



**SOILS TABLE (WITHIN LOT)**

SYMBOL	RATING	NAME	K FACTOR
CgB	(B)	GLENELG LOAM, 3-8% SLOPES.	.20

SOIL MAP: 10 (WOODBINE, SE)

**LOW PRESURE DOSING SYSTEM - INITIAL INSTALLATION**

TRENCH	GROUND ELEVATION (FT)	PIPE INV. ELEVATION (FT)	TRENCH LENGTH (FT)	LATERAL LENGTH (FT)	PERFORATION DIAMETER (IN)	PRESSURE HEAD (FT)	PERFORATION FLOW RATE (GPM)	PERFORATION SPACING (FT)	NUMBER OF PERFORATIONS	TRENCH FLOW RATE (GPM)
1-A...1-F	585.45-585.95	582.00	31.00'	26.90'	5/16	2.0	1.63	6.2	5	8.15

GROUND ELEVATION TAKEN DIRECTLY FROM SURVEY SURFACE

**ON-SITE SEWAGE DISPOSAL SYSTEM:**

RESIDENTIAL SYSTEM DESIGN: HOOT 1000 BNR  
 4 BEDROOM HOUSE  
 150 GALLONS X # OF BEDROOMS = VOLUME OF WASTEWATER / DAY  
 150 X 4 = 600 GPD  
 PERC RATE = 16-30 MINUTES/INCH  
 APPLICATION RATE = 0.6 GPD/SQ.F.T.  
 DESIGN FLOW = APPLICATION RATE = SQ.F.T. OF TRENCH REQUIRED  
 600 ÷ 0.6 = 1,000 SQ.F.T.  
 SQ.F.T. REQUIRED ÷ WIDTH OF TRENCH = LENGTH OF TRENCH  
 1,000 ÷ 3.0' = 333.3 SQ.F.T.

**PRIMARY SYSTEM:**  
 USE 30" OF GRAVEL BELOW DRAIN PIPE  
 333.3 X 0.55 = 183.3  
 USE SIX (6) TRENCHES (31') EACH  
 A MINIMUM OF 10' BETWEEN TRENCHES UTILIZING SIDEWALL REDUCTION CREDIT.

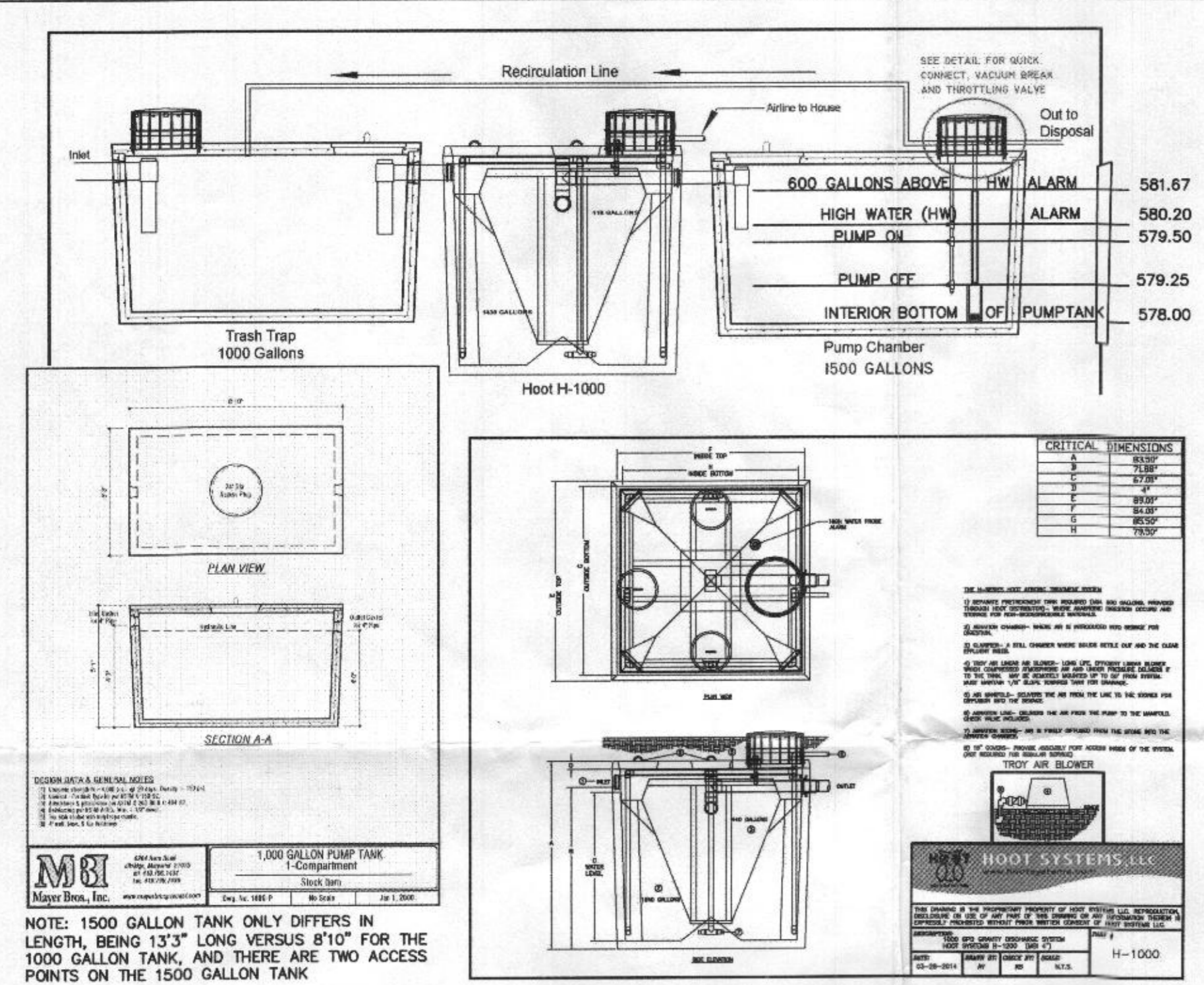
**1ST REPLACEMENT:**  
 USE 12" OF GRAVEL BELOW DRAIN PIPE  
 333.3 X 0.83 = 276.7  
 USE FOUR (4) TRENCHES (69.2')  
 A MINIMUM OF 10' BETWEEN TRENCHES UTILIZING SIDEWALL REDUCTION CREDIT.  
 MINIMUM TANK CAPACITY = 750 GALLONS

