

GENERAL NOTES

- THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
- THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JULY 2016. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
- THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JULY, 2016.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 17FB AND 18DB WERE USED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED "R-ED" AND "R-20" IN ACCORDANCE WITH THE 10/6/2013 COMPREHENSIVE ZONING PLAN AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAM(S) OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
- WATER FOR THIS PROJECT IS TO BE SERVICE CONNECTIONS FROM CONTRACT NO. 70-W.
- SEWER FOR THIS PROJECT IS TO BE SERVICE CONNECTIONS FROM CONTRACT NO. 14-4432-D.
- EXISTING UTILITIES LOCATED FROM TOPOGRAPHIC SURVEY AND AS-BUILT DRAWINGS. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE.
- NO STEEP SLOPES OVER 20,000 SF CONTIGUOUS AREA ARE LOCATED ONSITE.
- FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT SHALL BE ADDRESSED BY A FOREST CONSERVATION PLAN SUBMITTED WITH THE SUBDIVISION OR SITE DEVELOPMENT PLAN.
- WETLANDS ARE PRESENT ONSITE PER ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, SEPTEMBER, 2018.
- IN ACCORDANCE WITH SECTION 16.121(A)(2) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, THE OPEN SPACE REQUIREMENTS FOR THIS R-20 PROJECT (18,000 SF LOT) IS 10% OF GROSS AREA (2.27 AC. GROSS AREA X 10% = 0.227 AC.).
- GEOTECHNICAL INVESTIGATIONS SHALL COMPLETED AS PART OF THE FUTURE FINAL PLAN SUBMISSION.
- A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
- FOREST STAND DELINEATION PLAN PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, ON SEPTEMBER, 2018.
- CHURCH LANE ROAD IS CLASSIFIED AS A LOCAL PUBLIC ROAD. SITE ACCESS SHALL BE VIA A USE-IN-COMMON DRIVEWAY.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
- THE EXISTING DWELLING AND STRUCTURES WILL BE REMOVED.
- THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE MICRO-BIORETENTION AREAS (M-6) FACILITIES. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME.
- IF ANY PRIVATE WELL AND/OR SEPTIC SYSTEMS COMPONENTS ARE DISCOVERED ON THE SUBJECT PROPERTY, THEY SHALL BE PROPERLY ABANDONED WITH PROPER DOCUMENTATION SENT TO THE HEALTH DEPARTMENT PRIOR TO THE FINAL RECORD PLAT RECEIVING HEALTH SIGNATURE.

ENVIRONMENTAL SITE DESIGN NARRATIVE:

IN ACCORDANCE WITH CHECKLIST ITEM III.K.

- THE NATURAL AREAS ON THE PROJECT SITE ARE LOCATED IN THE SOUTHERN PORTION OF THE SITE DRAINING TO THE SOUTH TO THE PATAPSCO RIVER. NO DISTURBANCE TO THE WETLAND, WETLAND BUFFER, STREAM AND STREAM BUFFER, OR THEIR WOODED RESOURCES IS PROPOSED. THE ONSITE FOREST, FOR THE MOST PART, WILL REMAIN UNDISTURBED. THERE ARE NO STEEP SLOPES, BY DEFINITION, OR FLOODPLAINS EXISTING ON THE PROJECT SITE.
 - NO DRAMATIC DISTURBANCE TO THE NATURAL DRAINAGE PATTERNS ARE PROPOSED, PLEASE REFER TO THE PROPOSED GRADING.
 - THE CONCEPTUAL REDUCTION IN IMPERVIOUS AREA THROUGH BETTER SITE DESIGN IS ACHIEVED THROUGH THE ENVIRONMENTAL SITE DESIGN (ESD) FOR THE PROJECT. THE ESD CONCEPT INCLUDES THE USE OF MICRO-SCALE PRACTICES INCLUDING MICRO-BIORETENTION (M-6). THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
 - SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE A PROPOSED PERIMETER CONTROLS. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT.
 - STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF THE MICRO-SCALE PRACTICE MICRO-BIORETENTION (M-6). THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION".
- TARGET PE = 1.49" PROVIDED PE = 1.5"+
 TARGET ESDV = 1,460 CUFT(1) PROVIDED = 1,797 CUFT(2)
- (1) ESTIMATED
 (2) MEASURED
- AT THIS CONCEPT STAGE OF DEVELOPMENT, NO DESIGN MANUAL WAIVERS AND/OR ALTERNATIVE COMPLIANCE REQUESTS FOR ENVIRONMENTAL AND STORMWATER MANAGEMENT DESIGN ARE REQUIRED. AN ALTERNATIVE COMPLIANCE REQUEST SHALL BE SUBMITTED UNDER SEPARATE COVER AT THE FINAL PLAN PHASE OF THE PROJECT FOR THE REMOVAL OF THREE SPECIMEN TREES

