IN-COMMON DRIVEWAY MAINTENANCE AGREEMENT FOR LOTS 1 THRU 5 HAS BEEN RECORDED IN THE HOWARD COUNTY LAND RECORDS OFFICE SIMULTANEOUSLY WITH PLAT NO. 22465.

I hereby certify that I have surveyed the property shown hereon for the sole purpose of locating the improvements. This plan is a benefit to the customer only in so far as it is required by a lender or a title insurance company or its agent in connection with Contemplated transfer, financing or refinancing. It is not to be relied upon for the establishment of boundary, easement or right-of-way lines for any reason, such as the location of fences, garages, buildings, or other existing or future improvements. Offsets of buildings to property lines are to the nearest foot (1') unless otherwise noted and has an accuracy of +/- 1 foot.



REV: 03/24/23 ADDED SRA

FOUNDATION CERTIFICATION - LOT 2  
**RENFRO PROPERTY**  
13783 FREDERICK ROAD \* WAR PLAT NO. 22466  
TAX MAP 15 \* GRID: 1 \* PARCEL: 178  
3rd ELECTION DISTRICT \* HOWARD COUNTY, MD  
RECORDED PLAT NO. 22465

By: *Javier Morales Roldán* Date: *3/24/23*  
Javier Morales Roldán - Professional Land Surveyor No. 21885  
My license expires August 09, 2023

A licensed Maryland Surveyor either personally prepared this Location Drawing or was in responsible charge over its preparation and the surveying work reflected in it, in compliance with the Maryland Minimum Standards of Practice for Land Surveyors. (COMAR 09-13-06.07 AND .12)

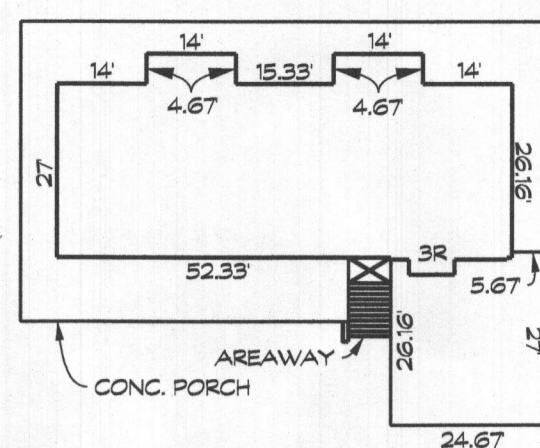


439 Eas\* Main Street Westminister, MD 21157-5539  
(410) 848-1790 FAX (410) 848-1791

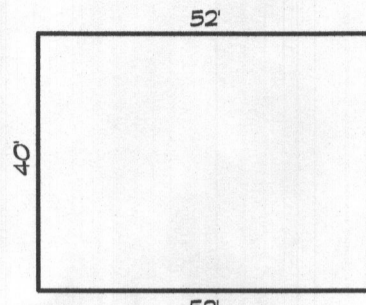
DRAWN BY:	JS, JL
DESIGN BY:	
REVIEW BY:	JMR
DATE:	12-12-2022
SCALE:	1" = 100'
JOB NO:	2017052
SHEET:	1 OF 1



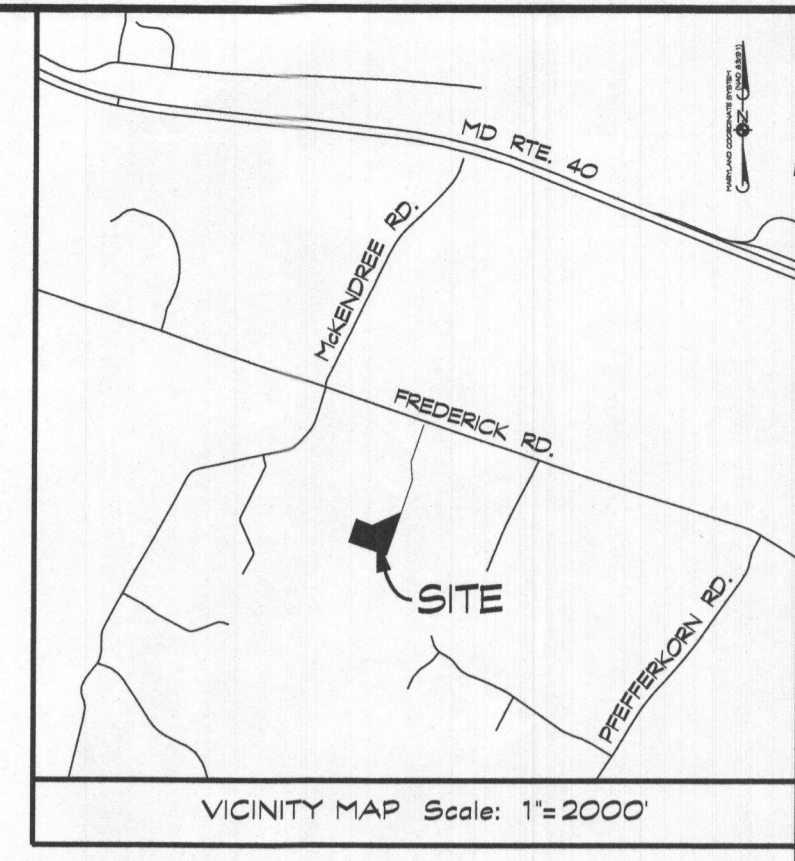
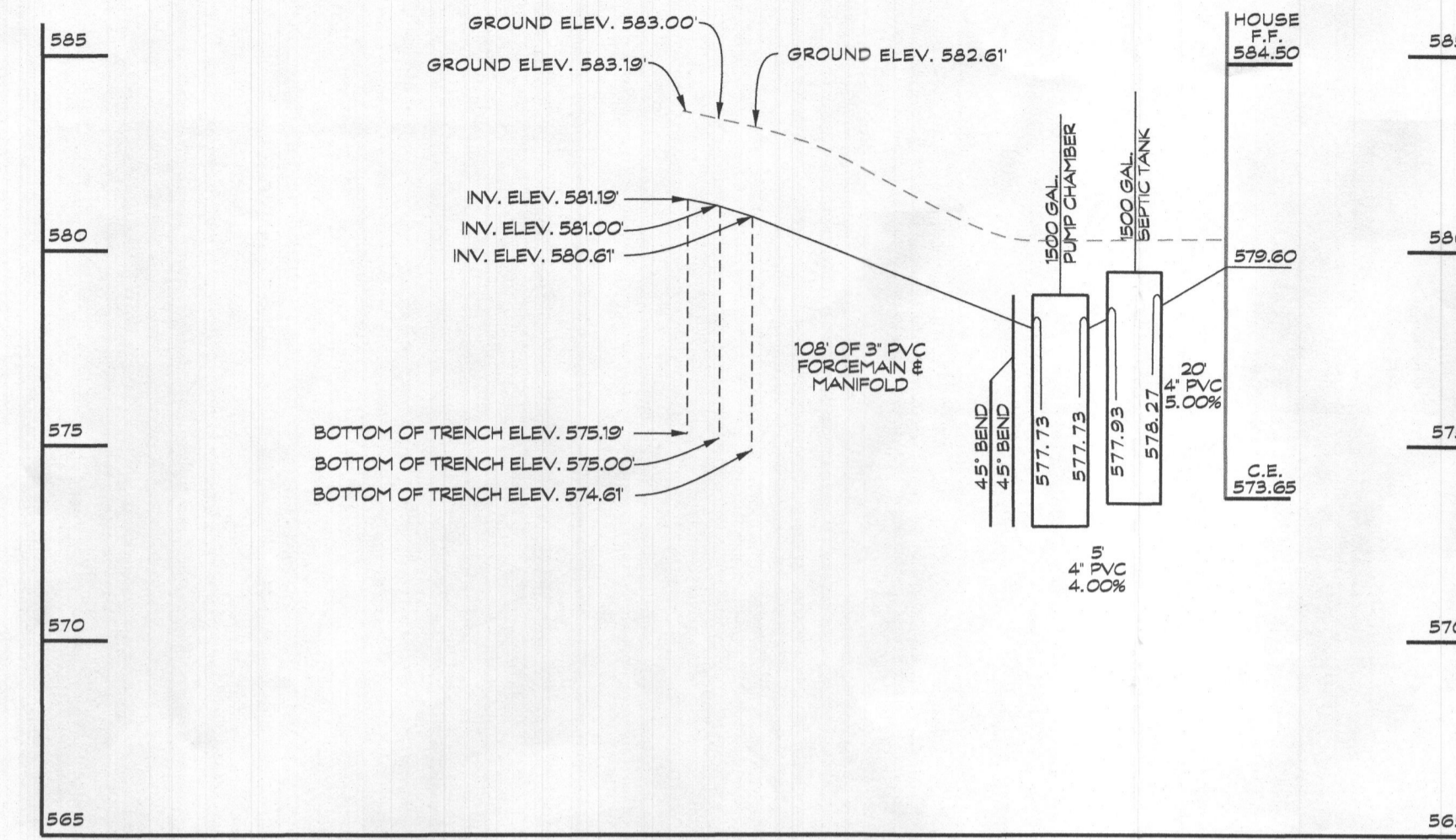
MARYLAND COORDINATE SYSTEM (NAD 83/91)



