

**GENERAL NOTES**

- THE PROJECT SHALL BE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY REQUIREMENTS UNLESS WAIVERS OR ALTERNATIVE COMPLIANCE PETITIONS HAVE BEEN APPROVED.
- THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A HOWARD COUNTY GIS.
- THE PROJECT BOUNDARY IS BASED ON AVAILABLE RECORDED PLATS AND DEED PLOTTING.
- THE SUBJECT PROPERTY IS ZONED "R-20" IN ACCORDANCE WITH THE 10/6/2013 COMPREHENSIVE ZONING PLAN.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE 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 PUBLIC EXTENSIONS OF CONTRACT NO. 238-S.
- EXISTING UTILITIES LOCATED FROM CONTRACT 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.
- THERE ARE NO FLOODPLAIN AND STEEP SLOPES OVER 20,000 SF CONTIGUOUS.
- FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT SHALL BE ADDRESSED BY A FOREST CONSERVATION PLAN SUBMITTED WITH THE SUBDIVISION PLAN.
- GEOTECHNICAL INVESTIGATIONS SHALL COMPLETED AS PART OF THE SITE DEVELOPMENT PLAN PACKAGE.
- A NOISE STUDY IS NOT REQUIRED.
- A WETLAND AND SIMPLIFIED FOREST STAND DELINEATION PLAN WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES, SEPTEMBER 13, 2018.  
-THREE (3) SPECIMEN TREES WERE FOUND ONSITE. ALL EFFORTS WILL BE MADE TO SAVE THE TREES.  
-NO WETLANDS, STREAMS OR BUFFERS ARE PRESENT ON THE SUBJECT PROPERTY.
- HIGH RIDGE ROAD IS CLASSIFIED AS A LOCAL ROAD.  
-PROPOSED IS A PRIVATE USE-IN-COMMON DRIVEWAY.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
- THERE IS ONE EXISTING STRUCTURE ON THIS SITE TO BE REMOVED.
- THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF A RAIN GARDEN (M-7) FACILITY AND DRYWELLS (M-5) IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. 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.
- REFERENCE WP-18-067, APPROVED 03/28/18 FOR AN ALTERNATIVE COMPLIANCE OF SECTION 16.120(c)(2)(1) WHICH REQUIRE TO HAVE 20 FEET OF ROAD FRONTAGE FOR SINGLE PIPESTEM LOTS SERVING SINGLE FAMILY DETACHED DWELLINGS, AND OF SECTION 16.121(c)(4)(i) WHICH REQUIRES ANY EXISTING DRIVEWAY ENTRANCES ONTO THE PUBLIC ROAD RIGHT OF WAY MUST BE CONNECTED TO A SINGLE USE IN COMMON DRIVEWAY OR ABANDONED. APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:  
1. COMPLIANCE WITH ALL SUBDIVISION REVIEW COMMITTEE COMMENTS.  
2. THE ALTERNATIVE COMPLIANCE APPLICATION NUMBER (WP-18-067) AND ITS CONITIONS OF APPROVAL MUST BE ADDED TO ALL SUBDIVISION PLANS AND FINAL PLAT.  
3. THE PROPOSED LOT FOR THE EXISTING HOUSE MUST COMPLY WITH ALL SETBACK PER THE R-20 ZONING REGULATIONS.
- F-04-140 PROVIDED A 35' PRIVATE USE-IN-COMMON ACCESS EASEMENT FOR THE USE AND BENEFIT OF LOTS 2 AND 3 OF THE CARVER ESTATES AND PARCEL 263. THE REQUIRED DRIVEWAY CULVERT, PROVIDING ACCESS ACROSS THE SDP-15-006 SWALE WILL BE MAINTAINED BY THE OWNER OF LOT 2 AS SHOWN HEREON.

