A/P ______________

138

dk brn L to brn L, 2fsbk

1.5' brn L, 1msbk

yel-red & brn cosl, Øm, ss dense

3.5 yel-red & pale brn sl medium platy slightly sticky

5' pale brn & yel-red ls cementation increases w/depth

7.5' — R=water —

136

dk brn chL 2vfsbk

0.6' brn L, thin platy

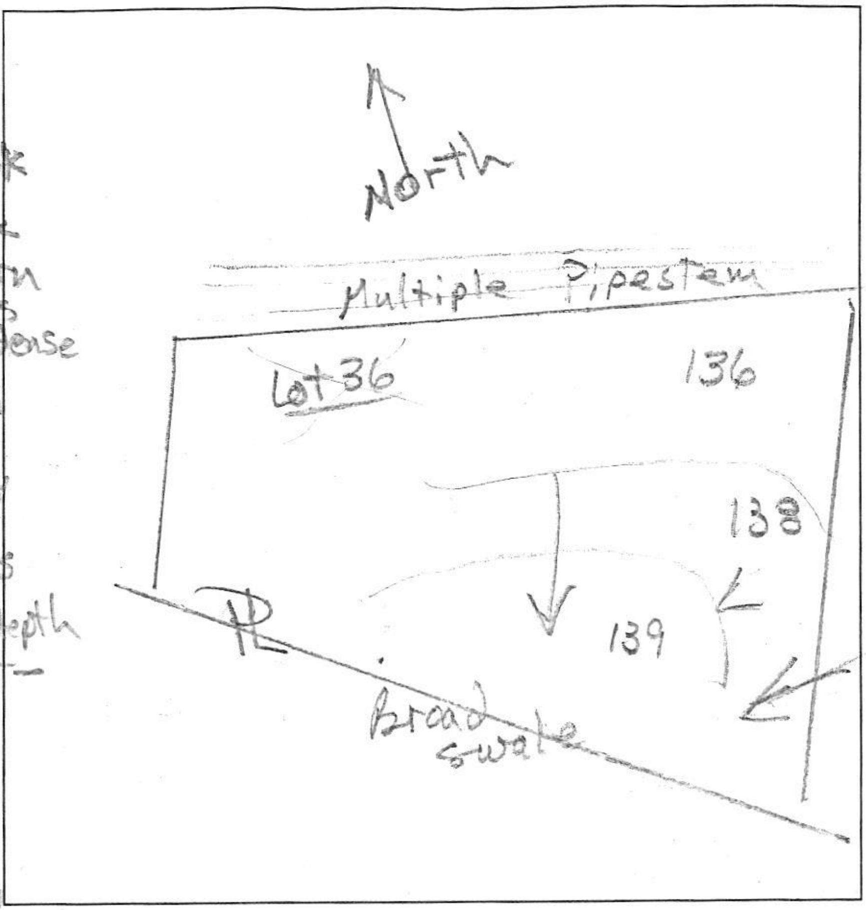
1.6' yel-red sl thin platy common mica

2.8' brn sl, Øm dense common mica

3.6' yellow-red & blk sil wk. platy

9.7' pale brn ls, Øm many mica

12.3' water



DATE	TEST #	DEPTH	START	BREAK 1" DROP	STOP 2" DROP	TIME OF 2ND INCH	P/F/H
11/6/14	138	5'	Visual	Fails on topo and depth			F
11/6/14	136	6"/12.3'	1:22	1:54	—	—	F

REMARKS ______________________________

SANITARIAN R Bricker BACKHOE Hatfields OTHERS Art Leonard, Bonnie

TEST HOLES USED IN SDA ______________ AVG. PERC TIME ______ SQ. FT/BR ______

TRENCH WIDTH ______ INLET DEPTH ______ MAX. BOT DEPTH ______ EFFECTIVE S/W ______

Lot 36

FINAL PUBLIC SEWER, FORCE MAIN AND SHARED ONSITE SEWER SYSTEM PLANS

FOR

WILLOWSHIRE

LOTS 23, 38, 39, 40 & 42

CONTRACT NO.: 50-5062-D

LOCATION OF SITE

5232 GREEN BRIDGE ROAD

TAX MAP 27, GRID 18, PARCELS 34,36, 98, 111 & 112

5TH ELECTION DISTRICT, ZONED RR-DE0

HOWARD COUNTY MARYLAND

STANDARD DRAWING LEGEND

FOR ENTIRE PLAN SET (NOT TO SCALE)

EXISTING NOTE	TYPICAL NOTE TEXT	PROPOSED NOTE
	ONSITE PROPERTY LINE / R.O.W. LINE	
	NEIGHBORING PROPERTY LINE / INTERIOR PARCEL LINE	
	EASEMENT LINE	
	SETBACK LINE	
	UNDERGROUND FORCE MAIN	FM
S	SANITARY SEWER MAIN	
Ⓢ	SANITARY MANHOLE	●
○	TERMINAL SANITARY MANHOLE	●
	STREAM BUFFER	SB SB
FP FP FP	FLOODPLAIN	
LOD LOD	LIMIT OF DISTURBANCE	
	UTILITY TEST PIT LOCATION	TP
WB WB	WETLAND BUFFER	
	PERCOLATION HOLE (PASSED)	●
	PERCOLATION HOLE (FAILED)	⊠
	PERENNIAL STREAM	
	INTERMITTENT STREAM	
	SEWAGE DISPOSAL AREA	PRIVATE / SHARED
	PROPOSED SEWER HOUSE CONNECTION	
	WETLAND BUFFER	
	STREAM BUFFER	
	TREELINE	
	SEWER CLEANOUT	●

SHEET INDEX

SHEET TITLE	SHEET NUMBER
WATER AND SEWER PLAN - TITLE SHEET	1
WATER AND SEWER PLAN - PUBLIC SEWER & FORCE MAIN PLAN & PROFILES	2
WATER AND SEWER PLAN - DRAINFIELD PLAN	3
WATER AND SEWER PLAN - TREATMENT SYSTEM DETAIL	4
WATER AND SEWER PLAN - DISTRIBUTION DETAILS	5

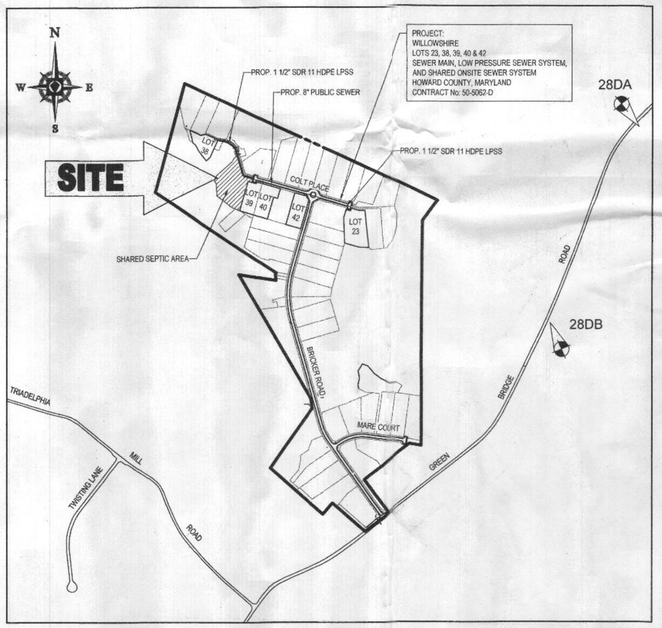
QUANTITIES TABLE

ITEMS	QUANTITIES ESTIMATED	QUANTITIES	AS-BUILT TYPE	MANUFACTURER / SUPPLIER
GRINDER PUMP (DUPLEX)	2	2	DUPLEX	ZOELLER
CLEANOUTS	7	7	CONCRETE	HORNE CONCRETE
GATE VALVES	1	1	MJ RS O/R	MUELLER CO.
4" S.H.C.	65 L.F.	75 L.F.	PVC-SDR 35	JM-MFG.
1 1/2" SDR 11 HDPE (LPSS)	830 L.F.	830 L.F.	HDPE	FLYING W PLASTICS
8" SDR 35 PVC	591 L.F.	590 L.F.	PVC	JM-MFG.
TERMINAL FLUSHING CONNECTION MANHOLE	2	2	PRECAST CONC.	ATLANTIC CONCRETE
SANITARY MANHOLE	2	2	PRECAST CONC.	ATLANTIC CONCRETE
3' WIDE DRAINFIELD TRENCH	750 L.F.	750 L.F.	TYPE 2-A WASHED STONE	HYDRO-TERRA
2"Ø PVC LATERALS	744 L.F.	744 L.F.	2" PVC HDPE	FLYING W PLASTICS
3"Ø PVC PVC FORCE MAINS	180 L.F.	180 L.F.	3" PVC HDPE	FLYING W PLASTICS
2,000 GALLON SETTLING TANKS	1	1	PRECAST CONC.	GILLESPIE
4.5 BAT UNIT (MICROFAST)	1	1	PRECAST CONC.	GILLESPIE
6,000 GALLON DOSING TANK	1	1	PRECAST CONC.	GILLESPIE
DOSING PUMPS	3	3	CAST IRON	GOULDS W3QTBHF
8' X 12' CONTROL SHED	1	1	COTTAGE A-FRAME	RIDGE CABINET CO.
TRANSITION MANHOLE	2	2	PRECAST CONC.	ATLANTIC CONCRETE
NAME OF UTILITY CONTRACTOR				HIGHLAND TURF, INC.
			CHECK BOX	
			AS-BUILT DATE	11-4-2021
			SURVEY AND DRAFTING DIVISION	