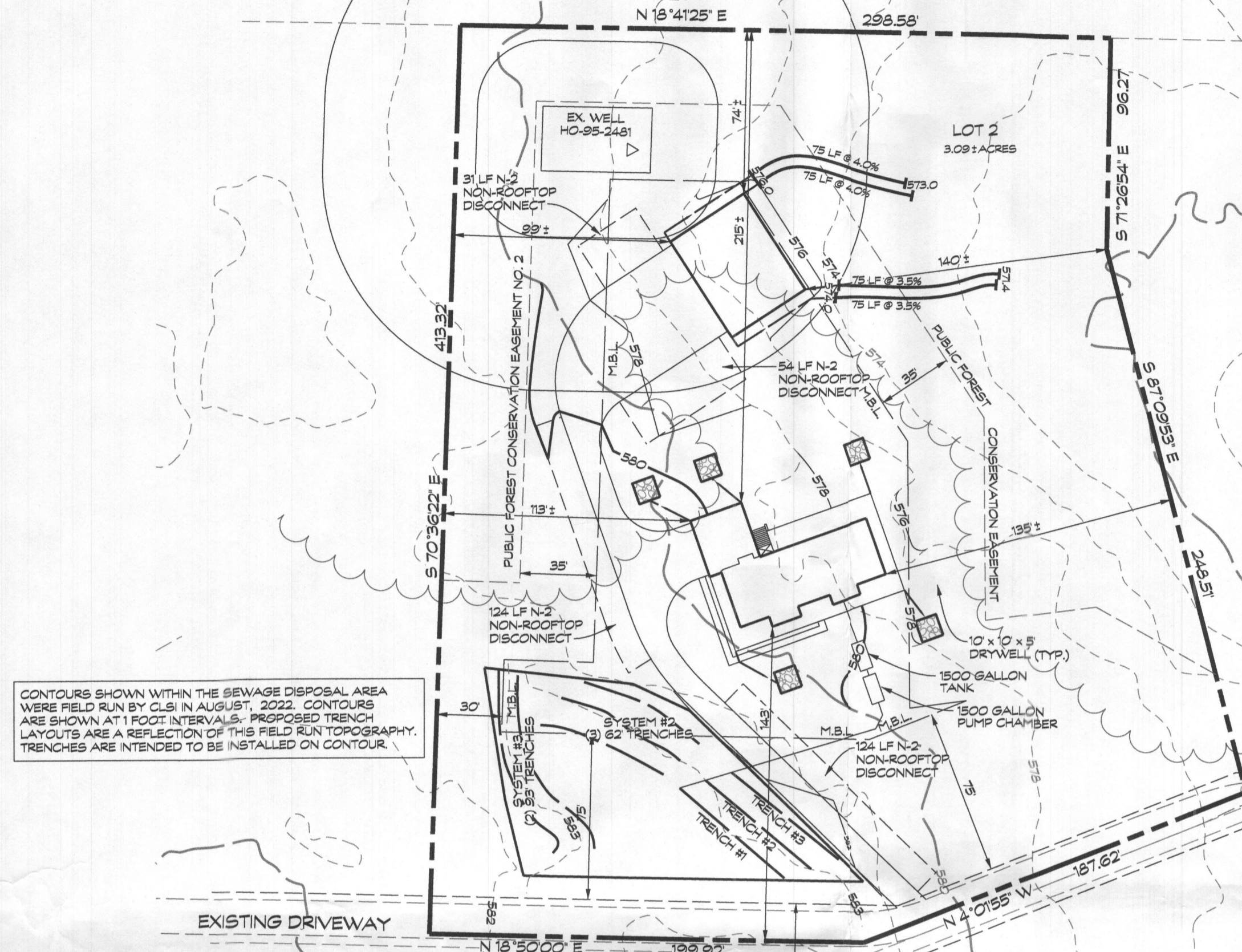
HOUSE PLAN SCALE: 1"= 50'



POLE BUILDING PLAN SCALE: 1"= 50'



DATA TABULATIONS:  
 1. ZONING DISTRICT: RC-DEO  
 2. NUMBER OF BUILDING SITES: 1  
 3. TOTAL AREA OF LOT: 3.088 ACRES



CONTOURS SHOWN WITHIN THE SEWAGE DISPOSAL AREA WERE FIELD RUN BY CLSI IN AUGUST, 2022. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS. PROPOSED TRENCH LAYOUTS ARE A REFLECTION OF THIS FIELD RUN TOPOGRAPHY. TRENCHES ARE INTENDED TO BE INSTALLED ON CONTOUR.

ITT

**APPLICATIONS**  
 Specifically designed for the following uses:  
 • Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

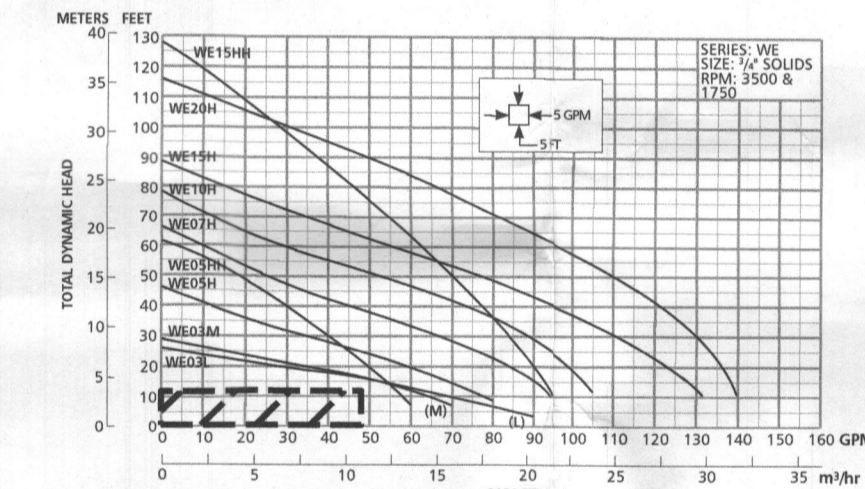
**SPECIFICATIONS**  
 • Solids handling capabilities: N/A maximum.  
 • Discharge size: 2" NPT.  
 • Capacities: up to 140 GPM.  
 • Total heads: up to 128 feet TDH.  
 • Temperature: 104°F (60°C) continuous, 140°F (60°C) intermittent.  
 • See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

**MOTORS**  
 • Fully submersible in high grade turbine oil for lubrication and efficient heat transfer.  
 • Class B insulation on 1/2 - 1 1/2 HP models.  
 • Class F insulation on 2 HP models.  
 • Single phase (60 Hz).  
 • Capacitor start motor for maximum starting torque.  
 • Built-in overload with automatic reset.  
 • SITOW or STOW severe duty oil and water resistant power cords.

GOULDS PUMPS Wastewater

• 1/2 - 1 HP models have NEMA three prong grounding plug.  
 • 1/2 HP and larger units have lead acid ends.  
 • Three phase (60 Hz):  
 • Class 10 overload protection must be provided in separately centered starter unit.  
 • SITOW power cords all have bare lead acid ends.  
 • Designed for Continuous Operation: Pump settings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.  
 • Bearings: Upper and lower heavy duty ball bearing construction.  
 • Power Cable: Seven duty rated, oil and water resistant. Epoxy seal on motor and provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.  
 • O-ring: Assures positive sealing against contaminants.

**AGENCY LISTINGS**  
 Listed in 16, 17A and C&A 22.2 108 Standards  
 In Compliance (under license) with the standards  
 Goulds Pumps is ISO 9001 Registered.



SPECIFICATIONS

- Tank measurements and elevations are based on septic tanks and pump chambers as manufactured by Mayer Bros., Elkridge, Maryland (410) 796-1434.
- All piping to be schedule 40 PVC of sizes shown.
- A submersible pump to remove 4.7.72 GPM against 1.1.3 TDH to be provided. Pump to be a Goulds Model WE-03M or WE-03L, or equal.
- Alarm to be located outside the house on circuit separate from the pump.

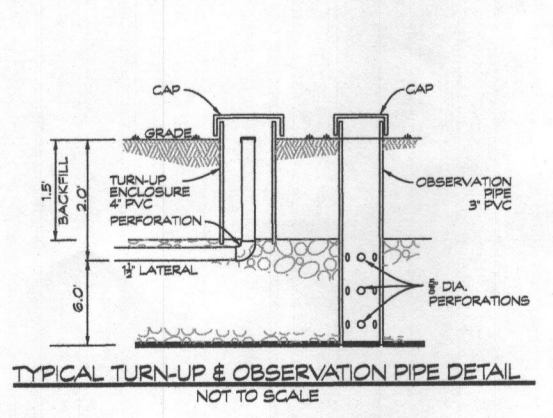
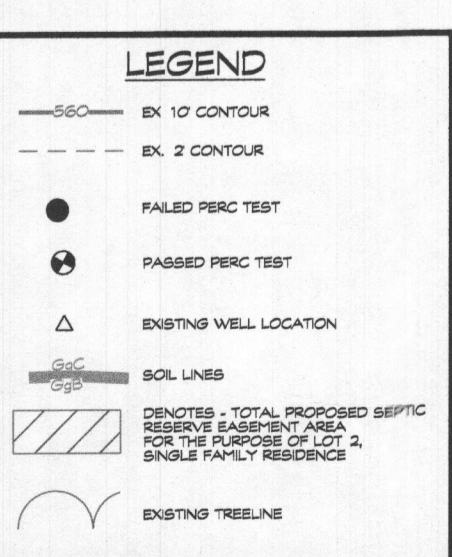
NOTE:  
 PUMP CHAMBER SIZE AND FLOATS BASED ON GOULDS WE SERIES SUBMERSIBLE PUMP. IF A PUMP SUBSTITUTION OCCURS, CHAMBER SIZE AND FLOATS WILL NEED TO BE RECALCULATED TO ENSURE THAT PUMP IS COVERED.

