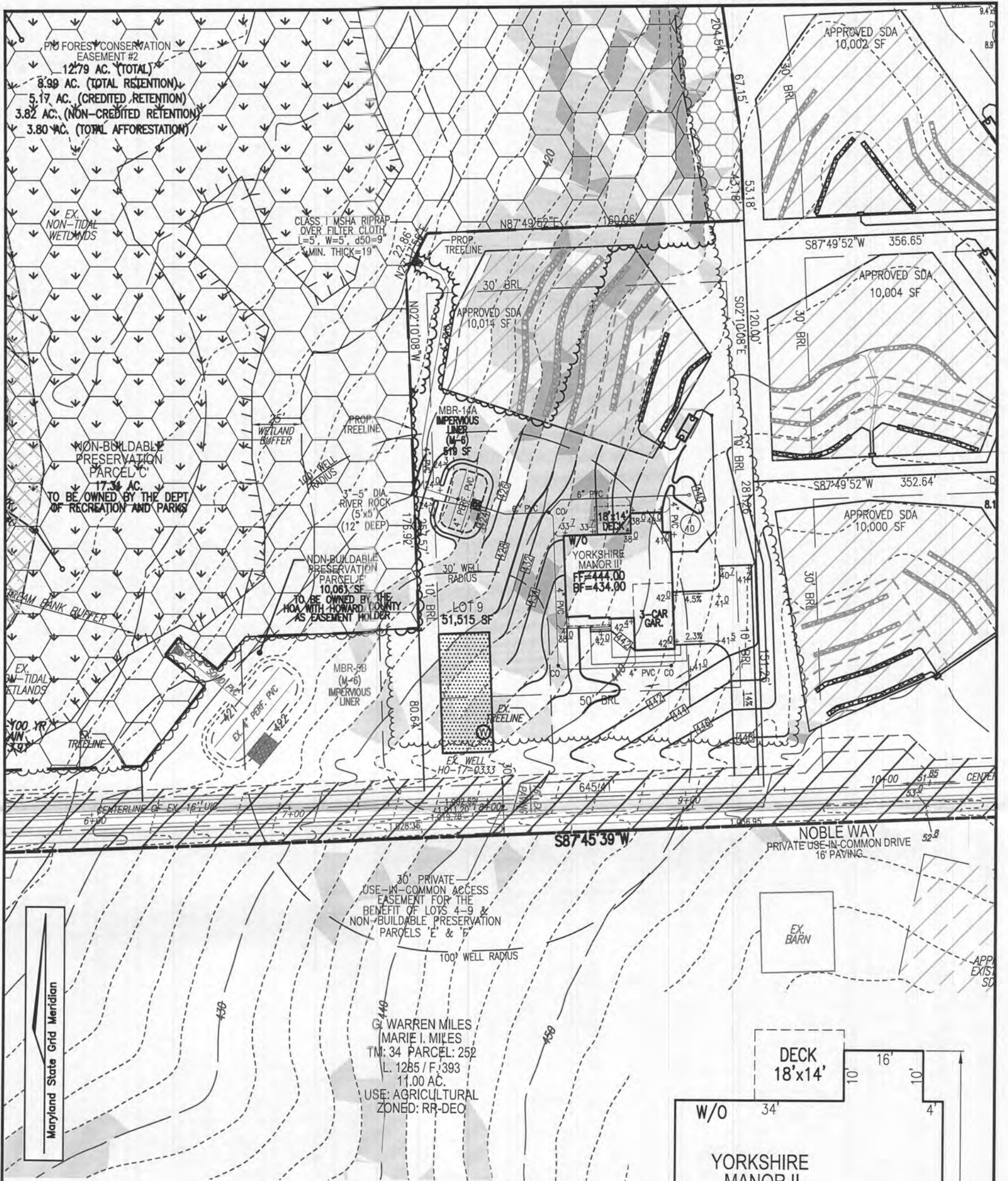
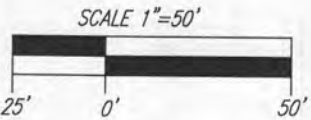
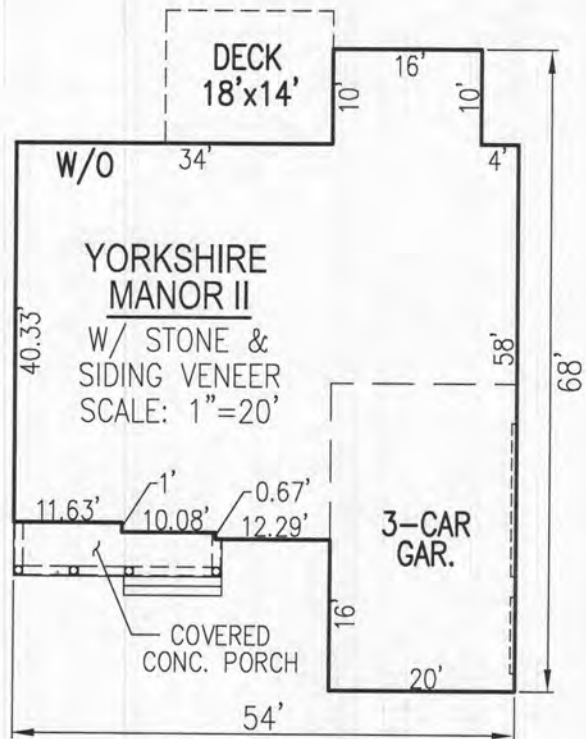
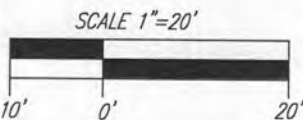