SANITARY STRUCTURE SCHEDULE

NAME	TYPE	RIM ELEV. (FT.)	INVERTS	NORTHING / EASTING
CO1	CLEANOUT (BATTERBOARD)	489.88'	INV OUT = 487.05 (4")	.92 N 570,893.3515 E 1,311,123.6152
CO2	CLEANOUT	499.22'	INV OUT = 497.05 (4")	.92 N 570,294.4186 E 1,312,236.6271
CO5	CLEANOUT	490.48'	INV OUT = 487.50| (1 1/2") INV OUT = 487.50| (1 1/2")	.92 N 570,902.4767 E 1,311,127.8163
CO6	CLEANOUT	499.96'	INV OUT = 497.50 (1 1/2") INV OUT = 497.50 (1 1/2")	.92 N 570,304.0229 E 1,312,239.3952
GP#1	GRINDER PUMP HO.CO. STD. DET. E-2.03	500.00'	INV IN = 497.50 (1 1/2") INV IN = 497.00 (4")	.92 N 570,299.2047 E 1,312,238.0072
GP#2	GRINDER PUMP HO.CO. STD. DET. E-2.03	490.00'	INV IN = 487.50 (1 1/2") INV IN = 487.00 (4")	.92 N 570,897.8891 E 1,311,125.7183
SHM-4	TERMINAL FLUSHING CONNECTION HO.CO. STD. DTL. E-103	499.88'	INV OUT = 494.84| (1 1/2")	.50 .12 N 570,332.4276 E 1,312,262.7808
SMH-3	TERMINAL FLUSHING CONNECTION HO.CO. STD. DTL. E-103	981.82'	INV OUT = 485.00| (1 1/2")	3.59 6.70 N 570,912.9433 E 1,311,127.1739
SMH 1	STANDARD MANHOLE HO.CO. STD. DET. G-5.12	498.77'	INV IN = 492.10 (8") INV IN = 492.00 (8") INV OUT = 491.90 (8")	.79 6.35 N 570,584.8743 E 1,311,377.1162
SMH 2	STANDARD MANHOLE HO.CO. STD. DET. G-5.12	500.00'	INV IN = 494.04 (8") INV IN = 494.14 (4") INV OUT = 493.94 (8")	.75 .53 N 570,538.3398 E 1,311,537.9644
TSMH 1	TRANSITION MANHOLE HO.CO. STD. DET. S-4.15	497.17'	INV IN = 493.09 (1 1/2") INV OUT = 492.50 (8")	2.53 2.25 N 570,599.0542 E 1,311,372.8479
TSMH 2	TRANSITION MANHOLE HO.CO. STD. DET. S-4.15	511.97'	INV IN = 506.65 (1 1/2") INV OUT = 506.15 (8")	4.35 4.10 N 570,427.6169 E 1,311,922.3346
VALVE BOX	ISOLATION VALVE BOX	497.19'	INV IN = 491.86 (8") INV OUT = 491.86 (8")	5.32 .49 N 570,579.6789 E 1,311,375.7006

AS-BUILT DATE 1/24/2022



LOCATION MAP

SCALE: 1"=600'

TYPE OF BUILDING : RESIDENTIAL - SINGLE FAMILY DETACH DWELLING
DRAINAGE AREA : PATAPSCO
NUMBER OF LOTS/PARCELS/UNITS WITHIN SUBDIVISION: 45
NUMBER OF LOTS/PARCELS SERVED BY PROPOSED SHARED SEPTIC SYSTEM: 5
AREA OF RESIDENTIAL LOT/PARCEL: 99.95AC
NUMBER OF S.H.C.: 5
WATER ZONE: N/A
TEST GRADIENT: N/A
TREATMENT PLAT: SHARED TREATMENT FACILITY
SHARED SEPTIC DISPOSAL FACILITY
ON NON-BUILDABLE PRES. PARCEL "D"

REFERENCE DRAWINGS

ECP-16-008 SP-17-002
WP-17-105 F-18-086
DMV2-19-009 (SEE GENERAL NOTE 12)

USE PROJECTION	
HOUSES SERVED BY ON-SITE SYSTEM	5
BEDROOMS PER HOUSE	5
FLOW PER BEDROOM (GPD)	150
TOTAL DESIGN FLOW AT 150 GPD/BEDROOM (GAL)	3,750
ADF (GPD)	1,875

BENCHMARK

GEODETIC SURVEY CONTROL - 28DA
ELEV. 564.389'
N 570,624.997
E 1,314,434.228

GEODETIC SURVEY CONTROL - 28DB
ELEV. 537.361'
N 569,055.561
E 1,313,795.348

SEE SHEET 4 FOR SHARED SEPTIC TREATMENT SYSTEM NOTES.

DEVELOPER: ELM STREET DEVELOPMENT
5074 DORSEY HALL ROAD, SUITE 205
COLUMBIA, MD 21042
CONTACT: JASON VAN KIRK
PHONE: (410) 720-3021

OWNERS:

PARCEL 36
TOLL MID ATLANTIC LP COMPANY INC.
250 GIBRAL TAR ROAD
HORSHAM PA, 19044
TEL.

PARCEL 34
TOLL MID ATLANTIC LP COMPANY INC.
250 GIBRAL TAR ROAD
HORSHAM PA, 19044
TEL.
PARCEL 111
DENNIS A LEAF
LENORE D SINES
5226 GREEN BRIDGE ROAD
DAYTON, MD 21036
TEL.

PARCEL 112
TOLL MID ATLANTIC LP COMPANY INC.
250 GIBRAL TAR ROAD
HORSHAM PA, 19044
TEL.
PARCEL 98
JERRY MAUCK
JANET BURKE J/T
5234 GREEN BRIDGE ROAD
DAYTON, MD 21036
TEL.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. (F-18-086)

HOWARD SCD — DATE 1/28/20

APPROVED: FOR PRIVATE WATER, AND SHARED SEWER SYSTEM FOR LOTS 23, 38, 39, 40 & 42.

COUNTY HEALTH OFFICER, HOWARD COUNTY HEALTH DEPARTMENT — DATE 2/12/2020

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES — DATE 1-15-2020

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2.19.20

THE FOLLOWING STATES REQUIRE NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE, IN VIRGINIA, MARYLAND, THE DISTRICT OF COLUMBIA, AND DELAWARE CALL - 811
(WV: 1-800-245-4848) (PA: 1-800-242-1776) (DC: 1-800-257-7777) (VA 1-800-552-7001) (MD: 1-800-257-7777) (DE: 1-800-282-8555)

BOHLER ENGINEERING
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
www.BohlerEngineering.com

B.R. ROWE
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 40858
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. 40858, EXPIRATION DATE: 7/3/2021

DES: AVG
DRN: AVG
CK: TG
DATE: 01/03/20

REV.	DATE	DESCRIPTION	BY
1	1/24/2022	AS-BUILT	SAL
A	11/23/21	AS BUILT	WRA

WATER AND SEWER PLAN

TITLE SHEET

PARCEL NO. 34, 36, 98, 111 & 112

600' SCALE MAP NO. 27 & 28 BLOCK NO.

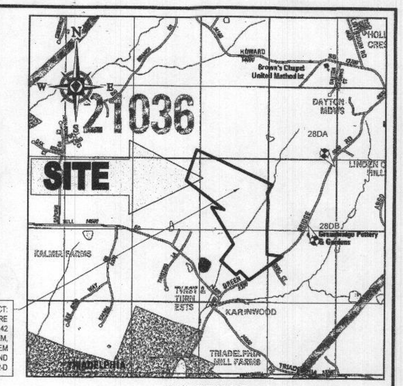
WILLOWSHIRE

LOTS 1 - 45, BUILDABLE PRESERVATION PARCEL C, NON-BUILDABLE PRESERVATION PARCEL A, B, D, E-G, L, & NON-BUILDABLE BULK PARCEL H-K

5232 GREEN BRIDGE ROAD
TAX MAP 27, GRID 18, PARCELS 34,36, 98, 111 & 112
5TH ELECTION DISTRICT, ZONED RR-DEO
HOWARD COUNTY MARYLAND
CONTRACT NO.: 50-5062-D

SCALE AS SHOWN

SHEET 1 OF 5



PROJECT:
WILLOWSHIRE
LOTS 23, 38, 39, 40 & 42
SEWER MAIN, LOW PRESSURE SEWER SYSTEM, AND SHARED ONSITE SEWER SYSTEM
HOWARD COUNTY, MARYLAND
CONTRACT No: 50-5062-D

VICINITY MAP

SCALE: 1"=2000'
ADC MAP COORDINATES: 30/C5

GENERAL NOTES

1. APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
2. TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON APRIL 28, 2015 BY BOHLER ENGINEERING.
3. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLAN COORDINATE SYSTEM. HORIZONTAL AND VERTICAL CONTROL DATUM ARE BASED ON HOWARD COUNTY MONUMENT NOS. 28DA AND 28DB WHICH WERE USED FOR THIS PROJECT.

   HOWARD COUNTY MONUMENT NO: 28DA ELEV. = 564.389'
   HOWARD COUNTY MONUMENT NO: 28DB ELEV. = 537.361'
4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
5. CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'- 0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED BY THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
6. FOR DETAILS NOT SHOWN ON THE DRAWING, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
7. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL TP AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IN INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
8. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

