

- 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., PERFORMED IN JUNE, 2018. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
 - THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED MAY, 2018.
 - THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 176A AND 170B WERE USED FOR THIS PROJECT.
 - THE SUBJECT PROPERTY IS ZONED "R-20" IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
 - THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
 - PUBLIC WATER IS PROVIDED BY CONTRACT 71-W. PUBLIC SEWER IS PROVIDED BY CONTRACT 20-1087.
 - THERE IS A 100-YEAR FLOODPLAIN WHICH CROSSES THROUGH THE PROPERTY WEST OF THE DEVELOPABLE AREA. THE FLOODPLAIN IS SHOWN ON THESE PLANS IN PER THE MAY 6, 2013 FEMA DIGITAL FLOOD INSURANCE RATE MAP (DFIRM).
 - THERE ARE NO STEEP SLOPES OVER 25% WITH A CONTIGUOUS AREA OF 20,000SF LOCATED ON-SITE.
 - WETLANDS DELINEATION AND FOREST STAND DELINEATION REPORT PREPARED BY EDD-SCIENCE PROFESSIONALS, INC. ON SEPTEMBER 10, 2018.
 - THERE ARE NO WETLANDS OR STREAMS WITHIN THE LOD. IN ACCORDANCE WITH SECTION 16.116(C) OF THE HOWARD COUNTY SUBDIVISIONS AND LAND DEVELOPMENT REGULATIONS A "NECESSARY DISTURBANCE" FOR STORM DRAIN OUTFALL AND SEWER CONSTRUCTION WITHIN THE STREAM BUFFER WILL BE SUBMITTED AT A LATER PLAN STAGE.
 - FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT SHALL BE ADDRESSED BY A FOREST CONSERVATION PLAN SUBMITTED WITH THE SUBDIVISION OR SITE DEVELOPMENT PLAN.
 - A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
 - GERMAN ROAD IS CLASSIFIED AS A LOCAL ROAD.
 - TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS OR CEMETERIES ON THIS PROPERTY. THERE ARE NO HISTORIC HOUSES LOCATED ON THIS PROPERTY.
 - STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY NINE MICRO-BIORETENTION FACILITIES (M-6) AND 26 DRY WELL FACILITIES (M-5). THESE FACILITIES SHALL BE PRIVATELY OWNED AND MAINTAINED, EXCEPT FOR MICRO-BIORETENTION FACILITY NUMBER 8, WHICH SHALL BE PUBLICLY OWNED AND MAINTAINED.
 - THE LIMITS OF DISTURBANCE (LOD) SHOWN ON THE PLAN IS ENTIRELY ON THE SITE.
 - 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 REDLINE 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 REDLINE 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. THE FINAL PLAN SHALL INCLUDE A SEQUENCE OF CONSTRUCTION WHICH SHALL DETAIL SEDIMENT & EROSION CONTROLS AND PHASING AND ADDRESS THE PROJECT TEMPORARY STORMWATER MANAGEMENT REQUIREMENTS.

ENVIRONMENTAL SITE DESIGN NARRATIVE:

- THE ENVIRONMENTAL AREAS FOR THIS SITE ARE LOCATED IN THE SOUTH AND WEST PORTION OF THE SITE INCLUDING PERENNIAL STREAMS AND NON-TIDAL WETLANDS. THERE IS A MINOR DISTURBANCE TO THE STREAM BUFFER REQUIRED FOR STORM DRAIN OUTFALL CONSTRUCTION AND A DISTURBANCE ASSOCIATED WITH SEWER CONSTRUCTION TO THE FLOODPLAIN AND STREAM BUFFER. THESE ARE CONSIDERED "NECESSARY DISTURBANCES" AS OUTLINED IN SECTION 16.116(C) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THERE IS APPROXIMATELY 0.8 AC. OF FOREST LOCATED WITHIN THE NET TRACT AREA. DISTURBANCES TO ENVIRONMENTAL FEATURES AND NATURAL RESOURCES WILL BE MINIMIZED TO THE GREATEST EXTENT POSSIBLE.
- THE SITE NATURALLY SLOPES FROM NORTHEAST TO SOUTHWEST. THE SITE HAS BEEN DESIGNED TO MAINTAIN THE NATURAL DRAINAGE PATTERNS, WITH NO DRAMATIC CHANGES TO THE NATURAL DRAINAGE.
- THE CONCEPTUAL REDUCTION IN IMPERVIOUS AREA THROUGH BETTER SITE DESIGN IS ACHIEVED THROUGH THE ENVIRONMENTAL SITE DESIGN (ESD) FOR THE PROJECT TO THE MAXIMUM EXTENT PRACTICABLE (MEP). THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION". THE ESD CONCEPT INCLUDES THE USE OF MICRO-BIORETENTION FACILITIES (M-6) AND DRYWELLS (M-5).
- SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF A PROPOSED STONE OUTLET SEDIMENT TRAP, EARTH DIKE, CLEAR WATER DIKE, AND SUPER SILT FENCE PERIMETER CONTROLS. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT DURING THE FUTURE SITE DEVELOPMENT PLAN PHASE OF THE PROJECT.
- STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO-BIORETENTION FACILITIES (M-6) AND DRYWELLS (M-5). THE PROPOSED PRACTICES HAVE BEEN MAXIMIZED TO THE EXTENT PRACTICAL. THE CALCULATED RAINFALL TARGET (PE) FOR THIS PROJECT IS 1.59", AND THE TOTAL RUNOFF VOLUME (ESDv) REQUIRED IS 5,359 CF.
- AN ALTERNATIVE COMPLIANCE REQUEST FOR REMOVAL OF SPECIMEN TREES IS REQUIRED IN ORDER FOR THE PROPOSED DESIGN TO BE DEVELOPED. SUBMISSION OF THE ALTERNATIVE COMPLIANCE REQUEST WILL OCCUR AT THE SKETCH PLAN STAGE. SIGNIFICANT DESIGN CHANGES MAY OCCUR BASED ON THE REVIEW OF THE SKETCH PLAN AND THE ALTERNATIVE COMPLIANCE REQUEST.

SITE DATA:

LOCATION: ELLICOTT CITY, MD.; TAX MAP 17, BLOCK 20, PARCEL 0385
 2ND ELECTION DISTRICT
 PRESENT ZONING: R-20
 PROJECT AREA: 7.54 AC.
 DPZ REFERENCES: L314/F.315 & L343/F.316
 USE OF STRUCTURES: RESIDENTIAL
 TOTAL BUILDING COVERAGE: 15,045 SF (0.5 AC. OR 4.58% OF GROSS AREA)
 PAVED AREA ON SITE: 22,537 SF (0.52 AC. OR 6.86% OF GROSS AREA)
 LIMIT OF DISTURBED AREA: 3.43 AC
 WETLANDS WITHIN LOD: 0.00 AC.
 WETLAND BUFFERS WITHIN LOD: 0.00 AC.
 STREAMS AND THEIR BUFFERS WITHIN LOD: 0.04 AC
 AREA OF ON-SITE 100 YEAR FLOODPLAIN: 2.1 AC
 AREA OF ON-SITE 100 YEAR FLOODPLAIN WITHIN LOD: 0.02 AC
 AREA OF EXISTING FOREST ON-SITE: 1.8 AC
 AREA OF EXISTING FOREST WITHIN LOD: 0.00 AC
 AREA OF ON-SITE NCRS/MDE/HSCD STEEP SLOPES (20% OR GREATER): 0.81 AC
 AREA OF ON-SITE STEEP SLOPES (25% OR GREATER): 0.13 AC
 AREA OF ERODIBLE SOILS: 5.06 AC.
 AREA MANAGED BY ESDv (THIS PLAN): 0.91 AC.
 IMPERVIOUS AREA (MANAGED BY ESDv): 0.50 AC.
 GREEN AREA (MANAGED BY ESDv): 0.41 AC.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 12/14/18
 CHIEF, DEVELOPMENT ENGINEERING DIVISION & DATE

[Signature] 12-11-18
 CHIEF, DIVISION OF LAND DEVELOPMENT & DATE

SPECIMEN TREE CHART

KEY (X#)	SPECIES	SIZE (IN DBH)/CRZ (FEET RADIUS)	COMMENTS	TO BE REMOVED
1	SILVER MAPLE	35.5 / 53.25		TO BE REMOVED
2	SOUR CHERRY	30.5 / 45.75		TO BE REMOVED
3	PIN OAK	31 / 46.5		TO BE REMOVED
4	TULIP POPLAR	31 / 46.5		TO REMAIN
5	SILVER MAPLE	46 / 69	FAIR CONDITION, SOME DIEBACK NOTED	TO REMAIN
6	BLACK OAK	33 / 49.5	GOOD CONDITION	TO REMAIN

