

BENCHMARKS

HOWARD COUNTY GEODETIC SURVEY CONTROL 36HA
 N 555,116.606 E 1,354,381.451 ELEV.: 292.221 FT.
 BROKEN LAND PARKWAY & CRADLECK WAY (N)

HOWARD COUNTY GEODETIC SURVEY CONTROL 36EA
 N 556,986.803 E 1,354,530.280 ELEV.: 354.861 FT.
 BROKEN LAND PARKWAY 0.1 MILE S OF STEVENS FOREST ROAD

VICINITY MAP
 SCALE: 1"=2000'
 ADC MAP 33, GRID C4

- ### GENERAL NOTES
- THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS NOTED OTHERWISE.
 - THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC. DATED NOVEMBER 2015. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
 - THE PROJECT BOUNDARY IS BASED ON THE SDP-92-75 PLAT 10361.
 - 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. 36HA AND 36EA WERE USED FOR THIS PROJECT.
 - THE SUBJECT PROPERTY IS ZONED "OPEN SPACE" IN ACCORDANCE WITH THE 10/6/2013 COMPREHENSIVE ZONING REGULATIONS AND FDP-212.
 - NO GRADING, REMOVAL OF VEGETATION COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAMS OR OTHER BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
 - THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
 - WORK FOR THIS PROJECT IS TO BE SERVICE CONNECTIONS FROM CONTRACT NO. 24-3157.
 - SEARCH FOR THIS PROJECT IS TO BE SERVICE CONNECTIONS FROM CONTRACT NO. 24-3157-D.
 - EXISTING UTILITIES LOCATED FROM TOPOGRAPHIC SURVEY AND AS-BUILT DRAWINGS. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MINIMIZE UNNECESSARY SERVICE.
 - A FLOODPLAIN IS LOCATED ON SITE (PLAT 3118). NO DISTURBANCE IS PROPOSED.
 - NO STEEP SLOPES BY HOWARD COUNTY DEFINITION, OVER 20.00% CONTIGUOUS ARE LOCATED ON SITE. ALL MODERATE AND/OR STEEP SLOPES SHOWN HEREON ARE NON-HIGH SLOPES. REFER TO SDP-92-75 PROPOSED GRADING.
 - THIS PROPERTY IS ZONED IN NEW TOWN AND IS THEREFORE EXEMPT FROM FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202D(1)(A) FOR A PLANNED UNIT DEVELOPMENT WHICH HAS PREVIOUSLY DEVELOPMENT PLAN APPROVAL AND IS SILENT OR MORE DEVELOPED BEFORE DECEMBER 31, 1992.
 - A METAL REPORT WAS COMPLETED BY HANNA & ROHDE, INC. APRIL 2016, REVISION NOVEMBER 2016.
 - GEOTECHNICAL INVESTIGATIONS SHALL COMPLETED AS PART OF THE FUTURE SUBDIVISION PLAN PHASE.
 - FOREST STAND DETERMINATION PLAN PREPARED BY HANNA & ROHDE, INC. APRIL 2016.
 - TO THE BEST OF THE OWNER'S KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
 - STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. THESE FACILITIES WILL BE PROPERLY MAINTAINED AND MONITORED.
 - 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 FUTURE PLAN SHALL INCLUDE A SCHEDULE OF CONSTRUCTION WHICH SHALL, BUT NOT BE LIMITED TO, ADDRESS THE PROPOSED SCHEDULE CONTROL, SCHEDULE STORMWATER MANAGEMENT REQUIREMENTS.

LEGEND:

	EXISTING CONTOUR		EXISTING FENCE
	PROPOSED CONTOUR		PROPERTY LINE
	EXISTING SPOT ELEVATION		RIGHT-OF-WAY LINE
	STEEP SLOPES (10% OR GREATER)		SOIL DIVIDE
	EXISTING CURB AND GUTTER		PROPOSED TREE LINE
	EXISTING UTILITY POLE		WATER LINE
	EXISTING LIGHT POLE		MICRO BIORETENTION FACILITY
	EXISTING SIGN		CONCRETE
	EXISTING SANITARY MANHOLE		ASPHALT PATHWAY
	EXISTING SANITARY LINE		SYNTHETIC TURF
	EXISTING WATER LINE		NON-ROOFTOP DISCONNECTION AREA <5% SLOPE
	EXISTING STORM DRAIN		SILT FENCE
	STORM DRAIN PIPE		SUPER SILT FENCE
	STORM DRAIN INLET		DIVERSION FENCE
	EXISTING FIELD LOCATED TREE		LIMIT OF DISTURBANCE
	EXISTING TREE LINE		STABILIZED CONSTRUCTION ENTRANCE
	LANDSCAPING APPROVED UNDER SDP-92-075		EARTH DIKE
	STORMWATER MANAGEMENT DRAINAGE AREA DIKE		FOREST CONSERVATION EASEMENT

OWNER - PARCEL A-1
 HOWARD COUNTY MARYLAND
 DEPARTMENT OF PUBLIC WORKS
 3430 COURT HOUSE
 ELLICOTT CITY, MD. 21043
 410-313-4401