   AT & T 1-800-252-1133
   BGE (CONSTRUCTION SERVICES) 410-637-8713
   BGE (EMERGENCY) 410-685-0123
   BUREAU OF UTILITIES 410-313-4900
   COLONIAL PIPELINE COMPANY 410-795-1390
   MISS UTILITY 1-800-257-7777
   STATE HIGHWAY ADMINISTRATION 410-531-5533
   VERIZON 1-800-743-0033
   HOWARD COUNTY HEALTH DEPARTMENT OFFICE 410-313-6300
9. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT BE REMOVED OR DAMAGED BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL REMOVE TREES, STUMPS, AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
11. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(A) OF THE HOWARD COUNTY CODE.
12. WAIVER (DMV2-19-009) FROM THE HOWARD COUNTY DESIGN MANUAL VOL. II, WATER AND SEWER SECTION 4.3.B.3.B AND 4.5.E FOR LOTS 23, 38-40 AND 42 (NO BASEMENT GRAVITY SERVICE) HAS BEEN APPROVED BY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS ON DEC. 14, 2018. AS A RESULT OF TOPOGRAPHY CAUSING DEPTHS OF SEWER IN EXCESS OF 20 FEET, BASEMENT SEWER SERVICE CANNOT BE PROVIDED TO THESE LOT PROPOSED LOTS. FOR THESE LOTS: GRAVITY SEWER SERVICE TO BE PROVIDED TO FIRST FLOOR ONLY; BASEMENT SERVICE TO BE PROVIDED BY PRIVATE ON-SITE PUMP TO BE LOCATED INSIDE THE HOUSE. THE APPROVAL AND INSPECTION OF ON-SITE PUMPING UNITS INCLUDES THE DEPARTMENT OF INSPECTION, LICENSE AND PERMIT (DILP).
13. CONSTRUCTION SHALL CONFORM TO ALL LOCAL, COUNTY, AND STATE GUIDELINES, INCLUDING HOWARD COUNTY BUILDING CODES AND RECOMMEND STANDARD FOR WASTEWATER SYSTEMS (2004); DISCREPANCIES SHALL BE REFEREED TO ENGINEER.
14. REFER TO SEPTIC PERMIT APPROVAL FOR SAMPLING PROTOCOLS AND FREQUENCY FOR THE RESPECTIVE SITES. COPY OF THE SEPTIC PERMIT APPROVAL SHALL BE KEPT WITH THE O&M MANUAL.
15. A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH THE, MDE (410-537-3680), HOWARD COUNTY HEALTH DEPARTMENT AND BUREAU OF UTILITIES & CONSTRUCTION INSPECTIONS REPRESENTATIVES PRIOR TO STARTING WORK TO REVIEW DESIGN DOCUMENTS AND CONSTRUCTION REQUIREMENTS.
16. AN OPEN TRENCH INSPECTION SHALL BE CONDUCTED PRIOR TO FILLING WITH GRAVEL.
17. THIS AREA DESIGNATES A SEWAGE DISPOSAL AREA OF AT LEAST 10,000 SQ FT PER LOT ON SHARED-SYSTEM AS REQUIRED BY THE MARYLAND DEPARTMENT OF ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWERAGE IS AVAILABLE. THESE AREAS SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWAGE AREA. RECORDATION OF A REVISED SEWAGE EASEMENT SHALL NOT BE NECESSARY.
18. WAIVER (DMV2-20-00) FROM THE HOWARD COUNTY DESIGN MANUAL VOL. II, WATER AND SEWER, SECTION 8.1.E.9.C WHICH REQUIRES "SEPTIC TANKS SIZED (TOTAL CAPACITY) FOR A MINIMUM VOLUME EQUAL TO 1250 GALLONS PER 4-BEDROOM HOUSE. WITH AN ADDITIONAL 250 GALLONS FOR EACH ADDITIONAL BEDROOM. HAS BEEN APPROVED BY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS ON AUGUST 14, 2019.
19. THE DEVELOPER SHALL CONDUCT QUARTERLY MONITORING OF THE TREATED EFFLUENT DURING THE 12-MONTH PERIOD FOLLOWING 80% OCCUPANCY OF THE LOTS CONNECTED TO THESHARED SYSTEM. THE SAMPLING AND ANALYSES SHALL BE IN ACCORDANCE WITH MDE GUIDANCE FOR PRE-TREATMENT SYSTEMS WITH GREATER THAN 1500GPD CAPACITY. THIS INCLUDES GRAB SAMPLING EFFLUENT IN THE PUMP TANK WITH LABORATORY ANALYSES OF BOD, TSS, TOTAL NITROGEN (TKN, NITRATE, NITRITE), ALKALINITY, AND FOG. DO, PH, AND TEMPERATURE SHOULD BE FIELD TESTED AS CLOSE TO THE TREATMENT PLANT EFFLUENT PIPE AS POSSIBLE. IF THE EFFLUENT CONSISTENTLY EXCEEDS THE APPROVED DESIGN CRITERIA OR APPLICABLE REGULATORY LIMITS, THE DEVELOPER WILL NOTIFY HCHD, MDE, AND HCBU AND WILL MAKE THE NECESSARY ADJUSTMENTS OR REPAIRS TO THE SYSTEM WITH AGENCY OVERSIGHT PRIOR TO DEDICATION OF THE SYSTEM TO HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS. IF A TREATMENT REDUCTION IN PERCENT IS SPECIFIED, CONCURRENT INFLUENT MONITORING IS REQUIRED.

WATER NOTES:

1. WATER SERVICE TO ALL BUILDABLE LOTS SHALL BE PRIVATE AND PROVIDED BY INDIVIDUAL PRIVATE WELLS.

SEWER NOTES:

1. ALL SEWER MAINS SHALL BE DIP OR PVC UNLESS OTHERWISE NOTED.
2. ALL MANHOLES SHALL BE 4' - 0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
3. FORCE MAINS SHALL BE D.I.P. ONLY.
4. MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
5. MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVERS, STANDARD DETAIL G5.52. WHERE WATERTIGHT FRAME AND COVER IS USED, SET TOP OF FRAME 1' - 6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
6. HOUSE(S) WITH THESYMBOL "C.N.S." INDICATES THAT CELLAR CANNOT BE SERVED.
7. LOTS 1 THRU 22, 24THRU 37, 41, AND 43 THRU 45 SHALL HAVE PRIVATE ON-SITE DISPOSAL SYSTEMS.
8. LOW PRESSURE SEWER PORTION OF THE COLLECTION SYSTEM MUST BE HDPE SDR-11 OR BETTER WITH THERMALLY WELDED JOINTS.
9. ALL FORCE MAIN MUST BE LEAK TESTED.
10. TRACER WIRE SHALL BE INSTALLED ALONG ENTIRE LENGTH OF LOW PRESSURE SEWER.
11. A SPARE PUMP WILL BE PROVIDED TO THE COUNTY AT DEDICATION OF THE PUBLIC SANITARY SEWER IMPROVEMENTS.
12. THE FORCEMAIN ELEMENT OF THE SHARED-SEPTIC SYSTEM MUST BE CONSTRUCTED OF FUSIBLE HDPE WHEN PASSING WITHIN 50 FEET OF THE WELL ZONES ON LOTS 22, 29 AND 30.

1 1/2" SDR 11 HDPE L.P.S.S. TABULATION CHART (FOR LOT 38)

STATION	APPURTENANCE	NORTHING	EASTING
0+00.00 MH-1 TO LOT 38	BATTERBOARD CLEANOUT	N 570893.3515	E 1311123.6162
0+02.27 FROM LPSS TO LOT 38	STANDARD MANHOLE HO.CO. STD. DET. G-5.12	N 570584.6743	E 1311377.1162
0+14.27 FROM LPSS TO LOT 38	CLEANOUT	N 570902.4267	E 1311127.9163
0+19.27 FROM LPSS TO LOT 38	GRINDER PUMP HO.CO. STD. DET. E-2.03	N 570897.8891	E 1311125.7163
PC = 2+26.01 MH-1 TO LOT 38	CRIMP RADIUS - 97.27'	N 570801.3402	E 1311312.8047
PT = 2+66.80 MH-1 TO LOT 38	CRIMP RADIUS - 97.27'	N 570857.4601	E 1311272.5545

1 1/2" SDR 11 HDPE L.P.S.S. TABULATION CHART (FOR LOT 38)

STATION	APPURTENANCE	NORTHING	EASTING
PC = 3+22.97 MH-1 TO LOT 38	CRIMP RADIUS - 97.27'	N 570872.0506	E 1311250.5917
PT = 3+63.29 MH-1 TO LOT 38	CRIMP RADIUS - 104.0'	N 570886.8871	E 1311213.4020
PC = 3+98.31 MH-1 TO LOT 38	CRIMP RADIUS - 101.86'	N 570892.8575	E 1311178.8935
PT = 4+27.05 MH-1 TO LOT 38	CRIMP RADIUS - 101.86'	N 570901.6257	E 1311151.6281
END = 4+53.99 MH-1 TO LOT 38	TERMINAL FLUSHING CONNECTION HO.CO. STD. DTL. E-1.03	N 570912.9433	E 1311127.1739

1 1/2" SDR 11 HDPE L.P.S.S. TABULATION CHART (FOR LOT 23)

STATION	APPURTENANCE	NORTHING	EASTING
3+69.88	CLEANOUT	N 570304.0229	E 1312239.3982
3+74.90	GRINDER PUMP HO.CO. STD. DET. E-2.03	N 570299.2047	E 1312238.0072
3+79.88	CLEANOUT	N 570294.4136	E 1312236.6271

SEWER HOUSE CONNECTION AS-BUILT LOCATION TABLE

LOT NUMBER	ADDRESS	LOCATION DIMENSION 1	LOCATION DIMENSION 2
LOT 23	7009 COLT PLACE	S.D. MH-4 = 25'	SMH-4 = 26'
LOT 38	7041 COLT PLACE	SMH-3 = 11'	VALVE = 10'
LOT 39	7035 COLT PLACE	1-39 = 24'	SMH-2 = 32'
LOT 40	7029 COLT PLACE	1-39 = 49'	SMH-2 = 20'
LOT 42	7021 COLT PLACE	TRANSFORMER=79'	TSMH-2 = 46'

LOT	MCE	TBF	FF	Inv. Out of House	SHC Length (ft)	SHC Slope	Inv. @ Cleanout	Inv. @ Grinder Pump	Prop. Grade @ Grinder Pump	Bottom of Grinder Pump	Drop Connection	Drop Length (ft)	CNS
23	502.81	495.50	505.50	500.31	331.00	1.00%	497.05	497.00	500.00	490.00	N/A	N/A	NO
38	491.00	485.00	495.00	488.50	150.00	1.00%	487.05	487.00	490.00	480.00	N/A	N/A	NO
39	498.30	491.00	501.00	495.80	183.00	1.00%	494.15	N/A	N/A	N/A	NO	N/A	NO
40	499.44	495.00	505.00	496.94	278.00	1.00%	494.34	N/A	N/A	N/A	NO	N/A	NO
42	510.30	508.00	518.00	507.80	264.00	1.00%	505.34	N/A	N/A	N/A	YES	2.56	NO

★ C.N.S. (CELLAR NOT SERVED). DENOTES GRAVITY SEWER SERVICE, FIRST FLOOR ONLY. GRAVITY BASEMENT SERVICE NOT AVAILABLE. BASEMENT TO BE PROVIDED BY PRIVATE ONSITE PUMP.

PUBLIC SEWER & FORCE MAIN - PLAN

SCALE : 1" = 50'

LOT 23 - PROFILE

SCALE : 1" = 50' HORIZONTAL
1" = 5' VERTICAL

LOT 38 - PROFILE

SCALE : 1" = 50' HORIZONTAL
1" = 5' VERTICAL

1 1/2" LPSS FORCE MAIN - PROFILE

SCALE : 1" = 50' HORIZONTAL
1" = 5' VERTICAL

1 1/2" LPSS FORCE MAIN AND 8" SEWER MAIN - PROFILE

SCALE :1" = 50' HORIZONTAL
1" = 5' VERTICAL

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT (F-18-83)

HOWARD SCD — DATE 1/28/20

APPROVED: FOR PRIVATE WATER AND SHARED SEWER SYSTEM FOR LOTS 23, 38, 39, 40 AND 42.