MINIMUM LOT SIZE CHART

LOT	GROSS AREA	PIPESTEM AREA	NET AREA	MIN. LOT SIZE
1	18,003 SF	0 SF	18,003 SF	18,000 SF
2	18,005 SF	0 SF	18,005 SF	18,000 SF
3	18,297 SF	290 SF	18,006 SF	18,000 SF
4	18,722 SF	717 SF	18,005 SF	18,000 SF
5	19,273 SF	1,217 SF	18,056 SF	18,000 SF
6	19,670 SF	1,628 SF	18,042 SF	18,000 SF
7	19,830 SF	1,809 SF	18,021 SF	18,000 SF

ESDv CONCEPT PLAN
 SCALE: 1"=50'

SCALE 1"=50'
 25' 0' 50'

SHEET INDEX

DESCRIPTION	SHEET NO.
COVER SHEET AND ESDv CONCEPT PLAN	1 OF 2
STORMWATER MANAGEMENT DRAINAGE AREA MAP & DETAILS	2 OF 2

ENVIRONMENTAL CONCEPT PLAN

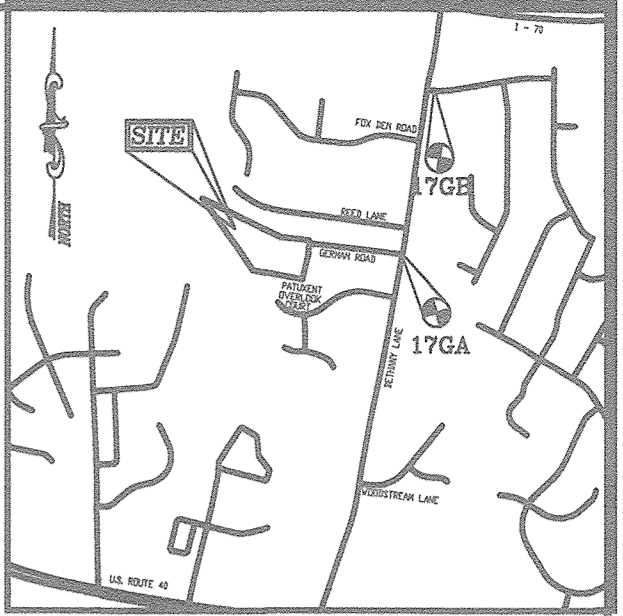
RIVER BIRCH MANOR

LOTS 1-7 AND OPEN SPACE LOT 8
 10039 GERMAN ROAD
 HOWARD COUNTY, MD

BENCHMARKS

HOWARD COUNTY BENCHMARK - 176A (CONC. MONUMENT)
 N 591048.57 E 1352732.11 ELEV. 432.03
 LOCATION: NORTHWEST CORNER OF BETHANY LANE AND GERMAN ROAD

HOWARD COUNTY BENCHMARK - 170B (CONC. MONUMENT)
 N 592656.77 E 1353019.88 ELEV. 441.52
 LOCATION: NORTHEAST CORNER OF BETHANY LANE AND POSTWICK DRIVE



VICINITY MAP
 SCALE: 1"=2000'
 ADC MAP 11 GRID G/5

- LEGEND:**
- EXISTING CONTOUR
 - PROPOSED CONTOUR
 - PROPERTY LINE
 - PROPERTY LINE TO BE ABANDONED
 - TOP OF STREAM BANK
 - BOTTOM OF STREAM BANK
 - STREAM CENTERLINE
 - EXISTING TREE LINE
 - PROPOSED TREE LINE
 - EXISTING EDGE OF PAVING
 - EXISTING SPECIMEN TREE
 - EXISTING TREE
 - EXISTING UTILITY
 - EXISTING FENCE
 - EXISTING SANITARY SEWER
 - EXISTING WATER
 - PROPERTY LINE TO BE ABANDONED
 - PROPERTY LINE
 - RIGHT-OF-WAY LINE
 - STEEP SLOPES (15% - 24.99%)
 - STEEP SLOPES (>25%)
 - 100 YEAR FLOODPLAIN
 - EX. WETLANDS
 - EX. 25' WETLAND BUFFER
 - EX. 100' STREAM BUFFER
 - SOIL TYPE
 - MICRO-BIORETENTION
 - DRY WELL
 - PROPOSED SIDEWALK
 - PROPOSED STORM DRAIN PASS THRU
 - PROPOSED STORM DRAIN PASS THRU
 - 24' PUBLIC USE-IN-COMMON ACCESS EASEMENT
 - LOD
 - LIMIT OF DISTURBANCE

