

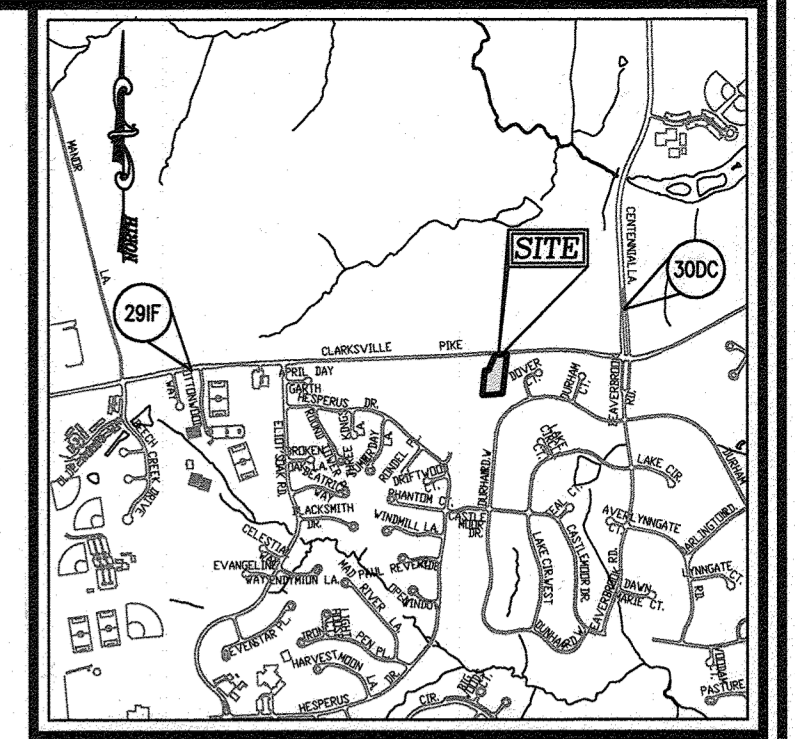
# ENVIRONMENTAL CONCEPT PLAN

## NEW PATH REFORMED CHURCH

10425 CLARKSVILLE PIKE (MD RTE 108)  
HOWARD COUNTY, MD

### 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 ENGINEERS, INC., PERFORMED ON JANUARY 25, 2018. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
- THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERS, INC., DATED MARCH 22, 2018.
- 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. 291F AND 300C WERE USED FOR THIS PROJECT. HORIZONTAL DATUM (BEARINGS AND COORDINATES AS SHOWN HEREON) ARE BASED ON THE MARYLAND COORDINATE SYSTEM NAD 83.
- THE SUBJECT PROPERTY IS ZONED R-20 PER 10/06/2013 COMPREHENSIVE ZONING PLAN AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/02/2003 PER COUNCIL BILL 75-2003.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAM(S), OR THEIR REQUIRED BUFFERS, FLOODPLAIN AND FOREST CONSERVATION EASEMENT AREAS.
- WATER AND FIRE SUPPRESSION SERVICE TO BE PUBLIC. CONNECTION TO BE PROVIDED ACROSS PARCEL 168 (LOT 16) OWNED BY JAMES AND PATRICIA CITRO BY PUBLIC EASEMENT.
- SEWER SERVICE TO BE PUBLIC. CONNECTION TO BE PROVIDED ACROSS PARCEL 168 (LOT 15) OWNED BY REDMOND AND LAUREN BARNES BY PUBLIC EASEMENT.
- CLARKSVILLE PIKE (MD RTE 108) IS A MINOR ARTERIAL.
- THIS PROJECT IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
- THERE ARE NO FLOODPLAINS ON THE PROPERTY.
- THERE ARE NO STEEP SLOPES WITH A CONTIGUOUS AREA OF 20,000 SF LOCATED ON THE PROPERTY.
- THERE ARE NO WETLANDS, STREAMS OR BUFFERS LOCATED WITHIN THE PROJECT BOUNDARY.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS OR CEMETERIES ON THIS PROPERTY. THERE ARE NO EXISTING STRUCTURES ON THIS SITE TO BE REMOVED. THE SITE IS NOT LISTED ON THE HISTORIC SITES INVENTORY.
- THERE ARE 8 SPECIMEN TREES ON THE SITE, ALL OF WHICH ARE TO BE REMOVED.
- THE FOREST CONSERVATION OBLIGATION WILL BE ADDRESSED WITH THE SITE DEVELOPMENT PLAN.
- A GEOTECHNICAL STUDY WILL BE PROPOSED IN CONJUNCTION WITH THE SITE DEVELOPMENT PLAN.