Maryland State Grid Meridian



GRADING PLAN
SCALE: 1"=50'



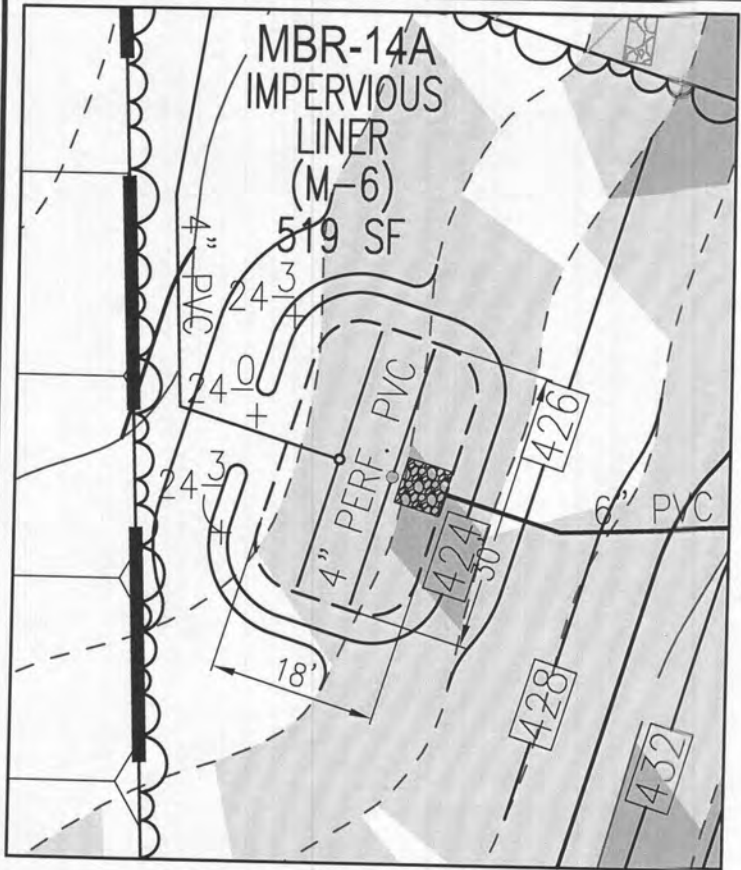
NOTE:
1-10 TO BE A 12" NYLOPLAST DRAIN BASIN
WITH A DOME GRATE, OR EQUIVALENT

SCALE _____ AS SHOWN
DRAWN BY _____ JMR
CHECKED BY _____ RHV
DATE _____ JUNE 21, 2022
W. O. # _____ 15-39
SHEET# _____ 2 OF 4

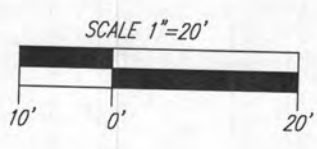
5TH ELECTION DISTRICT
TAX MAP: 34 PARCEL: 389
DPZ REF'S: ECP-16-064, WP-17-034,
WP-17-128, SP-17-007, F-18-064