DEVELOPER
 TRINITY HOMES MARYLAND, LLC
 3675 PARK AVE., SUITE 301
 ELLICOTT CITY, MD 21043
 (410) 480-0023

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

COVER SHEET AND ESDv CONCEPT PLAN

RIVER BIRCH MANOR

LOTS 1-7 AND OPEN SPACE LOT 8

L 314 / F. 315
 L 343 / F. 316
 TAX MAP: 17 GRID: 20
 2ND ELECTION DISTRICT

10039 GERMAN ROAD
 ELLICOTT CITY, MD 21042

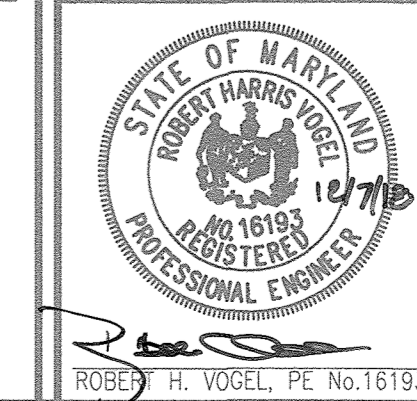
ZONED: R-20
 PARCEL: 0385
 HOWARD COUNTY, MARYLAND

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 LAWS OF THE STATE OF MARYLAND. LICENSE NO. 16193 EXPIRATION DATE: 09-27-2020

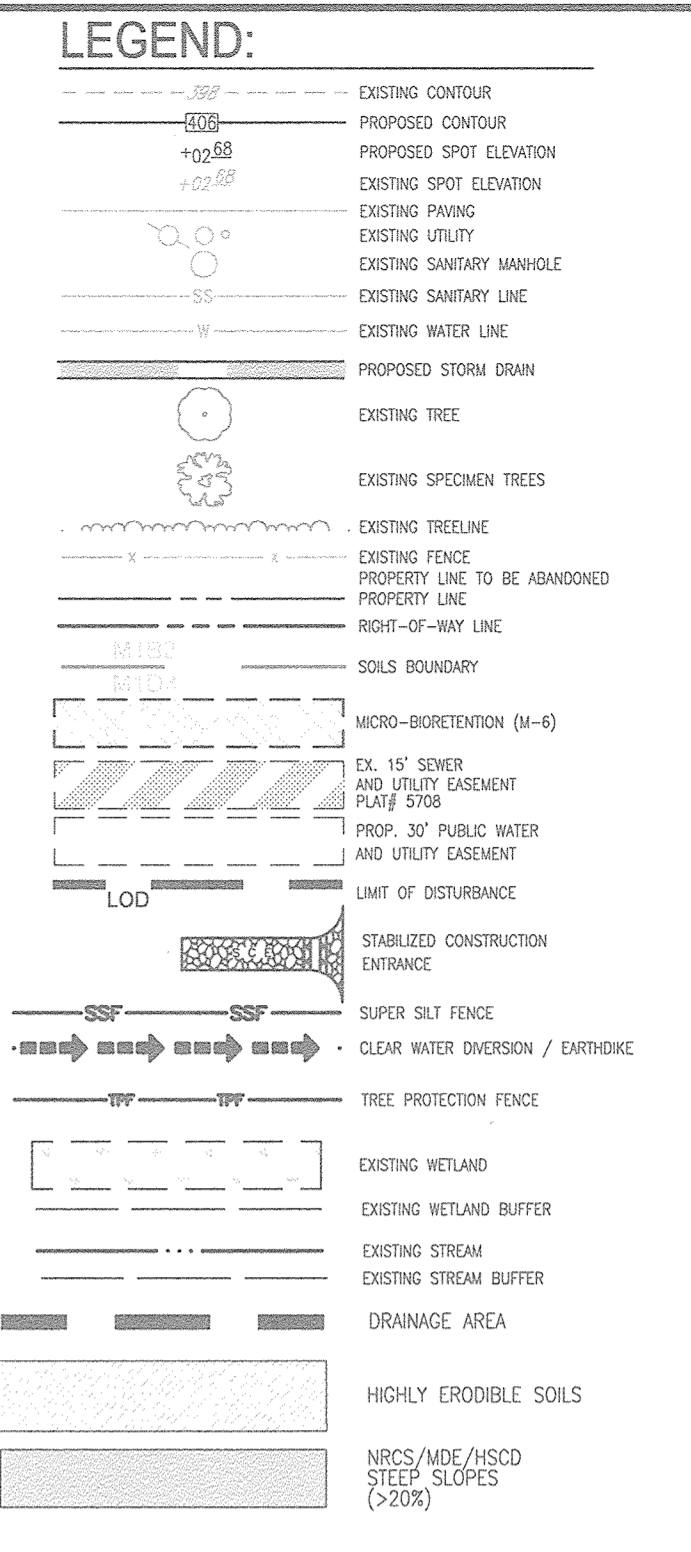
DESIGN BY: RHV
 DRAWN BY: LAG
 CHECKED BY: RHV
 DATE: DECEMBER 2018
 SCALE: AS SHOWN
 W.O. NO.: 41656