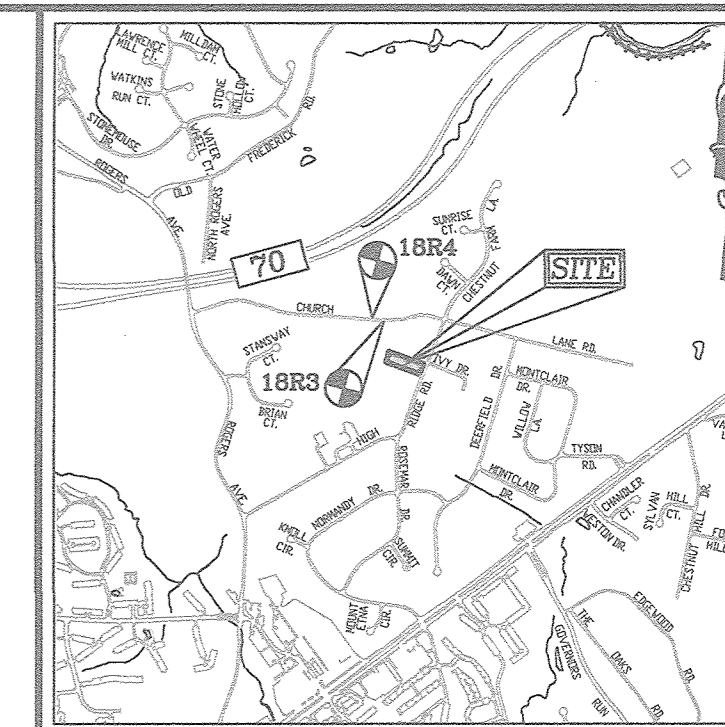
**ENVIRONMENTAL SITE DESIGN NARRATIVE:**

- IN ACCORDANCE WITH CHECKLIST ITEM III.K.
- THERE ARE NO NATURAL/ENVIRONMENTAL AREAS LOCATED ON THE PROJECT SITE. NO WETLAND AND WETLAND BUFFER IS PRESENT ONSITE.
  - NO DRAMATIC DISTURBANCE TO THE NATURAL DRAINAGE PATTERNS ARE PROPOSED. PLEASE REFER TO THE PROPOSED SINGLE LOT / HOUSE 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 A RAIN GARDEN (M-7) AND DRYWELL (M-5) FACILITIES. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
  - SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF DIVERSION FENCING, SILT 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.
  - STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO-SCALE PRACTICES INCLUDING A RAIN GARDEN (M-7) AND DRYWELL (M-5) FACILITIES. THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION".
- TARGET PE = 1.6"  
TARGET ESDV = 699 CUFT
- PROVIDED PE = 1.6"+  
RAIN GARDEN = 456 CUFT  
DW A1 = 86 CUFT  
DW A2 = 86 CUFT  
DW A3 = 86 CUFT  
PROVIDED = 715 CUFT
- REFER TO SUBAREA SUMMARY ON SHEET 2
- AT THIS CONCEPT STAGE OF DEVELOPMENT, NO DESIGN MANUAL WAIVERS AND/OR ALTERNATIVE COMPLIANCE REQUESTS FOR ENVIRONMENTAL DISTURBANCE AND/OR STORMWATER MANAGEMENT DESIGN IS REQUIRED.

# ENVIRONMENTAL CONCEPT PLAN STAMATAKIS PROPERTY

LOTS 1 & 2  
8418 HIGH RIDGE ROAD, ELLICOTT CITY, MD 21043  
HOWARD COUNTY, MD

**BENCHMARKS**  
HOWARD COUNTY BENCHMARK - 18R3  
N 529044.94 E 1350855.03 ELEV.: 337.61  
HOWARD COUNTY BENCHMARK - 18R4  
N 530494.49 E 1350872.35 ELEV.: 312.28