OWNER - PARCEL B-1
 THE HOWARD RESEARCH AND
 DEVELOPMENT CORPORATION
 P.O. BOX 8333
 COLUMBIA MD 21044
 410-992-4377

OWNER
 O.S. LOT 65 - PARCEL 405
 BOARD OF EDUCATION
 HOWARD COUNTY
 10910 CLARKSVILLE PIKE
 ELLICOTT CITY MD 21042

SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN

EAST COLUMBIA LIBRARY PARK
 COLUMBIA VILLAGE OF OWEN BROWN
 PARCELS A-1, B-1 AND OPEN SPACE LOT 65

PARCEL A-1 & B-1
 TAX MAP 36 GRID 21
 OPEN SPACE LOT 65
 TAX MAP 36 GRID 21
 6TH ELECTION DISTRICT

ZONED: NT
 ZONED: NT
 SDP-92-075

PARCEL 275
 P/O PARCEL 405
 HOWARD COUNTY, MARYLAND

HUMAN & ROHDE, INC.
 Landscape Architects
 512 Virginia Ave.
 Towson, Maryland 21286
 (410) 825-3885 Phone
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ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET
 ELLICOTT CITY, MD 21043
 TEL: 410.461.7666
 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE

DESIGN BY: RHV / EDS
 DRAWN BY: RVE
 CHECKED BY: RHV
 DATE: JANUARY 2017
 SCALE: AS SHOWN
 W.O. NO.: 15-06

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: 09-27-2018.

1 SHEET OF 5

MAPPED SOILS TYPES - SAVAGE NW MAP #18

SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	PERCENT WETLANDS	Kw	RANGE *	CRS SLOPE PROPORTION
Guj3	Glaciously-urban land complex, 0 to 8 percent slopes	R	NO	0	0.20	NO	NO
Guj2	Glaciously-urban land-urban/thermally complex, 0 to 8 percent slopes	C	NO	0	0.37	YES	NO
Uuj3	Urban land-urban/thermally complex, 0 to 8 percent slopes	G	NO	0	0.37	YES	YES

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY, MARYLAND
 * K-FACOR = 10 x 0.47 x DRAINAGE CLASSIFICATION
 * BASED UPON ESTIMATED CUTS

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL EROSION FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

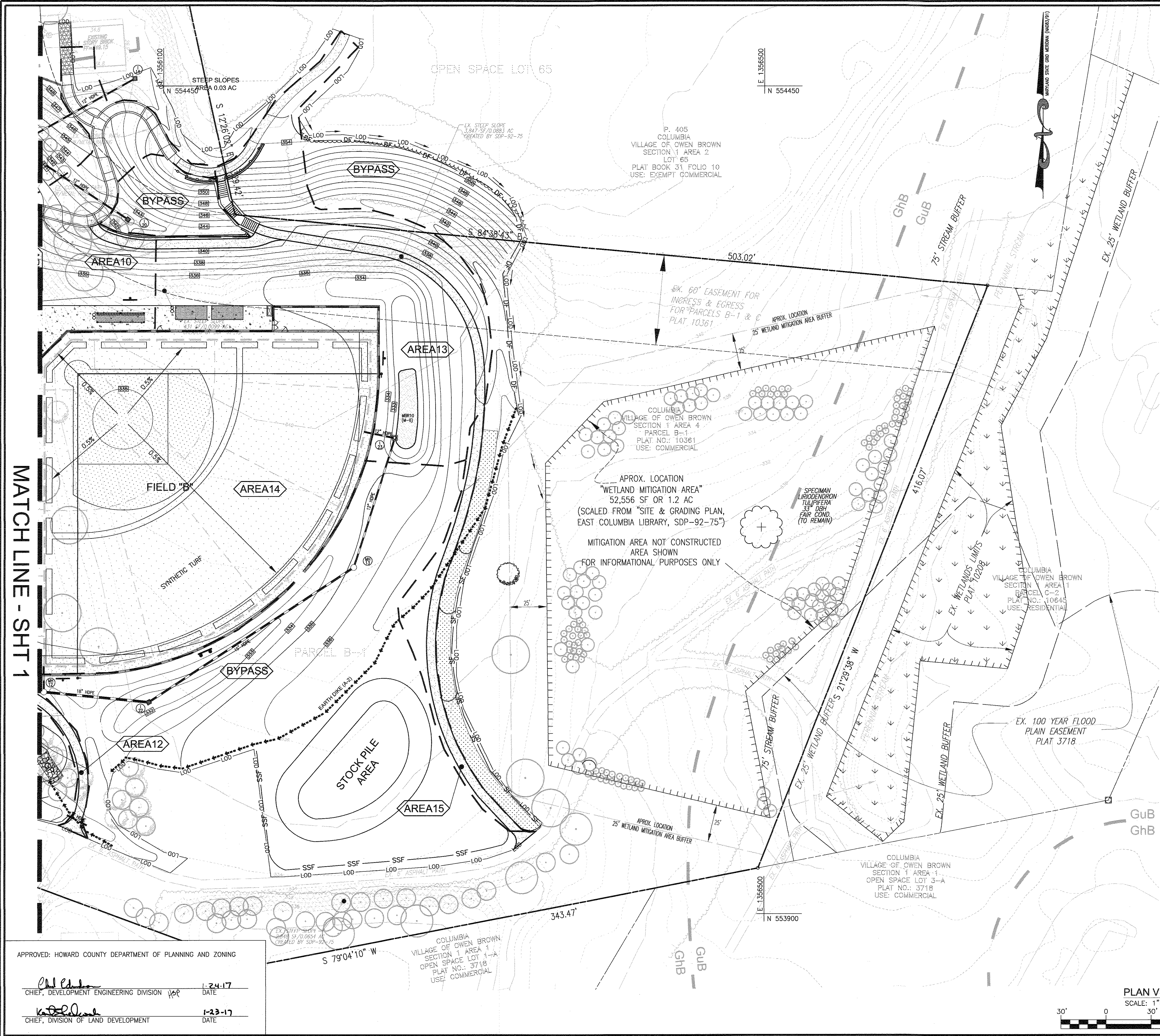
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Chabon
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 1-24-17