SITE ANALYSIS DATA CHART

A. TOTAL PROJECT AREA:	2.27 AC.
B. AREA OF PLAN SUBMISSION:	2.27 AC.
DEDICATED RIGHT-OF-WAY:	0.04 AC. (1,876 S.F.)
LOTS 1-2:	0.93 AC. (40,492 S.F.)
OPEN SPACE LOT 3:	1.30 AC. (56,670 S.F.)
C. AREA OF WETLANDS AND BUFFERS:	51,443 S.F.
D. AREA OF FLOODPLAIN:	0.0 AC. +/-
E. AREA OF FOREST:	1.2 AC. (REFER TO FSD)
F. AREA OF MODERATE SLOPES (15% TO 24.9%):	3,351 SF OR 0.08 AC.
G. AREA OF STEEP SLOPES (25% & GREATER):	3,095 SF OR 0.07 AC.
H. ERODIBLE SOILS:	N/A
I. LIMIT OF DISTURBED AREA:	0.93 AC. +/-
J. PROPOSED USES FOR SITE AND STRUCTURES:	RESIDENTIAL SINGLE FAMILY DETACHED (SFD) HOMES
K. GREEN OPEN AREA:	2.02 AC.
L. PROPOSED IMPERVIOUS AREA:	0.25 AC.
M. PRESENT ZONING DESIGNATION:	R-ED & R-20
N. OPEN SPACE REQUIRED:	0.227 ACRES (10%)
O. TOTAL NUMBER OF UNITS ALLOWED:	2
P. TOTAL NUMBER OF UNITS PROPOSED:	2
Q. DPZ FILE REFERENCES:	-

Eco-Science Professionals, Inc.
 CONSULTING ECOLOGISTS
 P.O. BOX 8988 GREEN BELT MARYLAND 20770
 Telephone: 410.631.7641
 www.ecosciencemaryland.com

PLAN PREPARED BY:
 JOHN CANOLES
 MD DNR FCA QUALIFIED PROFESSIONAL

Specimen Tree Chart

Key (X#)	Species	Size (in dbh)	CRZ (feet radius)	Comments	
1	Silver maple	50.5	75.75	fair condition, limb dieback	TO BE REMOVED
2	Silver maple	32.5	48.75	fair condition, trunk rot	TO BE REMOVED
3	Red maple	39	58.5	poor condition, trunk and limb rot	TO BE REMOVED
4	Tulip poplar	33	49.5	good condition	TO REMAIN
5	Red maple	32.5	48.75	good condition	TO REMAIN
6	Red maple	34.5	51.75	poor condition, dead twin and trunk rot	TO REMAIN
7	Pin oak	48.5	72.75	good condition	TO REMAIN

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] **3/26/19**
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] **3/29/19**
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