PLOT PLAN
THE ESTATES AT RIVER HILL - LOT 9
13601 NOBLE WAY
HIGHLAND, MD 20777

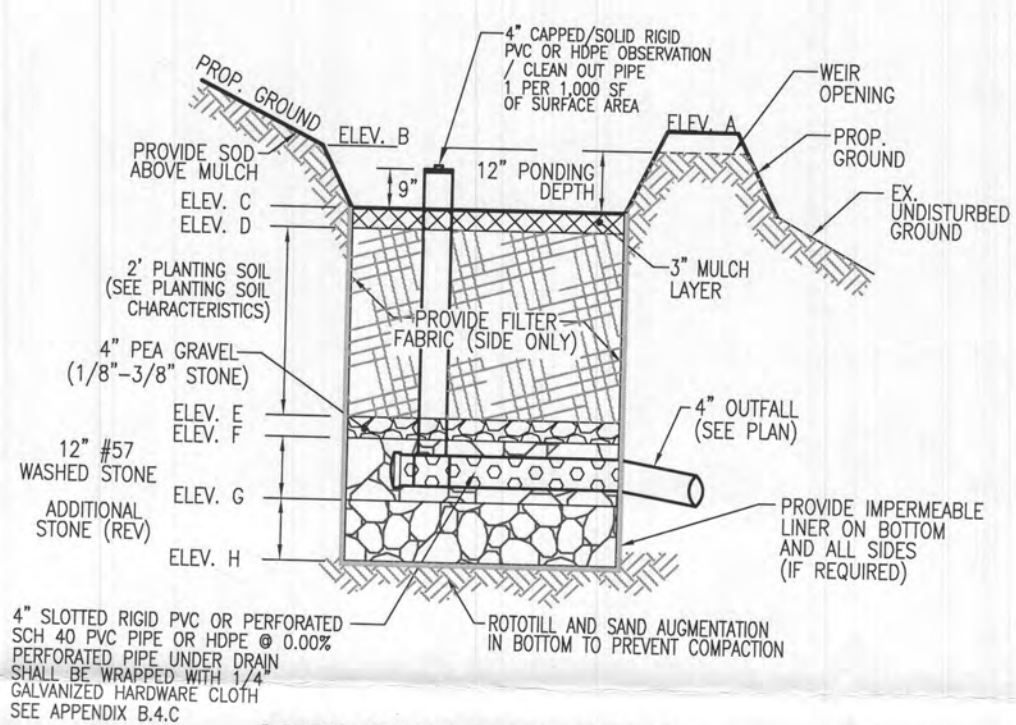
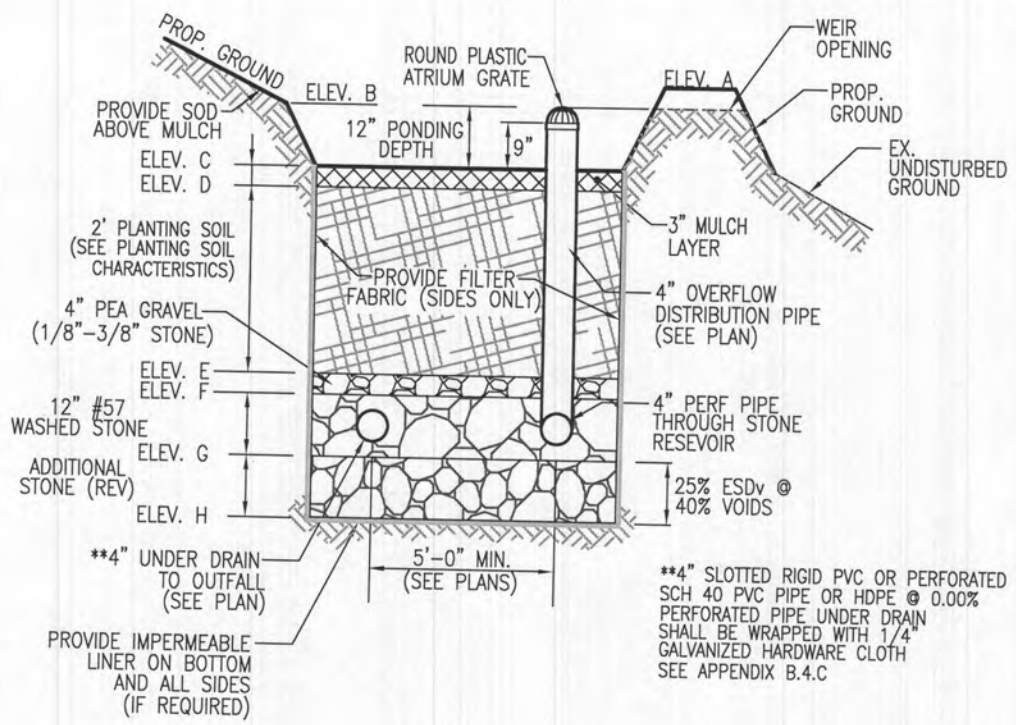
BLOCK: 23
ZONED: RR-DEO
HOWARD COUNTY, MARYLAND



SPILL WAY ELEVATION = 424.00
MBR-14A DESIGN DETAIL (519 SF)
 SCALE: 1"=20'



MBR-14A
 D.A.=14,637 SF IMP=4,891 I=33
 $R_v=0.05+(0.009)(33)=.35$
 $ESD_v=(14,637)(1.58)(0.35)/12=675$ CF
 AREA ABOVE MULCH=(675 CF)(0.75)=506 SF
PROVIDED 519 SF



MICRO-BIORETENTION
 W/ WEIR OUTFALL
 NOT TO SCALE

MICRO-BIORETENTION FACILITY ELEVATIONS (M-6)													
LOT #	FACILITY	A	B	C	D	E	F	G	H	WEIR ELEV.	UNDERDRAIN INV. OUT	OUTFALL INV.	FACILITY SIZE
LOT 9	MBR-14A*	424.30	424.00	423.00	422.75	420.75	420.42	419.42	418.59	424.00	419.75	416.00	519 SF

*PROVIDE AN IMPERVIOUS LINER WITH THIS FACILITY.

geotextile fabric (if required)	ASTM-D-4833 (puncture strength - 125 lb.) ASTM-D-4632 (Tensile Strength - 300 lb.)	0.08" thick equivalent opening size of #80 sieve	Must maintain 125 gpm per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to "separate" sand filter layers.
impermeable liner (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength 1,100 lb., elongation 200%) ASTM-D-624 (Tear resistance - 150 lb./in) ASTM-D-471 (water adsorption: +8 to -2% mass)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.