Kurt Johnson
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 1-23-17

PLAN VIEW
 SCALE: 1"=30'

MATCH LINE - SHT 2



LEGEND:

	EXISTING CONTOUR		EXISTING FENCE
	PROPOSED CONTOUR		PROPERTY LINE
	EXISTING SPOT ELEVATION		RIGHT-OF-WAY LINE
	STEEP SLOPES (15% OR GREATER)		SOIL DIVIDE
	EXISTING CURB AND GUTTER		PROPOSED TREELINE
	EXISTING UTILITY POLE		WATER LINE
	EXISTING LIGHT POLE		MICRO BORE-TRENCH FACILITY
	EXISTING SIGN		CONCRETE
	EXISTING SANITARY MANHOLE		ASPHALT
	EXISTING SANITARY LINE		POROUS ASPHALT
	EXISTING WATER LINE		SYNTHETIC TURF
	EXISTING STORM DRAIN		NON-ROOFTOP DISCONNECTION AREA <5%
	STORM DRAIN INLET		SILT FENCE
	EXISTING TREE		SUPER SILT FENCE
	EXISTING TREELINE		DIVERSION FENCE
	LANDSCAPING APPROVED UNDER SDP-92-075		LIMIT OF DISTURBANCE
	STORMWATER MANAGEMENT DRAINAGE AREA		STABILIZED CONSTRUCTION ENTRANCE
			EARTH DIKE
			STORMWATER MANAGEMENT DRAINAGE AREA DIVIDE

SPECIMEN TREE INVENTORY

BOTANICAL NAME - COMMON NAME	DBH (INCH)	CRZ (FEET)	CONDITION	NOTE
ACER RUBRUM - RED MAPLE	36"	54'	FAIR	MULTI-STEM
LIRIODENDRON TULIPIFERA - TULIP POPLAR	33"	49.5'	FAIR	VINE COVERED

NOTE:
 TREE CONDITIONS WERE EVALUATED BASED ON THEIR OVERALL HEALTH, THE PRESENCE OF INSECTS OR DISEASE.
 * DECAY AND WERE ASSIGNED A CONDITION OF "FAIR" IF THE TREE HAD ± 50% DEAD BRANCHES OR MAJOR TRUNK DAMAGE

SITE ANALYSIS DATA CHART

A. TOTAL PROJECT AREA:	16.59 AC. PARCEL B-1
B. AREA OF PLAN SUBMISSION:	11.05± AC. TOTAL
-PROJECT SITE ACCESS ONLY	0.0± AC. PARCEL A-1
-PROJECT SITE WORK SHOWN HEREON	10.8± AC. PARCEL B-1
-MINOR SLOPE GRADING	0.3± AC. OPEN SPACE LOT 65
C. AREA OF WETLANDS AND BUFFERS:	1.79 AC.± (PARCEL B-1 - SDP-92-75)
STREAM BUFFER:	0.33 AC.± (PARCEL B-1)
STREAM:	0.00 AC.± (PARCEL B-1)
D. AREA OF FLOODPLAIN:	0.07 AC.± (PARCEL B-1)
E. AREA OF FOREST:	2.93 AC.± - REFER TO FSD
F. AREA OF STEEP SLOPES (15% & GREATER):	0.81 AC.±
NO STEEP SLOPES BY HOWARD COUNTY DEFINITION OTHER THAN 20% OR GREATER ARE LOCATED ON-SITE.	
ALL MODERATE AND/OR STEEP SLOPES SHOWN HEREON ARE MAN-MADE SLOPES. REFER TO SDP-92-75 PROPOSED GRADING.	
G. ERODIBLE SOILS:	SEE SOILS LEGEND, SHT 1
H. LIMIT OF DISTURBED AREA:	11.05 AC. ±
I. PROPOSED USES FOR SITE AND STRUCTURES:	RECREATION - BALL FIELDS, PLAYGROUND, PATHWAYS, PAVILLION, AND TENNIS COURTS
J. GREEN OPEN AREA:	9.23 AC.
K. PROPOSED IMPERVIOUS AREA:	1.82 AC.
L. PRESENT ZONING DESIGNATION:	NT
M. OPEN SPACE REQUIRED:	N/A
N. TOTAL NUMBER OF UNITS ALLOWED:	N/A
O. TOTAL NUMBER OF UNITS PROPOSED:	N/A
P. DPZ FILE REFERENCES:	FDP #212, WP-91-206, F-92-51, SDP-92-75, Cap Proj. L-0008, F-92-152, F-93-43

ENVIRONMENTAL SITE DESIGN NARRATIVE:
 IN ACCORDANCE WITH THE DEVELOPMENT ENGINEERING DIVISION ECP CHECKLIST ITEM B.IX.