OWNER / DEVELOPER  
 JODY & MICHAEL RICK  
 8396 OAK TREE ROAD  
 WESTMINSTER, MD 21157  
 (301) 843-2377

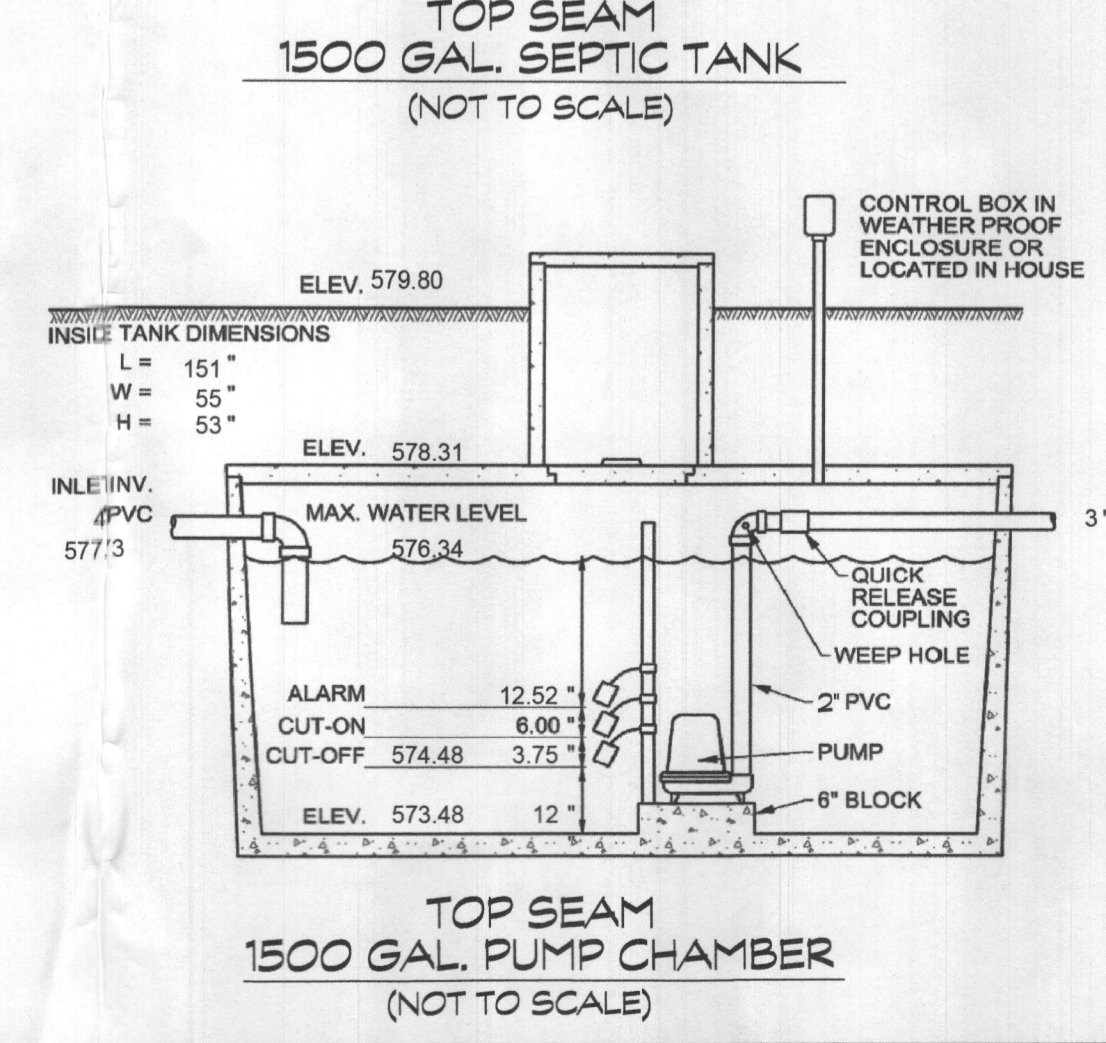
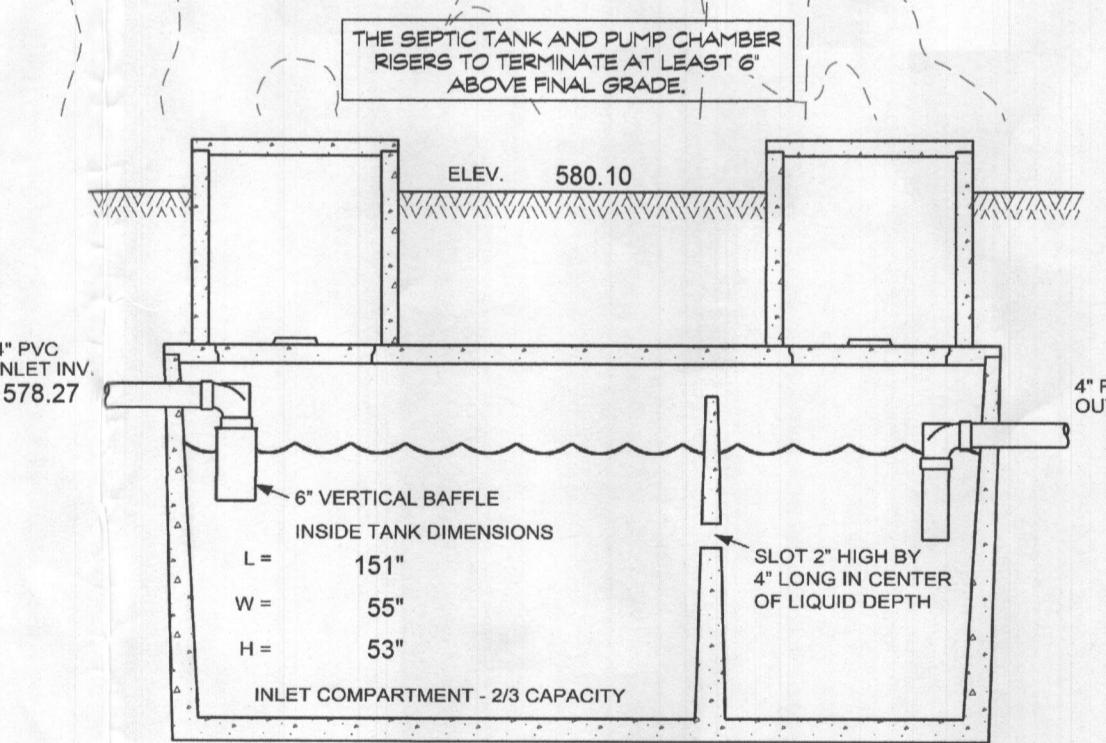
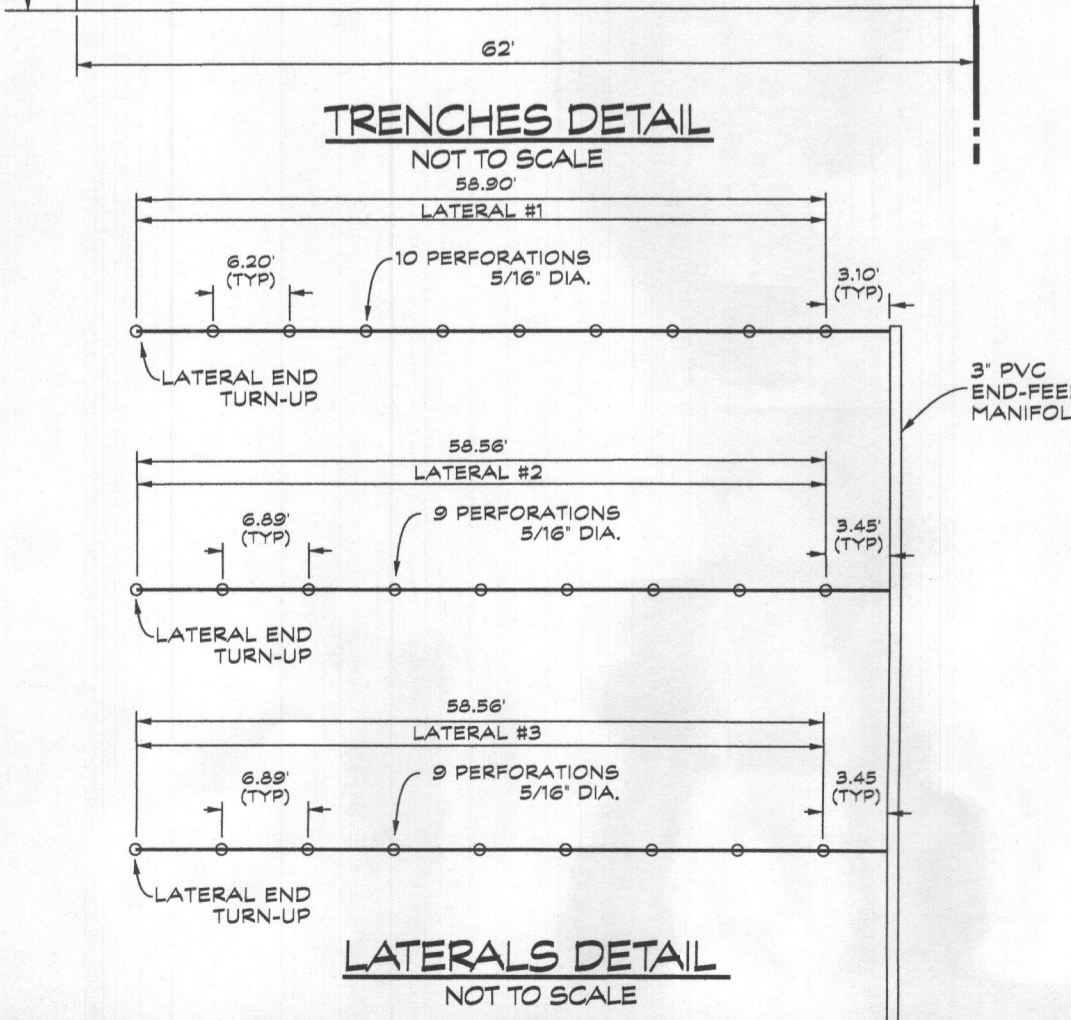
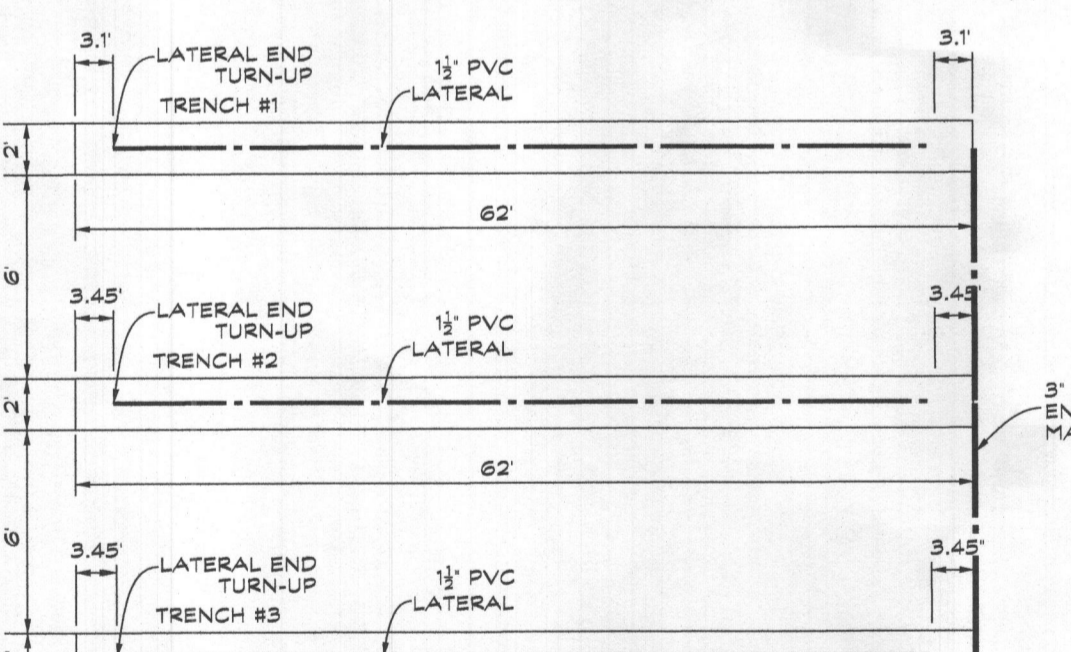
Lateral	Lateral Invert Elevation (ft)	Lateral Head (ft) ± 1 head + diff. by heads*	Trench Length (ft)	Number of Orifices	Orifice Spacing (ft)	Distance from Manifold to closest Orifice (ft)	Lateral Length (ft)	Lateral Diameter (in) - See Figure 4.3	Orifice Diameter (in) - 1/4, 3/16, 5/16, or 3/8	Orifice Discharge Rate (gpm)	Square feet of trench (ft²)	Total Lateral Flow Rate (gpm)	Discharge per square foot of trench	Minimum Orifice flow in lateral (gpm) - Equation	Maximum Orifice flow in lateral (gpm) - Equation	Percent difference in orifice flow by square feet (%)	Percent difference in orifice flow by length lateral - use R2 instead.	PERCENT difference in lateral flow (%)
1	583.190	2.00	62	10	6.20	3.10	58.90	1.5	5/16	1.63	124.00	16.28	0.1313128	0.87	1.63	1.63	0.00	0.00
2	583.000	2.19	62	9	6.89	3.44	58.56	1.5	5/16	1.70	124.00	15.33	0.1236678	0.84	1.70	1.70	0.00	0.00
3	582.610	2.58	62	9	6.89	3.44	58.56	1.5	5/16	1.85	124.00	16.19	0.1305645	0.87	1.85	1.85	0.00	0.00
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Force Main (FM) and Supply Manifold (SM)

