

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 FREDERICK WARD ASSOCIATES, PERFORMED IN JULY, 2002. OFFSITE TOPOGRAPHY IS FROM HOWARD COUNTY GIS.
- THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY FREDERICK WARD ASSOCIATES, DATED JULY, 2002.
- 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. 41C2 AND 0057 WERE USED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED "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 FOREST CONSERVATION EASEMENT AREAS.
- THIS PROPERTY IS NOT LOCATED WITHIN THE METROPOLITAN DISTRICT.
- WATER AND SEWER SERVICE FOR THIS PROJECT IS TO BE FROM 34-1849-D.
- THERE ARE NO FLOODPLAIN ON THE PROPERTY.
- THERE ARE NO STEEP SLOPES OVER 20,000 CONTIGUOUS SQUARE FEET ON THE PROPERTY.
- THIS PROPERTY IS LESS THAN 40,000 SF. FOREST CONSERVATION IS NOT REQUIRED FOR THIS PROPERTY.
- THERE ARE NO WETLANDS, STREAMS OR BUFFERS PRESENT ON THE SITE.
- JUDY LANE AND NEWBERRY DRIVE ARE LOCAL ROAD.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS OR CEMETERIES ON THIS PROPERTY. THERE IS ONE EXISTING STRUCTURE ON THIS SITE TO BE REMOVED. THE SITE IS NOT LISTED ON THE HISTORIC SITES INVENTORY.
- 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 PRACTICES USED ARE MICRO-BIORETENTION FACILITY (M-6) AND FOUR DRYWELLS (M-5). 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 COUNTY 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.
- NO WAIVER PETITIONS OR/AND ALTERNATIVE COMPLIANCE FOR ENVIRONMENTAL DISTURBANCE OR ENCROACHMENTS ARE REQUIRED FOR THIS PROJECT.

ENVIRONMENTAL SITE DESIGN NARRATIVE:

- THE PROPERTY IS A GENERALLY LEVEL LOT. THERE IS NO FOREST, WETLAND, AND STREAM ON SITE.
- THE SITE NATURALLY SLOPES FROM EAST TO WEST. 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 FACILITY (M-6), AND DRYWELLS (M-5).
- SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF EARTH DIKE AND SILT FENCE PERIMETER CONTROLS. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD COUNTY 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-BIORETENTION FACILITY (M-6), AND DRYWELLS, THE CALCULATED RAINFALL TARGET (PE) FOR THIS PROJECT IS 1.80", AND THE TOTAL RUNOFF VOLUME (ESDV) REQUIRED IS 877 CF.
- NO WAIVER PETITIONS OR/AND ALTERNATIVE COMPLIANCE FOR ENVIRONMENTAL DISTURBANCE OR ENCROACHMENTS ARE REQUIRED FOR THIS PROJECT.