- THE NATURAL AREAS ON THIS PROJECT ARE LOCATED NEAR THE EASTERN BOUNDARY OF PARCEL B-1. NO DISTURBANCE TO THE SDP92-75 WETLAND MITIGATION AREA AND NEARBY FLOODPLAIN IS PROPOSED. NO STREAMS ARE LOCATED ON-SITE. HOWEVER THE OPPOSITE STREAMS BUFFER IS LOCATED ON PARCEL B-1. THESE ARE AREAS OF GREATER THAN 15% SLOPES ON THE PROJECT SITE. HOWEVER NONE SHOULD BE CONSIDERED STEEP SLOPES BY HOWARD COUNTY DEFINITION. ALL MODERATE AND/OR STEEP SLOPES SHOWN HEREON ARE MAN-MADE SLOPES. REFER TO SDP-92-75 PROPOSED GRADING. SHALL AREA OF FOREST AS REFERRED BY HUMAN & ROHDE, INC. WILL BE DESIGNATED BY THE PROJECT PROPOSAL. THE AREAS OF FOREST CLEARING IS THE LEAST NECESSARY TO GRAD THE SITE FOR THE HOWARD COUNTY - DEPARTMENT OF RECREATION AND PARKS 4:1 SLOPE REQUIREMENTS.
- NO DRAMATIC DISTURBANCE TO THE NATURAL DRAINAGE PATTERNS ARE PROPOSED. PLEASE REFER TO THE PROPOSED GRADING AND STORM DRAIN OUTFALLS.
- 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 TO INCLUDE MICRO-BORE-TRENCH, BIO-SWALE, SWALE AND STONE STORAGE UNDER TURF FIELDS.
- SEEDMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF SEEDMENT TRAPS, EARTH DIKE AND PERMETER "SILT FENCE" PERMETER CONTROLS. SEEDMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REGULATIONS AND SHALL BE APPROVED BY THE HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
- STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO-SCALE PRACTICES TO INCLUDE MICRO-BORE-TRENCH, BIO-SWALE, SWALE AND STONE STORAGE UNDER TURF FIELDS. THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION".

SOILS:
 TARGET PE = 1.5" TARGET ESDM = 8.488 CUT PROVIDED PE = 1.5" PROVIDED = 6.07H CUT TURF FIELD TARGET PE = 1.0" TARGET ESDM = 7.533 CUT PROVIDED PE = 1.0" PROVIDED ESDM = 11.181 CUT

6. AT THIS CONCEPT STAGE OF DEVELOPMENT, NO DESIGN MANUAL WAIVERS AND/OR ALTERNATIVE COMPLIANCE REQUESTS FOR ENVIRONMENTAL DISTURBANCE AND/OR STORMWATER MANAGEMENT DESIGN ARE REQUIRED.

OWNER - PARCEL A-1
 HOWARD COUNTY MARYLAND
 DEPARTMENT OF PUBLIC WORKS
 3420 COLUMBIA BLVD
 ELLICOTT CITY, MD 21043
 410-313-4401

OWNER - PARCEL B-1
 THE HOWARD RESEARCH AND
 DEVELOPMENT CORPORATION
 PO BOX 833
 COLUMBIA MD 21044
 410-992-4377

OWNER
 O.S. LOT 65 - PARCEL 405
 BOARD OF EDUCATION
 HOWARD COUNTY
 10910 CLARKSVILLE PIKE
 ELLICOTT CITY MD 21042

NO.	REVISION	DATE

SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN
EAST COLUMBIA LIBRARY PARK
 COLUMBIA VILLAGE OF OWEN BROWN
 PARCELS A-1, B-1 AND OPEN SPACE LOT 65

PARCEL A-1 & B-1 ZONED: NT PARCEL 275
 TAX MAP 36 GRID 21 ZONED: NT P/O PARCEL 405
 OPEN SPACE LOT 65 ZONED: NT HOWARD COUNTY, MARYLAND
 TAX MAP 36 GRID 21 P/O PARCEL 405
 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

HUMAN & ROHDE, INC.
 Landscape Architects
 512 Virginia Ave.
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 ELLICOTT CITY, MD 21043 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE

DESIGN BY: RHY / EDS
 DRAWN BY: RVE
 CHECKED BY: RHY
 DATE: JANUARY 2017
 SCALE: AS SHOWN
 W.O. NO.: 15-06

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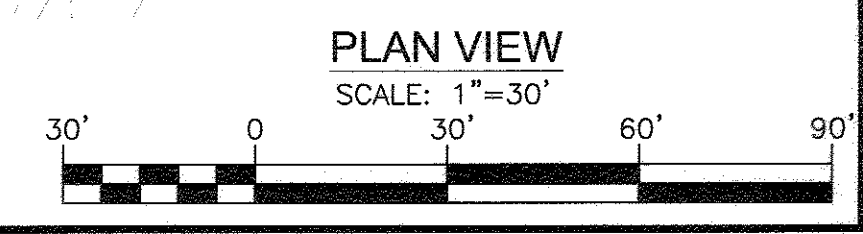
2 SHEET OF 5

MATCHLINE - SHT 1

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION 1-24-17
 DATE

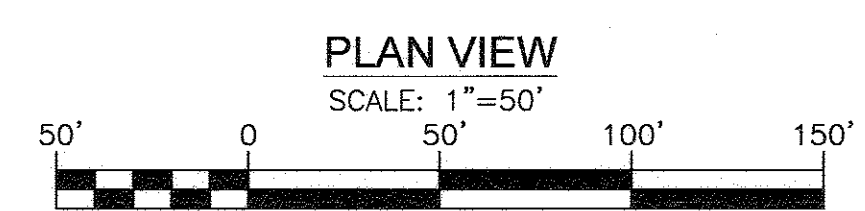
CHIEF, DIVISION OF LAND DEVELOPMENT 1-23-17
 DATE





LEGEND:

	EXISTING CONTOUR		EXISTING FENCE
	PROPOSED CONTOUR		PROPERTY LINE
	EXISTING SPOT ELEVATION		RIGHT-OF-WAY LINE
	EXISTING CURB AND GUTTER		SOIL DIVIDE
	EXISTING UTILITY POLE		PROPOSED TREELINE
	EXISTING LIGHT POLE		WATER LINE
	EXISTING SIGN		MICRO BIO-RETENTION FACILITY
	EXISTING SANITARY MANHOLE		CONCRETE
	EXISTING SANITARY LINE		ASPHALT
	EXISTING WATER LINE		SYNTHETIC TURF
	EXISTING STORMWATER		NON-ROOFTOP DISCONNECTION AREA <=5
	STORM DRAIN PIPE		
	STORM DRAIN INLET		
	EXISTING TREE (FIELD LOCATED)		
	EXISTING TREELINE		
	EXISTING LANDSCAPING		
	APPROVED UNDER SDR-92-075 STORMWATER MANAGEMENT DRAINAGE AREA		
	STORMWATER MANAGEMENT DRAINAGE AREA DIVIDE		
	SITE ACCESS DIRECTION ARROWS		



OWNER - PARCEL A-1 HOWARD COUNTY MARYLAND DEPT. OF PUBLIC WORKS 10001 P. 0275 LOT A-1 ELLICOTT CITY, MD. 21043 410-313-4401	OWNER - PARCEL B-1 THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION PO BOX 633 COLUMBIA MD 21044 410-992-4377	OWNER O.S. LOT 65 - PARCEL 405 BOARD OF EDUCATION HOWARD COUNTY 10910 CLARKSVILLE PIKE ELLICOTT CITY MD 21042
--	---	---

NO.	REVISION	DATE

SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN
SITE ACCESS PLAN
EAST COLUMBIA LIBRARY PARK
COLUMBIA VILLAGE OF OWEN BROWN
PARCELS A-1, B-1 AND OPEN SPACE LOT 65

PARCEL A-1 & B-1 TAX MAP 36 GRID 21 ZONED: NT PARCEL 275
OPEN SPACE LOT 65 TAX MAP 36 GRID 21 ZONED: NT PARCEL 405
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

HUMAN & ROHDE, INC.
Landscape Architects
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PROFESSIONAL CERTIFICATE

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

DESIGN BY: RHV / EDS
DRAWN BY: RVE
CHECKED BY: RHV
DATE: JANUARY 2017
SCALE: AS SHOWN
W.O. NO.: 15-06

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: 09-27-2018.

3 SHEET OF 5

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature]
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 1-24-17

[Signature]
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 1-23-17

SEE SHEET 1 FOR CONCEPT PLAN CONTINUATION

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

- MATERIAL SPECIFICATIONS**
THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.
- FILTERING MEDIA OR PLANTING SOIL**
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SOLID 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 PROVIDE A HINDERANCE 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 COWAR 11.01.01.01. 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 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. MICROBIORETENTIONS (E.G., URE, 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.

- 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 TUFF 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 ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE 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 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.

- PLANT MATERIAL**
RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.
- 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. FINE 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.
ROOTS OF THE PLANT MATERIAL SHALL BE KEPT MOST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT 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 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 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, DEFOLIANTS, OR AT A MINIMUM, IMPROVES 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.

- UNDERDRAINS**
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
• PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OR HDPE).
• PERFORATIONS - IF PERFORATIONS ARE 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 SHOULD 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 UNDERDRAIN SYSTEM.
• 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 INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".
THE 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).

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

OPERATION AND MAINTENANCE SCHEDULE FOR MICROBIORETENTION / BIO-SWALE AREAS

- ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFUNCT STINKS AND WIPES.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

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

Table B.4.1 Materials Specifications for Micro-Bioretention, 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%) & compost (30%) & compost (40%)	n/a	LISDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)	n/a	
Mulch	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	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" perft. @ 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 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 350.8/R9; vertical loading (FH-10 or FH-20); allowable horizontal loading (based on soil pressures); and analysis of potential cracking. Sand substitutions such as Diabase and Graystone (AASHTO #10 are not acceptable. No calcium carbonate 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"	

EAST COLUMBIA LIBRARY - SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN ESDv COMPUTATIONS

SITE AREA:	10.51 AC	457866 sf
TARGET P:	1.30 IN	
SITE IMPERVIOUS:	17.31 PERCENT	1.82 Acres Impervious
SITE Rv:	0.2058	

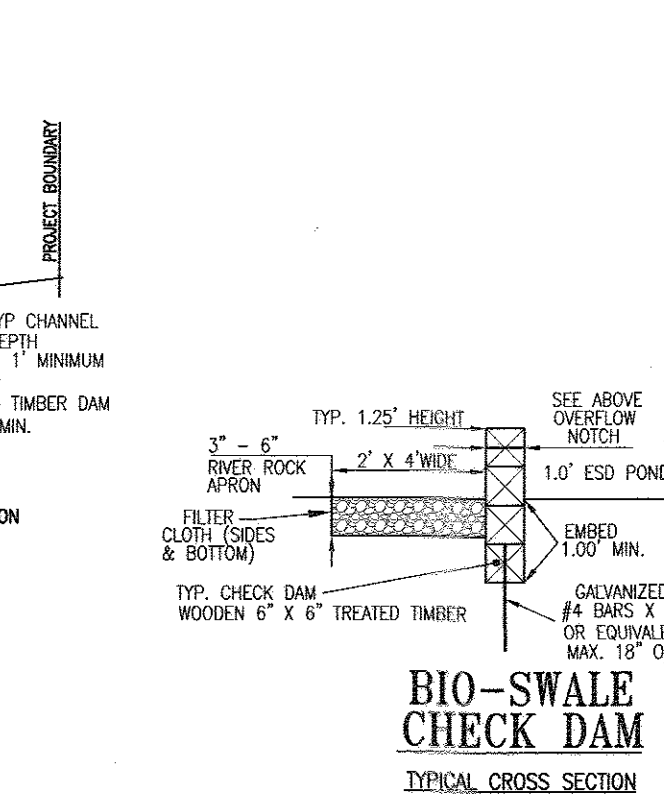
Rv=0.05+0.009Xl
V=0.01+0.001Xl
Vmax=1.0+0.001Xl
l=1.0+0.95A/l
l=2.0+0.95A/l