1 SHEET OF 2



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 A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOINTVINE 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 (30%), COARSE SAND (30%), AND COMPOST (40%).
 - CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
 - PH RANGE - SHOULD BE BETWEEN 6.5 - 7.0. AMENDMENTS (E.G. LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.
 THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. 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 STOCKPILED 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 MARCH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE 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 ALLEVATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHESEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACURE THE SOIL PROFILE 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 PONDING 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/LOADER WITH MARCH SHOES.
- 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 MOST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED 50% 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX 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 ON THE OUTSIDE OF THE TREE BALL. GRASSES AND LEGUMES SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS, UREA, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.
THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).
- 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 UNDERDRAIN.
 - THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
 - A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT POINT AND MONITOR PERFORMANCE OF THE FILTER.
 - A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".
- 7. MISCELLANEOUS**
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

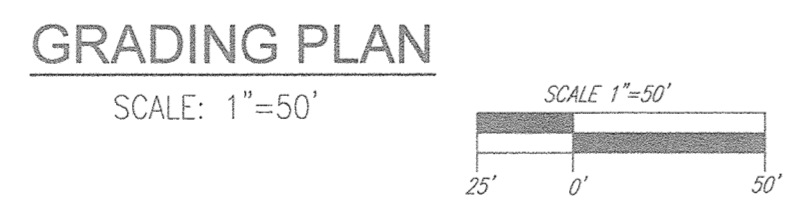


OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3), MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8), AND ENHANCED FILTERS (M-9)

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. 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 PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.
2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT. REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE SPRING MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

SOILS LEGEND
HOWARD COUNTY SOILS MAP #13

SYMBOL	NAME / DESCRIPTION	GROUP	K FACTOR	ERODIBLE	ACREAGE
GhB	GLENVILLE-BALE SILT LOAMS, 0 TO 8 PERCENT SLOPES	C	0.49	YES	0.88
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	0.32	YES	0.02
Ho	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	D	0.43	NO	2.48
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	0.43	NO	3.71
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	0.37	NO	0.46



ENVIRONMENTAL CONCEPT PLAN 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 COMPLETE COMPLIANCE WITH ZONING AND SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SITE DEVELOPMENT STAGE AND THEREFORE, THIS PLAN IS SUBJECT TO ADDITIONAL AND MORE DETAILED COMMENTS AS THE PLAN PROGRESSES THROUGH THE SITE DEVELOPMENT PROCESS.
3. THIS SITE HAS STREAMS, WETLANDS, AND A 100YR FLOODPLAIN ON THE PROPERTY. THESE FEATURES AND THEIR ASSOCIATED BUFFERS CONSTRAIN THE DEVELOPABLE AREA ON THE WEST AND SOUTH.

RIVER BIRCH MANOR - ECP ESOV COMPUTATIONS

DA	AREA	PERCENT	SOIL	GROUP	K FACTOR	ERODIBLE	ACREAGE	REMARKS
LOT 10A#1	21.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#2	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#3	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#4	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#5	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#6	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#7	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#8	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#9	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#10	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#11	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#12	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#13	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#14	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#15	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#16	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#17	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#18	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#19	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#20	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#21	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#22	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#23	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#24	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#25	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#26	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#27	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#28	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#29	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#30	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#31	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#32	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#33	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#34	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#35	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#36	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#37	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#38	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#39	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#40	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#41	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#42	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#43	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#44	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#45	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#46	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#47	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#48	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#49	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#50	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#51	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#52	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#53	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#54	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#55	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#56	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#57	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#58	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#59	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#60	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#61	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#62	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#63	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#64	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#65	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#66	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#67	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#68	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#69	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#70	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#71	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#72	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#73	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#74	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#75	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#76	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#77	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#78	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#79	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#80	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#81	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#82	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#83	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE
LOT 10A#84	20.00	0.20%	GhB	C	0.49	YES	0.13	MICROBIORETENTION-BIORETENTION SWALE