COUNTY HEALTH OFFICER, HOWARD COUNTY HEALTH DEPARTMENT — DATE 2/12/2020

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES — DATE 1-15-2020

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2-19-20

THE FOLLOWING STATES REQUIRE NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE IN VIRGINIA, MARYLAND, THE DISTRICT OF COLUMBIA, AND DELAWARE CALL - 811
(WV 1-800-245-4848) (PA 1-800-242-1776) (DC 1-800-257-7777) (VA 1-800-552-7001) (MD 1-800-257-7777) (DE 1-800-282-8555)

BOHLER ENGINEERING
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
www.BohlerEngineering.com

B.R. ROWE — 1/8/2020
PROFESSIONAL ENGINEER
MARYLAND LICENSE NO. 40900
BOHLER PROFESSIONAL CERTIFICATION
I, BRANDON R. ROWE, 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. 40900, EXPIRATION DATE: 7/2/2021

DES: AVG
DRN: AVG
CK: TG
DATE: 01/03/20

REV.	DATE	DESCRIPTION	BY
2	1/24/22	AS-BUILT	S4L
1	11/23/21	AS BUILT	WRA

WATER AND SEWER PLAN
PUBLIC SEWER & FORCE MAIN PLAN & PROFILES

PARCEL NO. 34, 36, 98, 111 & 112
600' SCALE MAP NO. 27 & 28 BLOCK NO.

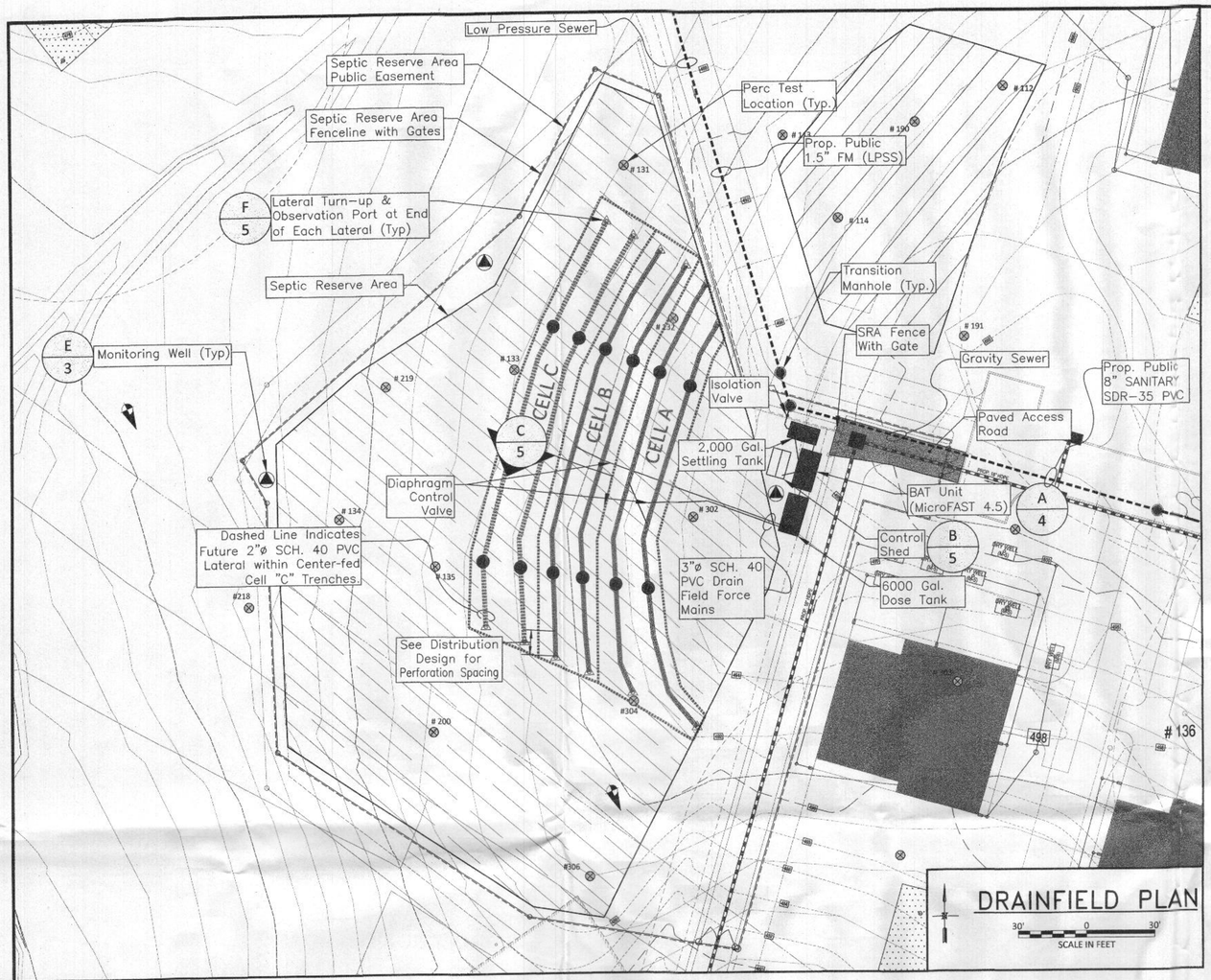
WILLOWSHIRE

LOTS 1 - 45, BUILDABLE PRESERVATION PARCEL C, NON-BUILDABLE PRESERVATION PARCEL A, B, D, E-G, L, & NON-BUILDABLE BULK PARCEL H-K

5232 GREEN BRIDGE ROAD
TAX MAP 27, GRID 18, PARCELS 34,36, 98, 111 & 112
5TH ELECTION DISTRICT, ZONED RR-DEO
HOWARD COUNTY MARYLAND
CONTRACT NO.: 50-5062-D

SCALE: AS SHOWN

SHEET 2 OF 5



DRAINFIELD PLAN

30' 0 30'
SCALE IN FEET

Use Projections	
properties served	5
bedrooms per property	5
flow per bedroom (gpd)	150
MDF (gpd)	*3,750*
ADF (gpd)	*1,875*

Design Wastewater Strength	Influent	Effluent
BOD (mg/L)	220	30
TSS (mg/L)	220	30
Total Nitrogen (mg/L as N)	60	30

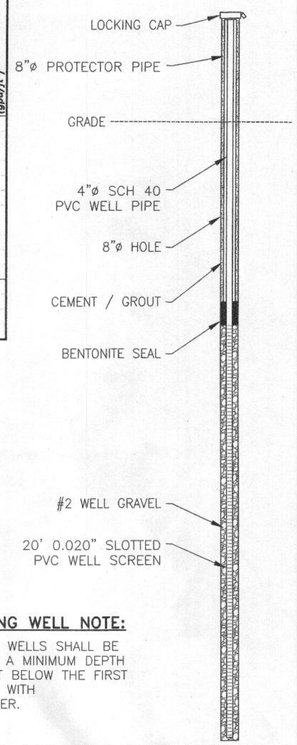
Notes
calculated values in italics
ADF = average daily flow
MDF = maximum daily flow
unit rates from Howard County Well and Septic memo Nov 2014

USE PROJECTIONS

*All results recorded here are for passed perc testing locations within the septic reserve area

Test #	Perc Test Depth (feet)	Test Pit Depth (feet)	Limiting Zone Depth (ft)	Perc Rates (min/inch)	*Max sidewall height (feet)*	*Max gravel depth (feet)*	Approx. Ground Surface Elevation (feet msl)	*Perc Test Depth Elevation (feet msl)*	*Sidewall Bottom Elevation (feet msl)*	*Application Rate (gpd/ft²)*
131	3.5	10.0	2.5	<5	*3.5*	*6.0*	486.10	*482.6*	*480.1*	*1.2*
132	4.3	13.5	3	5.0	*6.5*	*9.5*	490.82	*486.5*	*481.3*	*1.2*
133	4.3	14.7	2.5	3.3	*8.2*	*10.7*	485.96	*481.7*	*475.3*	*1.2*
134	4.1	11.5	3.8	6.0	*3.7*	*7.5*	478.74	*474.6*	*471.2*	*0.8*
135	4.2	12.5	2.5	3.1	*6.0*	*8.5*	484.75	*480.6*	*476.3*	*1.2*
200	4.0	12.5	2	4.0	*6.5*	*8.5*	484.43	*480.4*	*475.9*	*1.2*
218	3.5	8.0	2.8	5.0	*1.2*	*4.0*	474.69	*471.2*	*470.7*	*1.2*
219	4.0	9.5	2.2	4.0	*3.3*	*5.5*	480.83	*476.8*	*475.3*	*1.2*
302	3.5	13.0	1.8	3.0	*7.2*	*9.0*	494.34	*490.8*	*485.3*	*1.2*
304	4.5	13.0	2.2	4.0	*6.8*	*9.0*	491.42	*486.9*	*482.4*	*1.2*
306	4.5	12.0	3.3	5.0	*4.7*	*8.0*	487.98	*483.5*	*480.0*	*1.2*
112	3.0	11.0	1.7	<5	*5.3*	*7.0*	497.19	*494.2*	*490.2*	*1.2*
113	4.3	12.0	2.8	7.0	*5.2*	*8.0*	491.09	*486.8*	*483.1*	*0.8*
114	3.7	14.0	2.2	3.0	*7.8*	*10.0*	495.87	*492.2*	*485.9*	*1.2*
190	4.0	9.0	1.5	4.0	*3.5*	*5.0*	495.40	*491.4*	*490.4*	*1.2*

PERC TEST RESULTS



MONITORING WELL NOTE:
MONITORING WELLS SHALL BE DRILLED TO A MINIMUM DEPTH OF 15 FEET BELOW THE FIRST ENCOUNTER WITH GROUNDWATER.