**INITIAL SYSTEM TRENCH DATA**

TRENCH NUMBER	EX. GROUND ELEVATION	INVERT ELEVATION	BOTTOM OF TRENCH EL.
1-A	585.92	582.00	578.45
1-B	585.76	582.00	578.45
1-C	585.63	582.00	578.45
1-D	585.50	582.00	578.45
1-E	585.85	582.00	578.45
1-F	585.66	582.00	578.45

**REPLACEMENT SYSTEM TRENCH DATA**

TRENCH NUMBER	EX. GROUND ELEVATION	INVERT ELEVATION	BOTTOM OF TRENCH EL.
2-A	585.45	581.45	577.45
2-B	585.30	581.30	577.30
2-C	584.00	580.00	576.00
2-D	583.80	579.80	575.80



**LOW PRESURE DOSING SYSTEM**

NO. OF BEDROOMS: 4  
 TRENCH LENGTH: TRENCH #1 THRU #6 = 31.0'  
 FLOW METHOD: GRAVITY TO SEPTIC TANK  
 LOW PRESSURE DOSE PUMPING TO TRENCH SYSTEM

MANIFOLD TYPE: END FEED MANIFOLD  
 HOLE DIAMETER: 5/16"  
 HOLE SPACING: LATERAL #1 THRU #6 = 6.2'

LATERAL LENGTH: LATERAL #1 THRU #6 = 26.9'  
 HOLES NO/LATERAL: LATERAL #1 THRU #6 = 2.0

LATERAL DIAMETER: 1.25" (TABLE 4.1)  
 PRESSURE HEAD: LATERAL #1 THRU #6 = 2.0'  
 ORIFICE DISCHARGE: LATERAL #1 THRU #6 = 1.63 GPM PER ORIFICE.  
 LATERAL DISCHARGE: (NO. OF HOLES X ORIFICE DISCHARGE)  
 LATERAL #1 THRU #6 = 48.90

SYSTEM DISCHARGE: 48.90 GPM

**MINIMUM DOSE:**  
 5x LATERAL VOL. + MANIFOLD VOL. + FORCE MAIN VOL. (TABLE 4.2)  
 FORCE MAIN DIAMETER: 3" 27.14' x 38.4 GAL/100' = 10.4 GAL  
 MANIFOLD DIAMETER: 2" 66.50' x 17.4 GAL/100' = 11.6 GAL  
 LATERAL VOLUME(EA): 1.25" 26.90' x 7.8 GAL/100' = 2.1 GAL  
 NO. OF LATERALS = 6; 5 x LATERAL VOL. = 2.1 x 6 x 5 = 63.0 GAL

**MINIMUM DOSE:** 85.0 GAL (63.0 + 11.6 + 10.4)  
 6 DISCHARGES PER DAY  
 VOLUME PER DISCHARGE (600/6) 100 GAL / DOSE

**TOTAL HEAD:**  
 DYNAMIC HEAD = STATIC HEAD + FRICTION HEAD + DISTAL HEAD  
 48.9 GPM  
 FORCE MAIN FRICTION LOSS: 33.45' x 0.56/100 = 0.19' (TABLE 4.4)  
 MANIFOLD FRICTION LOSS: 63.01' x 3.82/100 = 2.41' (TABLE 4.4)