- THE PROJECT IS LOCATED IN THE COLUMBIA COMMUNITY.
- PROPOSED LIGHTING SHALL BE IN ACCORDANCE WITH SECTION 134.0 OF THE HOWARD COUNTY ZONING REGULATIONS. ALL LIGHTING WILL BE DIRECTED DOWN AND AWAY FROM ADJACENT PROPERTIES AND ROADS.
- EXISTING USE: VACANT AND UNDEVELOPED.
- PROPOSED SHED FOR MAINTENANCE EQUIPMENT. MAXIMUM HEIGHT: 8 FEET, AREA: 240 SF.
- THIS PROJECT IS SUBJECT TO BOARD OF APPEALS CASE NO. 19-031C WHICH GRANTED THE PETITION OF NEW PATH REFORMED CHURCH FOR A RELIGIOUS FACILITY CONDITIONAL USE IN AN R-20 (RESIDENTIAL: SINGLE) ZONING DISTRICT. THE FOLLOWING CONDITIONS SHALL APPLY:  
THE CONDITIONAL USE SHALL BE CONDUCTED IN CONFORMANCE WITH AND SHALL APPLY ONLY TO THE USES AS DESCRIBED IN THE PETITION AND DEPICTED ON THE CONDITIONAL USE PLAN (JUNE 2019) AND NOT TO ANY OTHER ACTIVITIES, USES, STRUCTURES, OR ADDITIONS TO THE PROPERTY. PETITIONER SHALL COMPLY WITH ALL AGENCY COMMENTS. LIGHTING SHALL BE RESIDENTIAL IN CHARACTER AND ORIENTED AWAY FROM RESIDENCES AND IN COMPLIANCE WITH COUNTY LIGHTING REGULATIONS. PETITIONER SHALL OBTAIN ALL REQUIRED PERMITS. PETITIONER SHALL COMPLY WITH ALL FEDERAL, STATE AND COUNTY LAWS AND REGULATIONS.
- THERE IS A STATE HIGHWAY ADMINISTRATION PROJECT (CONTRACT NO. HO1495187) PROPOSED FOR IMPROVEMENTS TO ROUTE 108 IN THE VICINITY OF THE CENTENNIAL LANE/BEAVERBROOK ROAD INTERSECTION THAT EXTEND ALONG THE ROUTE 108 PROPERTY FRONTAGE. THE MDSA IMPROVEMENTS ARE SHOWN ON THIS PLAN AS "BY OTHERS". THE PROPOSED PRIVATE STORM DRAIN SYSTEM WILL CONNECT TO THE PROPOSED MDSA STORM DRAIN SYSTEM IMPROVEMENTS.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA SYSTEM. THE MICRO-SCALE PRACTICE USED IS MICRO-BIOTENTION (M-6). THESE FACILITIES SHALL 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. 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.



VICINITY MAP  
SCALE: 1"=2,000'  
ADC MAP COORDINATE: 4935-A3

### BENCHMARKS

HOWARD COUNTY BENCHMARK 29F  
N 571309.756 E 1345093.245 ELEV. 444.45  
HOWARD COUNTY BENCHMARK 300C  
N 571937.882 E 1349597.155 ELEV. 421.40