E 3 **MONITORING WELL**
NOT TO SCALE

200% capacity build-out with low pressure distribution system

Cell	Trench	Existing Ground Elevation (feet msl)	perc ID's	Sidewall Top Elevation (feet msl)	Perc Rate (min/inch)	Sidewall Height (feet)	*Sidewall Bottom Elevation (feet msl)*	Trench Bottom Depth (feet)	Trench Length (feet)	Trench Width (feet)	Application Rate (gpd/ft²)	*Capacity (gpd, L*W*AppRt/ft²)*
A	1	492.5	304, 132, 302	489.50	≤5	5	*484.5*	*8.0*	186	3	1.2	*1,875*
	2	491.5	304, 132	488.50	≤5	5	*483.5*	*8.0*	186	3	1.2	*1,875*
B	3	490.5	304, 132	487.50	≤5	5	*482.5*	*8.0*	186	3	1.2	*1,875*
	4	489.5	132, 131	486.50	≤5	5	*481.5*	*8.0*	186	3	1.2	*1,875*
C	5	488.0	133,135	485.00	≤5	5	*480.0*	*8.0*	186	3	1.2	*1,875*
	6	487.0	133,135	484.00	≤5	5	*479.0*	*8.0*	186	3	1.2	*1,875*

300 % total capacity (gpd) *11,250*
100% capacity (gpd) *3,750*
primary capacity, 200% (gpd) *7,500*
reserve capacity, 100% (gpd) *3,750*

calculated values in italics
gpd = gallons per day
NA = not available
msl = mean sea level in feet
laterals in each trench are at same elevation

TRENCHFIELD DESIGN

SYMBOLS

A / 1 INDICATES DETAIL
A / 1 INDICATES SECTION OR VIEW

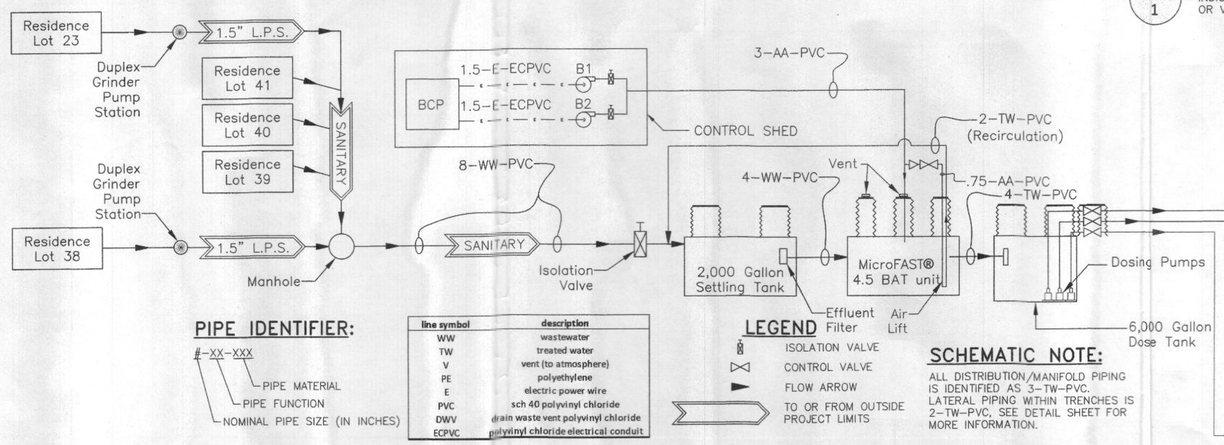
A / 1 NUMBER INDICATES A DETAIL, A LETTER INDICATES A SECTION.
SHEET NUMBER ON WHICH THE DETAIL OR SECTION IS DRAWN, OR THE SHEET NUMBER FROM WHERE THE DETAIL OR SECTION IS REFERENCED.

Center feed with 50/50 design

Cell	Trench	Lateral	Sidewall Top Elevation (feet msl)	Lateral Elevation (feet msl)	Trench Length (feet)	# Holes - Each Lateral	Perf Spacing (feet)	Lateral Length (feet)	Perf Dia (inches)	Perf Flow (gpm)	Lateral Flow (gpm)	Dose Rate (gpm/foot of trench)	Max. Lateral Friction Loss (feet)	Lateral Velocity (feet/second)	*Cell Flow (gpm)*
A	1	a	489.5	489.5	*186*	15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	*120*
		b				15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	
	2	a	488.5	489.5	*186*	15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	
		b				15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	
B	3	a	487.5	487.5	*186*	15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	*120*
		b				15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	
	4	a	486.5	487.5	*186*	15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	
		b				15	*6.20*	*89.9*	5/16	*2.00*	*30.0*	*0.33*	*0.7*	*2.9*	

Notes
calculated values in italics
gpm = gallons per minute
msl = mean sea level in feet
Minimum cover over laterals shall be 24".
All laterals within a cell shall be at the same elevation.
design distal head (feet)= 3.0
friction C factor for plastic pipe= 130
lateral inside diameter (2"dia sch40PVC, in)= 2.067

DISTRIBUTION DESIGN



PIPE IDENTIFIER:
#-XX-XXX
- PIPE MATERIAL
- PIPE FUNCTION
- NOMINAL PIPE SIZE (IN INCHES)

line symbol	description
WW	wastewater
TW	treated water
V	vent (to atmosphere)
PE	polyethylene
E	electric power wire
PVC	sch 40 polyvinyl chloride
DWV	drain waste vent polyvinyl chloride
ECPVC	polyvinyl chloride electrical conduit

LEGEND
- ISOLATION VALVE
- CONTROL VALVE
- FLOW ARROW
- TO OR FROM OUTSIDE PROJECT LIMITS

SCHEMATIC NOTE:
ALL DISTRIBUTION/MANIFOLD PIPING IS IDENTIFIED AS 3-TW-PVC. LATERAL PIPING WITHIN TRENCHES IS 2-TW-PVC, SEE DETAIL SHEET FOR MORE INFORMATION.

WASTEWATER TREATMENT SYSTEM SCHEMATIC
NO SCALE

P&ID Key Notes					
part symbol	component	size	notes	material	#
ST	settling tank	2000 gal	(2) 30"dia PE manholes	concrete	1
TT	treatment tank	4240 gal	Biomicrobics MicroFAST 4.5	concrete	1
PT	dose tank	6000 gal	(2) 30"dia PE manholes	concrete	1
B1-2	blower	2" disch.	Spencer Turbine (1 duty, 1 spare)	var.	2
P1-3	dose pump	2" disch.	Goulds WS07BHF (2 duty, 1 spare)	cast iron	3
T1-T6	trenches per plan	3' wide	8' total depth, 5' sidewall, 186' long each		6

P&ID KEY NOTES

APPROVED FOR PRIVATE WATER AND SHARED SEWER SYSTEM FOR LOTS 23, 38, 39, 40 & 42

HOWARD COUNTY HEALTH OFFICER — DATE 2/12/2020

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES — DATE 1-15-2020

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2-19-20

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Hydro-Terra Group
1106 Business Parkway South Suite E
Westminster, Maryland 21157
(410) 861-5376 (phone)
(410) 861-5467 (fax)
www.hydro-terra.com

PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 19293
PROFESSIONAL CERTIFICATION
I, MARK J. MUZOCHETTE, 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. 19293, EXPIRATION DATE: 12/15/20

DES: MJM
DRN: MDS
CK: MDH
DATE: 1/3/2020

REV.	DATE	DESCRIPTION	BY

Water and Sewer Plans

DRAINFIELD PLAN

PARCEL NO. 34, 36, 98, 111 & 112
600' SCALE MAP NO. 27 & 28 BLOCK NO.

WILLOWSHIRE

LOTS 1 - 45, BUILDABLE PRESERVATION PARCEL C, NON-BUILDABLE PRESERVATION PARCEL A, B, E-G & L, NON-BUILDABLE BULK PARCEL D & H-K

5232 GREEN BRIDGE ROAD
TAX MAP 27, GRID 18, PARCELS 34,36, 98, 111 & 112
5TH ELECTION DISTRICT
HOWARD COUNTY MARYLAND
CONTRACT NO.: 50-5062-D

SCALE As Noted
SHEET 3 OF 5

This drawing printed on: January 7, 2020

H:\PROJECTS\3241 STREET DEVELOPMENT\SIMPSON & DENAULT PROPERTIES, DAYTON, MD\CAD\SSD-ADP-WWTS-DESIGN.DWG

SHARED SEPTIC TREATMENT SYSTEM NOTES

1. ALL INSPECTION, VIEWING AND PUMP OUT PORTS MUST BE SECURED TO PREVENT ACCIDENTAL OR UNAUTHORIZED ACCESS.
2. CONCRETE SHALL BE 5,000 P.S.I.
3. NO MORE THAN 3' OF FILL SHALL BE PLACED OVER ANY TANK LID. ALL TANKS SHALL BE SET UPON 6" TO 8" OF GRAVEL BEDDING.
4. TANK MEASUREMENTS AND ELEVATIONS ARE BASED ON SEPTIC TANKS AND PUMP CHAMBERS AS MANUFACTURED BY GILLESPIE PRECAST, LLC (1-800-638-6884). TANKS FROM ALTERNATIVE MANUFACTURERS MAY BE USED. ALL TANK SHOP DRAWINGS SHALL BE SUBMITTED FOR ENGINEER'S APPROVAL PRIOR TO FABRICATION.
5. ALL NEW TANKS SHALL BE TESTED FOR WATER TIGHTNESS PRIOR TO BACKFILLING. A VACUUM AIR TEST IS AN ACCEPTABLE METHOD.
6. BLOWER PIPING TO FAST MAY NOT EXCEED 100 FT TOTAL LENGTH AND USE 45° ELBOWS MAXIMUM. BLOWER MUST BE LOCATED ABOVE FLOOD/STANDING WATER LEVELS ON A CONCRETE BASE 28" X 42" X 2" MINIMUM OR WITHIN CONTROL SHED.
7. VENT TO BE LOCATED ABOVE FINISHED GRADE TO AVOID INFILTRATION. VENTILATION AREA SHALL BE PROVIDED PER MANUFACTURER'S SPECIFICATION. SECURE WITH STAINLESS STEEL SCREWS.
8. ALL APPURTENANCES TO FAST UNIT SHALL CONFORM TO ALL PLUMBING AND ELECTRICAL CODES.
9. ALL VALVES AND QUICK CONNECTS WITHIN PORTS SHALL BE ACCESSIBLE FROM FINISHED GRADE AND SHALL NOT REQUIRE TANK ENTRY FOR SERVICE. ALL PUMPS SHALL HAVE SAFETY ROPES.
10. REMOTE MONITORING SYSTEM (RMS) SHALL AUTOMATICALLY NOTIFY THE COUNTY IN THE EVENT OF A PUMP FAILURE OR HIGH WATER ALARM. REMOTE NOTIFICATION SHALL BE ROUTINELY TESTED AS PART OF REGULAR O&M.
11. TWO BLOWERS SHALL BE PROVIDED BY THE TREATMENT SYSTEM MANUFACTURER AND SHALL EACH BE CAPABLE OF CONTINUOUS DUTY AT ~~THE~~ THE DESIGN VALUES, WITH ONE BLOWER SERVING AS AN INSTALLED SPARE. BLOWER SHALL BE BY SPENCER TURBINE, INC.
12. ONE CONTROL PANEL SHALL BE PROVIDED FOR BLOWER CONTROL. BLOWER CONTROL PANEL SHALL ~~HAVE~~ HAVE A GASKETED, HINGED, LOCKABLE DOOR; DOOR-MOUNTED BLOWER ON-OFF SWITCHES; AND ALARM LIGHTS/SILENCERS. CONTROL PANEL SHALL BE BY SJE RHOMBUS OR APPROVED EQUAL.