ENVIRONMENTAL CONCEPT PLAN HORVATH PROPERTY

8457 CHURCH LANE ROAD
 ELLICOTT CITY, MD. 21043
 HOWARD COUNTY, MD

MINIMUM LOT SIZE CHART

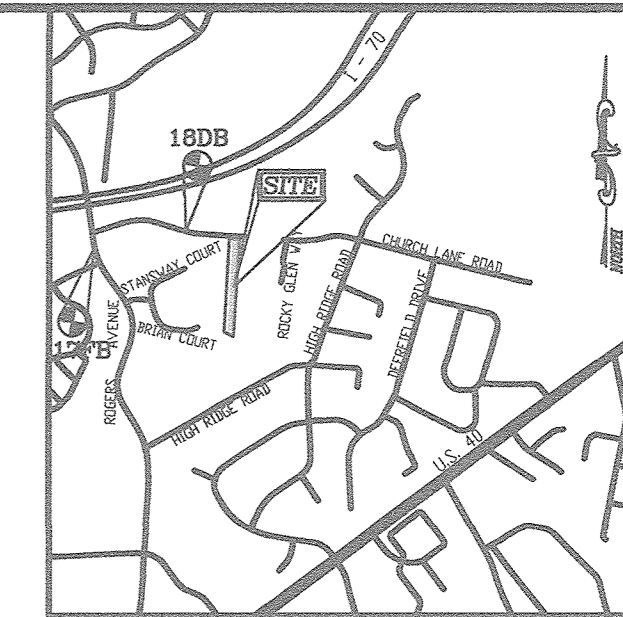
LOT	GROSS AREA SF	PIPESTEM AREA SF	NET AREA SF	MIN. LOT SIZE SF
1	18,001	N/A	18,001	18,000
2	22,491	4,485	18,006	18,000

NOTES:
 1. ALL WATER CONNECTIONS SHALL BE 1-1/2" WITH 1" OUTSIDE METER SETTINGS, UNLESS OTHERWISE NOTED. REFER TO HOWARD COUNTY DETAILS W-3.28 OUTSIDE METER SETTINGS.

SHEET INDEX

DESCRIPTION	SHEET NO.
LAYOUT PLAN	1 OF 3
SOILS MAP, GRADING, AND SOIL EROSION & SEDIMENT CONTROL PLAN	2 OF 3
SWM DRAINAGE AREA MAP, NOTES & DETAILS	3 OF 3

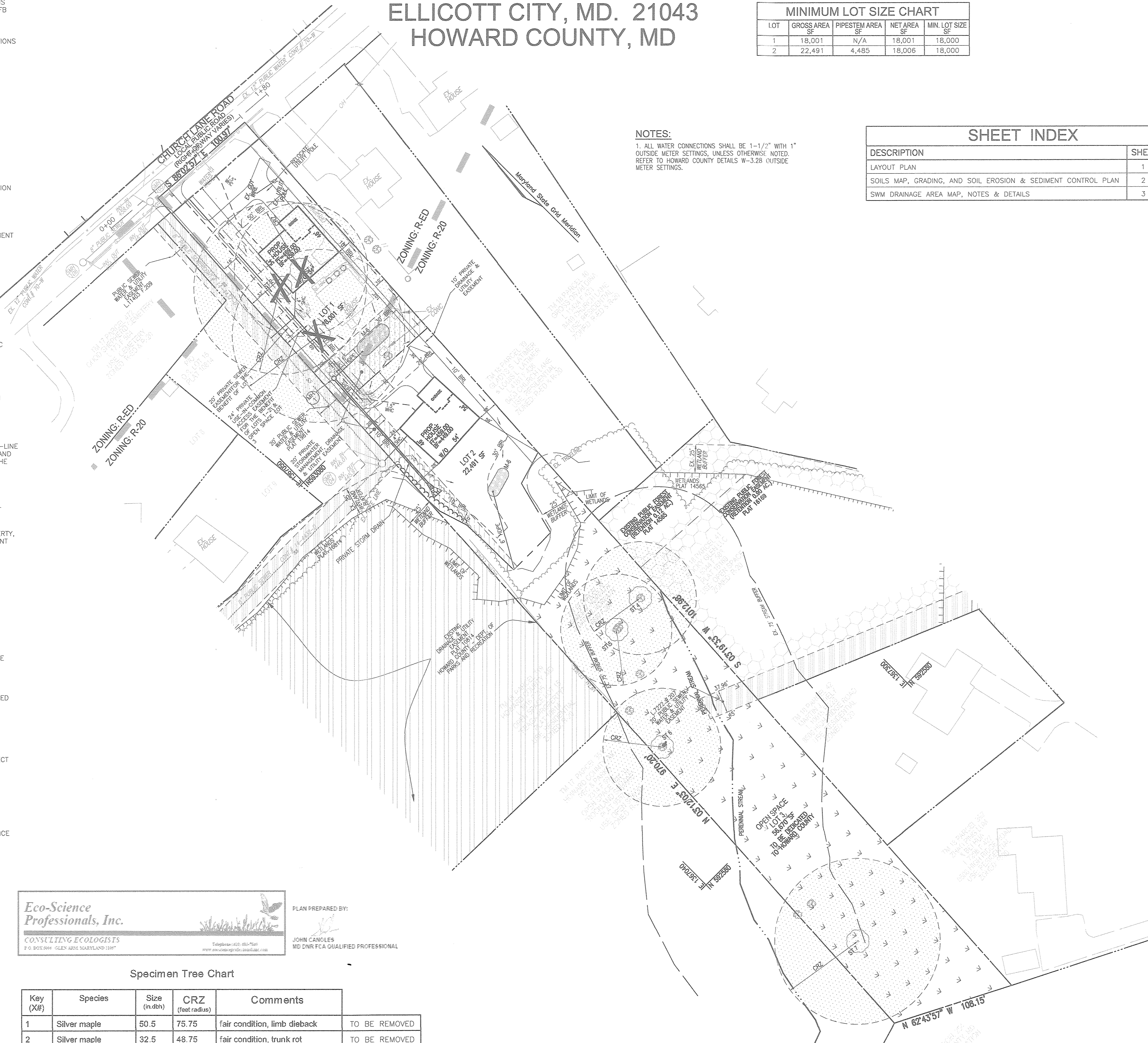
BENCHMARKS
 COORDINATES BASED ON NAD 83 MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS 17FB, 18DB.
 HOWARD COUNTY BENCHMARK
 17FB N 593214.43 E 1365669.114 ELEV. 456.236
 180B N 593414.583 E 1366491.104 ELEV. 474.964