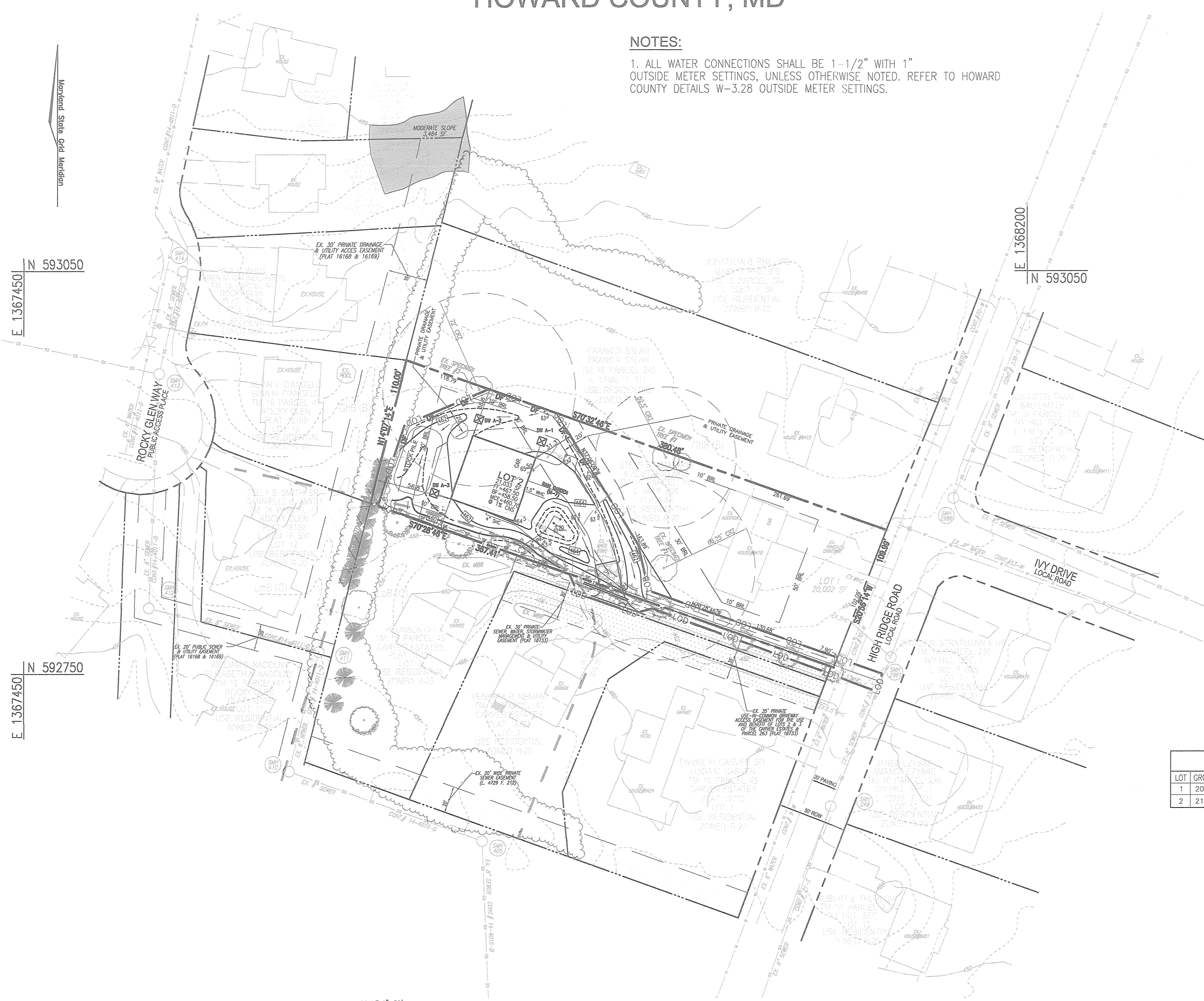


**VICINITY MAP**  
SCALE: 1"=2,000'  
ADC MAP COORDINATE: 21 - B5

**NOTE:**  
- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
- SUPER 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.

**NOTES:**

- 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.
COVER SHEET, ESDV LAYOUT, AND GRADING PLAN	1 OF 2
STORMWATER MANAGEMENT DRAINAGE AREA MAP & DETAILS	2 OF 2

**LEGEND:**

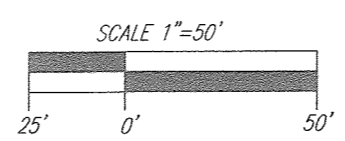
- - - - - EXISTING CONTOUR
- - - - - PROPOSED CONTOUR
- 102.88  
+02.88 EXISTING SPOT ELEVATION
- - - - - EXISTING CURB AND GUTTER
- - - - - EXISTING UTILITY POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- STORM DRAIN
- - - - - EXISTING TREELINE
- - - - - EXISTING FENCE
- - - - - PROPERTY LINE
- - - - - RIGHT-OF-WAY LINE
- - - - - SOILS BOUNDARY
- RAIN GARDEN
- EX. 35' PRIVATE USE IN COMMON ACCESS EASEMENT (PLAT 18733)
- EX. 30' PRIVATE DRAINAGE & UTILITY ACCESS EASEMENT (PLAT 16168 & 16169)
- EX. 20' WIDE PRIVATE SEWER EASEMENT (L. 4728 F. 212)
- EX. 20' PUBLIC SEWER EASEMENT (PLAT 16168 & 16169)
- EX. 30' PRIVATE SEWER, WASTEWATER MANAGEMENT, & UTILITY EASEMENT (PLAT 18733)
- - - - - LIMIT OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- - - - - SF SILT FENCE
- - - - - DF DIVERSION FENCE