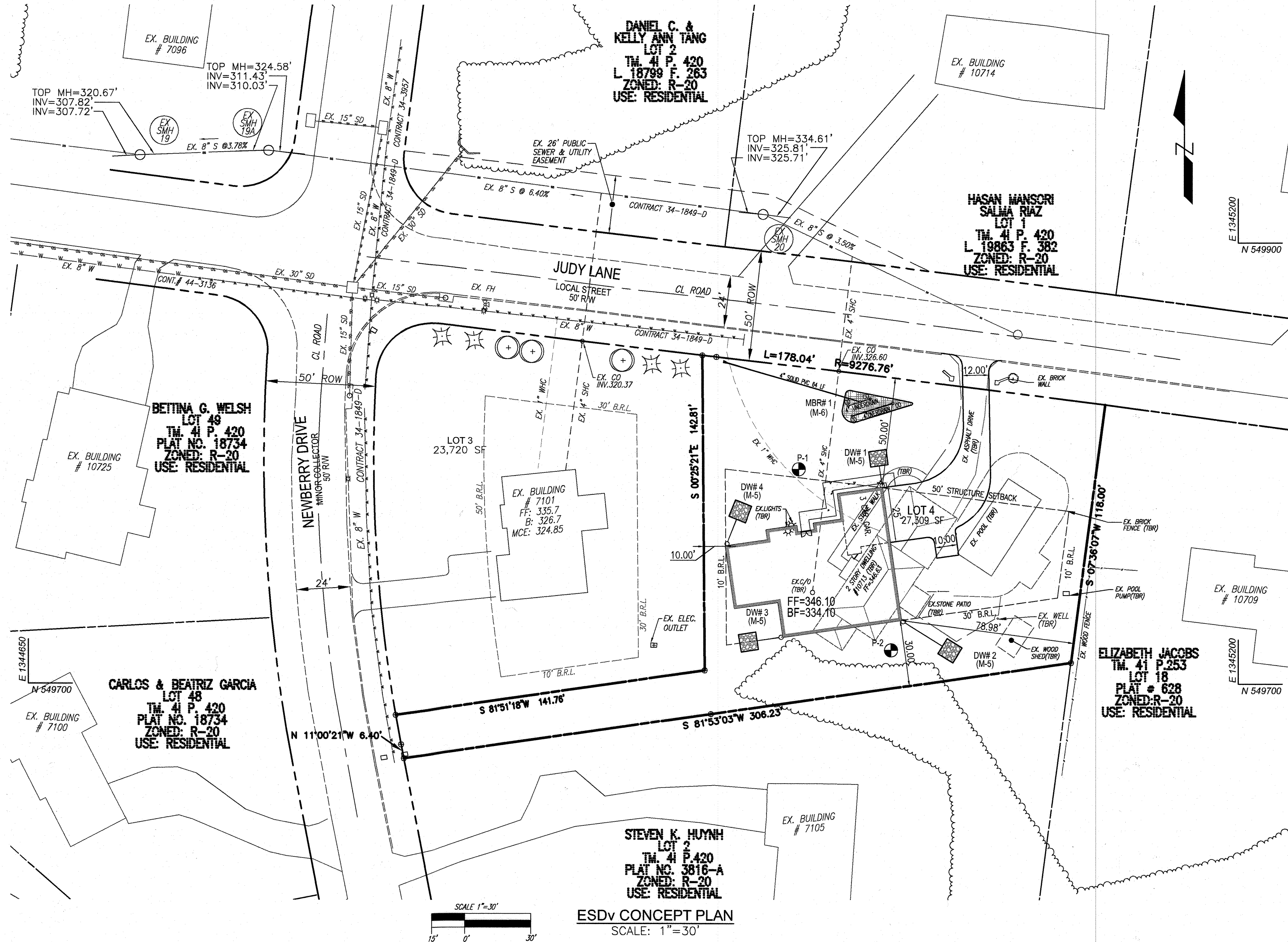
SITE ANALYSIS DATA CHART

TOTAL PROJECT AREA:	0.62 AC.
NET AREA OF PROJECT:	0.62 AC.
AREA OF WETLANDS AND WETLAND BUFFERS:	0.00 AC.
AREA OF FLOODPLAIN:	0.00 AC.
AREA OF FOREST:	0.00 AC.
AREA OF MODERATE SLOPES (15% TO 24.99%):	0.00 AC.
AREA OF STEEP SLOPES (25% OR GREATER):	0.00 AC.
ERODIBLE SOILS:	2,970 SF / 0.068 AC.
LIMIT OF DISTURBED AREA:	0.46 AC.
PROPOSED USES FOR SITE AND STRUCTURES:	RESIDENTIAL (OPEN AND ENVIRONMENTAL)
GREEN OPEN AREA:	0.50 AC.
PROPOSED IMPERVIOUS AREA:	0.12 AC.
PRESENT ZONING DESIGNATION:	R-20
DPZ FILE REFERENCES:	XXX