Design input			Calculations
Primary and Secondary Treatment and Equalization			
settling tank capacity (gallons per inch)	44.9	*maximum daily flow (MDF) (gpd)*	*3,750*
normal settling tank fluid level (inches)	45	*average daily flow (ADF) (gpd)*	*1,875*
		recommended minimum settling tank volume (gal)	*1,875*
		normal settling tank volume (gal)	*2,020*
Static Hydraulic Profile (with invert elevations)			
influent invert elev. (feet msl)	491.80	*From Bohler*	
dose tank influent invert elev. (feet msl)	490.88		
dose tank floor elev. (feet msl)	484.88		
dose pump elev. (feet msl)	485.38		
Cell A lateral elev. (feet msl)	489.50	*Cell A in-service lift (feet)*	*4.1*
Cell B lateral elev. (feet msl)	487.50	*Cell B in-service lift (feet)*	*2.1*
Drainfield Dosing			
cell A flow (gpm)	***120***	*force main velocity (feet/second)*	*5.2*
Cell A force main length (feet)	78	*Cell A force main friction loss (feet)*	*4.7*
Cell A minor loss equivalent lengths (feet)	44.4	***Cell A max. total dynamic head (feet)***	***12.5***
		Cell A main volume (gal)	*30*
		Cell A total lateral volume (gal)	*63*
		Cell A dose vol. @ main + 5x lateral (gal)	*343*
cell B flow (gpm)	***120***	*force main velocity (feet/second)*	*5.2*
Cell B force main length (feet)	100	*Cell B force main friction loss (feet)*	*5.5*
Cell B minor loss equivalent lengths (feet)	44.4	***Cell B max. total dynamic head (feet)***	***11.4***
		Cell B main volume (gal)	*38*
		Cell B total lateral volume (gal)	*63*
		Cell B dose vol. @ main + 5x lateral (gal)	*352*
dose tank length (inches)	192		
dose tank width (inches)	96	***dose tank capacity (gal)***	***5,745***
dose tank height to invert (inches)	72	*dose tank capacity (gals per inch)*	*79.8*
# cells in service	2	*design dose volume (gals)(Cell B)*	*352*
lag pump on (inches)	27	*effective dose volume (gals)*	*399*
high water alarm height (inches)	**25**	*min # daily doses @ ADF*	*5.3*
lead pump on (inches)	**23**	***average dose time (minutes)***	***2.9***
low water cutoff (inches)	**18**	***dose off time setting (hours)***	***4.5***
Pump model (Goulds)	**WS07BHF**	*residual settling volume (gal)*	*1,436*
min. tank height above invert (inches)	9	***volume above high water alarm (gal)***	***3,750***
dose pump control panel model (SJE Rhombus)	IFS 41W--4H 4A 4D 8AC 10E 19F		

Notes
gpd = gallons per day
gpm = gallons per minute
msl = mean sea level in feet
calculated values in italics
set floats based on weight +/- 3"
one cell is always in service, with the other resting

design distal head (feet)= 3.0
friction C factor for plastic pipe= 130
force main ID (3"dia sch40PVC, in)= 3.069
lateral inside diameter (2"dia sch40PVC, in)= 2.067

DESIGN INPUT

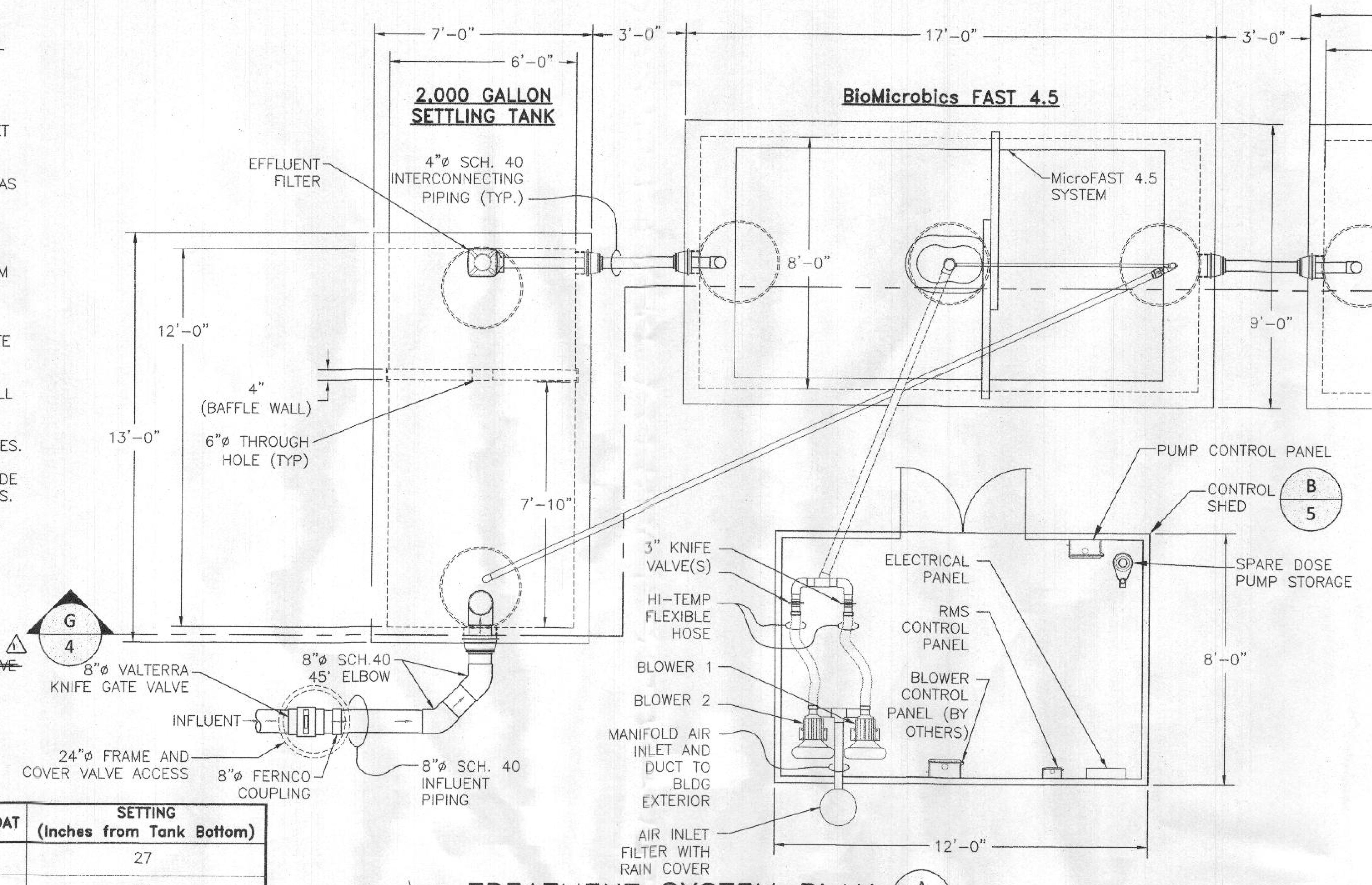
DOSE PUMP TANK FLOAT	SETTING (Inches from Tank Bottom)
LAG PUMP ON	27
HIGH WATER	25
LEAD PUMP ON	23
LOW WATER CUT-OFF	18

Float settings are based upon tank dimensions indicated. If different tanks are used, float settings shall be adjusted accordingly.

Elevation I.D.	Elevation (Feet; MSL)
Ⓐ	Varies (497'-498')
Ⓑ	491.80
Ⓒ	486.22
Ⓓ	491.55
Ⓔ	491.30
Ⓕ	486.22
Ⓖ	491.13
Ⓗ	490.88
Ⓘ	484.88
Ⓙ	484.38