VICINITY MAP
 SCALE: 1"=2000'
 ADC MAP 21 GRIDS B-4 & B-5

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING STORM DRAIN
- EXISTING WOOD FENCE
- EXISTING METAL FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS BOUNDARY
- EXISTING TREELINE (FIELD LOCATED)
- PROPOSED TREELINE
- EXISTING TREES (FIELD LOCATED)
- EXISTING WETLAND
- PROPOSED STORMDRAIN
- PROPOSED STORMDRAIN INLET
- PROPOSED EDGE OF PAVEMENT
- SPECIMEN TREE WITH CRITICAL ROOT ZONE DELINEATION
- EX. SPECIMEN TREE TO BE REMOVED



LAYOUT PLAN
 SCALE: 1"= 50'

50' 0 50' 100' 150'

OWNER/DEVELOPER
 DAVID HORVATH
 8457 CHURCH LANE ROAD
 ELLICOTT CITY, MD 21043
 (410) 707-1323

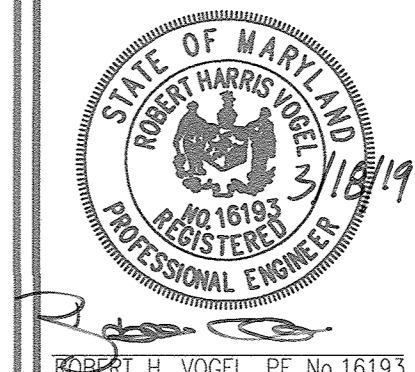
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ENVIRONMENTAL CONCEPT PLAN
 LAYOUT PLAN
HORVATH PROPERTY
 8457 CHURCH LANE ROAD
 ELLICOTT CITY, MD 21043
 ZONED: R-ED & R-20
 L.16550/F.00291

TAX MAP 18 BLOCK 13
 2TH ELECTION DISTRICT

PARCEL 39
 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 3300 N. RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
 TEL: 410.461.7666 FAX: 410.461.8961



PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE PROFESSIONAL ENGINEERING AND SURVEYING ACT OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 08-27-2020

DESIGN BY: RVE
 DRAWN BY: IMH
 CHECKED BY: RHV
 DATE: MARCH 2019
 SCALE: AS SHOWN
 W.O. NO.: 16-05

1 SHEET OF 3

NOTES:

APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) BY THE HOWARD SOIL CONSERVATION DISTRICT DOES NOT GRANT APPROVAL OF THE PROPOSED SEDIMENT CONTROL SCHEME.

1. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING
2. THE PROJECT SHALL ADDRESS ANY TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.
3. THE FINAL PLAN SUBMISSION SHALL PROVIDE A DRAINAGE AREA MAP SPECIFIC TO CHOSEN SEDIMENT CONTROLS
4. THE FINAL PLAN SUBMISSION SHALL PROVIDE COMPUTATIONS TO VERIFY VELOCITIES ALONG DIKES, SWALES AND AT DIKES OUTLET LOCATIONS

LEGEND:

	PROPERTY LINE		STORMDRAIN
	RIGHT-OF-WAY LINE		STORMDRAIN INLET
	ADJACENT PROPERTY LINE		EDGE OF PAVEMENT
	EXISTING CURBS AND GUTTER		EXISTING WETLAND
	EXISTING UTILITY POLE		MODERATE SLOPES (15% - 24.9%)
	EXISTING LIGHT POLE		STEEP SLOPES (>25%)
	EXISTING MAILBOX		PROPOSED TREE LINE
	EXISTING SIGN		PROPOSED 10' CONTOUR
	EXISTING SANITARY MANHOLE		PROPOSED 2' CONTOUR
	EXISTING SANITARY LINE		STABILIZED CONSTRUCTION ENTRANCE
	EXISTING CLEANOUT		SUPER SILT FENCE
	EXISTING FIRE HYDRANT		LIMIT OF DISTURBANCE
	EXISTING WATER LINE		EARTH DIKE
	EXISTING 10' CONTOUR		STANDARD INLET PROTECTION
	EXISTING 2' CONTOUR		
	SOILS		
	EXISTING TREE LINE (FIELD LOCATED)		
	EXISTING TREES (FIELD LOCATED)		
	EXISTING FENCE		
	EXISTING METAL FENCE		
	CENTERLINE OF EXISTING STREAM		
	SPECIMEN TREE WITH CRITICAL ROOT ZONE DELINEATION		
	EX. SPECIMEN TREE TO BE REMOVED		



NOTE:
 - SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
 - SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 35 FEET APART
 - DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

NOTE:
 EITHER PERMANENT OR TEMPORARY STABILIZATION IS TO BE APPLIED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF DAYS/DATES IN THE STANDARD SEDIMENT CONTROL NOTES AND/OR SEEDING SPECIFICATIONS.

NOTES:

1. APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED BUILDING AND/OR GRADING PERMIT
2. REVIEW OF THIS PLAN FOR COMPLIANCE WITH ZONING AND SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE PERMIT STAGES; AND THEREFORE, THIS PLAN IS SUBJECT TO ADDITIONAL AND MORE DETAILED COMMENTS AS THE PLAN PROGRESSES THROUGH THE PERMIT PROCESS.
3. THERE ARE NO ENVIRONMENTAL FEATURES: FORESTS, FLOODPLAIN, WETLANDS, WETLAND BUFFERS, STREAMS, STREAM BUFFERS OR STEEP SLOPES WITH A CONTIGUOUS AREA OF 20,000 SQUARE FEET OR GREATER THAT EXISTS WITHIN THE DEVELOPED AREA.

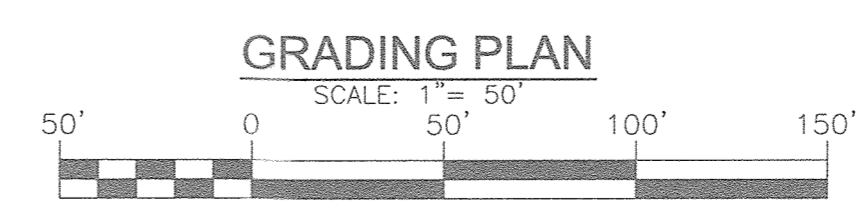
MAPPED SOILS TYPES						
SYMBOL NAME / DESCRIPTION	GROUP	HYDRC	LYTIC INCLUSIONS	Kw RANGE*	PRIME FARMLAND	<15% SLOPE / EROSION POTENTIAL
UHQ GLENCLE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	R	NO	NO	0.20	NO	NO
UHR LEGORE-MONTALTO SILT LOAMS, 3 TO 8 PERCENT SLOPES	C	NO	NO	0.02/0.32	YES	NO
UHL JACKLAND SILT LOAM, 3 TO 8 PERCENT SLOPES	D	NO	NO	0.43	YES	NO
UHL LEGORE-MONTALTO-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	C	NO	NO	0.02/0.32	NO	NO