FM & SM Diameter	3.068	inches
FM length	24.00	feet
SM length	23.00	feet
Combined length of FM and SM	47.00	feet
Combine length of laterals	176.91	feet



TRENCH #1	GRADE	583.19
LATERAL INVERT:	581.19	
TRENCH BOTTOM:	575.19	
TRENCH #2	GRADE:	583.00
LATERAL INVERT:	581.00	
TRENCH BOTTOM:	575.00	
TRENCH #3	GRADE:	582.61
LATERAL INVERT:	580.61	
TRENCH BOTTOM:	574.61	



SEPTIC SYSTEM TRENCH DESIGN:

AVERAGE PERCOLATION TEST TIME = 12 MINS.  
 APPLICATION RATE = 0.8 GPD/SQ. FT.  
 EFFECTIVE DEPTH IS 1.5 = 0.66  
 150 GALS x 3 BEDROOM = 450 GAL/DAY  
 450 GAL/DAY / 0.8 GAL. (DAY/SQ. FT. = 562.5 SQ. FT.  
 562.5 SQ. FT. / 2 FT. = 281.25 LF. OF TRENCH  
 281.25 LF. x .66 = 186 LF. OF TRENCH  
 USE 3 x 62' OF TRENCH FOR THE SYSTEM  
 MAINTAIN AT LEAST 10 FT SPACING CENTER TO CENTER  
 LATERAL LENGTH: TRENCH #1 58.90 - 1 1/2" PVC  
 TRENCH #2 58.56 - 1 1/2" PVC  
 TRENCH #3 58.56 - 1 1/2" PVC

USE 5/16" DIA HOLES  
 USE 3" DIA. PVC MANIFOLD (2.21 FPS VELOCITY)

PUMP DESIGN:

- DESIGN FLOW: 450 GPD
- DESIGN HEAD:  
 • STATIC HEAD: 581.19 - 574.48 = 6.71  
 • FRICTION HEAD: 2.0  
 • OPERATING HEAD: 8.71  
 • TOTAL DYNAMIC HEAD = 6.71 + 2.0 + 1.09 = 11.3

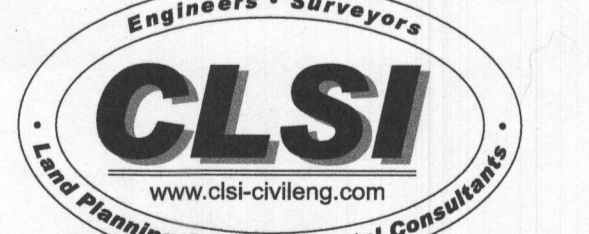
- MINIMUM DOSE CALCULATION:  
 176.02 OF 1" LATERALS  
 25 OF 3" MANIFOLD  
 25 x 38.4/100 = 9.6 GAL  
 83 OF 3" FORCEMAIN  
 83 x 38.4/100 = 31.9 GAL  
 (5 x 18.66 = 93.3) + 9.6 + 31.9 = 134.8 GAL  
 USE: 134.8 GAL DOSE

- MINIMUM SYSTEM DISCHARGE RATE:  
 LATERAL #1 x 10 HOLES = 1.63 = 16.30 GPM  
 LATERAL #2 x 9 HOLES = 1.60 = 15.23 GPM  
 LATERAL #3 x 9 HOLES = 1.60 = 16.19 GPM  
 LATERAL #1 + LATERAL #2 + LATERAL #3 = 47.72 GPM

- PUMP ON TO PUMP OFF  
 D = 134.8 X 231 / 8305 = 3.75'
- HIGH WATER ALARM TO PUMP CHAMBER INLET  
 R = 450 X 231 / 8305 = 12.52'