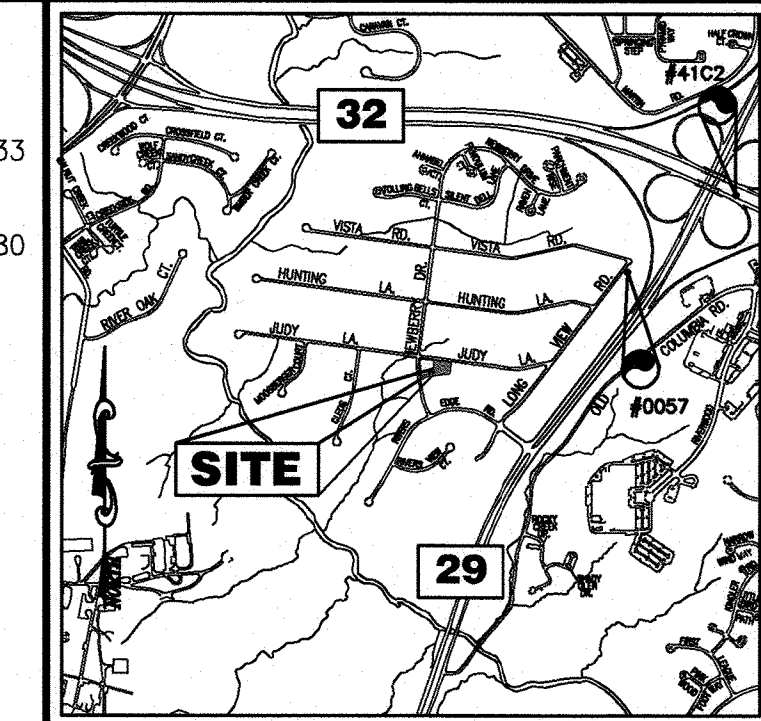
ENVIRONMENTAL CONCEPT PLAN

JUDY LANE

HOWARD COUNTY, MD



BENCHMARKS
 HOWARD COUNTY BENCHMARK - 0057
 N 550835.21 E 1347017.66 ELEV.: 398.933
 HOWARD COUNTY BENCHMARK - 41C2
 N 551616.41 E 1348104.23 ELEV.: 395.180



VICINITY MAP
 SCALE: 1"=2,000'
 ADC MAP = 32 D6

LEGEND:

[Symbol]	PROPERTY LINE
[Symbol]	RIGHT-OF-WAY LINE
[Symbol]	ADJACENT PROPERTY LINE
[Symbol]	EXISTING PAVING
[Symbol]	EXISTING TREELINE
[Symbol]	EXISTING FENCE
[Symbol]	EXISTING TREE
[Symbol]	EXISTING MAILBOX
[Symbol]	EXISTING JUNCTION BOX
[Symbol]	EXISTING SIGN
[Symbol]	EXISTING UTILITY POLE
[Symbol]	EXISTING SANITARY MANHOLE
[Symbol]	EXISTING SANITARY LINE
[Symbol]	EXISTING CLEANOUT
[Symbol]	EXISTING FIRE HYDRANT
[Symbol]	EXISTING WATER LINE
[Symbol]	EXISTING STORMDRAIN
[Symbol]	MICRO BIO-RETENTION

SHEET INDEX

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

MAPPED SOILS TYPES - HOWARD COUNTY, MARYLAND

SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	Kw	RANGE	ERODIBLE	SHOULDER
G1B	GLADSTONE-URBAN LAND COMPLEX, 0-8 PERCENT SLOPES	A	NO	0.28	NO		
G1C	GLADSTONE-URBAN LAND COMPLEX, 8-15 PERCENT SLOPES	A	NO				
M2D	MANOR LOAM, 15-25 PERCENT SLOPES, VERY ROCKY	B	NO	0.28	YES		

NOTE: TAKEN FROM: USDA, SCS-WEB SOIL SURVEY AND HOWARD COUNTY SOIL CONSERVATION DISTRICT WEBSITE DOCUMENTS. [HTTPS://WWW.HOWARDSCD.ORG/DOCUMENTS](https://www.howardscd.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

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 2/15/23
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 2/9/23
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

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

Table B.4.1 Materials Specifications for Micro-Bioretenion, Rain Gardens & Landscape Infiltration-