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION / DATE: 3-26-19

 CHIEF, DIVISION OF LAND DEVELOPMENT / DATE: 3/25/19



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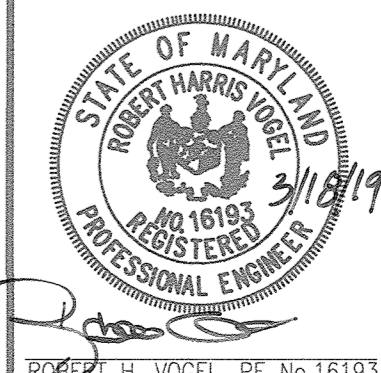
NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
 SOILS MAP, GRADING AND SOIL EROSION & SEDIMENT CONTROL PLAN
HORVATH PROPERTY

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TAX MAP 18 BLOCK 13 2TH ELECTION DISTRICT PARCEL 38 HOWARD COUNTY, MARYLAND

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SWM DRAINAGE AREA MAP
SCALE: 1" = 50'

PROJECT: HOVARTH PROPERTY
 AREA: 2.27 AC GROSS AREA
 AREA: 0.98 AC LIMIT OF DISTURBANCE
 IMPERVIOUS: 0.25 AC
 TARGET Pe: 1.49 IN
 Rv: 0.28
 ESDv: 1482 CF TOTAL ESDv TARGET