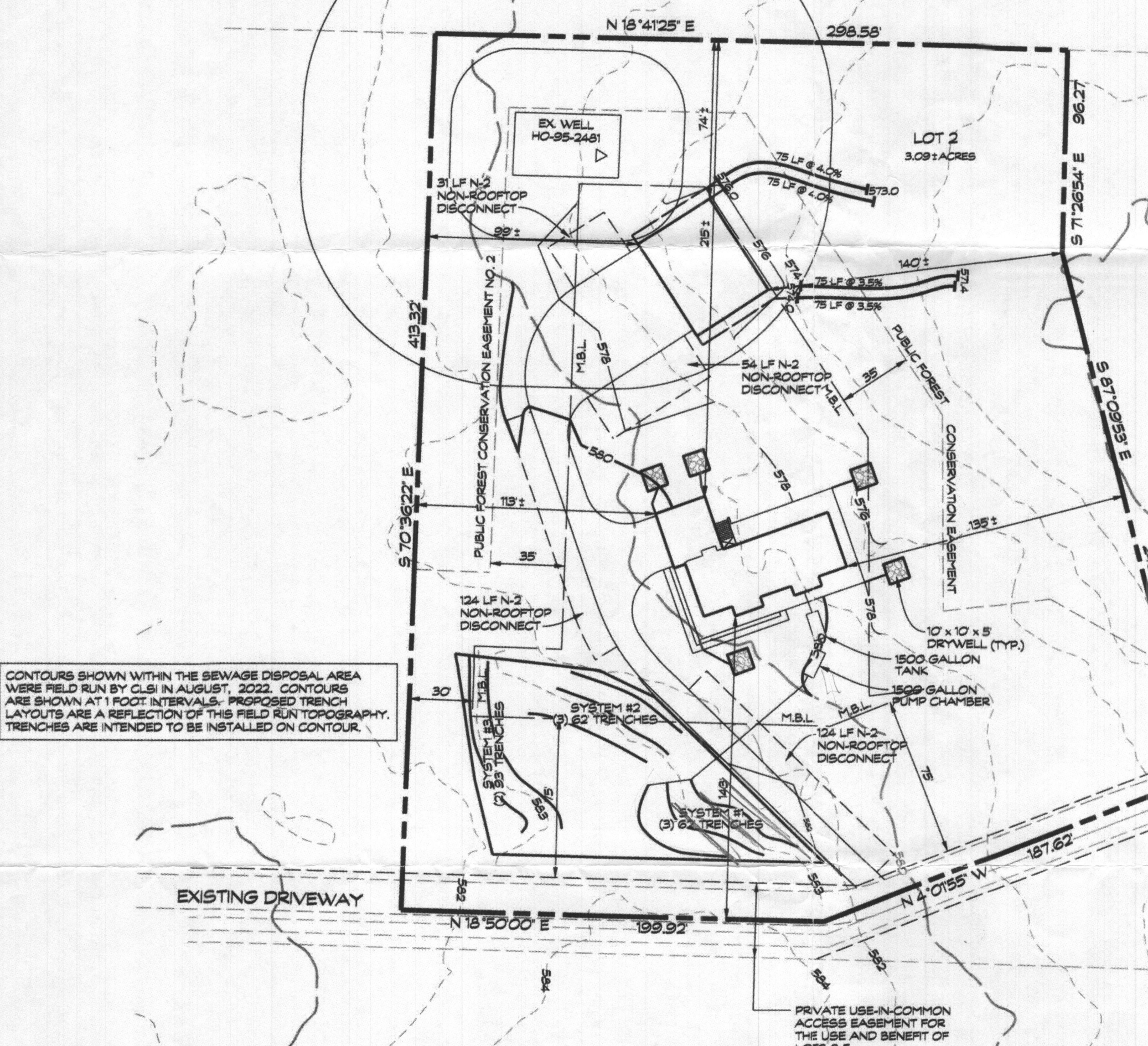
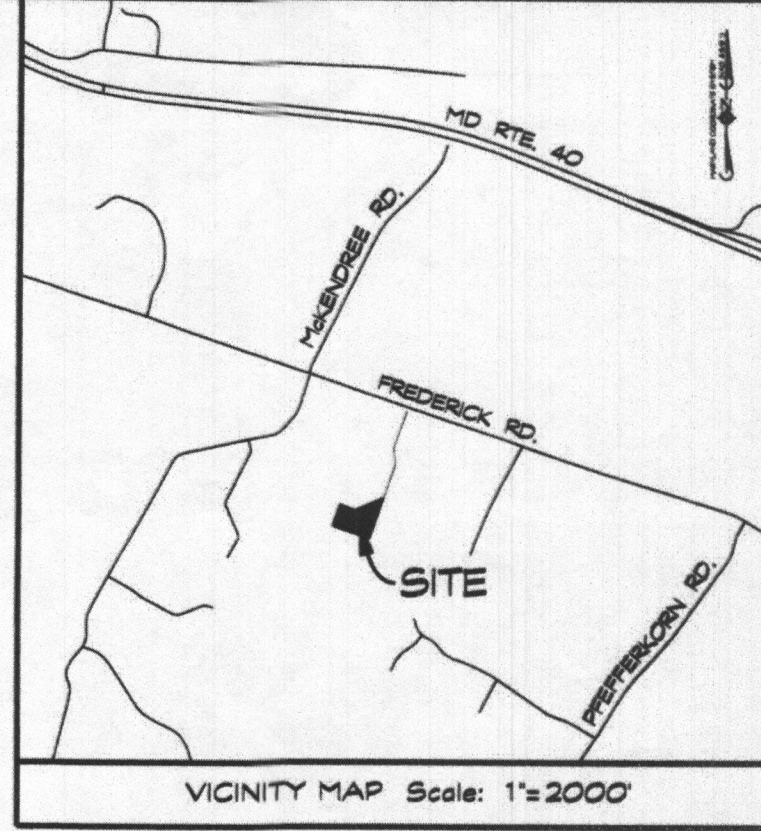
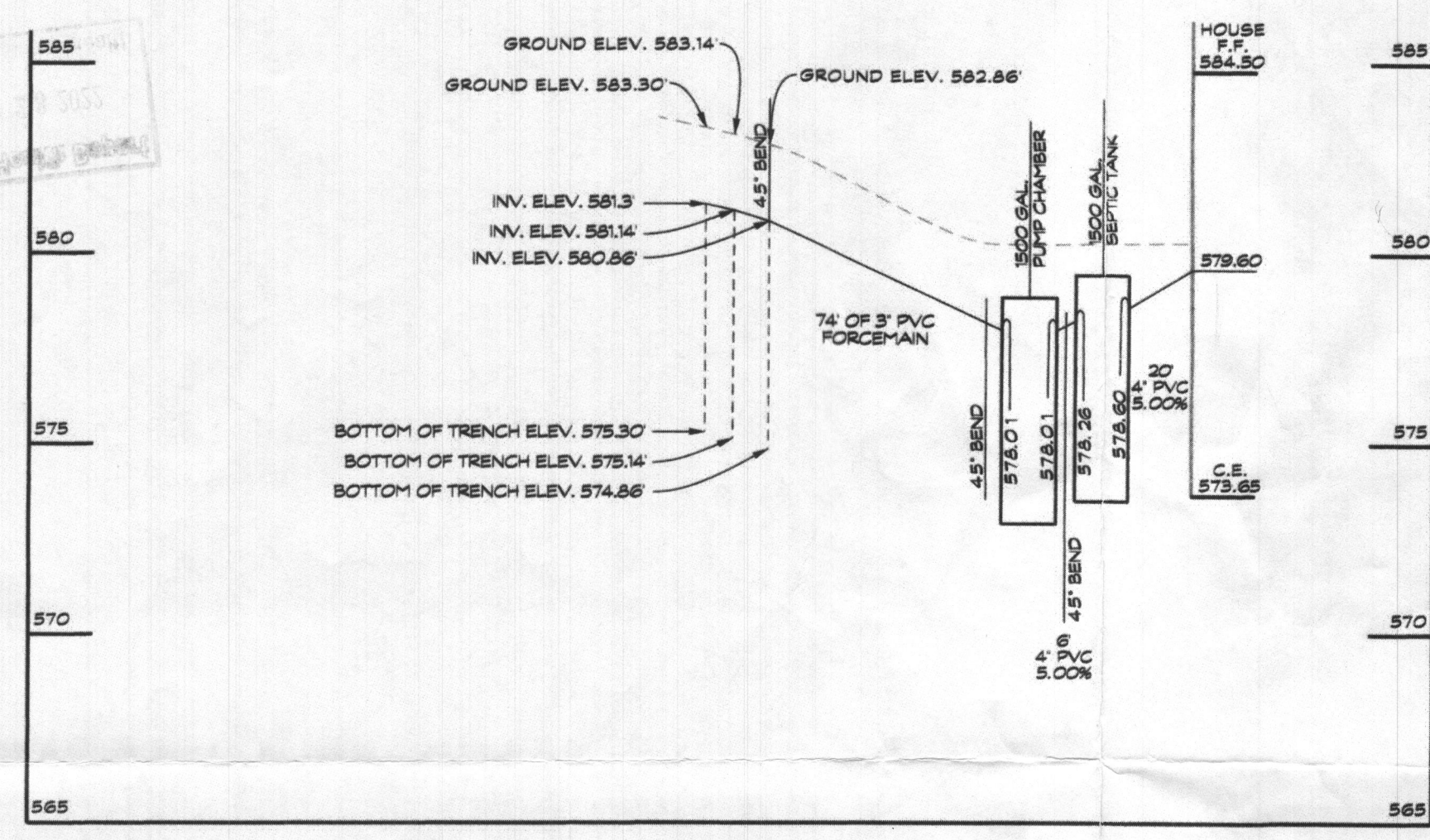
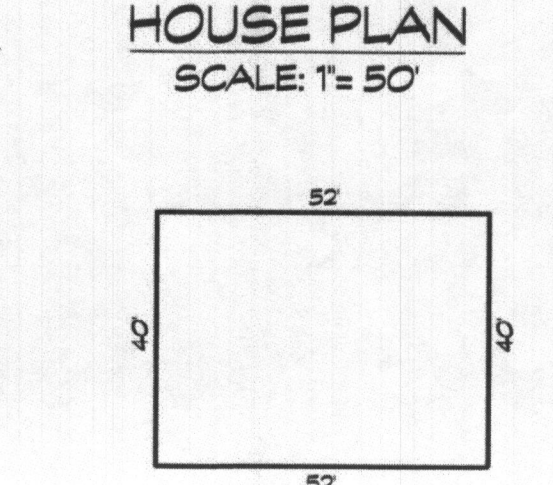
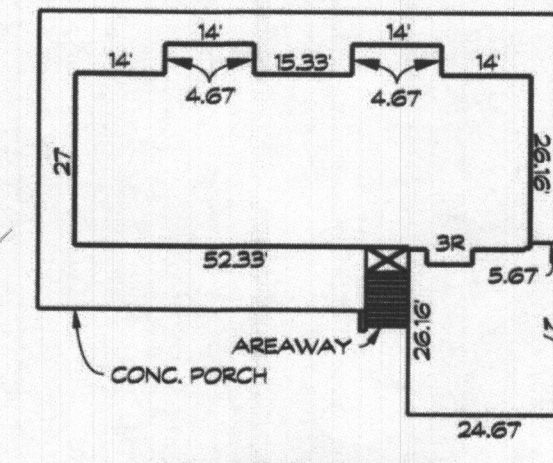
ONSITE SEWAGE DISPOSAL SYSTEM DESIGN PLAN  
 RENFRO PROPERTY