**MINIMUM LOT SIZE CHART**

LOT	GROSS AREA	PIPESTEM AREA	NET AREA	MIN. LOT SIZE
1	20,002 SF	0 SF	20,002 SF	20,000 SF
2	21,033 SF	1,031 SF	20,002 SF	20,000 SF

**OWNER**  
STEVE AND EVE STAMATAKIS  
8418 HIGH RIDGE ROAD  
ELLICOTT CITY, MD 21043  
(410) 461-9295

**LAYOUT AND GRADING PLAN**  
SCALE: 1" = 50'



**NOTES:**

- APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED BUILDING AND/OR GRADING PERMIT.
- 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.
- THERE ARE NO 100YR FLOODPLAIN, STREAMS, WETLANDS, AND THEIR BUFFERS LOCATED ON THE SITE.

**SITE ANALYSIS DATA CHART**

- A. TOTAL PROJECT AREA: 0.94 AC ±
- B. AREA OF PLAN SUBMISSION: 0.48 AC ±
- C. AREA OF WETLANDS AND BUFFERS: 0.00 SF
- D. AREA OF FLOODPLAIN: 0.00 AC
- E. AREA OF FOREST: 0.00 AC
- F. AREA OF STEEP SLOPES (15% & GREATER): 0.00 AC
- G. AREA OF ERODIBLE SOILS: 0.47 AC
- H. LIMIT OF DISTURBED AREA: 0.47 AC
- I. PROPOSED USES FOR SITE AND STRUCTURES: RESIDENTIAL SINGLE FAMILY DETACHED (SFD) HOMES
- J. GREEN OPEN AREA: 0.37 AC
- K. PROPOSED IMPERVIOUS AREA: 0.11 AC
- L. PRESENT ZONING DESIGNATION: R-20
- M. OPEN SPACE REQUIRED: FUTURE FEE IN LIEU PAYMENT
- N. TOTAL NUMBER OF UNITS ALLOWED: 1
- O. TOTAL NUMBER OF UNITS PROPOSED: 1
- P. DPZ FILE REFERENCES: WP-18-067

**SOILS LEGEND**  
HOWARD COUNTY SOILS MAP #14

SYMBOL	NAME / DESCRIPTION	GROUP	K FACTOR	ERODIBLE	HYDRIC
GnB	Glennig-Urban land complex, 0 to 8 percent slopes	B	0.20	NO	NO
LoB	Legore-Montalto-Urban land complex, 0 to 8 percent slopes	C	0.02/0.32	NO	NO

**NOTE:**  
-TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY.  
-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.

**HSCD NOTE:**

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.

**Eco-Science Professionals, Inc.**  
Consulting Ecologists  
P.O. Box 5006 Glen Arm, Maryland 21057 Telephone (410) 832-2480 Fax (410) 832-2488

**MD DNR Qualified Professional**  
USACOE Wetland Delineator  
Certification # WDCP93MD0610044B2  
John P. Canoles

**Specimen Tree Chart**

Key (DxH)	Species	Size (in dbh)	CRZ (feet radius)	Comments
1	Silver maple	45.5	68.25	fair condition, limited crown
2	White pine	35	52.5	good condition
3	Silver maple	48	72	fair condition, good shape but trunk rot noted

**NOTE:** SPECIMEN TREES TO REMAIN UNDISTURBED.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/13/19  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 2/7/19  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN  
COVER SHEET,  
ESDV LAYOUT, AND GRADING PLAN  
STAMATAKIS PROPERTY  
LOTS 1 & 2  
8418 HIGH RIDGE ROAD, ELLICOTT CITY, MD 21043