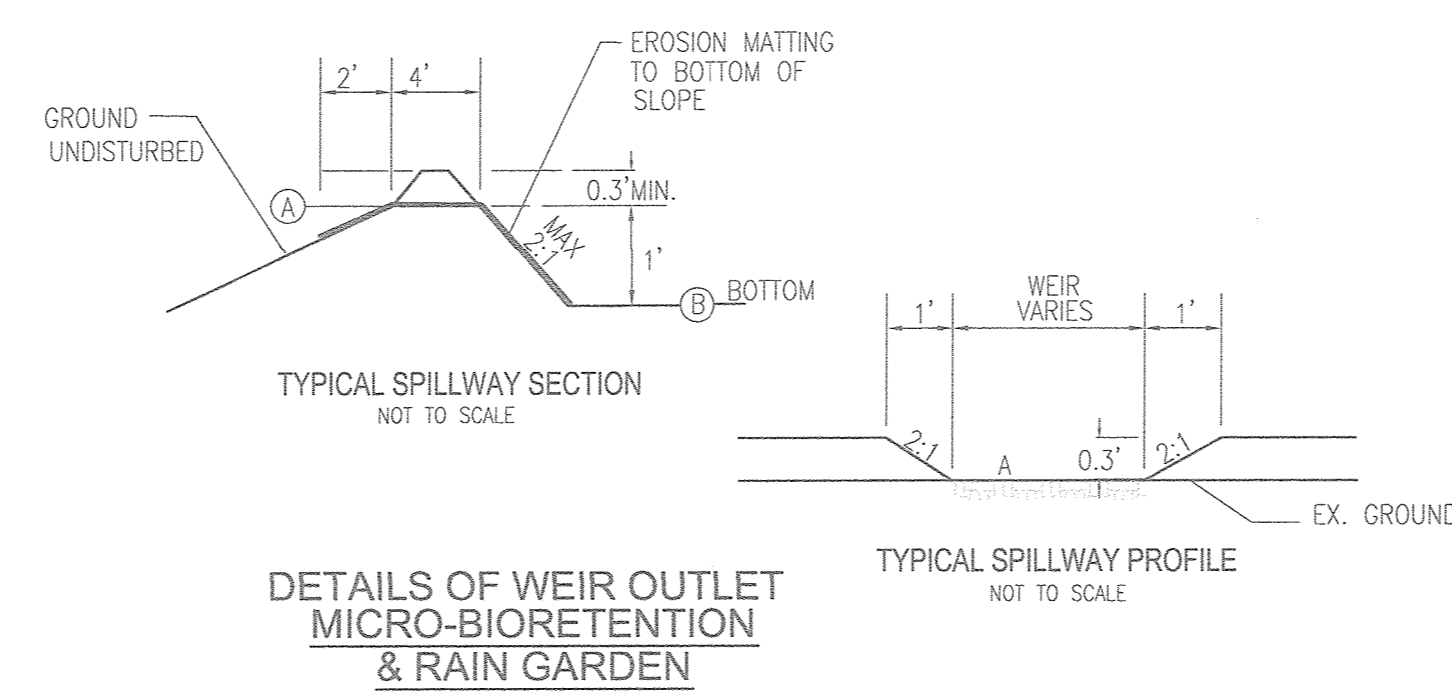
HOVARTH PROPERTY

DRAINAGE	IMPERVIOUS	GRASS	TOTAL	PERCENT	RV	ESDv	ESDv	ESDv	ESDv
AREA	AREA (SF)	AREA (SF)	AREA (SF)	IMPERVIOUS		MIN (CF)	MAX (CF)	TARGET (CF)	PROVIDED (CF)
A	4677	11649	16326	28.6	0.31	419	1089	624	702
B	8226	16476	24702	33.3	0.35	720	1872	1073	1096

* THIS AREA IMPERVIOUS AREA ONLY

TOTAL ESDv PROVIDED			
DRAINAGE	ESDv FACILITIES	STORAGE	PONDING
AREA	SURFACE	E	G
A	266	323	379
B	432	524	572

- NOTES:
- THE ABOVE COMPUTATIONS SHOW ESD TO MEP HAS BEEN PROVIDED FOR THIS ENVIRONMENTAL CONCEPT PLAN SUBMISSION. FINAL PLAN SHALL PROVIDE FURTHER DETAIL.
 - MICRO-BIORETENTION / RAINGARDEN FACILITIES SHALL HAVE STANDARD OVERFLOW PIPES AND EARTH WEIRS TO CONVEY AND/OR DIRECT LARGER STORM FLOWS TOWARD OR INTO THE PROPOSED STORM DRAIN SYSTEM. REFER TO DETAILS HEREON.
 - AS REQUIRED, THE FUTURE FINAL PLAN SUBMISSION SHALL PROVIDE THE NECESSARY COMPUTATIONS WHICH ANALYZE THE LARGER STORM (10/100) EVENTS.



DETAILS OF WEIR OUTLET MICRO-BIORETENTION & RAIN GARDEN

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS
 THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL
 THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE AN OBSTACLE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
 * SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
 * ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (50%), COARSE SAND (30%), AND COMPOST (40%).
 * CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
 * PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G. LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.
 THESE SHALL BE AT LEAST ONE SOIL TEST PER PRACTICE. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILE TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION
 IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR WASH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURTLE TYRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.
 COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO IMPROVE WATER QUALITY. ADDITIONAL TILLING THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT. ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.
 WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.
 WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/DOZER WITH WASH TRACKS.

4. PLANT MATERIAL
 RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION
 COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
 ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST 5% INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED
 GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLANTS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

6. UNDERDRAINS
 UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
 * PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F758, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED 4" RIGID PIPE (E.G. PVC OF HDPE).
 * PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4x4) GALVANIZED HARDWARE CLOTH.
 * GRAVEL - THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAN.
 * PERFORMANCE OF THE FILTER:
 * A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
 * A 1" APERTURE OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".
 THIS MAIN COLLECTOR PIPE FOR UNDERDRAN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5% OBSERVATION WELLS AND/OR CLEAN-OUT MAINS MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS
 THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

LEGEND:

	PROPERTY LINE
	RIGHT-OF-WAY LINE
	ADJACENT PROPERTY LINE
	EXISTING CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	EXISTING STORM DRAIN
	EXISTING METAL FENCE
	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	SOILS BOUNDARY
	EXISTING TREES (FIELD LOCATED)
	EXISTING WETLAND
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	PROPOSED EDGE OF PAVEMENT
	DRAINAGE DIVIDE
	MICRO-BIORETENTION (M-6)
	MODERATE SLOPES (15% - 24.9%)
	STEEP SLOPES (>25%)
	PROPOSED TREE LINE
	PROPOSED 10' CONTOUR
	PROPOSED 2' CONTOUR
	SPECIMEN TREE WITH CRITICAL ROOT ZONE DELINEATION
	EX. SPECIMEN TREE TO BE RETAINED
	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA DELINEATION