13775 FREDERICK ROAD • WAR PLAT NO. 22446  
 TAX MAP 15 • GRID: 1 • PARCEL: 172  
 3rd ELECTION DISTRICT • HOWARD COUNTY, MD



Date	Revisions	Drawn By:	MS
7/3/23	REVISE PER HCD	Designed By:	MS
		Reviewed By:	
		Date:	AUGUST, 2022
		Scale:	1" = 50'
		Job No.:	2017052A
		Sheet:	1 OF 1

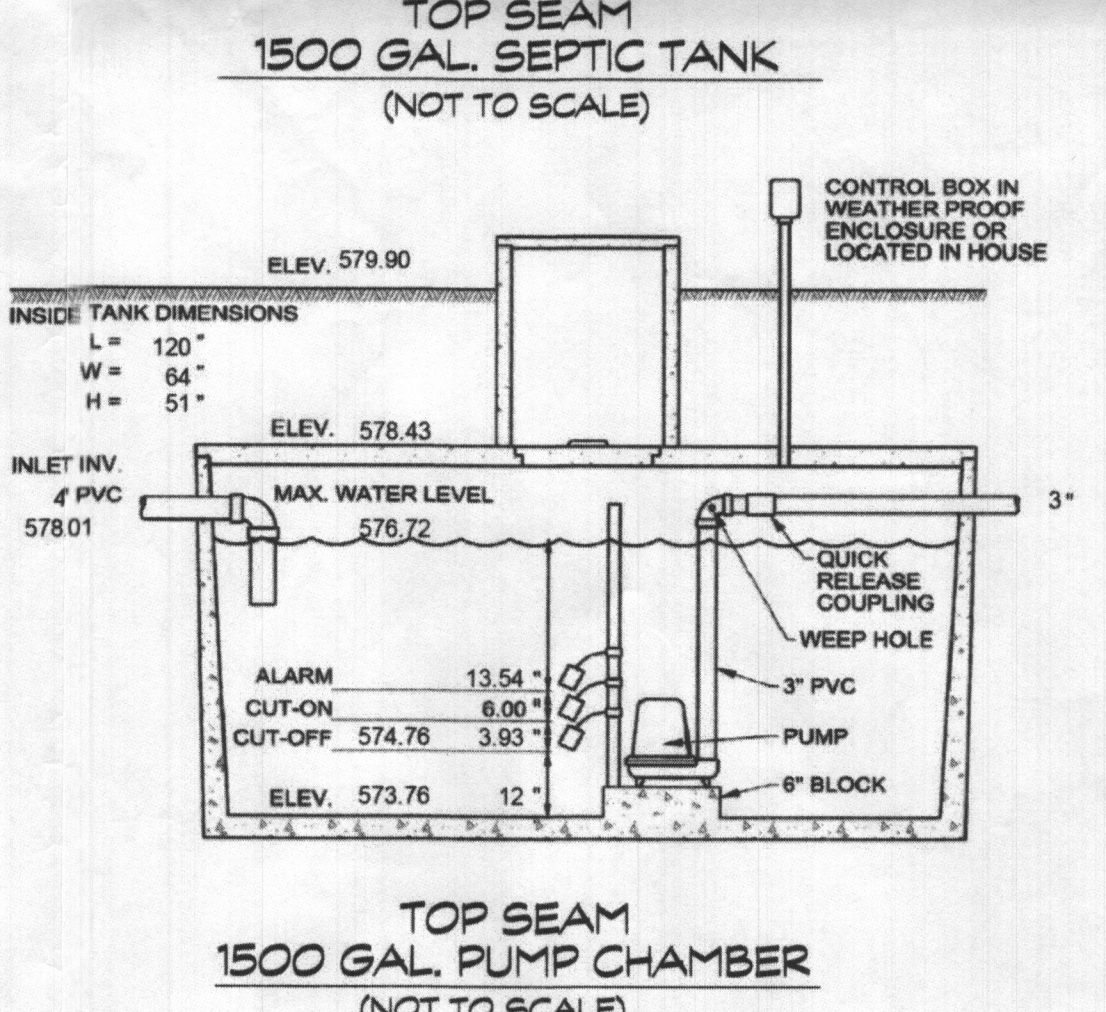
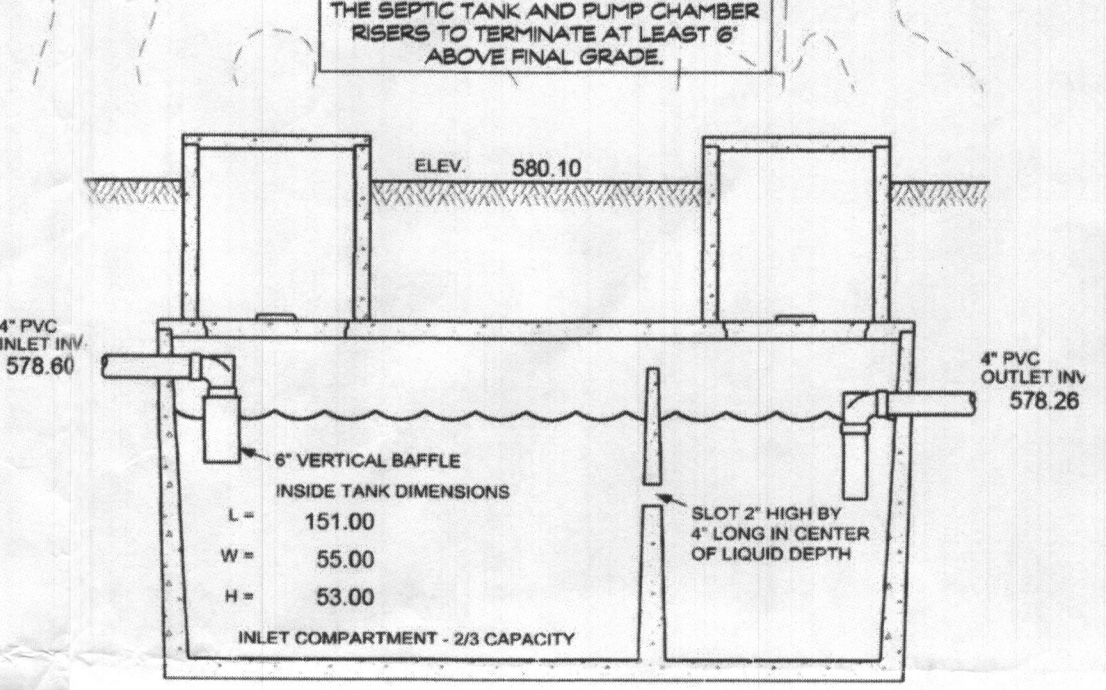
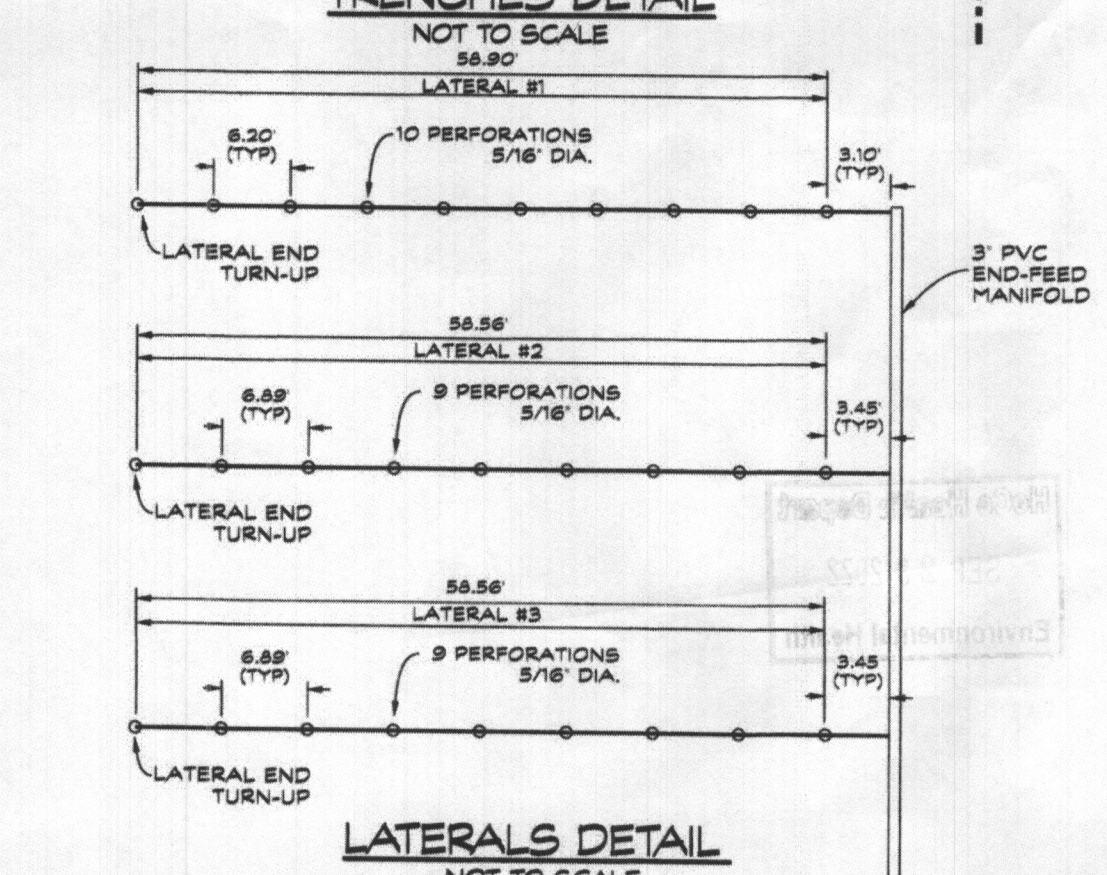