TAX MAP: 18 PARCEL: 263 BLOCK 13 ZONING: R-20  
2ND ELECTION DISTRICT HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
3300 N. RIDGE ROAD SUITE 110 TEL: 410.461.7666  
ELLICOTT CITY, MD 21043 FAX: 410.461.9561

**PROFESSIONAL CERTIFICATE**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18183 EXPIRATION DATE: 09-27-2020

DESIGN BY: RHV  
DRAWN BY: KG  
CHECKED BY: RHV  
DATE: JANUARY 2019  
SCALE: 1"=50'  
W.O. NO.: 05-09/40398

1 SHEET OF 2

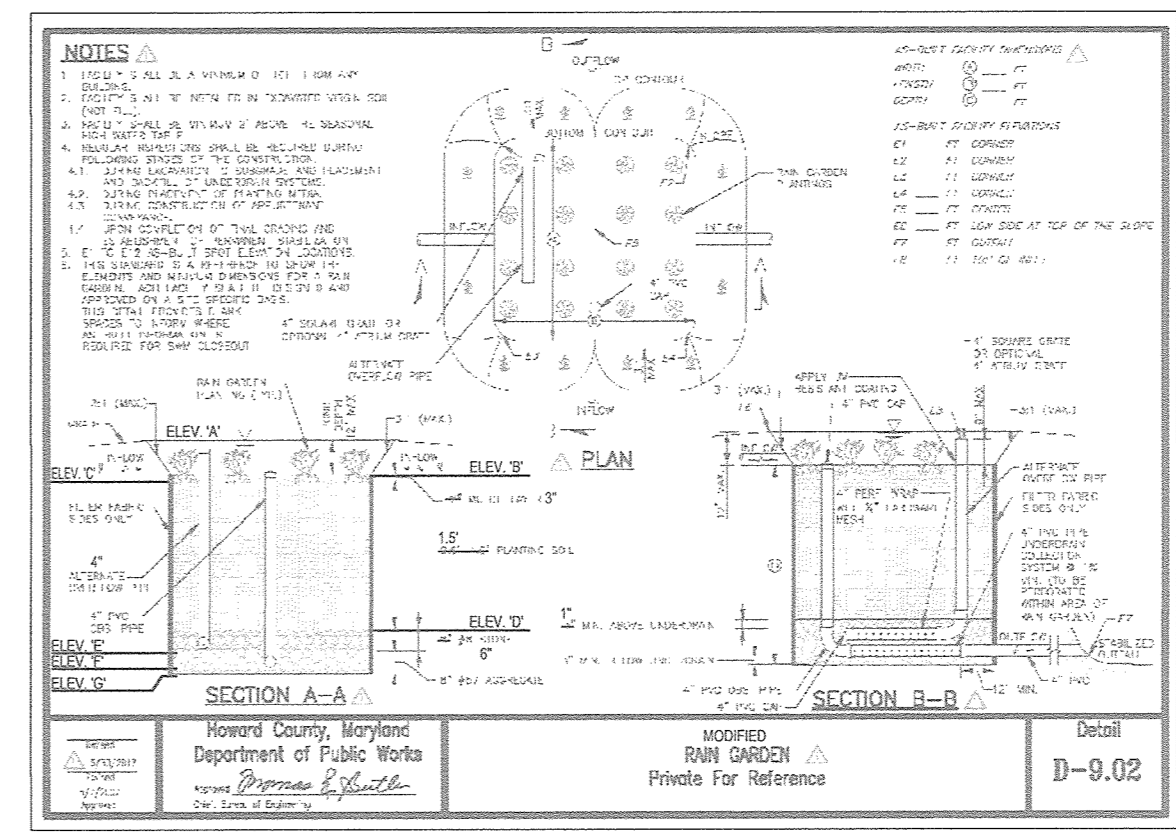
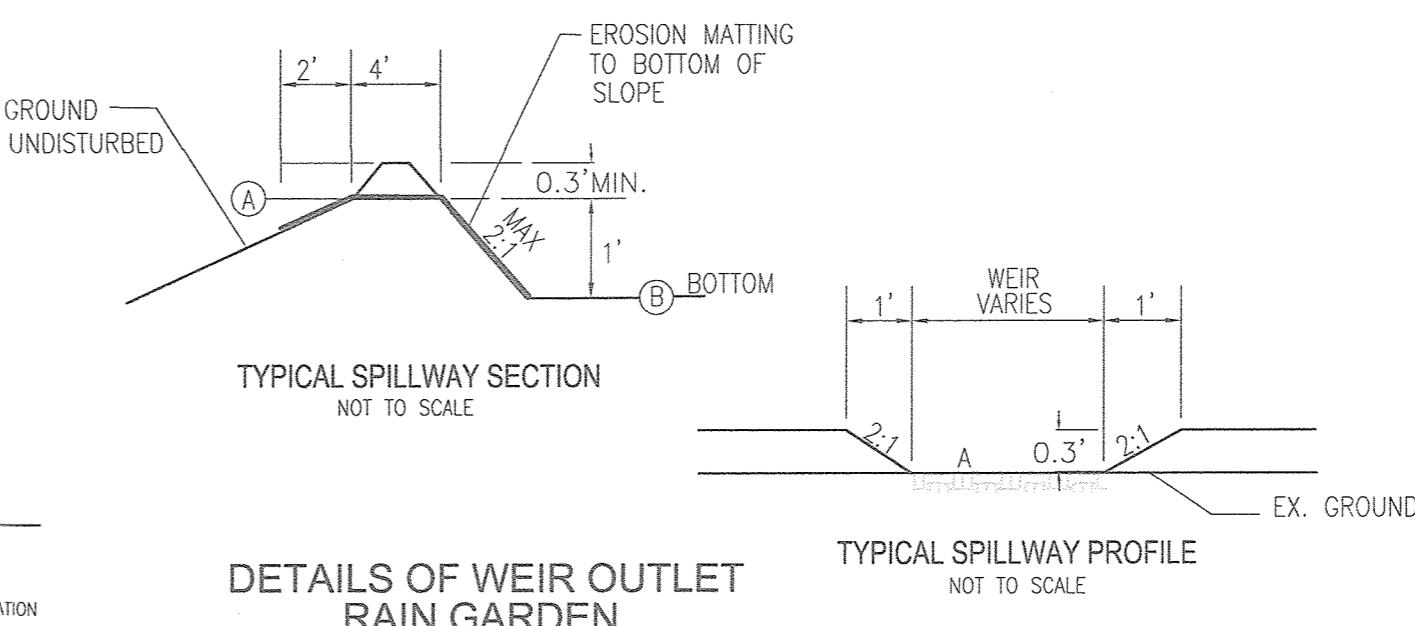