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific.
Planting soil (2' to 4' deep)	loamy sand (60-65%) & compost (35-40%) or sandy loam (30%) & coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mesh	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel (diaphragm)	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO-M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" TO 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 2" of gravel over pipe; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth.
Poured in place concrete (if required)	MSHA Mix No. 3, f _c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-A15-00	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 350.R.89; vertical loading (16-10 or 16-20); allowable horizontal loading (based on soil pressures); and analysis of potential cracking.
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO #10) are not acceptable. No calcium carbide or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

OWNER/DEVELOPER
 QINGYU CHEN
 8211 GUNNAR DR.
 FULTON, MD 20759
 PHONE: 917-330-4000

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
 COVER SHEET
 AND ESDV CONCEPT PLAN
JUDY LANE
 10713 JUDY LANE, COLUMBIA, MD 21044
 ZONE: R-20

TAX MAP 41 BLOCK 11
 5TH ELECTION DISTRICT

HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING
 (+)
TIMMONS GROUP
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043
 P: 410.461.7666 F: 410.461.8961 www.timmons.com

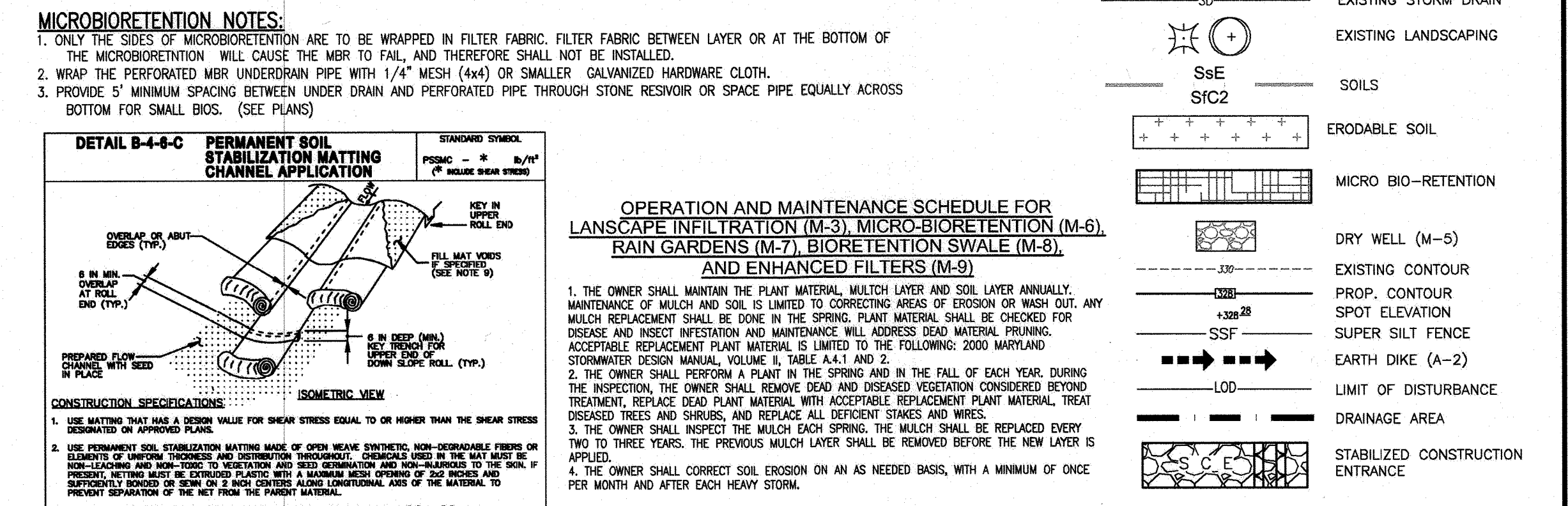
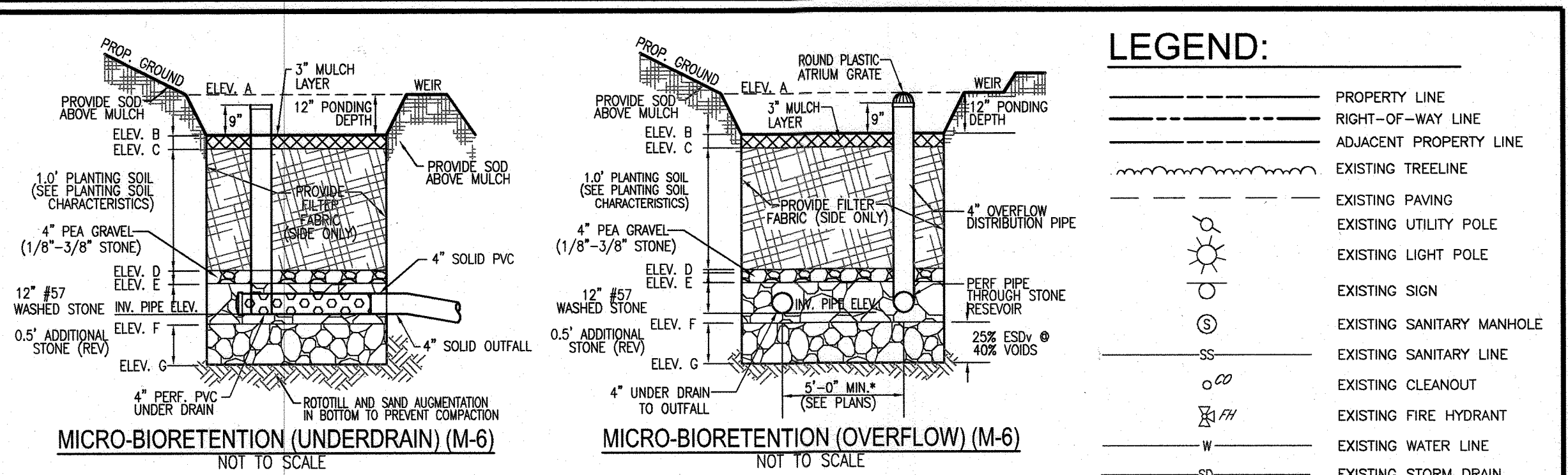
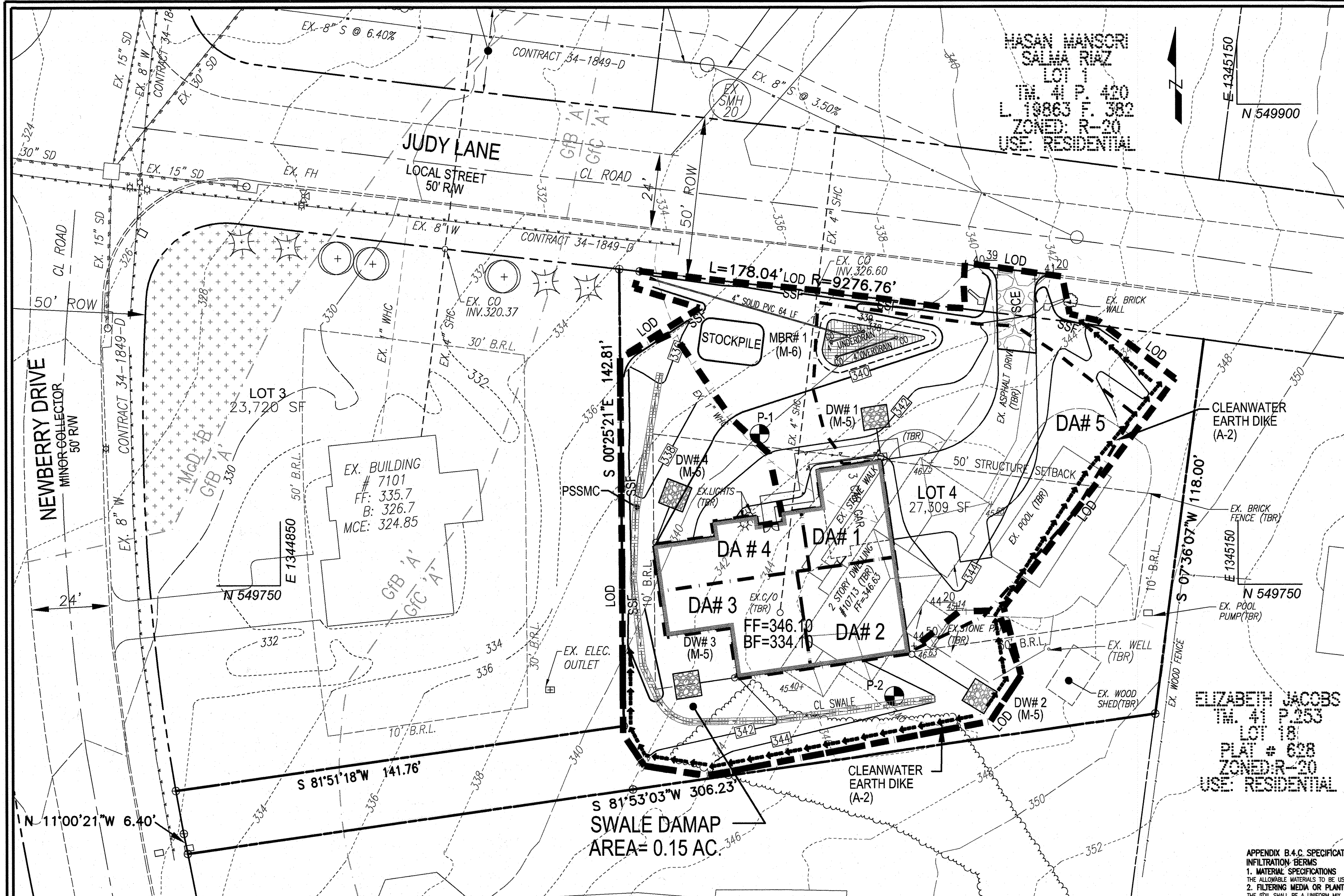
PROFESSIONAL CERTIFICATE