FORCE MAIN (FM) FITTINGS FRICTION LOSS (EQUIVALENT PIPE LENGTHS):  
 1 QUICK CONNECT 3  
 2 REDUCERS 2x3= 8  
 1 T 90° BEND 15  
 1 GATE VALVE 2  
 1 90° ELBOW 10  
 1 45° ELBOW 6  
 FM FITTINGS TOTAL: 42 42' x 0.56/100 = 0.24' (TABLE 4.3)

MANIFOLD FITTINGS FRICTION LOSS (EQUIVALENT PIPE LENGTHS):  
 4 T STR. RUN 3 x 4 = 12  
 4 T 90° BEND 15 x 4 = 60  
 3 90° ELBOW 10 x 3 = 30  
 MANIFOLD FITTINGS TOTAL 102' x 3.82/100 = 3.89' (TABLE 4.3)

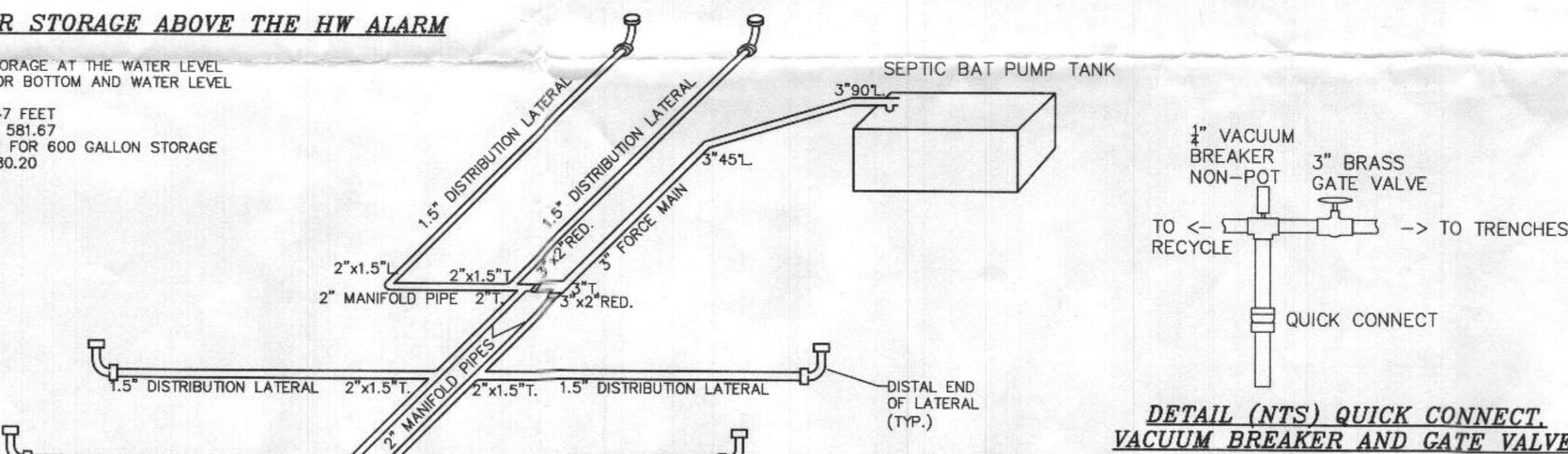
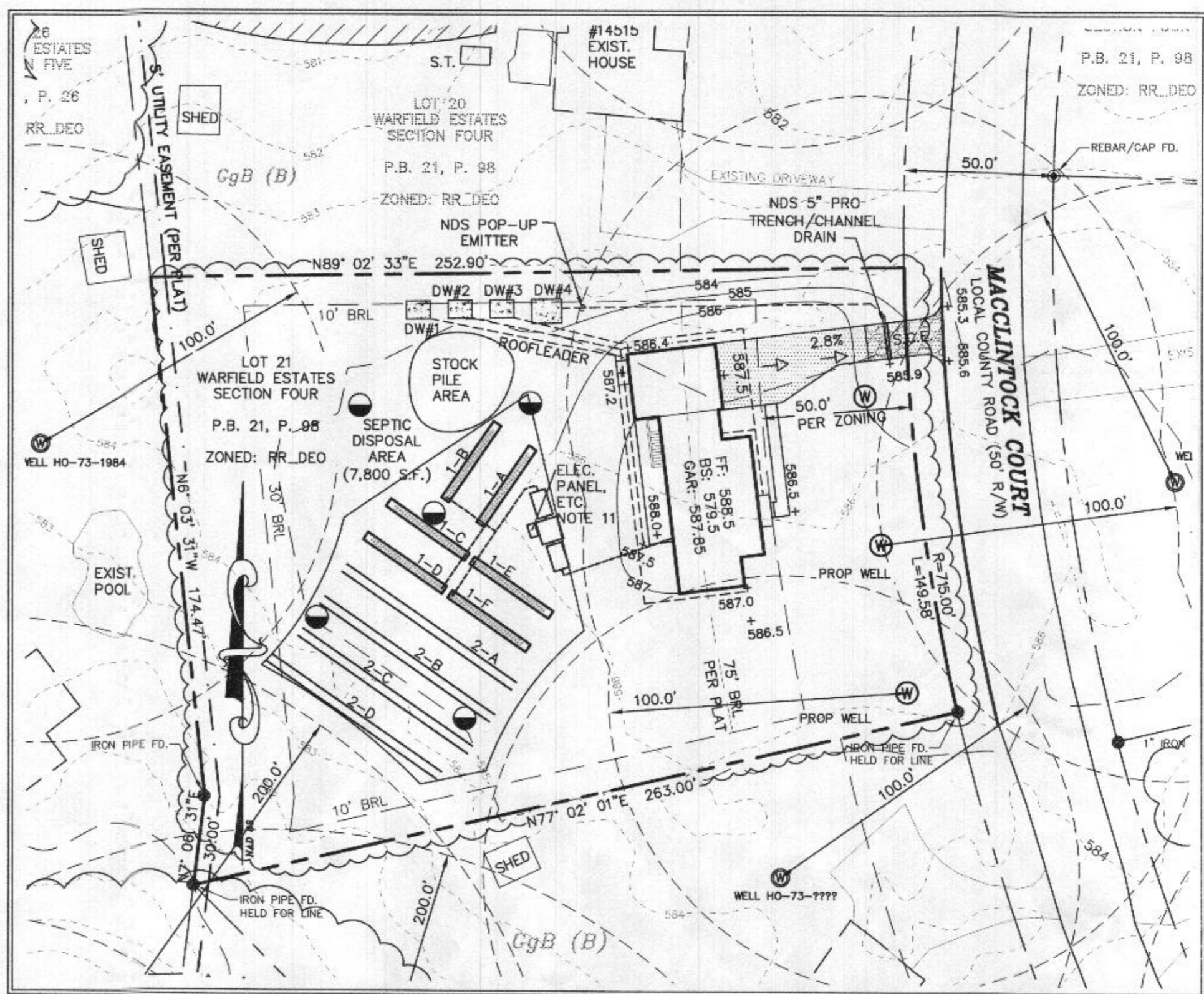
LATERAL SAFETY FACTOR: 1.5'  
 STATIC HEAD: 3.75'  
 DISTAL HEAD: 2.0'  
**TOTAL DYNAMIC HEAD:** 13.98' (19+2.41+2.4+3.89+1.5+3.75+2.0)  
 GATE VALVE TO BE INCLUDED NOTE: VALVE WILL BE ADJUSTED TO ALLOW DESIGN FLOW OF 48.9 GPM (AS NECESSARY).  
**TOTAL DYNAMIC HEAD (ADJUSTED BY VALVE) 15.5' YIELDS 48.9 GPM (APPROX)**  
 USE GOULDS PUMP WEO3M.