### SITE ANALYSIS DATA SHEET

LOCATION: COLUMBIA, MD; TAX MAP 29, BLOCK 15, PARCEL 106  
5TH ELECTION DISTRICT  
PRESENT ZONING: R-20  
TOTAL PROJECT AREA: 77,145 SF OR 1.771 AC  
MINIMUM LOT SIZE: 1.0 AC  
DEED REFERENCE: L17973/F.380  
PROPOSED USE OF STRUCTURE: RELIGIOUS FACILITY  
AREA OFFICES & CLASSROOM SPACE WITHIN THE 7,972 SF PROPOSED BUILDING: 2,287 SF SANITARY, A 2,108 SF FELLOWSHIP AREA, OFFICES & CLASSROOM SPACE WITHIN THE 7,972 SF PROPOSED BUILDING: 16,286 SF OR 0.443 AC (25% OF GROSS AREA)  
ALLOTTED LOT COVERAGE (BUILDINGS): 16,286 SF OR 0.443 AC (25% OF GROSS AREA)  
ALLOTTED LOT COVERAGE (BALDINGS): 7,972 SF OR 0.183 AC (10.3% OF GROSS AREA)  
ALLOTTED BUILDING HEIGHT: 34 FT  
PROPOSED BUILDING HEIGHT: 28 FT  
POST DEVELOPED IMPERVIOUS AREA: 37,785 SF OR 0.864 AC  
POST DEVELOPED GREEN AREA: 83,008 SF OR 1.906 AC  
LIMIT OF DISTURBED AREA (LOD): 83,008 SF OR 1.906 AC  
AREA OF WETLANDS & WETLAND BUFFERS: 37,785 SF OR 0.864 AC  
STREAMS AND THEIR BUFFERS WITHIN LOD: 0.00 AC  
AREA OF ON-SITE 100 YEAR FLOODPLAIN: 0.00 AC  
AREA OF EXISTING FOREST WITHIN LOD: 0.00 AC  
AREA OF STEEP SLOPES 10% AND GREATER: 0.00 AC  
AREA OF SPURGE SOILS: 58,706 SF OR 1.348 AC  
AREA MANAGED BY ESDv: 35,049 SF OR 0.804 AC  
WETLANDS AREA MANAGED BY ESDv: 23,669 SF OR 0.543 AC  
AREA UNTERMINED BY ESDv: 18,439 SF OR 0.423 AC  
DPE FILE REFERENCES: SA CASE NO. 19-031C

### PARKING TABULATION

REQUIRED PARKING:	4,545 SF
ASSEMBLY AREA (SANITARY + FELLOWSHIP)	4,545 SF
SANITARY	2,287 SF
FELLOWSHIP	2,158 SF
10 SPACES PER 1,000 SF OF ASSEMBLY AREA	46 SPACES
ACCESSIBLE PARKING SPACES REQUIRED	3 SPACES (1 W/M)
PROVIDED PARKING:	
STANDARD PARKING (9' X 18')	67 SPACES
ACCESSIBLE SPACES PROVIDED	3 SPACES (1 W/M)
TOTAL PARKING PROVIDED	71 SPACES

### SHEET INDEX

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

### DEVELOPER

NEW PATH REFORMED CHURCH  
3502 SPLIT RAIL LANE  
ELLICOTT CITY, MD 21042  
410-829-8829  
EMAIL: NPHRCHURCH@GMAIL.COM

### OWNER

KYUNG JOO YOON REVOCABLE TRUST  
9115 FATHERS LEGACY  
ELLICOTT CITY, MD 21042  
410-804-6196  
CONTACT: KYUNG JOO YOON  
EMAIL: KYOON93@GMAIL.COM

ENVIRONMENTAL CONCEPT PLAN  
COVER SHEET AND ESDv  
CONCEPT PLAN  
NEW PATH REFORMED CHURCH  
10425 CLARKSVILLE PIKE (MD RTE 108)  
ELLICOTT CITY, MD  
L. 17973 / F. 380  
TAX MAP 29 BLOCK 15  
5TH ELECTION DISTRICT  
ZONED: R-20  
PARCEL 106  
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING  
TIMMONS GROUP  
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
P: 410.461.7656 F: 410.461.8961 www.timmons.com

DESIGN BY: RHW/ACS  
CHECKED BY: ACS  
DRAWN BY: RHW  
DATE: APRIL 2021  
SCALE: AS SHOWN  
W.O. NO.: 41079

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, EXPIRES DATE: 08-27-2022

ROBERT H. VOGEL, PE No.16193

1 SHEET OF 2

ANTHONY D. SCARPONE,  
ROSE MARIE SCARPONE  
TM: 29 PARCEL: 95  
SCARPONE PROP.  
L.5559 / F. 31 PLAT: 19185  
LOT: 5 26,945 SF USE:  
RESIDENTIAL ZONED: R-20