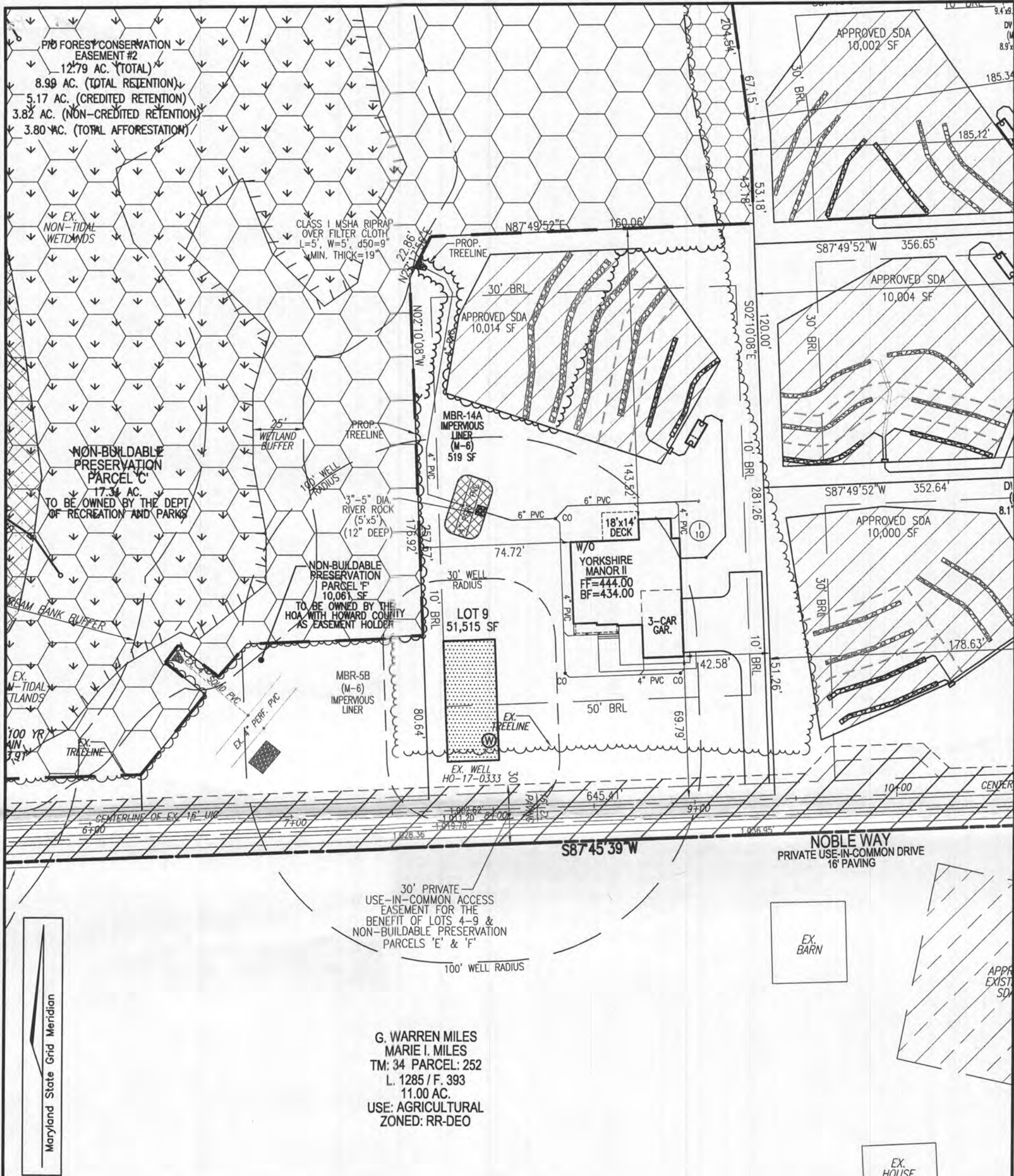
IMPERMEABLE LINER SPECIFICATIONS

PLOT PLAN
THE ESTATES AT RIVER HILL - LOT 9
 13601 NOBLE WAY
 HIGHLAND, MD 20777

SCALE AS SHOWN
 DRAWN BY JMR
 CHECKED BY RHV
 DATE JUNE 21, 2022
 W. O. # 15-39
 SHEET# 3 OF 4

5TH ELECTION DISTRICT
 TAX MAP: 34 PARCEL: 389
 DPZ REF'S: ECP:16-064, WP-17-034,
 WP-17-128, SP-17-007, F-18-064

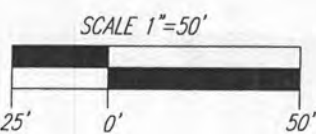
BLOCK: 23
 ZONED: RR-DEO
 HOWARD COUNTY, MARYLAND