**LEGEND:**

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- EXISTING CURB AND CUTTER
- EXISTING UTILITY POLE
- EXISTING MANHOLE
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEARCUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- EXISTING TREE LINE
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- SOILS BOUNDARY
- MICRO-BIORETENTION (M-6)
- EX. 35' PRIVATE USE IN COMMON ACCESS EASEMENT (PLAT 18733)
- EX. 10' PRIVATE DRAINAGE & UTILITY ACCESS EASEMENT (PLAT 16168 & 16169)
- EX. 30' WIDE PRIVATE SEWER EASEMENT (L. 4729 P. 210)
- EX. 30' PUBLIC SEWER EASEMENT (PLAT 16168 & 16169)
- EX. 30' PRIVATE SEWER, STORMWATER & UTILITY EASEMENT (PLAT 18733)
- DRAINAGE DIVIDE

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

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.1	n/a	Plantings are site-specific
Planting soil [2" to 4" deep]	loamy sand (60-65%) & compost (35-40%) of sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5% 100% soil types loamy sand (60-65%) & compost (35-40%) or sandy loam (30%), coarse sand (30%), and compost (40%)
Organic content	Min. 10% by dry weight (ASTM D 2974)	n/a	
Mulch	shredded hardwood	n/a	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 cobble	stone: 2" to 5"	
Geotextile	AASHTO M-43	n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (ASTM D 3363)	
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; underdrain pipes. Perforated pipe shall be wrapped with 1/4" 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) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 308.1R/99; vertical loading (16k or 18-20k) allowable horizontal loading (based on soil pressure); analysis of potential cracking. Sand substitutions such as Diabase and Gyrstone (AASHTO #10) are not acceptable. No calcium carbide or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Gyrstone (AASHTO #10) are not acceptable. No calcium carbide or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.