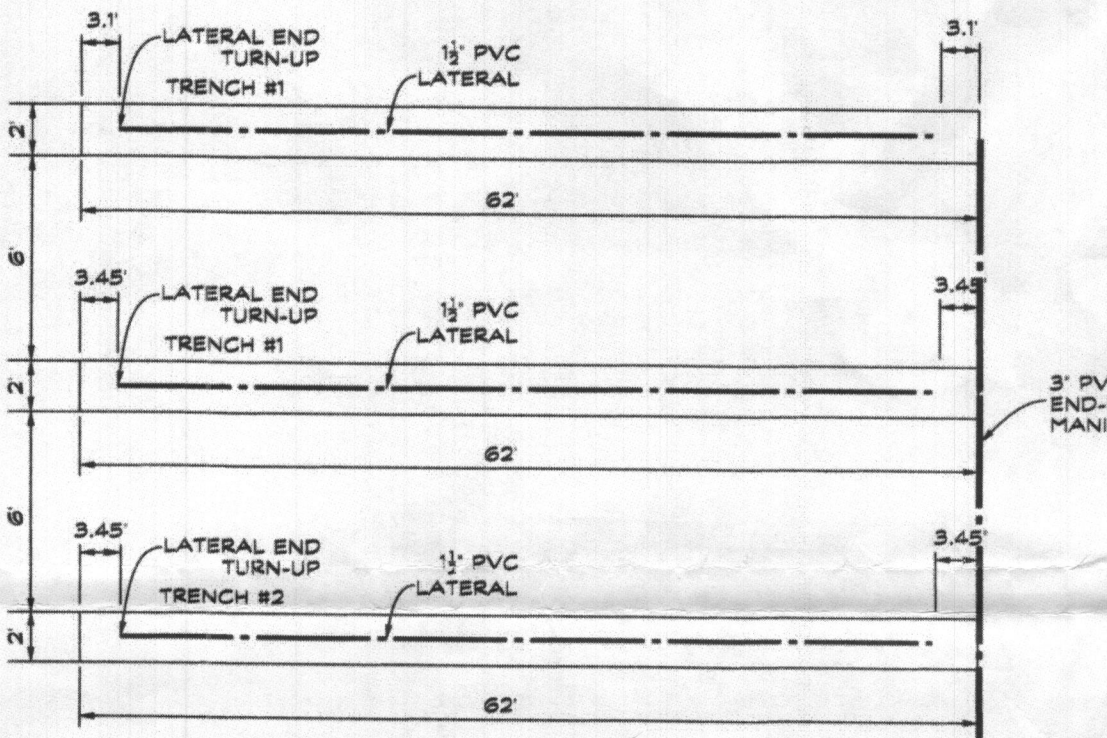
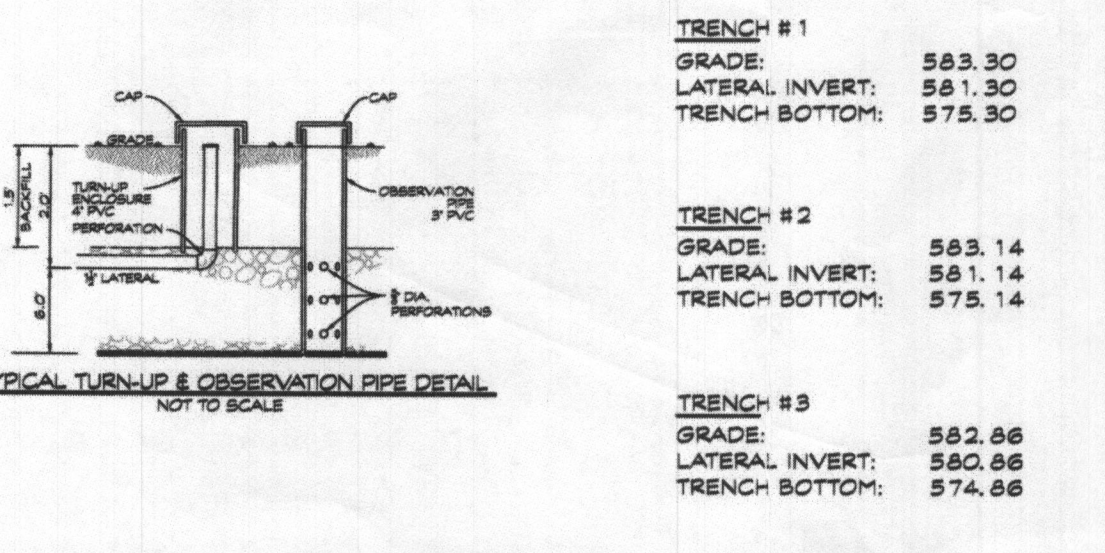
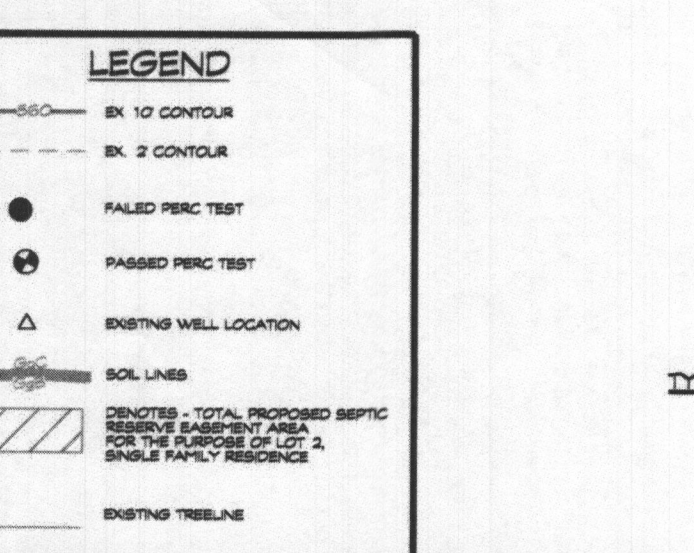
MARYLAND COORDINATE SYSTEM (NAD 83/99)



CONTOURS SHOWN WITHIN THE SEWAGE DISPOSAL AREA WERE FIELD RUN BY CLSI IN AUGUST, 2022. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS. PROPOSED TRENCH LAYOUTS ARE A REFLECTION OF THIS FIELD RUN TOPOGRAPHY. TRENCHES ARE INTENDED TO BE INSTALLED ON CONTOUR.