G. WARREN MILES
MARIE I. MILES
TM: 34 PARCEL: 252
L. 1285 / F. 393
11.00 AC.
USE: AGRICULTURAL
ZONED: RR-DEO

LAYOUT PLAN
SCALE: 1"=50'

REVISED
Date: 7/11/2022
Comments: B19-3294



VOGEL ENGINEERING
TIMMONS GROUP
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
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OWNER
ESTATES AT RIVER HILL, LLC
MICHAEL PFAU, MEMBER
3675 PARK AVENUE, SUITE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

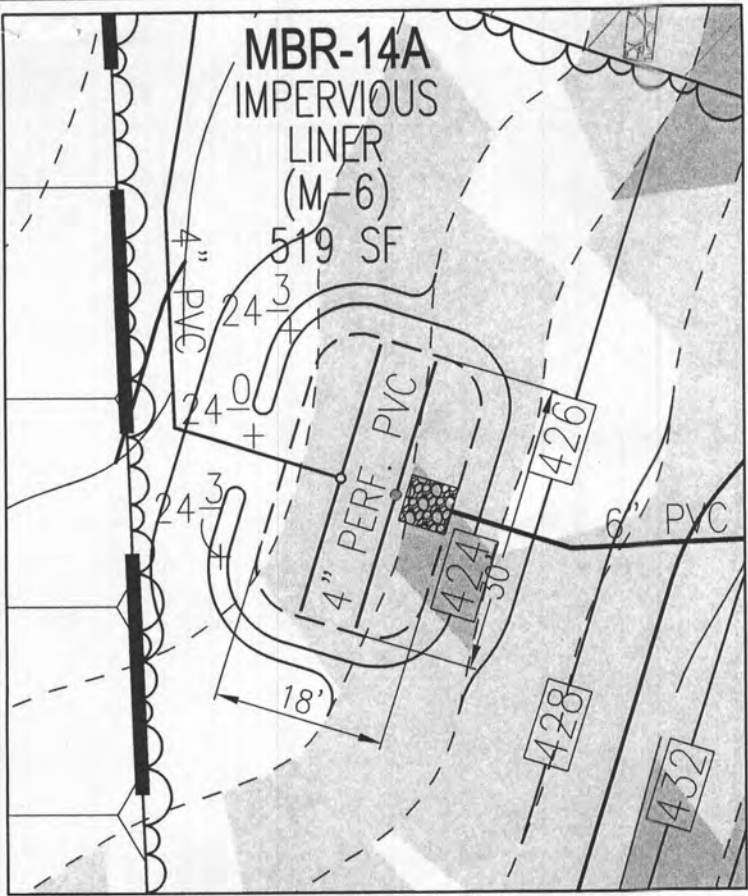
DEVELOPER
TRINITY HOMES MARY LAND, LLC
3675 PARK AVENUE, SUITE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

PLOT PLAN
THE ESTATES AT RIVER HILL - LOT 9
13601 NOBLE WAY
HIGHLAND, MD 20777

SCALE AS SHOWN
DRAWN BY JMR
CHECKED BY RHV
DATE JUNE 21, 2022
W. O. # 15-39
SHEET# 1 OF 4

5TH ELECTION DISTRICT
TAX MAP: 34 PARCEL: 389
DPZ REF'S: ECP:16-064, WP-17-034,
WP-17-128, SP-17-007, F-18-064

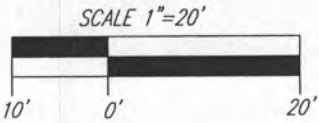
BLOCK: 23
ZONED: RR-DEO
HOWARD COUNTY, MARYLAND