**CALCULATION FOR STORAGE ABOVE THE HW ALARM**

1500 GALLONS NOMINAL STORAGE AT THE WATER LEVEL  
 3.67 FEET BETWEEN INTERIOR BOTTOM AND WATER LEVEL  
 408 GALLONS PER FOOT  
 600 GALLONS REQUIRES 1.47 FEET  
 WATER LEVEL ELEVATION = 581.67  
 SET HW ALARM 1.47 LOWER FOR 600 GALLON STORAGE  
 HW ALARM ELEVATION = 580.20

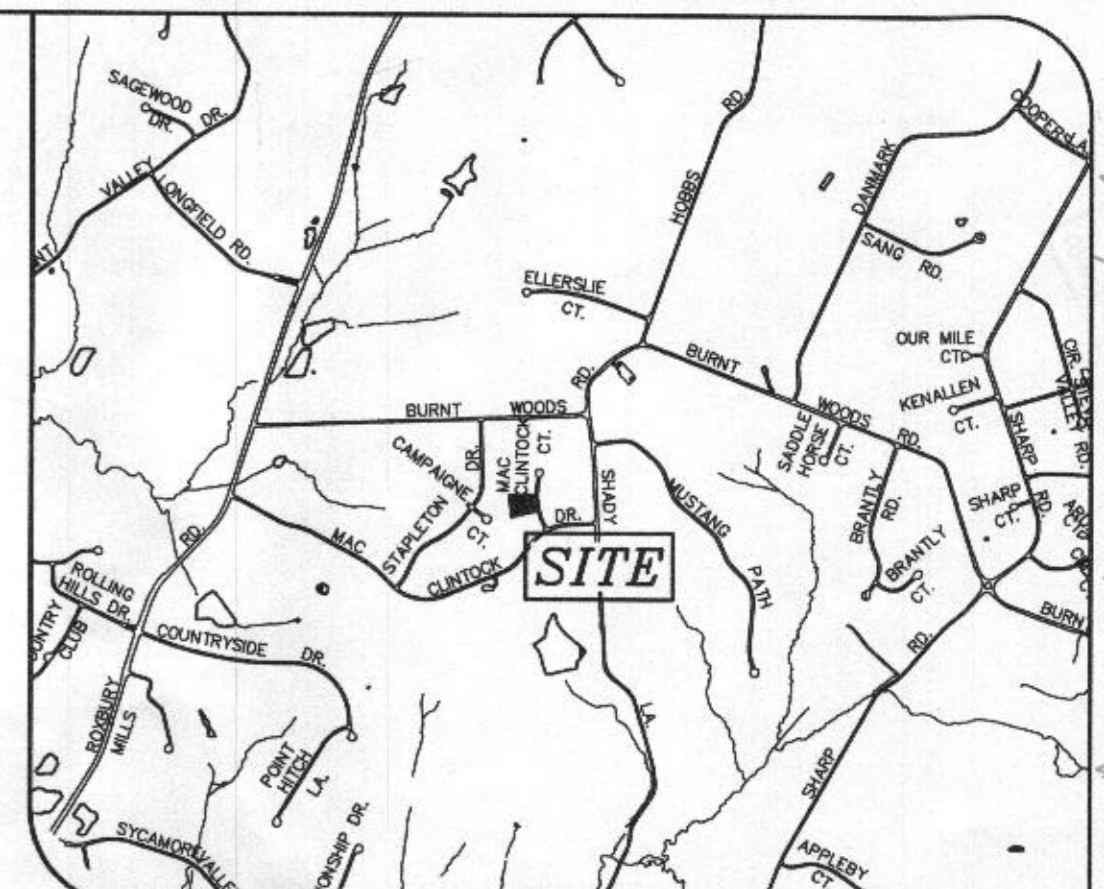
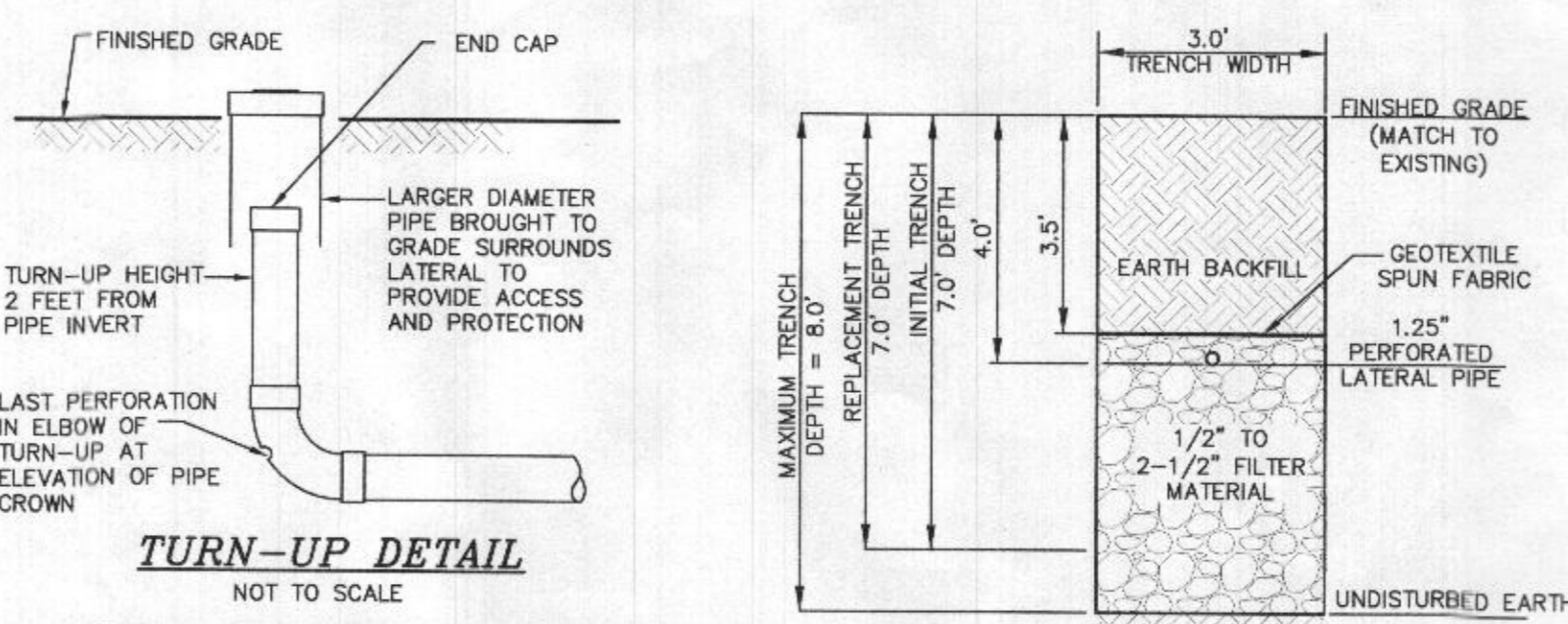
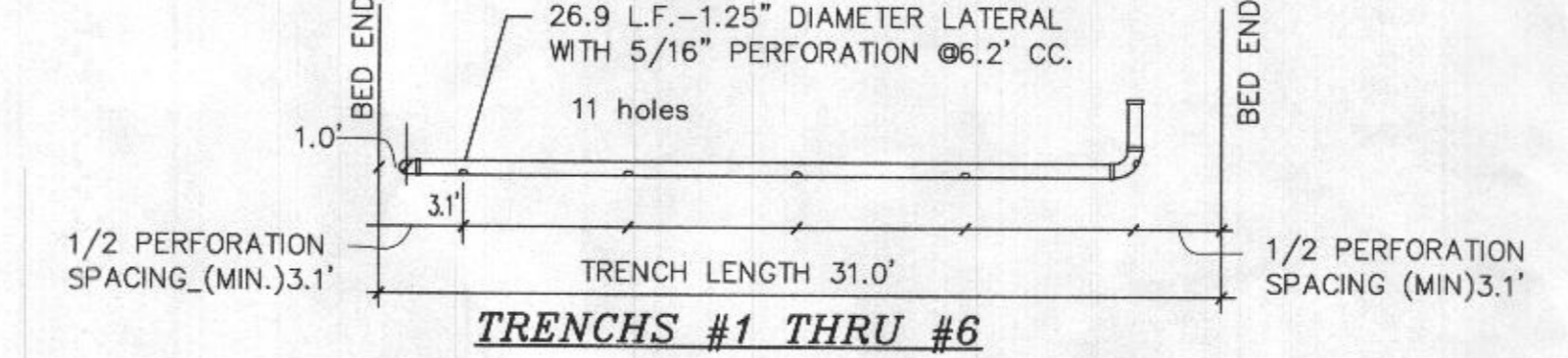
**SEPTIC TRENCH SIZING**