VIRGINIA O. YOCUM  
TM: 30 PARCEL: 168  
BEAVERBROOK S5  
L. 9718 / F. 645 LOT: 17  
36,285 SF USE:  
RESIDENTIAL ZONED: R-20

JAMES J. CITRO, SR. &  
WF TM: 30 PARCEL: 168  
BEAVERBROOK S5  
L.816 / F. 304 LOT: 16  
30,492 SF USE:  
RESIDENTIAL ZONED:  
R-20

REDMOND K. BARNES  
LAUREN M. BARNES  
TM: 30 PARCEL: 168  
BEAVERBROOK S5  
L. 15198 / F. 18 LOT: 15  
31,493 SF USE:  
RESIDENTIAL ZONED: R-20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
6/21/23  
DATE  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
6/19/23  
DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT

MAPPED SOILS TYPES - HOWARD COUNTY, MARYLAND

SYMBOL	NAME/DESCRIPTION	GROUP	HYDRIC	Kw RANGE	HIGHLY ERODIBLE
DB	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8% SLOPES	A	NO	0.28	NO

NOTE:  
TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, AND HOWARD COUNTY SOIL CONSERVATION DISTRICT WEBSITE DOCUMENTS  
HTTPS://WWW.HOWARDSCO.ORG/DOCUMENTS  
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.

SPECIMEN TREE CHART

KEY (X#)	SPECIES	SIZE (IN. DBH)	CRZ (FEET RADIUS)	COMMENTS	
1	BLACK OAK	48	72	POOR TO FAIR, DECAY IN LOWER TRUNK	TO BE REMOVED
2	WHITE OAK	40	60	POOR, SOME DIEBACK, LIMITED CROWN	TO BE REMOVED
3	WHITE OAK	43.5	65.25	GOOD TO FAIR CONDITION	TO BE REMOVED
4	CHESTNUT OAK	38.5	57.75	GOOD CONDITION, LEANING CROWN	TO BE REMOVED
5	SYCAMORE	49	73.5	GOOD CONDITION, VINE COVER	TO BE REMOVED
6	SWEET GUM	30	45	GOOD CONDITION	TO BE REMOVED
7	NORWAY MAPLE	32	48	POOR, STORM DAMAGE	TO BE REMOVED
8	BLACK CHERRY	40*	60	POOR, MULTI-STEMMED ABOVE BH, NOTABLE ROT	TO BE REMOVED

\* MEASURED MULTI-STEM TREE AT 18" FROM GROUND

### ENVIRONMENTAL SITE DESIGN NARRATIVE

- THE SUBJECT PROPERTY IS CURRENTLY UNDEVELOPED. THERE ARE NO ENVIRONMENTAL AREAS ON SITE. THE CLOSEST ENVIRONMENTALLY SENSITIVE AREA IS A STREAM APPROXIMATELY 2,000 FT SOUTH OF THE PROPERTY. NOTE THAT THERE ARE 8 SPECIMEN TREES, ALL OF WHICH ARE TO BE REMOVED.
- THE SITE NATURALLY SLOPES FROM THE SOUTHEAST CORNER OF THE PROPERTY TO THE NORTHWEST. 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-BIOTENTION FACILITIES (M-6).
- SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF SUPER SILT FENCE PERMIETER 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 MICRO-SCALE PRACTICE OF MICRO-BIOTENTION FACILITIES (M-6). THE PROPOSED PRACTICES HAVE BEEN MAXIMIZED TO THE EXTENT PRACTICAL. THE CALCULATED RAINFALL TREATMENT (PE) FOR THIS PROJECT IS 2.0", AND THE TOTAL RUNOFF VOLUME (ESDv) REQUIRED IS 6,544 CF.
- AN ALTERNATIVE COMPLIANCE REQUEST FOR REMOVAL OF SPECIMEN TREES IS REQUESTED IN ORDER FOR THE PROPOSED DESIGN TO BE DEVELOPED. SIGNIFICANT DESIGN CHANGES MAY OCCUR BASED ON THE REVIEW OF THIS PLAN AND THE ALTERNATIVE COMPLIANCE REQUEST.