DA #	% IMPERV	Rv	DA (SF)	DA (AC)	MINIMUM VOLUME	MAXIMUM VOLUME	1.3" VOLUME PROVIDED*	VOLUME IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS	
AREA 1 PAVILION & FUTURE PARKING	45.86	0.4628	12875	0.30	497	1291	645	650	5905	0.14	0.16	MICROSCALE MICRO-BIO RETENTION #1 650 487.5 SF MICRO BIO
AREA 2 FUTURE PARKING & PARK PATHWAY	47.38	0.4764	19490	0.45	774	2012	1006	1006	9235	0.21	0.24	MICROSCALE MICRO-BIO RETENTION #2 586 439.5 SF MICRO BIO MICROSCALE BIO SWALE #2 420 315 SF MICRO BIO
AREA 3 PARK PATHWAY & PARKING	43.63	0.4426	18555	0.43	684	1780	890	900	8095	0.19	0.24	MICROSCALE MICRO-BIO RETENTION #3 900 675 SF MICRO BIO
AREA 3A PARK PATHWAY & BALLFIELD CONCRETE	18.75	0.2188	15624	0.36	285	741	370	400	2930	0.07	0.29	MICROSCALE MICRO-BIO RETENTION #3A 400 300 SF MICRO BIO
AREA 4 PAVILION & PARK PATHWAY	35.29	0.3676	11760	0.27	360	937	468	468	4150	0.10	0.17	MICROSCALE MICRO-BIO RETENTION #4 468 351 SF MICRO BIO
AREA 5 PARK PATHWAY	24.51	0.2706	13425	0.31	303	787	393	395	3290	0.08	0.23	MICROSCALE BIO SWALE #5 395 296.25 SF MICRO BIO
AREA 6 TENNIS COURTS & PARK PATHWAY	53.13	0.5281	22720	0.52	1000	2600	1300	1600	12070	0.28	0.24	MICROSCALE MICRO-BIO RETENTION #6 1600 1200 SF MICRO BIO
AREA 7 PARK PATHWAY	100.00	0.9500	1590	0.04	126	-	164	126	1580	0.04	0.00	NON-ROOFTOP DISCONNECTION IMPERVIOUS LENGTH = 6' DISCONNECT LENGTH = 10' Pe = 1"
AREA 7A PARK PATHWAY & SHED ROOFTOP	100.00	0.9500	1436	0.03	114	-	148	114	1436	0.03	0.00	NON-ROOFTOP DISCONNECTION IMPERVIOUS LENGTH = 6' DISCONNECT LENGTH = 10' Pe = 1" Drywell - Shed Rooftop 5'x5'x4'x4' 04 Voids
AREA 7B PARK PATHWAY	100.00	0.9500	1100	0.03	87	-	113	87	1100	0.03	0.00	NON-ROOFTOP DISCONNECTION IMPERVIOUS LENGTH = 6' DISCONNECT LENGTH = 10' Pe = 1"
AREA 8 PARK PATHWAY	19.59	0.2263	14220	0.33	268	697	349	700	2785	0.06	0.26	MICROSCALE MICRO-BIO RETENTION #8 700 525 SF MICRO BIO
AREA 9 PARK PATHWAY & BALLFIELD CONCRETE	41.48	0.4233	21070	0.48	743	1933	966	1000	8740	0.20	0.28	MICROSCALE MICRO-BIO RETENTION #9 1000 750 SF MICRO BIO
AREA 10 PARK PATHWAY & BALLFIELD CONCRETE	37.09	0.3838	13575	0.31	434	1129	564	565	5035	0.12	0.20	MICROSCALE MICRO-BIO RETENTION #10 565 424 SF MICRO BIO
AREA 12 PARK PATHWAY	100.00	0.9500	1000	0.02	79	206	103	79	1000	0.02	0.00	NON-ROOFTOP DISCONNECTION IMPERVIOUS LENGTH = 6' DISCONNECT LENGTH = 10' Pe = 1"
AREA 13 PARK PATHWAY & BALLFIELD CONCRETE	20.14	0.2312	24580	0.56	474	1232	616	700	4950	0.11	0.45	MICROSCALE MICRO-BIO RETENTION #13 700 525 SF MICRO BIO
AREA 15 PARK PATHWAY	5.63	0.1006	34125	0.78	286	744	372	286	1920	0.04	0.74	NON-ROOFTOP DISCONNECTION IMPERVIOUS LENGTH = 6' DISCONNECT LENGTH = 10' Pe = 1"
PROJECT TOTALS	32.7	0.3441	227145	5.21	6514	16936	8468	9076	74231	1.70	3.51	