**RAIN GARDEN DATA CHART**

RG Facility	ELEV TOP	Ponding Depth (ft)	Ponding Elevation	Bottom of Mulch ELEV. B	Bottom of Plant Mix ELEV. D	Bottom of Invert ELEV. F	Bottom of Stone ELEV. G
1	463.50	1.00	462.20	462.20	461.95	460.45	459.95

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

**1. MATERIAL SPECIFICATIONS**  
THE 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 WITH 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 (30%), 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.  
 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 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 MARSH 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 REFRACTURE THE SOIL PROFILE THROUGHOUT THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLAGE 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/LOADER WITH MARSH 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". SHREDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. FINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDED 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 SHALL BE PLANTED SO 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 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. TREES SHALL BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL. GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLOUS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS. THE TOPSOIL SPECIFICATIONS ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFERS THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

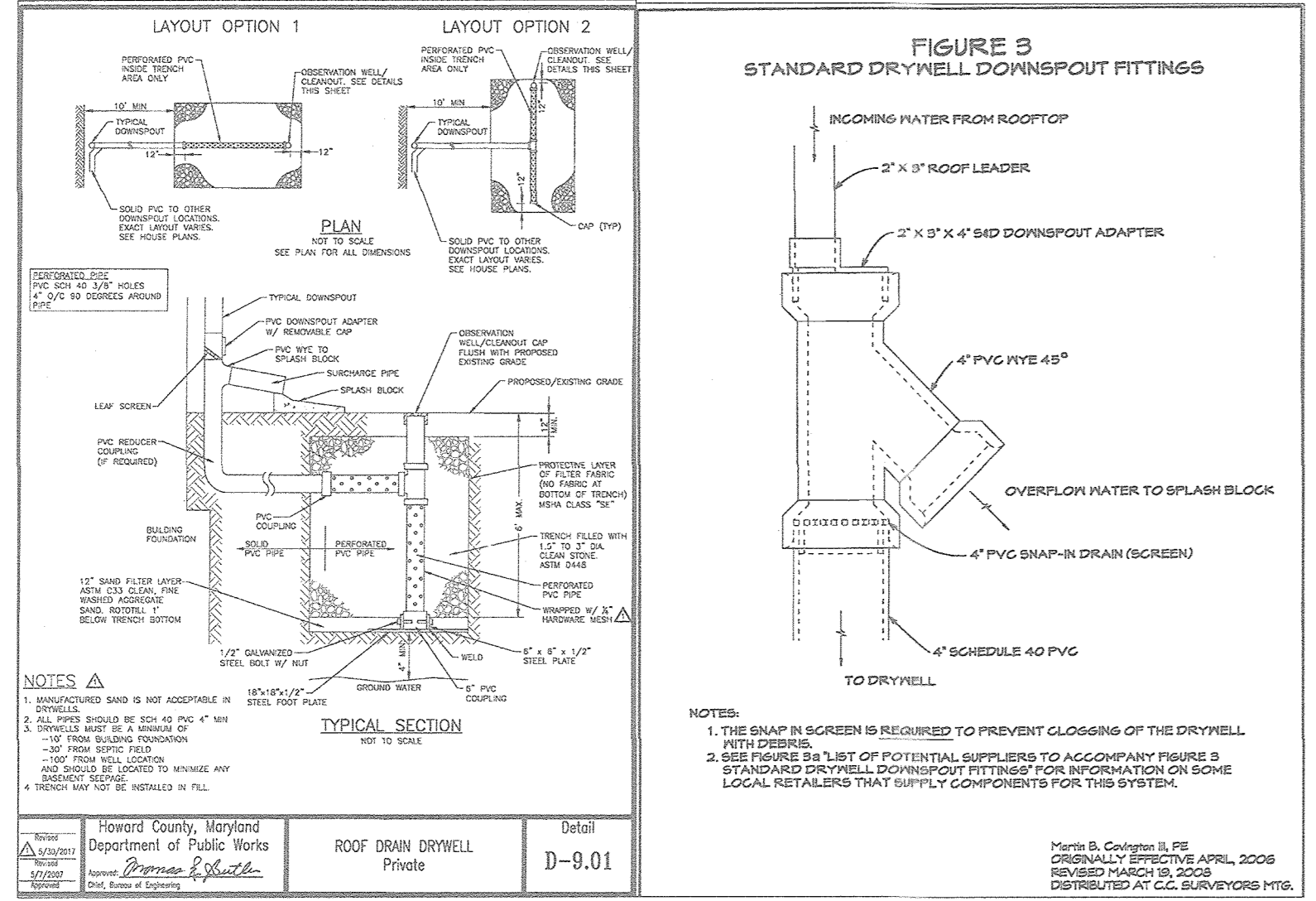
**6. UNDERDRAINS**  
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:  
 \* PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED HDPE PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF DIAMETER).  
 \* PERFORATIONS - 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 4+4) 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 PORT 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 THE 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".  
 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 1,000 SQUARE FEET OF SURFACE AREA).