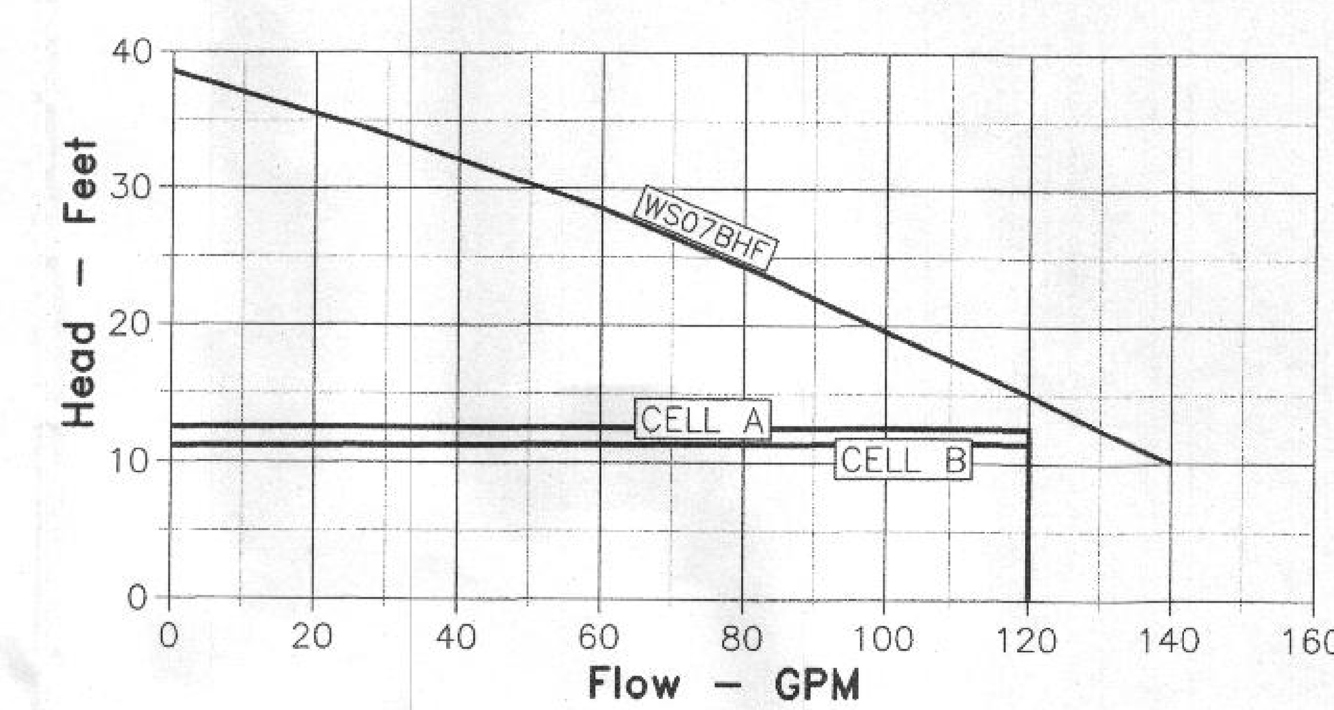
Elevations for Pipes refer to invert.

See Note 3

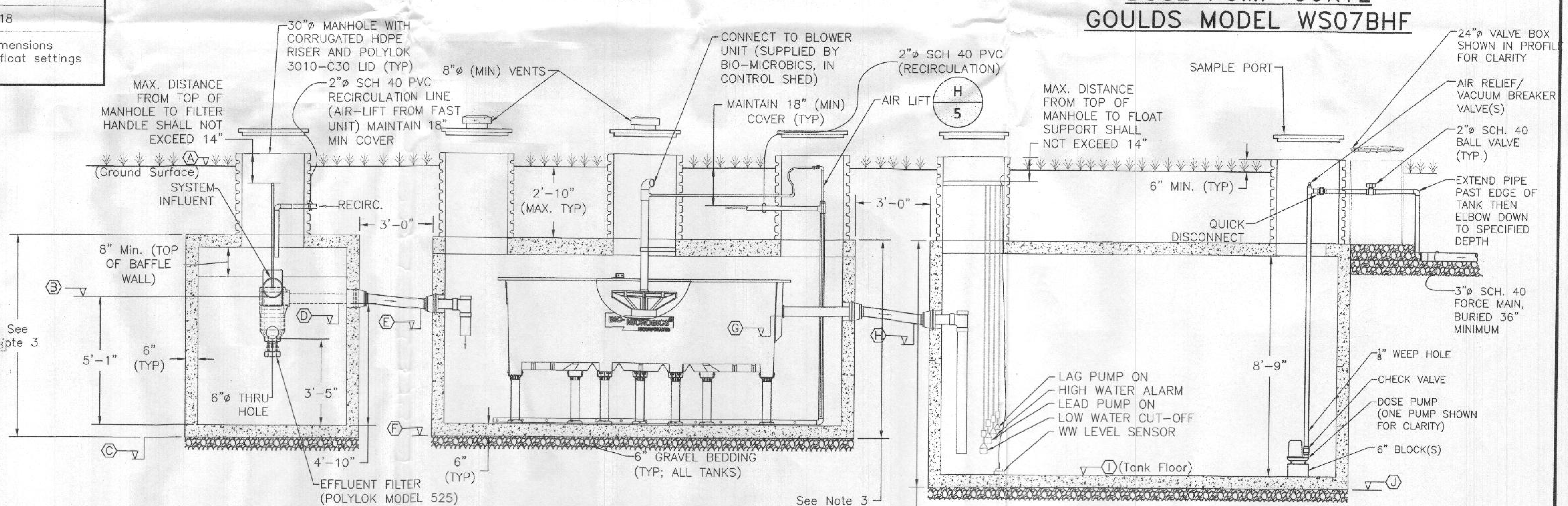


TREATMENT SYSTEM PLAN (A/3)

SCALE: 3/8" = 1'-0"



DOSE PUMP CURVE GOULDS MODEL WS07BHF



TREATMENT SYSTEM SECTION (G/4)

SCALE: 3/8" = 1'-0"

APPROVED FOR PRIVATE WATER AND SHARED SEWER SYSTEM FOR LOTS 23, 38, 39, 40 & 42

B Wilson for Maura Rossman 2/12/2020
HOWARD COUNTY HEALTH OFFICER DATE

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND
1-15-2020
CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND
2-19-20
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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Hydro-Terra Group
1106 Business Parkway South Suite E
Westminster, Maryland 21157
(410) 861-5376 (phone)
(410) 861-5467 (fax)
www.hydro-terra.com

PROFESSIONAL ENGINEER

DES: MJM
DRN: MDS
CK: MDH
DATE: 1/3/2020

REV.	DATE	DESCRIPTION	BY
2	1/24/22	AS-BUILT	S&L
1	11/23/21	AS BUILT	WRA

Water and Sewer Plans

TREATMENT SYSTEM DETAIL

PARCEL NO. 34, 36, 98, 111 & 112
600' SCALE MAP NO. 27 & 28 BLOCK NO.

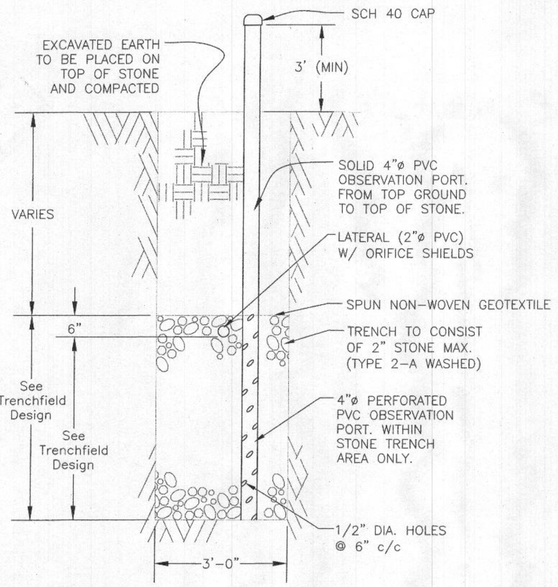
WILLOWSHIRE

LOTS 1 - 45, BUILDABLE PRESERVATION PARCEL C, NON-BUILDABLE PRESERVATION PARCEL A, B, E-G & L, NON-BUILDABLE BULK PARCEL D & H-K

5232 GREEN BRIDGE ROAD
TAX MAP 27, GRID 18, PARCELS 34,36, 98, 111 & 112
5TH ELECTION DISTRICT
HOWARD COUNTY MARYLAND
CONTRACT NO.: 50-5062-D

SCALE: As Noted

This drawing printed on: January 7, 2020

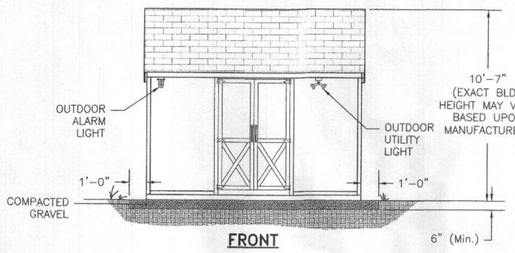


TYPICAL OBSERVATION PORT (F/3)

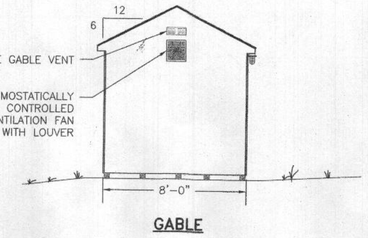
NOT TO SCALE

FEED LINE NOTES:

1. ALL HOLES (EXCEPT LAST) ARE FACE DOWN AND PROTECTED WITH ORIFICE DIFFUSER (SEE DETAIL THIS SHEET)
2. SEE DRAINFIELD CONSTRUCTION TABLE FOR TRENCH DIMENSIONS AND LATERAL PERFORATIONS NOT SHOWN.
3. DRAINFIELD FORCE MAINS AND MANIFOLDS SHALL BE CONSTRUCTED WITH NO "LOW POINTS" AND SHALL DRAIN COMPLETELY TO LATERALS AT PUMP CYCLE TERMINATION.