DESIGN BY: RHY
 DRAWN BY: KG
 CHECKED BY: RHY
 DATE: JANUARY 2023
 SCALE: 1"=30'
 W.O. NO.: 2024052

STATE OF MARYLAND
 REGISTERED PROFESSIONAL ENGINEER
 ROBERT H. VOGEL, PE No. 16193

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, EXPIRING DATE 06-27-2029.

1 SHEET OF 2



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 MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.6.1 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 DISHEAVED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISHEAVED TREES AND SHRUBS AND REPLACE ALL DEFECTIVE 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.

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

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

CELL - SIZING CHART

ESD DA	LOT #	DW LOCATION	NUMBER OF DW'S	FACE SIZE FT X FT	STONE DEPTH FT	SAND DEPTH FT
DA-1	4	R	1	7.00 X 8.00	4	1
DA-2	4	R	1	8.00 X 8.00	4	1
DA-3	4	R	1	8.00 X 8.00	4	1
DA-4	4	F	1	8.00 X 8.00	4	1

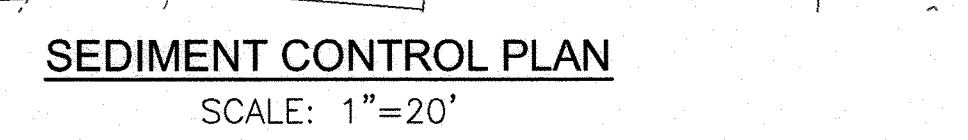
MICRO BIORETENTION DATA CHART

MBR Facility	Ponding Depth (ft)	Ponding Elevation ELEV. A	Top of Mulch ELEV. B	Bottom of Mulch ELEV. C	Depth of Plant Mix	Bottom of Plant Mix ELEV. D	Bottom of Pea Gravel ELEV. E	Depth of Stone (ft.)	Bottom of Stone ELEV. F	Invert of Underdrain INV. ELEV.	Bottom of Stone ELEV. G
1	1.00	339.00	338.00	337.75	1.00	336.75	336.42	1.00	335.42	335.75	334.92

TIMMONS GROUP + VOGEL ENGINEERING

ENVIRONMENTAL SITE DESIGN PRACTICE (CF)