Lateral	Lateral Invert Elevation (ft)	Lateral Head (ft) + 1 head + 2 ft. (ft)	Trench Length (ft)	Number of Orifices	Orifice Spacing (ft)	Distance from Manifold to closest Orifice (ft)	Lateral Length (ft)	Lateral Orifice Diameter (in) - 1/4, 3/16, or 1/8	Orifice Discharge Rate (gpm)	Square feet of trench per lateral (ft <sup>2</sup> )	Total Lateral Flow Rate (gpm)	Discharge per square foot of trench	Minimum Orifice Flow in laterals (gpm) - Equation	Maximum Orifice Flow in laterals (gpm) - Equation	Percent difference in orifice flow (by Equation)	Percent difference in trench length (by Equation)	PERCENT DIFFERENCE IN LATERAL FLOW (ft <sup>2</sup> )
1	583.30	2.00	62	10	6.20	3.10	58.90	1.5	5/16	1.63	124.00	16.28	0.1313128	0.1313128	0.0000000	0.0000000	0.0000000
2	583.00	2.16	62	9	6.89	3.44	58.56	1.5	3/16	1.69	124.00	15.23	0.1226179	0.1226179	0.0000000	0.0000000	0.0000000
3	582.86	2.44	62	9	6.89	3.44	58.56	1.5	3/16	1.80	124.00	16.19	0.1305645	0.1305645	0.0000000	0.0000000	0.0000000
4																	
5																	
6																	
7																	
8																	
9																	
10																	6.7%

Force Main (FM) and Supply Manifold (SM)	Value
FM & SM Diameter	3.000 inches
FM length	174.00 feet
SM length	103.00 feet
Combined length of FM and SM	277.00 feet
Combined length of laterals	176.01 feet
Volume/1000 for FM	38.40 gallons
Volume of FM	28.42 gallons
Volume/1000 for SM	38.40 gallons
Volume of SM	8.83 gallons
Volume of FM and SM	37.25 gallons
Volume/1000 (gal) each lateral	10.60 gallons
Volume of Laterals	18.66 gallons



ITT

**APPLICATIONS**  
Specifically designed for the following uses:  
• Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems.

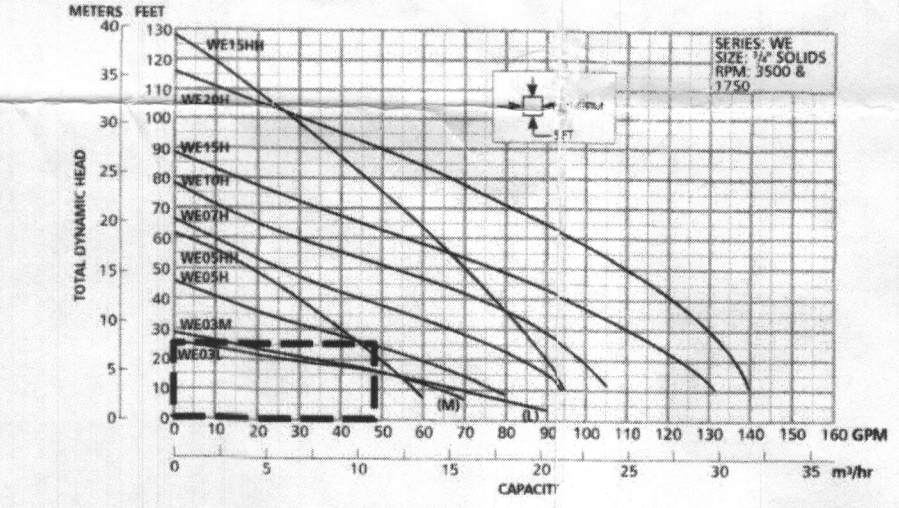
**SPECIFICATIONS**  
• Solid handling capabilities: 1" maximum.  
• Discharge size: 2" NPT.  
• Capacities: up to 140 GPM.  
• Total heads: up to 128 feet TDH.  
• Temperature: 100°F to 200°F continuous, 140°F to 200°F intermittent.  
• See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

**NOTES**  
• Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.  
• Class F insulation on 1" - 1 1/2" HP models.  
• Class F insulation on 2" HP models.  
• Single phase (60 Hz):  
• Capacitor start motors for maximum starting torque.  
• Built-in overload with automatic reset.  
• STOW or STOW severe duty oil and water resistant power cords.

**GOULDS PUMPS**  
Wastewater

• 1/2" - 1 1/2" HP models have NEMA three phase grounding plug.  
• 1 1/2" HP and larger units have bare lead cord ends.  
• Three phase (60 Hz):  
• Class F overload protection must be provided in separately ordered starter unit.  
• STOW power cords all have bare lead cord ends.  
• Designed for Continuous Operation: Pump ratings are within the motor manufacturer's recommended loading limits, can be operated continuously without damage when fully submerged.  
• Bearings: Upper and lower heavy duty ball bearing construction.  
• Power Cables: Severe duty rated, oil and water resistant. Epoxy seal on motor and provides secondary moisture barrier in case of cable jacket damage and to prevent oil wicking. Standard cold lead. Optional lengths are available.  
• O-rings: Accure positive sealing against contaminants and oil leakage.

**AGENCY LISTINGS**  
• Goolds Pumps is ISO 9001 Registered.



SEPTIC SYSTEM TRENCH DESIGN:

AVERAGE PERCOLATION TEST TIME = 12 MINS.  
APPLICATION RATE = 0.8 GPD/SQ. FT.  
EFFECTIVE DEPTH IS 1.5' = 0.56'  
150 GALS. x 3 BEDROOM = 450 GAL/DAY  
450 GAL/DAY / 0.8 GAL./DAY/SQ. FT. = 562.5 SQ. FT.  
562.5 SQ. FT. / 2 FT. = 281.25 LF. OF TRENCH  
281.25 LF. x .68 = 191.25 LF. OF TRENCH  
USE 3 x 62' OF TRENCH FOR THE SYSTEM  
MAINTAIN AT LEAST 6 FT. SPACING BETWEEN TRENCHES

LATERAL LENGTH TRENCH #1 58.90' - 1 1/2" PVC  
TRENCH #2 58.56' - 1 1/2" PVC  
TRENCH #3 58.56' - 1 1/2" PVC

USE 5/8" DIA. HOLES  
USE 3" DIA. PVC MANIFOLD (2.21 FPS VELOCITY)

PUMP DESIGN:

1. DESIGN FLOW: 450 GPD  
2. DESIGN HEAD:  
STATIC HEAD: 583.30 - 572.86 = 10.44'  
OPERATING HEAD: 2.0'  
FRICTION HEAD:  
3" PVC FORCE-MAN + MANIFOLD = .97'  
97' x 0.58' / 100 = 0.56'  
FITTINGS: 2 x 45' ELL. = 12'  
SAFETY FACTOR = 1.5'

TOTAL DYNAMIC HEAD = 0.56' + 12' + 15' + 10.44' + 2.0' = 26.5'

3. MINIMUM DOSE CALCULATION:  
176.01 OF 1 1/2" LATERALS  
176.01 x 10.6/100 = 18.66 GAL  
23 OF 3" MANIFOLD  
23 x 38.4/100 = 8.83 GAL  
74 OF 3" FORCE-MAN  
74 x 38.4/100 = 28.42 GAL  
(5 x 18.66 = 93.3) + 8.83 + 28.42 = 130.53 GAL

USE: 130.5 GAL DOSE

4. MINIMUM SYSTEM DISCHARGE RATE:  
LATERAL #1 x 10 HOLES x 1.69 = 16.90 GPM  
LATERAL #2 x 9 HOLES x 1.69 = 15.21 GPM  
LATERAL #3 x 9 HOLES x 1.69 = 15.21 GPM  
LATERAL #1 + LATERAL #2 + LATERAL #3 = 47.72 GPM

USE: 26.5 @ 47.72 GPM

5. PUMP CHAMBER CAPACITY:  
ONE DAY STORAGE = 450 GAL.  
DOSE = 130.5 GAL  
TOTAL STORAGE = 580.5 GAL

6. PUMP ON TO PUMP OFF  
D = 130.5 X 231 / 7680 = 3.93'

7. HIGH WATER ALARM TO PUMP CHAMBER INLET  
R = 450 X 231 / 7680 = 13.54'

Approved Septic System Plan  
Howard County Health Department  
Dana Beard  
Signature  
10-25-22  
Date

OWNER / DEVELOPER  
JODY & MICHAEL RICK  
636 OAK TREE ROAD  
WESTMINSTER, MD 21157  
(301) 943-2377

ONSITE SEWAGE DISPOSAL SYSTEM DESIGN PLAN  
RENFRO PROPERTY

13775 FREDERICK ROAD \* WAR PLAT NO. 22466  
TAX MAP 15 \* GRID: 1 \* PARCEL: 178  
3rd ELECTION DISTRICT \* HOWARD COUNTY, MD

Engineers - Surveyors  
**CLSI**  
Civil Planning & Environmental Consultants  
www.clsi-civileng.com

439 East Main Street Westminster, MD 21157-5539  
(410) 848-1790 FAX (410) 848-1791

Date	Revisions	Drawn By:	MSB
		Designed By: <td>MSB</td>	MSB
		Reviewed By: <td></td>	
		Date: <td>AUGUST, 2022</td>	AUGUST, 2022
		Scale: <td>T = 80'</td>	T = 80'
		Job No.: <td>207082A</td>	207082A
		Sheet: <td>1 OF 1</td>	1 OF 1