SYSTEM	APPLICATION RATE (GPD / SF)	MAXIMUM FLOW RATE (GPD)	AREA OF REQUIRED TRENCH (SF)	LENGTH OF TRENCH (LF)	EFFECTIVE DEPTH BEGINS (FT)	TRENCH BOTTOM DEPTH (FT)	TRENCH REDUCTION**	ADJUSTED LENGTH OF REQUIRED TRENCH (LF)	MINIMUM TRENCH SPACING (FT)	NUMBER OF TRENCHES	REQUIRED TRENCH LENGTH (FT)	
INITIAL	0.6	600	1,000	3	333.3	3.5	8.0	0.55	183.3	10.0'	6	30.60
REPLACEMENT	0.6	600	1,000	3	333.3	7.0	8.0	0.83	276.7	10.0'	4	69.18



**BAT SYSTEM CHART**

DESCRIPTION	ELEVATION
FINISHED GRADE AT SEPTIC TANK	586.07
INVERT INTO TANK	582.40
EXTERIOR BOTTOM OF SEPTICTANK	578.15
INTERIOR BOTTOM OF SEPTICTANK	578.48
INVERT OUT OF SEPTICTANK	582.15
INVERT INTO HOOT-1000	582.07
INVERT OUT OF HOOT-1000	582.00
INVERT INTO PUMP TANK	581.92
EXTERIOR BOTTOM OF PUMP TANK	577.67
INTERIOR BOTTOM OF PUMP TANK	578.00
PUMP OFF	579.25
PUMP ON	579.50
HIGH WATER (HW) ALARM	580.20
600 GALLONS ABOVE HW ALARM	581.67
INVERT OUT TO TRENCHES	583.00
INVERT INTO MANIFOLD	582.00
TOTAL DYNAMIC HEAD	13.98
DOSED VOLUME	100 GAL
PUMP RUNTIME	2.05 MIN.