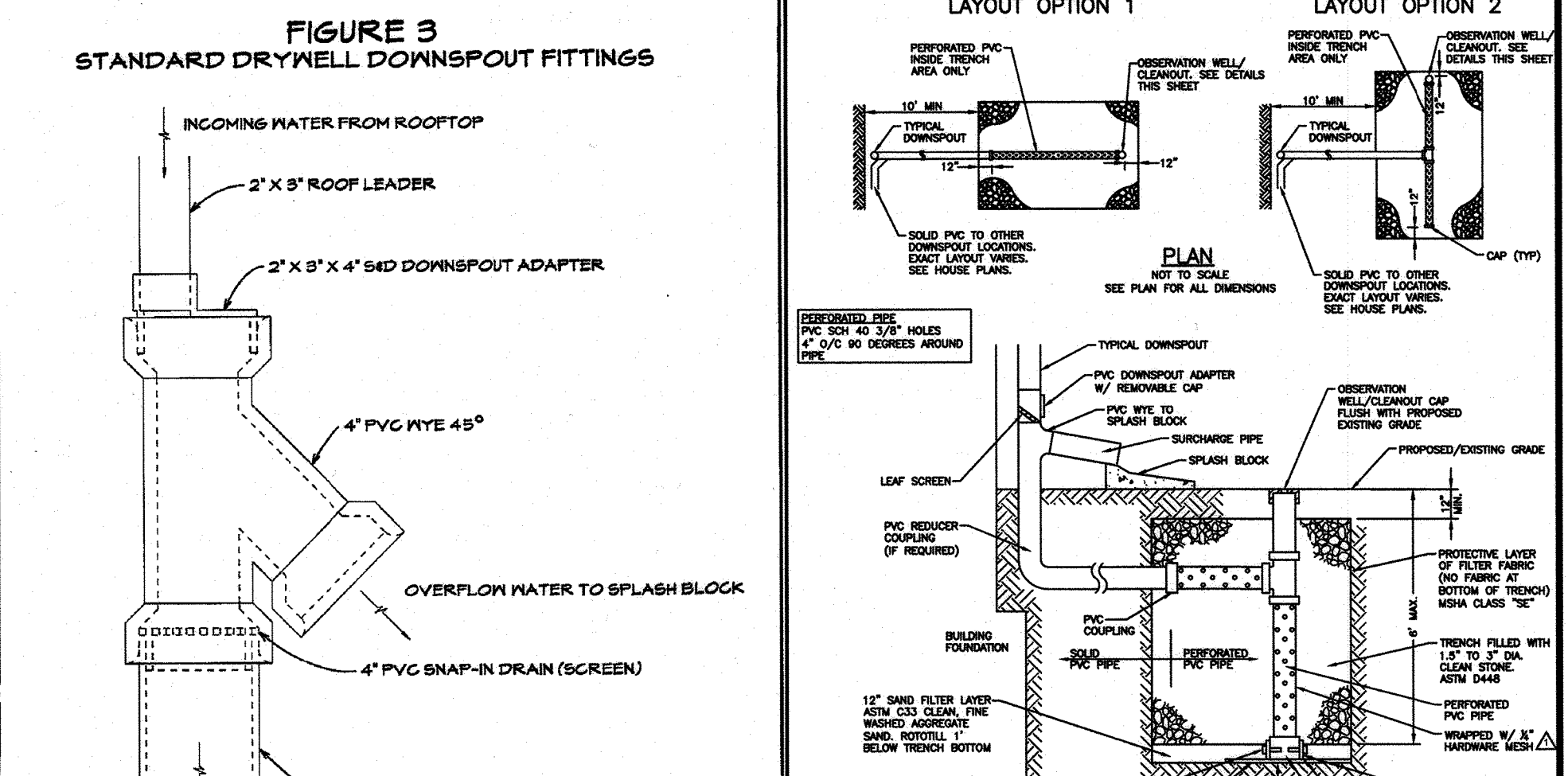
DRAINAGE AREA #	TREATED AREA	FACILITY NUMBER	PERM PAVEMENT	MICRO BIORETENTION	GRASS SWALE	BIO SWALE	NON DISCONNECT	ROOFTOP	DRY WELL	ESD#	VOLUME
LOT 4	3,498	DW 1-4	0	0	0	0	0	0	0	496	496
LOT 4	4,500	MBR-1	0	387	0	0	0	0	0	387	387
			0	0	0	0	0	0	0	0	0