SPILL WAY ELEVATION = 424.00

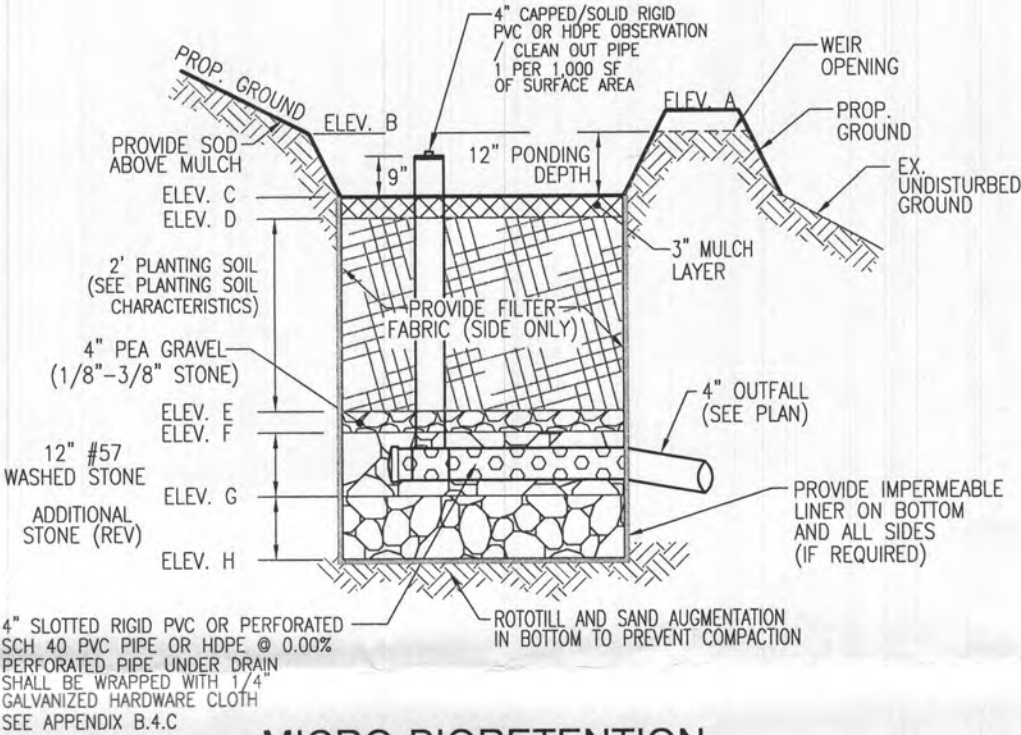
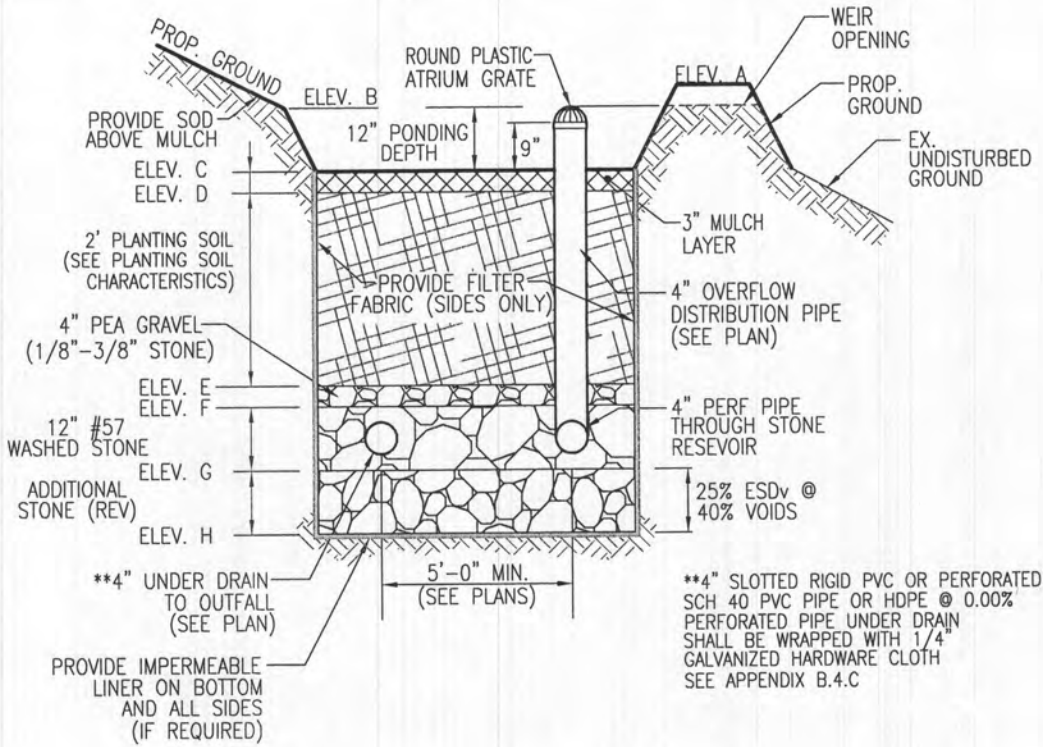
MBR-14A DESIGN DETAIL (519 SF)

SCALE: 1"=20'



MBR-14A

D.A.=14,637 SF IMP=4,891 I=33
Rv=0.05+(0.009)(33)=.35
ESDv=(14,637)(1.58)(0.35)/12=675 CF
AREA ABOVE MULCH=(675 CF)(0.75)=506 SF
PROVIDED 519 SF



MICRO-BIORETENTION

W/ WEIR OUTFALL
NOT TO SCALE

MICRO-BIORETENTION FACILITY ELEVATIONS (M-6)													
LOT #	FACILITY	A	B	C	D	E	F	G	H	WEIR ELEV.	UNDERDRAIN INV.	OUTFALL INV.	FACILITY SIZE
LOT 9	MBR-14A*	424.30	424.00	423.00	422.75	420.75	420.42	419.42	418.59	424.00	419.75	416.00	519 SF

*PROVIDE AN IMPERVIOUS LINER WITH THIS FACILITY.

geotextile fabric (if required)	ASTM-D-4833 (puncture strength - 125 lb.) ASTM-D-4632 (Tensile Strength - 300 lb.)	0.08" thick equivalent opening size of #80 sieve	Must maintain 125 gpm per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to "separate" sand filter layers.
impermeable liner (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength 1,100 lb., elongation 200%) ASTM-D-624 (Tear resistance - 150 lb./in) ASTM-D-471 (water adsorption: +8 to -2% mass)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.