**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)**

- 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.
- 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 CONTAINED BEYOND TREATMENT. REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
- THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
- THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH STORM EVENT.

**OWNER**  
STEVE AND EVE STAMATAKIS  
8418 HIGH RIDGE ROAD  
ELLCOTT CITY, MD 21043  
(410) 461-9295



**FIGURE 3 STANDARD DRYWELL DOWNSPOUT FITTINGS**

ROOF DRAIN DRYWELL  
D-9.01

NOTES:  
 1. THE DRAIN SCREEN IS REQUIRED TO PREVENT CLOGGING OF THE DRYWELL WITH DEBRIS.  
 2. THE DRYWELL SHALL BE CONSTRUCTED TO ACCOMPANY FIGURE 3 STANDARD DRYWELL DOWNSPOUT FITTINGS FOR INFORMATION ON SOME LEGAL RETAILERS THAT SUPPLY COMPONENTS FOR THIS SYSTEM.

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED STORMWATER DRY WELLS (M-5)**

- THE MONITORING WELLS AND STRUCTURES SHALL BE INSPECTED ON A QUARTERLY BASIS AND AFTER EVERY LARGE STORM EVENT.
- WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS SHALL BE RECORDED OVER A PERIOD OF SEVERAL DAYS TO INSURE TRENCH DRAINAGE.
- A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN THE 72 HOUR TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
- THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/13/19  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* 2/7/19  
CHIEF, DIVISION OF LAND DEVELOPMENT

**STAMATAKIS PROPERTY - ECP ESDv COMPUTATIONS**

Site Area: 0.46 AC = 20038 SF  
 Target P: 1.59 IN PERCENT  
 Site In: 0.2337

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	MINIMUM VOLUME	MAXIMUM VOLUME	LET VOLUME PROVIDED*	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS	
LOT 2	44.63	0.4516	4549	0.10	371	445	274	456	2030	0.05	0.06	MICROSCALE RAIN GARDEN
LOT 2 DRIVEWAY UNMANAGED	100.00	0.9500	940	0.02	74	183	119	0	940	0.02	0.00	OVERMANAGED IN RG
LOT 2 - REAR	100.00	0.9500	625	0.01	49	129	79	86	625	0.01	0.00	86 DRYWELL
LOT 2 - REAR	100.00	0.9500	625	0.01	49	129	79	86	625	0.01	0.00	86 DRYWELL
LOT 2 - FRONT	100.00	0.9500	625	0.01	49	129	79	86	625	0.01	0.00	86 DRYWELL
<b>PROJECT TOTALS</b>			<b>7364</b>	<b>0.17</b>		<b>630</b>	<b>715</b>	<b>485</b>	<b>0.11</b>	<b>0.06</b>		

THE ROUTE (FR-20) RAIN GARDEN FACILITY WILL RETAIN THE LARGER Q10 & Q100 STORM EVENTS, DISCHARGING THE OUTFLOW THROUGH THE SOIL MEDIA AND UNDERDRAIN PIPE.

TAX MAP: 18 PARCEL: 283  
2ND ELECTION DISTRICT

BLOCK 13 ZONING: R-20  
HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE  
 DESIGN BY: RHV  
 DRAWN BY: KG  
 CHECKED BY: RHV  
 DATE: JANUARY 2019  
 SCALE: 1"=50'  
 W.O. NO.: 05-09/40398

2 SHEET OF 2