### ESDv CONCEPT PLAN

SCALE 1"=30'

### LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING PAVING
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- EXISTING TREE LINE
- EXISTING SPECIMEN TREE TO BE REMOVED
- EXISTING OVERHEAD LINE
- EXISTING MAILBOX
- EXISTING JUNCTION BOX
- EXISTING SIGN
- EXISTING UTILITY POLE
- PROPOSED CURB & GUTTER
- PROPOSED CONTOUR
- PROPOSED PRIVACY FENCE
- PROPOSED TREE LINE
- PROPOSED LIGHT POLE
- PROPOSED BUILDINGS ACCESS
- LIMIT OF DISTURBED AREA
- PROPOSED MICRO-BIOTENTION
- PROPOSED STORM DRAIN (PRIVATE)
- PROPOSED STORM DRAIN (MDSA IMPROVEMENTS BY OTHERS)
- PROPOSED STORM DRAIN INLET
- PROPOSED SIDEWALK

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

Material	Specification	Notes
Plantings	see Appendix A, Table A.4	plantings are site-specific
Filtering soil (2" to 4" deep)	USDA soil types loamy sand or sandy loam; clay content < 3% or sandy loam (20%); coarse sand (20%); compost (40%)	
Organic content	Min. 10% by dry weight (ASTM D 2974)	aged 6 months, minimum no pine or wood chips
Mulch	shredded hardwood	
Pea gravel diaphragm	pea gravel: ASTM-D-448	No. 8 (or No. 9 (1/8" to 3/8"))
Curb/drain	conventional stone: washed cobblestones	stone: 2" to 5"
Geotextile	AASHTO-M-43	FE Type 1 nonwoven
Gravel (underdrain and filtration berms)	4" or 5" or No. 6 AGRGROATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	Slotted or perforated pipe, 3/8" per ft @ 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-inch galvanized hardware cloth.
Poured in place concrete (if required)	MSHA Min No. 3; 1" ±, 3500 psi @ 28 days normal weight, air-entrained; reinforcing to meet ASTM-A615-60	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 precast/segmental concrete or local materials requires design drawings scaled and approved by a professional structural engineer licensed in the State of Maryland; design to include meeting ACI Code 350.8R(9); vertical loading (10 to 100) allowable horizontal loading based on soil pressure; soil analysis of potential cracking.
Sand	AASHTO-M-66 or ASTM-C-33	Sand substitutions such as Diabase and Graystone (AASHTO #10) are not acceptable. No calcium carbide or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

**OPERATION AND MAINTENANCE SCHEDULE FOR LANSCAPE 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 REMOVE DEAD AND DISEASED VEGETATION CORRECTED BEFORE TREATMENT. REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TEST POSITIVE TREES AND SHRUBS, AND REPLACE ALL DORMANT STAKES AND WIRES.
3. 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.
4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