IMPERMEABLE LINER SPECIFICATIONS

PLOT PLAN

THE ESTATES AT RIVER HILL - LOT 9

13601 NOBLE WAY
HIGHLAND, MD 20777

SCALE AS SHOWN
DRAWN BY JMR
CHECKED BY RHV
DATE JUNE 21, 2022
W. O. # 15-39
SHEET# 3 OF 4

5TH ELECTION DISTRICT
TAX MAP: 34 PARCEL: 389
DPZ REF'S: ECP:16-064, WP-17-034,
WP-17-128, SP-17-007, F-18-064

BLOCK: 23
ZONED: RR-DEO
HOWARD COUNTY, MARYLAND

Table B.4.1 Materials Specifications for Micro-Bioretentation, Rain Gardens & Landscape Infiltration-			
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type I nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

OPERATION AND MAINTENANCE SCHEDULE FOR (M-6) MICROBIORETENTION AREAS

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOL. II, TABLE A.4.1 AND 2.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

MICROBIORETENTION NOTES:

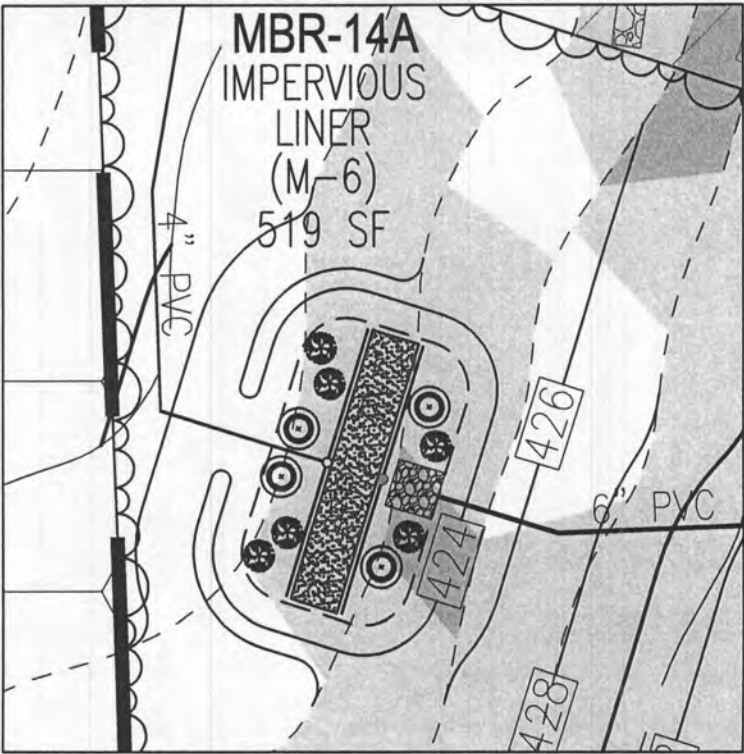
1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE MBR TO FAIL, AND THEREFORE SHALL NOT BE INSTALLED.
2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.
3. PROVIDE 5' MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFORATED PIPE THROUGH STONE RESERVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOS. (SEE PLANS)

"MICRO-BIORETENTION" PLANTING SCHEDULE NOTES:

1. ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HOWARD COUNTY PLANTING SPECIFICATIONS.
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
3. FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
4. CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.
5. MICROBIORETENTION AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (.0229 STEMS PER SQUARE FOOT). ABOVE PLANTING RATIOS ARE TO BE APPLIED TO THE AREAS PROVIDED IN THE ESDv SUMMARY.
6. FILTER AREA SHALL BE 50% COVERED BY PLANTINGS AT FULL GROWTH

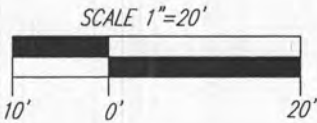
MICRO-BIORETENTION PLANTING SCHEDULE (MBR-14A)				
KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
	4	LINDERA BENZOIN SPICEBUSH	3 GALLON	CONT
	6	ILEX GLABRA INKBERRY	3 GALLON	CONT
	150 SF	LOBELIA CARDINALIS CARDINAL FLOWER	2" POT	1" O.C.