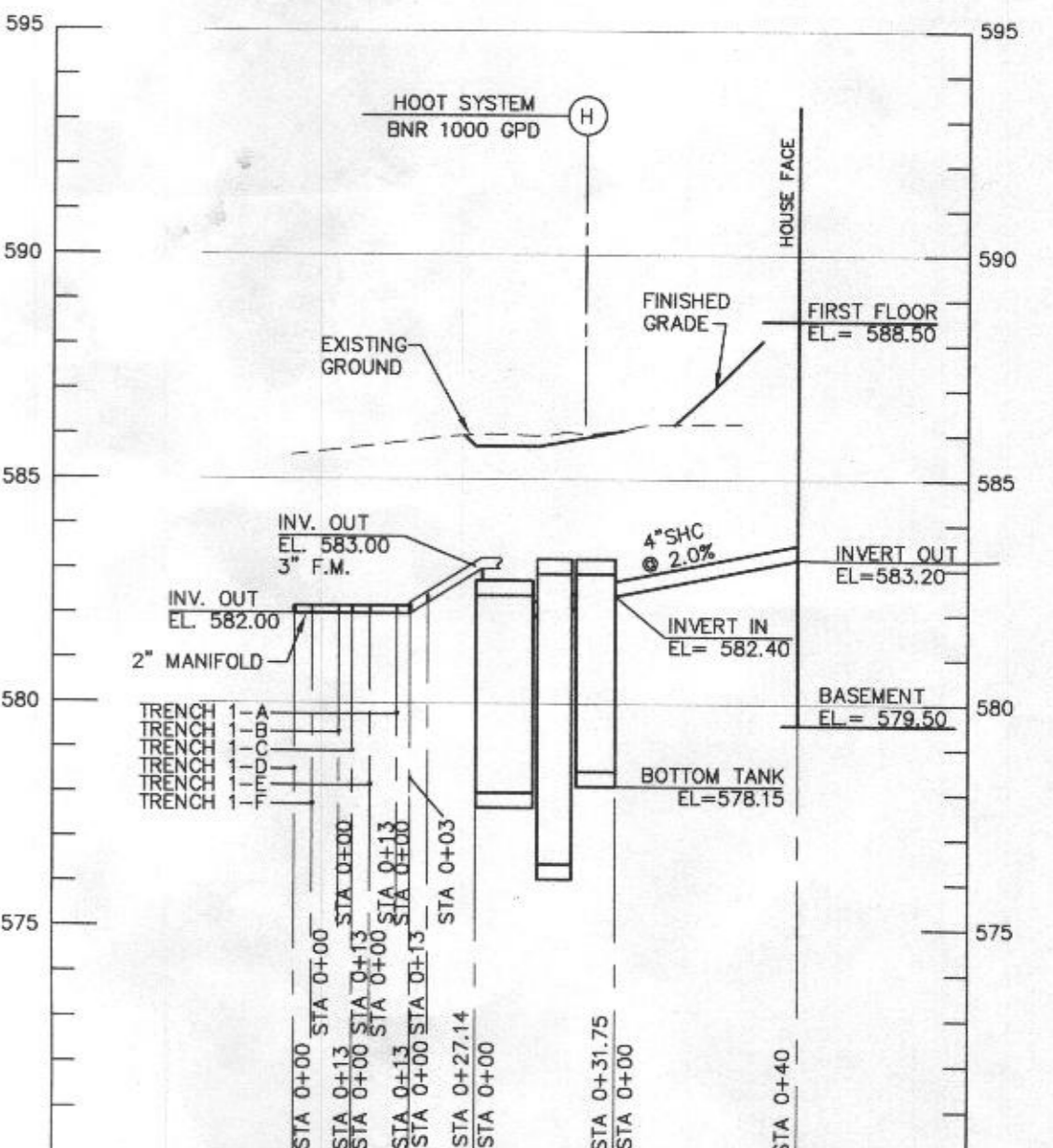


**GENERAL NOTES:**

- THE SUBJECT PROPERTY IS ZONED RR-DEO PER THE 10/06/2013 COMPREHENSIVE ZONING PLAN.
- PARCEL BACKGROUND:  
 ADDRESS : 14511 MacCLINTOCK COURT, GLENWOOD, MD 21738  
 TAX MAP 21; PARCEL 129; LOT 21  
 ELECTION DISTRICT: FOURTH  
 DEED REFERENCE: 19993/184  
 RECORD PLAT BOOK 21, PAGE 98 (PLAT DATED JAN. 1971.)  
 AREA : 44,305 S.F. OR 1,017 ACRES ±  
 TOTAL NUMBER OF UNITS: 1  
 TYPE OF PROPOSED UNIT : SFD  
 PROPOSED USE FOR SITE : RESIDENTIAL
- PROJECT BOUNDARY IS BASED ON A FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED ON OR ABOUT JULY, 2020 BY MILDBERG, BOENDER & ASSOC.
- TOPOGRAPHY SHOWN HERE IS GIS AND WILL BE FIELD VERIFIED BY MILDBERG, BOENDER & ASSOC, INC. IN JULY 2020 TO ACCURATELY REPRESENT THE RELATIVE CHANGES ON THE SUBJECT PROPERTY.
- SOILS LOCATION AND CLASSIFICATION BASED ON HOWARD COUNTY GIS SOIL SURVEY
- SEPTIC TANKS AND DRAIN FIELD SHOWN IS BASED ON DATA PROVIDED BY HOWARD COUNTY HEALTH DEPARTMENT.
- THIS AREA DESIGNATES A PRIVATE SEWERAGE AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF ENVIRONMENT FOR INDIVIDUAL SEWERAGE DISPOSAL. FOR LOTS CREATED PRIOR TO MARCH OF 1972 IT PROVIDES AT LEAST ENOUGH AREA TO ACCOMMODATE AN INITIAL AND TWO REPLACEMENT SEPTIC SYSTEMS AS REQUIRED BY THE HOWARD COUNTY HEALTH DEPARTMENT. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWERAGE IS AVAILABLE. THIS AREA SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWERAGE EASEMENT. RECORDATION OF A MODIFIED EASEMENT SHALL NOT BE NECESSARY.
- ANY CHANGES TO A PRIVATE SEWERAGE DISPOSAL EASEMENT SHALL REQUIRE A REVISED PERCOLATION CERTIFICATION PLAN.