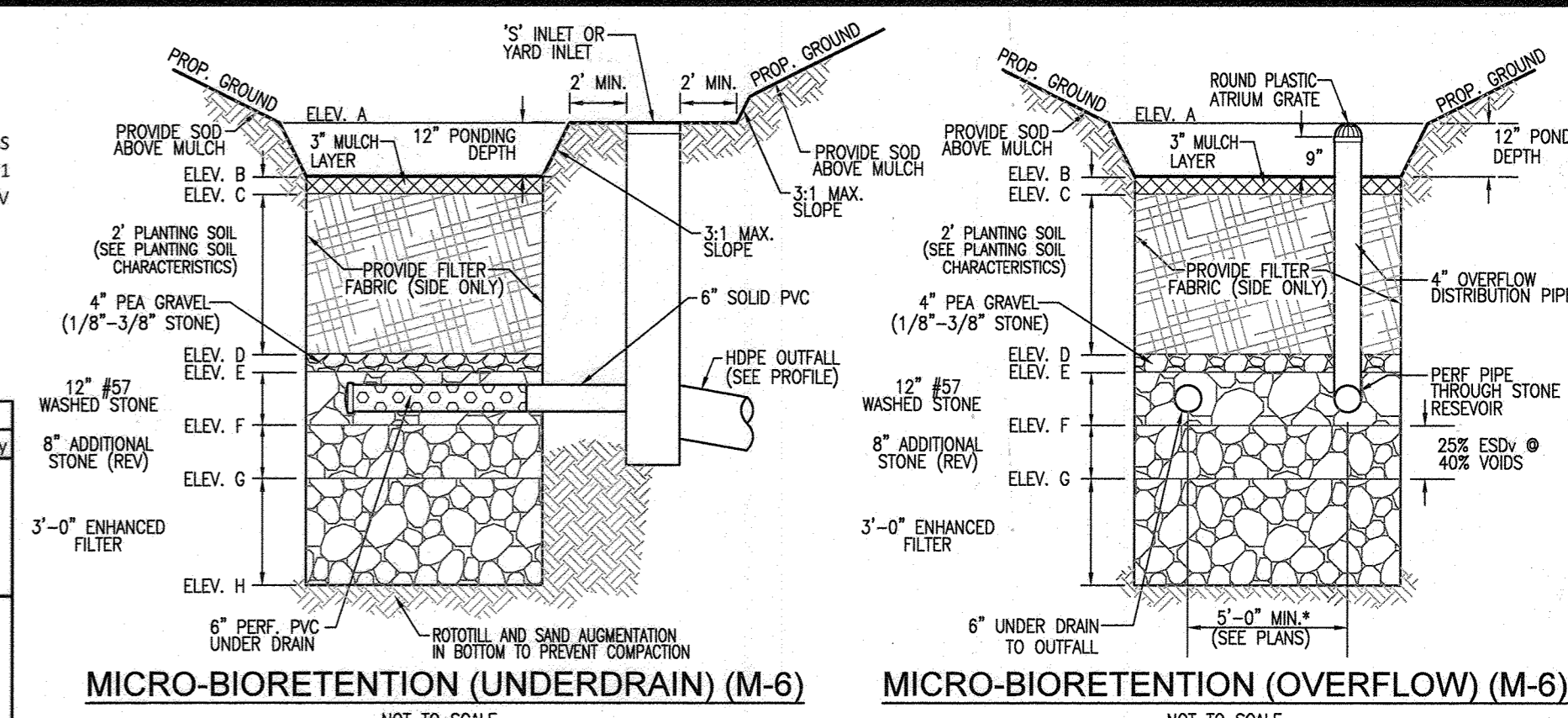
**APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS**

- 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 15.06.01.05. 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%-85%) AND COMPOST (35% TO 40%) OR SANDY LOAM (50%), COARSE SAND (30%), AND COMPOST (40%).
  - CLAY CONTENT - MEAN 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 INTO THE SOIL TO INCREASE OR DECREASE PH.
 THERE SHALL BE AT LEAST ONE SOIL TEST PER PRACTICE. THE 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 DETAILED.
- 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 LAZERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARCH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TIRE 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 RESON FAILURE.  
COMPACTION CAN BE ALLEVATED 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 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.
- 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 SUBSTRONG TO A UNIFORM THICKNESS OF 2" TO 3" SHREDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIPHERY OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE.  
SHREDED MULCH MUST BE WELL KEPT (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 50% TO 75% OF THE BALL IS ABOVE FINA GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST 30 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 BRANDED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE LOCALLY SPOILED 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 PLANTS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.  
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATTER TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS BEYOND 20 AT A MINIMUM, WEEDS, AND 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.
- 6. UNDERDRAINS**  
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
  - PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID 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 HOPE).
  - 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 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 0.2% SLOPE.
  - A REED, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1000 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".
  - THIS MAIN COLLECTOR PIPE SHALL BE DOWN SLOPING AND BE CONNECTED 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).
- 7. MISCELLANEOUS**  
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