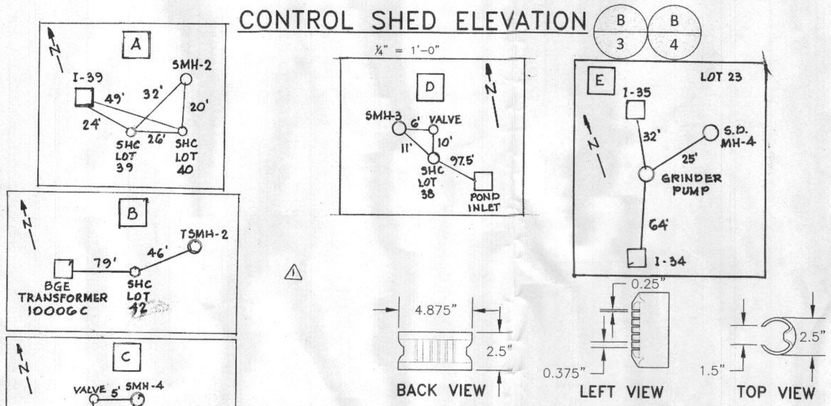


FRONT



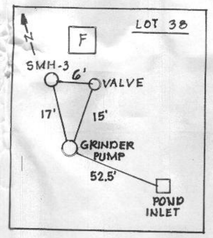
GABLE

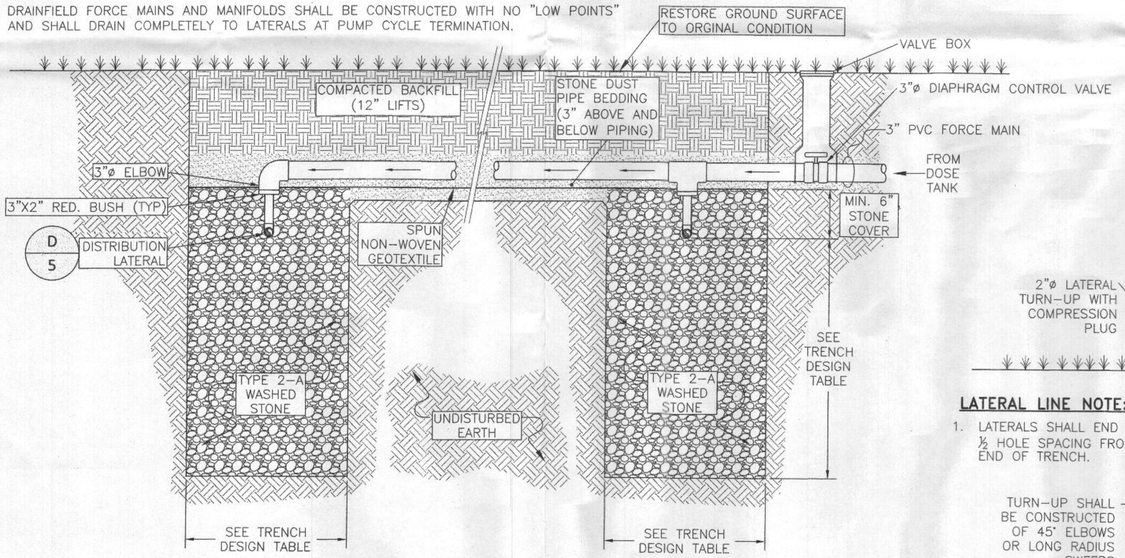
CONTROL SHED ELEVATION (B/3 B/4)



SIM TECH ORIFICE SHIELD 2" (STF-106-2.0)

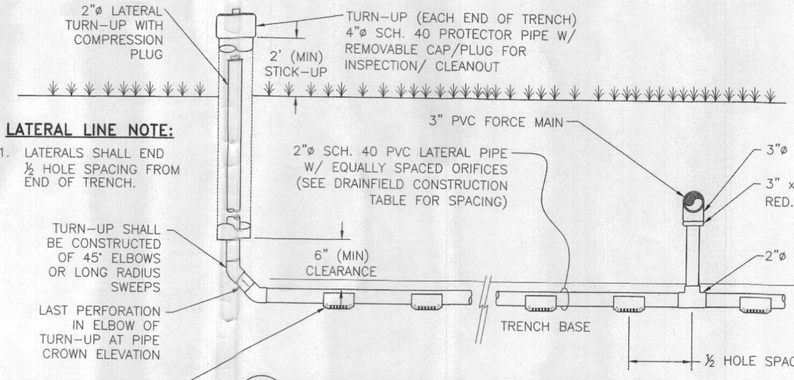
NOT TO SCALE





FEED LINE/DEEP TRENCH DETAIL (TYP) (C/3)

NOT TO SCALE



LATERAL LINE NOTE:

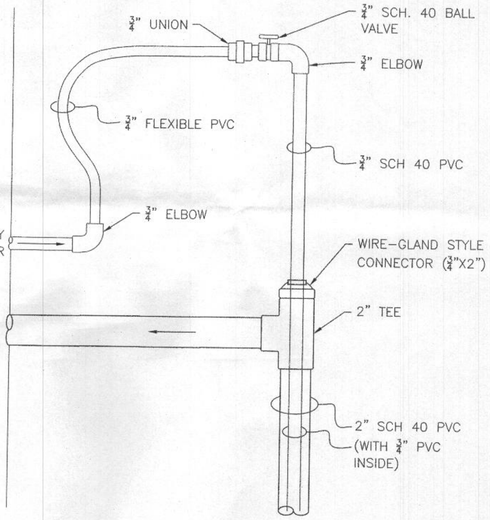
1. LATERALS SHALL END 1/2 HOLE SPACING FROM END OF TRENCH.

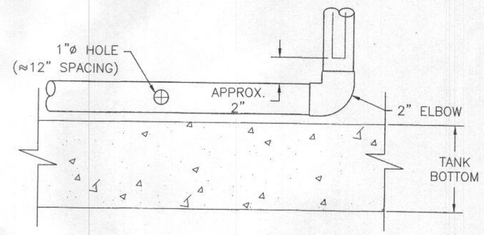
DISTRIBUTION LATERAL DETAIL (D/5)

NOT TO SCALE

CONTROL SHED NOTES:

1. UTILITY STORAGE BUILDING SHALL BE PROVIDED NEAR WASTE WATER TREATMENT SYSTEM WITH CONTROL PANEL MOUNTED INSIDE.
2. BUILDING SHALL BE RIDGE CABINET COMPANY "COTTAGE A-FRAME" STYLE STORAGE BUILDING, 8' X 12', VINYL SIDED WITH NOMINAL 7' SIDE WALLS AND NO WINDOWS, WITH ONE DOUBLE DOOR CENTERED ON 12' SIDE OF BUILDING. BUILDING SHALL HAVE 10" RIDGE VENT, 4"X4" PRESSURE TREATED SKIDS, 2"X4" FLOOR JOISTS (16" ON CENTER), 5/8" PLYWOOD FLOOR SHEATHING, 2'X4' VENT, ALL WALLS TO BE PLATED AT BOTTOM AND DOUBLE PLATED AT THE TOP, 1/2" ROOF SHEATHING, ARCHITECTURAL SHINGLES, DOORS AND FRAME TO BE REINFORCED, DOOR HINGES MUST BE "T" TYPE OR STRAP TYPE, 3 HINGES PER DOOR SIDE (PIANO HINGES ARE NOT ACCEPTABLE), LOCKS ARE TO BE KEYED ALIKE WITH BAUER CH751 LOCK.
3. VINYL SIDING SHALL BE ALMOND COLOR AND SHINGLES SHALL BE BROWN COLOR.
4. A RED ALARM BEACON SHALL BE MOUNTED ON THE OUTSIDE OF THE BUILDING.
5. BUILDING SHALL BE PLACED ON TOP OF 6" (MIN.) COMPACTED STONE.
6. GRADING TO BE LEVEL AND COMPACTED PRIOR TO PLACEMENT OF BUILDING.
7. FIELD PLACEMENT OF PANELS, PIPING, BLOWERS, AND TANKS SHALL BE APPROVED BY SITE ENGINEER.
8. BUILDING SHALL HAVE A 230 VAC LOAD CENTER WITH APPROPRIATE CIRCUIT BREAKERS, POWER SHALL BE PROVIDED TO SERVE ALL EQUIPMENT SPECIFIED HEREIN.
9. BUILDING SHALL HAVE AT LEAST 3 DOUBLE-DUPLEX CONVENIENCE OUTLETS, A CEILING LIGHT, OUTDOOR FLOODLIGHTS, AND AN OUTDOOR ALARM LIGHT.
10. A REMOTE MONITORING SYSTEM (RMS) SHALL BE INSTALLED THAT SHALL REMOTELY NOTIFY THE COUNTY IN THE EVENT OF A PUMP FAILURE OR A HIGH WATER ALARM. THE RMS SHALL BE COMPATIBLE WITH THE COUNTY'S EXISTING REMOTE MONITORING NETWORK AND INFRASTRUCTURE. RMS ALERT SYSTEM TESTING SHALL BE PART OF REGULAR O&M.
11. ADEQUATE VENTILATION SHALL BE PROVIDED FOR SHED TO AVOID EQUIPMENT WEAR DUE TO EXTREME HEAT. (MAX PERMISSIBLE INTERIOR TEMPERATURE IS 104°F).
12. HOWARD COUNTY ISSUED LOCKS SHALL BE PROVIDED TO SECURE UTILITY SHED AND ANY OTHER APPROPRIATE SYSTEM APPURTENANCES (E.G. MANHOLE COVERS AND EXTERIOR MOUNTED CONTROL BOXES).





AIR LIFT RECIRCULATION PUMP (H/4)

NOT TO SCALE

APPROVED FOR PRIVATE WATER AND SHARED SEWER SYSTEM FOR LOTS 23, 38, 39, 40 & 42

for Maura Rossman 2/12/2020
HOWARD COUNTY HEALTH OFFICER DATE

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

1-15-2020
CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

2-19-20
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

THE FOLLOWING STATES REQUIRE NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE IN VIRGINIA, MARYLAND, THE DISTRICT OF COLUMBIA, AND DELAWARE CALL - 811
(WV 1-800-245-4848) (PA 1-800-242-1776) (DC 1-800-257-7777) (VA 1-800-552-7001) (MD 1-800-257-7777) (DE 1-800-282-8555)

Hydro-Terra GROUP
Hydro-Terra Group
1106 Business Parkway South
Suite E
Westminster, Maryland 21157
www.hydro-terra.com
(410) 861-5376 (phone)
(410) 861-5467 (fax)

PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 30293
PROFESSIONAL CERTIFICATION.
I, MARK J. MAZZOCHETTE, 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. 30293, EXPIRATION DATE: 12/15/20

DES: MJM
DRN: MDS
CK: MDH
DATE: 1/3/2020

REV.	DATE	DESCRIPTION	BY
1	11/25/21	AS BUILT	WRA

Water and Sewer Plans

DISTRIBUTION DETAILS

PARCEL NO. 34, 36, 98, 111 & 112
600' SCALE MAP NO. 27 & 28 BLOCK NO.

WILLOWSHIRE

LOTS 1 - 45, BUILDABLE PRESERVATION PARCEL C, NON-BUILDABLE PRESERVATION PARCEL A, B, E-G & L, NON-BUILDABLE BULK PARCEL D & H-K

5232 GREEN BRIDGE ROAD
TAX MAP 27, GRID 18, PARCELS 34,36, 98, 111 & 112
5TH ELECTION DISTRICT
HOWARD COUNTY MARYLAND
CONTRACT NO.: 50-5062-D

SCALE: As Noted
SHEET: 5 OF 5

This drawing printed on: January 7, 2020

H:\PROJECTS\ELM STREET DEVELOPMENT\SIMPSON & DEWALT PROPERTIES_DAYTON, MD\CAD\ES\50-5062-WWTS-DESIGN.DWG