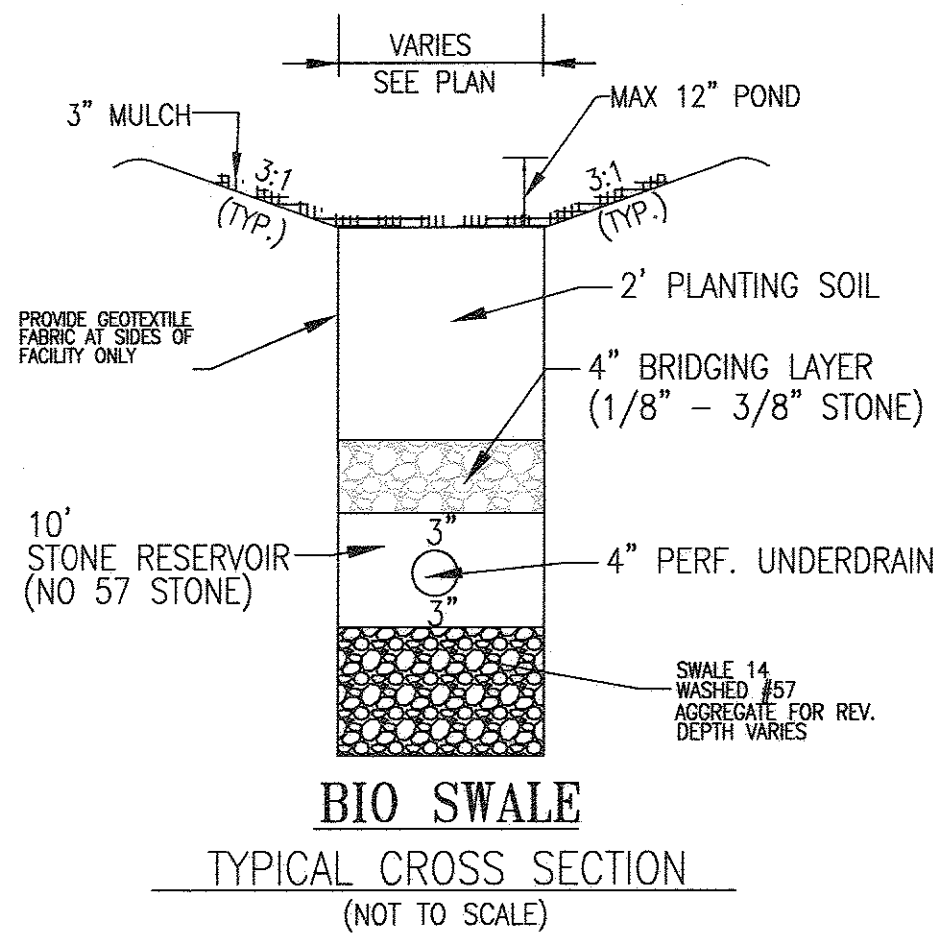
DA #	% IMPERV	Rv	DA (SF)	DA (AC)	MINIMUM VOLUME	MAXIMUM VOLUME	1.3" VOLUME PROVIDED*	VOLUME IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS	
AREA 11 FIELD A	100.00	0.9500	5000	1.15	3966	10312	5156	5696	50100	1.15	0.00	Pe = 1.3" - Provided in stone reservoir under field Pe = 1.0" Required for Turf Field
AREA 14 FIELD B	100.00	0.9500	5000	1.15	3966	10312	5156	5696	50100	1.15	0.00	Pe = 1.3" - Provided in stone reservoir under field Pe = 1.0" Required for Turf Field
TURF FIELD TOTALS	100.0	0.9500	100200	2.30	7933	20625	10312	11391	100200	2.30	0.00	

BIO-SWALE - PLANTING

PLANTINGS SHALL CONSIST OF A MIXTURE:
REED CANARY GRASS - PHALARIS ARUNDINACEA
SWITCHGRASS - PANICUM VIRGATUM
MAESTIC 1-LY TURF - LIROPE MISCARU MAESTIC*
OR EQUAL COMBINATION OF COOL / WARM SEASON GRASSES TOLERANT OF FREQUENT INFUNDATION



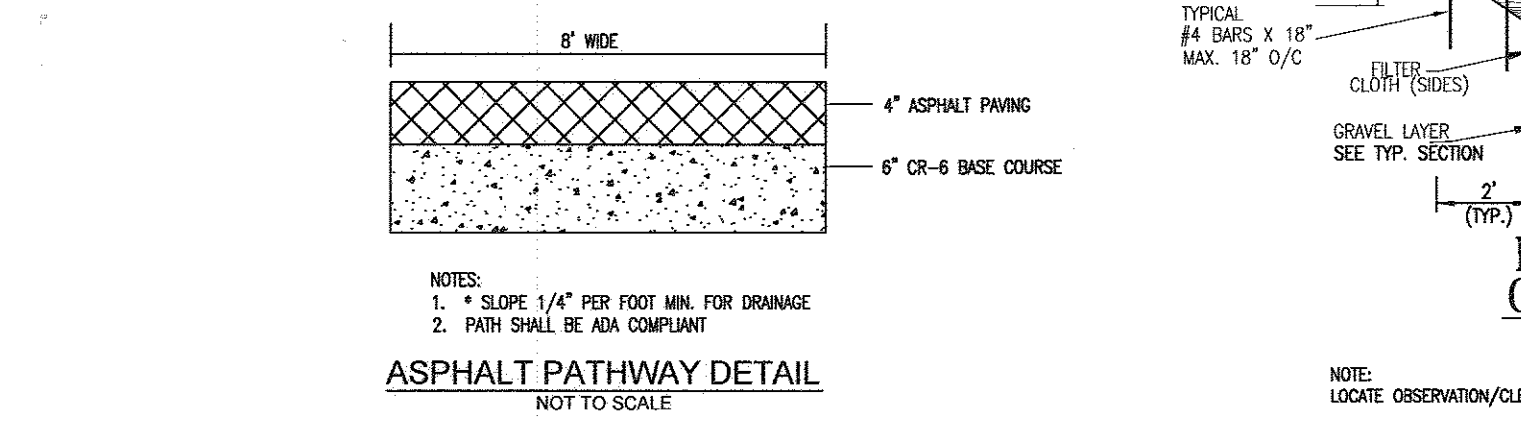
BIO-SWALE CHECK DAM
TYPICAL CROSS SECTION (NOT TO SCALE)