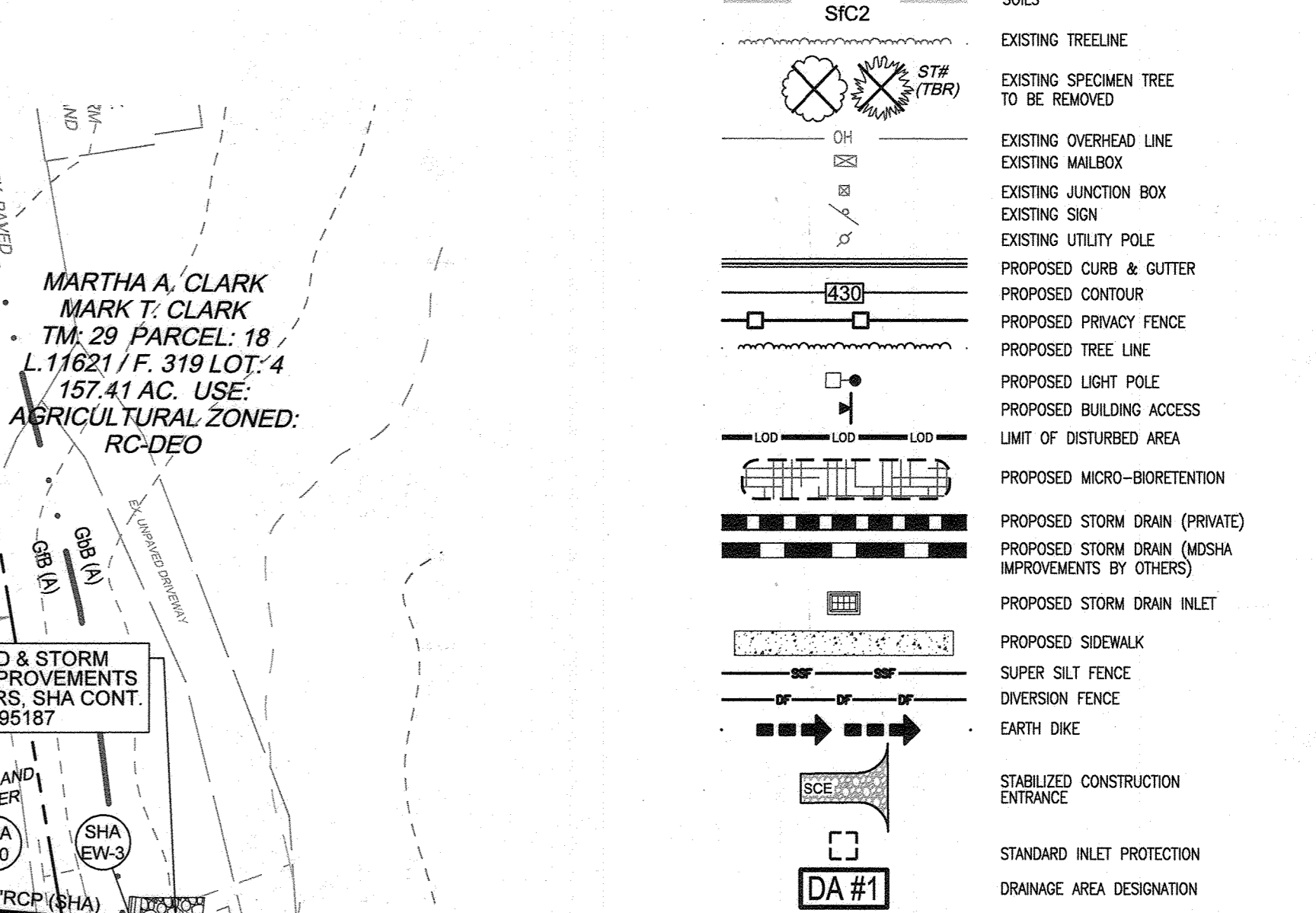
**INDIVIDUAL PRACTICE ESDv DESIGN COMPUTATIONS**

Project: NEW PATH REFORMED CHURCH  
 Development Area: 1.77 AC.  
 Post Development Impervious: 0.90 AC.  
 Total Impervious Pe: 2.00  
 Target ESDv Required: 6,544 c.f.  
 ESDv Provided: 6,648  
 ESDv: (Pe + Rv x A)/12  
 Rv=0.05+0.0001  
 Vmin 1yr rainfall = 1"  
 Vmax 1yr rainfall = 2.6"