VOGEL ENGINEERING + TIMMONS GROUP

INDIVIDUAL PRACTICE ESDV DESIGN COMPUTATIONS

PRACTICE	DA #	PRACTICE DA (AC)	PRACTICE DA (AC)	IMPV. (SF)	IMPV. (AC)	PERF. (SF)	PERF. (AC)	TOTAL VOLUME PROVIDED	Flow Required	Flow Provided	REMARKS	
DA #1	804	0.02	804	0.02	0	0.00	0.00	64	165	332	MICROSCAL DRYWELL (M-5)	
DA #2	955	0.02	955	0.02	0	0.00	0.00	74	192	328	MICROSCAL DRYWELL (M-5)	
DA #3	980	0.02	980	0.02	0	0.00	0.00	78	202	328	MICROSCAL DRYWELL (M-5)	
DA #4	790	0.02	790	0.02	0	0.00	0.00	62	160	328	MICROSCAL DRYWELL (M-5)	
DA #5	4,500	0.10	1,751	0.04	2,709	0.06	0.04	0.11	398	387	87	MICROSCAL MICRO-BIORETENTION (M-6)
TOTALS									885			



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 2/15/23 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 2/14/23 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT

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

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 DAMPED WITH THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH OR PROVIDE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERRAND 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 (30% 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.

THESE 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 USED. METHODS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL IS EXCAVATED.

3. COMPACTION

IT IS VERY IMPORTANT TO MAINTAIN COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE OR LIGHT SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TIRE TYPE TRUCKS OR 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 CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGHOUT 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 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

THE MOST 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 SUPERIMPOSED 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 MOUTH OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDED MULCH MUST BE WELL AERED (6 TO 12 MONTHS) FOR ACCEPTANCE. ROOTBOOTS OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALLS SHOULD BE PLANTED SO 1/3RDS OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST 6 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 LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLOWS SHALL BE PLANTED FOLLOWING THE HIGH-GRASS COVER PLANTING SPECIFICATIONS ON THE OUTSIDE OF THE TREE BALL. 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, DEFERS, OR AT A MINIMUM, IMPROVES THIS GOAL. ONLY FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL WATER DEFERS, 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 RIBBON PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PERFORATED MATERIAL IS SLOTTED, 4" RIBBON PIPE (E-COR PVC OF 40%).
- * PERFORATIONS - PERFORATION 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 4A) GALVANIZED HARDWARE CLOTH.
- * DRAGS - IN THE GRAVEL LAYER (NO. 57 STONE PERFORATED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
- * THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
- * A RIBBON, 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 BIORETENTION FACILITY. THE OBSERVATION WELL SHALL BE AT LEAST 6 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 LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLOWS SHALL BE PLANTED FOLLOWING THE HIGH-GRASS COVER PLANTING SPECIFICATIONS ON THE OUTSIDE OF THE TREE BALL. 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, DEFERS, OR AT A MINIMUM, IMPROVES THIS GOAL. ONLY FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL WATER DEFERS, AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.
- * EXCESSIVE 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 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS

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

ENVIRONMENTAL CONCEPT PLAN

STORMWATER MANAGEMENT DRAINAGE AREA MAP & DETAILS

JUDY LANE

10713 JUDY LANE, COLUMBIA, MD 21044

ZONE: R-20

TAX MAP 41 BLOCK 11 5TH ELECTION DISTRICT

PARCEL 420 HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING

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DESIGN BY: RHW

DRAWN BY: KG

CHECKED BY: RHW

DATE: JANUARY 2023

SCALE: 1"=30'

W.O. NO.: 2024052

2 SHEET OF 2

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. 16193 EXPIRES 09/29/2024

ROBERT H. VOGEL, PE No. 16193