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

- 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 VOLUME II, TABLE A.4.1 AND 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.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

Appendix B.4. Construction Specifications for Environmental Site Design Practices

Material	Specification	Size	Notes
Filtering media	USDA soil types loamy sand or sandy loam; clay content < 5%	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Planting soil	loamy sand (60-65%) & compost (35-40%) or sandy loam (50%), coarse sand (30%), and 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)	n/a	aged 6 months, minimum; no pine or wood chips
Mulch	shredded hardwood	n/a	aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	ASTM D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	n/a
Curbside drain	ornamental stone; washed cobble	stone: 2" to 5"	n/a
Gravel	AASHTO M-63	n/a	PE Type I nonwoven
Gravel (sandstone and infiltration berms)	AASHTO M-63	NO. 21 OR NO. 6 AGGREGATE (1/8" to 3/4")	n/a
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" or 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" orf. @ 6" on center, 4 holes per row, minimum of 3' of gravel over pipe; not necessary unless underdrain. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth.
Placed in place concrete (if required)	MESA Mix No. 3; F-3500	n/a	on-site testing of placed-in-place concrete required; 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using pre-approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland (designer shall include MCA Code 300.009, vertical loading [18-10 or 18-20]; allowable horizontal loading based on soil pressure); and analysis of potential cracking.
Sand	AASHTO M-6 or ASTM C-33	0.075 to 0.04"	#10 is not acceptable. No calcium carbonate or dolomitic sand. Substitutions are acceptable. No "rock dust" can be used for sand.

MAPPED SOILS TYPES

SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	PERCENT CLAY	PERCENT SAND	PERCENT SILT	PERCENT LOAM	PERCENT SANDY SILT	PERCENT SILTY SAND	PERCENT SILTY LOAM	PERCENT SANDY LOAM	PERCENT LOAMY SAND	PERCENT LOAMY SILT	PERCENT CLAYEY SILT	PERCENT CLAYEY LOAM	PERCENT CLAY	<15% SLOPE / EROSION POTENTIAL
CUH	GLACIAL-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	B	NO	NO	0.20	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
LUB	LEGUME-MONOTROPIC SILTY LOAMS, 3 TO 8 PERCENT SLOPES	C	NO	NO	0.02/0.32	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
LGB	LEGUME-MONOTROPIC SILTY LOAMS, 3 TO 8 PERCENT SLOPES	D	NO	NO	0.43	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
LSB	LEGUME-MONOTROPIC-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	C	NO	NO	0.02/0.32	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

MICRO-BIORETENTION NOTES:
 1. ONLY THE SIDES OF MICRO-BIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYERS OR AT THE BOTTOM OF THE MICRO-BIORETENTION WILL CAUSE THE MBR TO FAIL AND THEREFORE SHALL NOT BE INSTALLED.
 2. WRAP THE PERFORATED MBR UNDERDRAN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH. SEE APPENDIX B.4.C.
 3. PROVIDE 5" MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFORATED PIPE THROUGH STONE RESERVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 3-26-19
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 3/26/19
 CHIEF, DIVISION OF LAND DEVELOPMENT

ENVIRONMENTAL CONCEPT PLAN
 SWM DRAINAGE AREA MAP, NOTES & DETAILS
HORVARTH PROPERTY
 8457 CHURCH LANE ROAD
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 ZONED: R-ED & R-20
 L 16650/F 00291

TAX MAP 18 BLOCK 13
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DESIGN BY: RVE
 DRAWN BY: IMH
 CHECKED BY: RHW
 DATE: MARCH 2019
 SCALE: AS SHOWN
 W.O. NO.: 16-05

PROFESSIONAL CERTIFICATE
 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. 16193 EXPIRATION DATE: 08-27-2020

ROBERT H. VOGEL, PE No.16193

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