PRACTICE	PRACTICE DA (SF)	PRACTICE DA (AC)	IMPV (SF)	IMPV (AC)	PERV (SF)	PERV (AC)	PRACTICE % IMPERV	PRACTICE Rv	PRACTICE 1" MIN VOLUME	PRACTICE TARGET P <sub>i</sub> VOLUME	PRACTICE 2.6" MAX VOLUME	TOTAL VOLUME PROVIDED (CF)	Rev REQUIRED	Rev PROVIDED	REMARKS	depth	porosity
MBR#1	18,267	0.419	8,927	0.205	9,340	0.214	49%	0.49	746	1,491	1,939	1,552	290	290	MICROSCALE MICRO-BIORETENTION (M-6)		
SWM#1												1,160	870	870	Surface Area of MBR @ 1.0 ponding (75% above)		
SWM#2	11,794	0.271	8,164	0.187	3,630	0.083	69%	0.67	661	1,323	1,720	1,509	293	293	MICROSCALE MICRO-BIORETENTION (M-6)		
SWM#3	21,510	0.494	13,996	0.321	7,514	0.173	65%	0.64	1,139	2,279	2,962	2,680	501	501	MICROSCALE MICRO-BIORETENTION (M-6)		
SWM#4	7,135	0.164	3,952	0.091	3,182	0.073	55%	0.55	326	652	848	847	158	158	MICROSCALE MICRO-BIORETENTION (M-6)		
<b>TOTAL AREA TREATED BY ESDv</b>	<b>58,706</b>	<b>1.348</b>	<b>35,040</b>	<b>0.804</b>	<b>23,666</b>	<b>0.543</b>	<b>60%</b>	<b>0.59</b>				<b>6,648</b>	<b>1,243</b>	<b>1,243</b>			



- MICRO-BIORETENTION NOTES:**
1. ONLY THE SIDES OF MICRO-BIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER 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 UNDERDRAIN PIPE WITH 1/2" MESH (#4) OR SMALLER GALVANIZED HARDWARE CLOTH. PROVIDE 5" MINIMUM SPACING BETWEEN UNDERDRAIN AND PERFORATED PIPE THROUGH STONE RESERVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL DIPS (SEE PLANS).



- 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. THERE ARE NO ENVIRONMENTAL FEATURES, FLOODPLAINS, WETLANDS, STREAMS OR FOREST THAT EXISTS ON THIS PROPERTY OR WITHIN THE DEVELOPED AREA.

<b>DEVELOPER</b> NEW PATH REFORMED CHURCH 3652 SPRL RAIL LANE ELLICOTT CITY, MD 21042 EMAIL: NPROCHURCH@GMAIL.COM	<b>OWNER</b> KYUNG JOO YOON REVOCABLE TRUST 911 NATHAN LEE CIRCLE ELLICOTT CITY, MD 21042 410-804-5156 CONTACT: KYUNG JOO YOON EMAIL: KYJOON88@GMAIL.COM
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**ENVIRONMENTAL CONCEPT PLAN**  
**STORMWATER MANAGEMENT DRAINAGE AREA MAP & DETAILS**  
 NEW PATH REFORMED CHURCH  
 10425 CLARKSVILLE PIKE (MD RTE 108)  
 ELLICOTT CITY, MD  
 L 17973 / F 380  
 TAX MAP 29 BLOCK 18  
 5TH ELECTION DISTRICT  
 ZONED: R-20  
 PARCEL 108  
 HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410.461.7666 F: 410.461.8961 www.timmons.com

**TIMMONS GROUP**  
 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.  
 EXPIRATION DATE: 09-27-2022

DESIGN BY: RHV/ACS  
 DRAWN BY: ACS  
 CHECKED BY: RHV  
 DATE: APRIL 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 41079

2 OF 2

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

DATE: 6/15/23

DATE: 6/15/23

CHIEF, DEVELOPMENT ENGINEERING DIVISION

CHIEF, DIVISION OF LAND DEVELOPMENT