**BEST AVAILABLE TECHNOLOGY SITE PLAN NOTES**

- ANY CHANGE TO THE LOCATIONS OR DEPTHS TO ANY COMPONENTS MUST BE APPROVED BY THE ENGINEER AND THE HOWARD COUNTY HEALTH DEPARTMENT PRIOR TO INSTALLATION. A REVISED 'SITE' PLAN MAY BE REQUIRED.
- THE MAXIMUM DEPTH OF THE BAT PER THE MANUFACTURER'S SPECIFICATION IS 3.0'
- THE BLOWER MAY NOT BE LOCATED MORE THAN 100 FEET FROM THE TANK BASED ON MANUFACTURER'S SPECIFICATIONS.
- THE BAT SYSTEM SHALL BE MAINTAINED AND OPERATED FOR THE LIFE OF THE SYSTEM.
- THE BAT SHALL BE OPERATED BY AND MAINTAINED BY A CERTIFIED SERVICE PROVIDER.
- WITHIN ONE (1) MONTH OF INSTALLATION, A PERSON INSTALLING THE BAT SYSTEM SHALL REPORT TO THE MARYLAND STATE DEPARTMENT OF ENVIRONMENT (MDE) IN A MANNER ACCEPTABLE TO MDE, THE ADDRESS AND DATE OF COMPLETION OF THE BAT INSTALLATION AND THE TYPE OF BAT INSTALLED.
- ELECTRICAL WORK FOR THE BAT INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
- AN AGREEMENT AND EASEMENT MUST BE COMPLETED AND SIGNED BY ALL APPLICABLE PARTIES, AND RECORDED IN THE LAND RECORDS OF HOWARD COUNTY.
- THE HEALTH DEPARTMENT REQUIRES DOCUMENTATION FOR THE START-UP CERTIFICATION FROM THE MANUFACTURER PRIOR TO FINAL APPROVAL OF THE INSTALLATION.
- HIGH WATER (HW) ALARM MUST BE ON A DEDICATED CIRCUIT
- ELECTRICAL PANEL, BLOWER MOTOR, AND ALARM TO BE LOCATED ADJACENT TO H-1000 UNIT.



**PERFORMANCE RATINGS (gallons per minute)**

Order No.	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	4"	6"	8"
1	120	150	180	210	240	270	300	330	360	390

**COMPONENTS**

Item No.	Description
1	Motor
2	Control
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearing
7	Power Cable
8	Control Cable

**AGENCY LISTINGS**

Yylem, Inc.  
 2081 East Bayshore Drive, Suite A  
 Glenwood, MD 21738  
 Phone: (410) 325-4210  
 Fax: (410) 325-3877  
 www.yylem.com  
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**Goulds Water Technology**

Wastewater

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

**SPECIFICATIONS**  
 • Built-in handling capabilities: maximum.  
 • Discharge size: 2" NPT.  
 • Capacities: up to 140 GPM.  
 • Total head: up to 128 feet TDH.  
 • Temperature:  
 • 104°F (40°C) continuous, 149°F (60°C) intermittent.  
 • Size order numbers on reverse side for specific hp, voltage, phase and HPFA's available.

**MOTORS**  
 • Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.  
 • Class B insulation on 3/4 - 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.

**AGENCY LISTINGS**  
 Goulds Water Technology, Inc.  
 176 and 182 188th Street  
 Grand Rapids, MI 49508  
 By Canadian Standards Association File B-28260

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. 34027, EXP. DATE 01/16/2023

MICHAEL G. KIRK, P.E.  
 DATE: 04/16/2021

STATE OF MARYLAND  
 MICHAEL G. KIRK, P.E.  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 34027  
 EXPIRES 01/16/2023

**OWNER/DEVELOPER**  
 PATRICK CURLEY &  
 BROOKE CURLEY  
 14511 MacCLINTOCK COURT  
 GLENWOOD, MD 21738  
 (410) 913-9787

WARFIELD ESTATES, S-4, BL-A  
 14511 MacCLINTOCK CT. - LOT 21  
 TAX MAP: 21 - GRID: 04 - PARCEL: 129  
 FOURTH ELECTION DISTRICT

MILDBERG, BOENDER & ASSOC., INC.  
 Engineers Planners Surveyors  
 7850-B Bruce Drive, Columbia, Maryland 21044  
 (410) 997-0296 Tel. (410) 997-0298 Fax.

Approved Septic System Plan  
 Howard County Health Department  
 Signature: [Signature]  
 Date: 5/4/2021  
 Scale: 1"=40'

DATE: APR 2021  
 ILLUSTRATION: MMM  
 ENGINEERING: MMM  
 APPROVAL: MK

1 OF 1