1. SF x 0.0229 STEMS PER SQUARE FOOT = PLANTS REQUIRED
2. PLANTINGS REQUIRED: 12
3. (50 SF) CARDINAL FLOWER = 1 PLANTING UNIT



MBR-14A PLANTING DETAIL (519 SF)

SCALE: 1"=20'

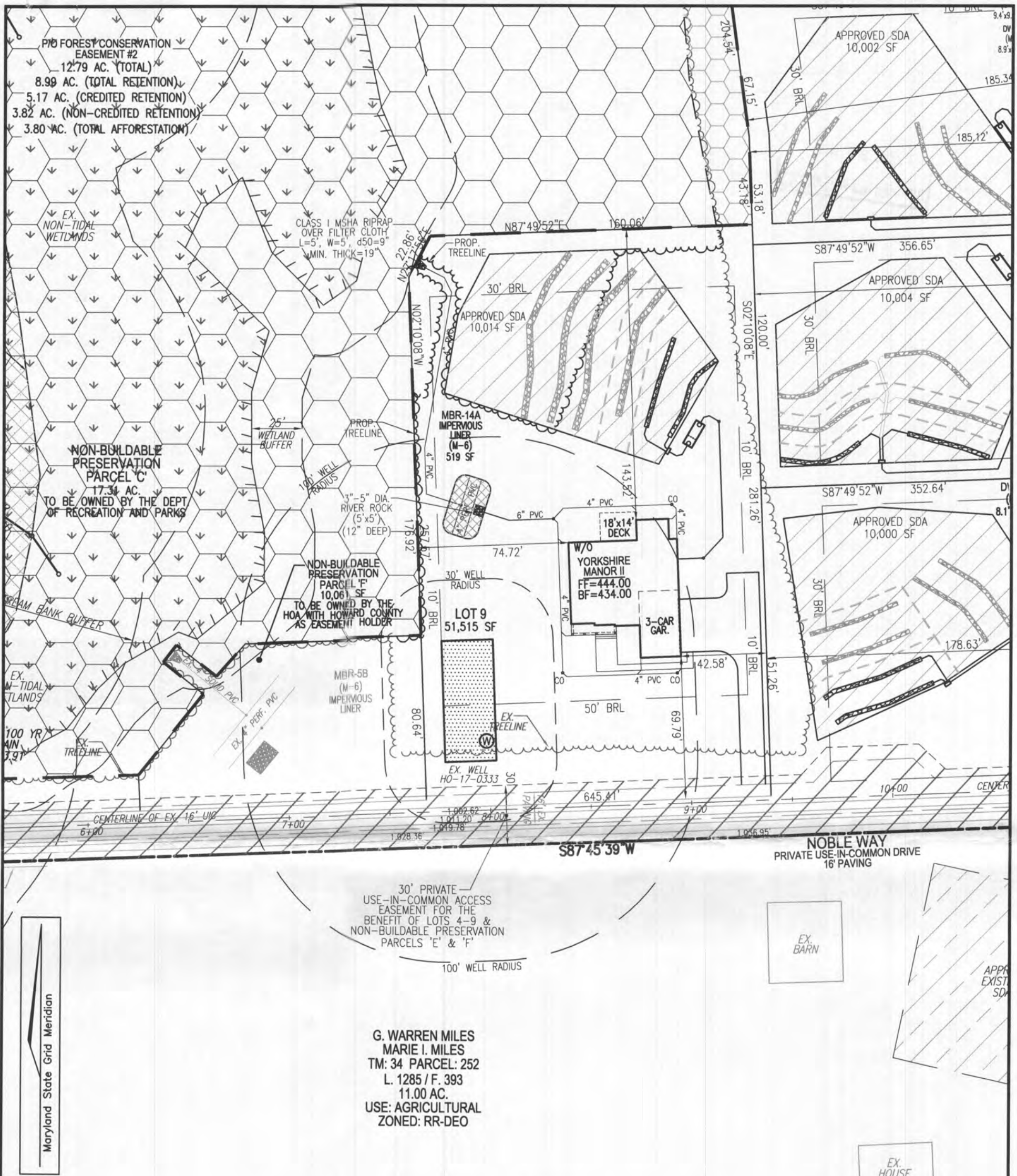


SCALE _____ AS SHOWN
DRAWN BY _____ JMR
CHECKED BY _____ RHV
DATE _____ JUNE 21, 2022
W. O. # _____ 15-39
SHEET# _____ 4 OF 4

PLOT PLAN
THE ESTATES AT RIVER HILL – LOT 9
13601 NOBLE WAY
HIGHLAND, MD 20777

5TH ELECTION DISTRICT
TAX MAP: 34 PARCEL: 389
DPZ REF'S: ECP-16-064, WP-17-034,
WP-17-128, SP-17-007, F-18-064

BLOCK: 23
ZONED: RR-DEO
HOWARD COUNTY, MARYLAND



LAYOUT PLAN
SCALE: 1"=50'

REVISED

Date: 6/6/22

Comments: B19003294

Change to a Yorkshire Manor III

VOGEL ENGINEERING

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3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
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ELLICOTT CITY, MD 21043
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SCALE AS SHOWN
DRAWN BY JMR
CHECKED BY RHV
DATE MAY 24, 2022
W. O. # 15-39
SHEET# 1 OF 4

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PLOT PLAN
THE ESTATES AT RIVER HILL - LOT 9
13601 NOBLE WAY
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