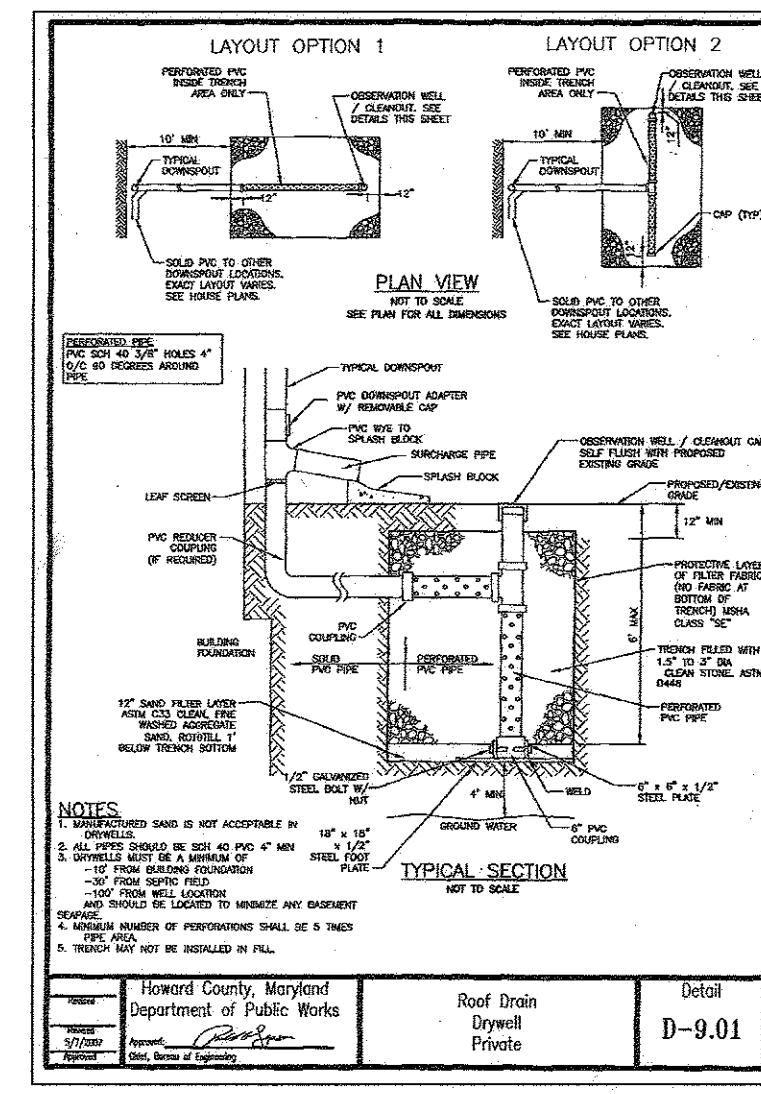
BIO SWALE
TYPICAL CROSS SECTION (NOT TO SCALE)

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division
Chief, Division of Land Development
DATE: 1-23-17



ASPHALT PATHWAY DETAIL
NOT TO SCALE



HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRYWELL (M-5)

- THE OWNER SHALL INSPECT & CLEAN ANNUALLY, INCLUDING PIPES, GUTTERS, DOWNSPUTS AND FILTERS.
- PONDING STANDING WATER OR ALGAL GROWTH ON THE TOP OF A DRYWELL MAY INDICATE FAILURE DUE TO SEDIMENTATION IN THE GRAVEL MEDIA. IF WATER POUNDS FOR MORE THAN 48 HOURS AFTER A MAJOR STORM OR MORE THAN SIX INCHES OF SEDIMENT HAS ACCUMULATED, THE GRAVEL MEDIA SHOULD BE EXCAVATED AND REPLACED.

OWNER - PARCEL A-1
OWNER - PARCEL B-1
OWNER
HOWARD COUNTY MARYLAND
DEPARTMENT OF PUBLIC WORKS
3430 COURT HOUSE DR
ELLICOTT CITY, MD 21043
410-313-4401

THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION
PO BOX 833
COLUMBIA MD 21044
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PARCELS A-1, B-1 AND OPEN SPACE LOT 65

PARCEL A-1 & B-1
TAX MAP 36 GRID 21
GREEN SPACE LOT 65
TAX MAP 36 GRID 21
6TH ELECTION DISTRICT

ZONED: NT
ZONED: NT

PARCEL 275
PARCEL 405
HOWARD COUNTY, MARYLAND

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DESIGN BY: RHY / EDS
DRAWN BY: RVE
CHECKED BY: RHY
DATE: JANUARY 2017
SCALE: AS SHOWN
W.O. NO.: 15-06

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: 09-27-2018

5 SHEET OF 5