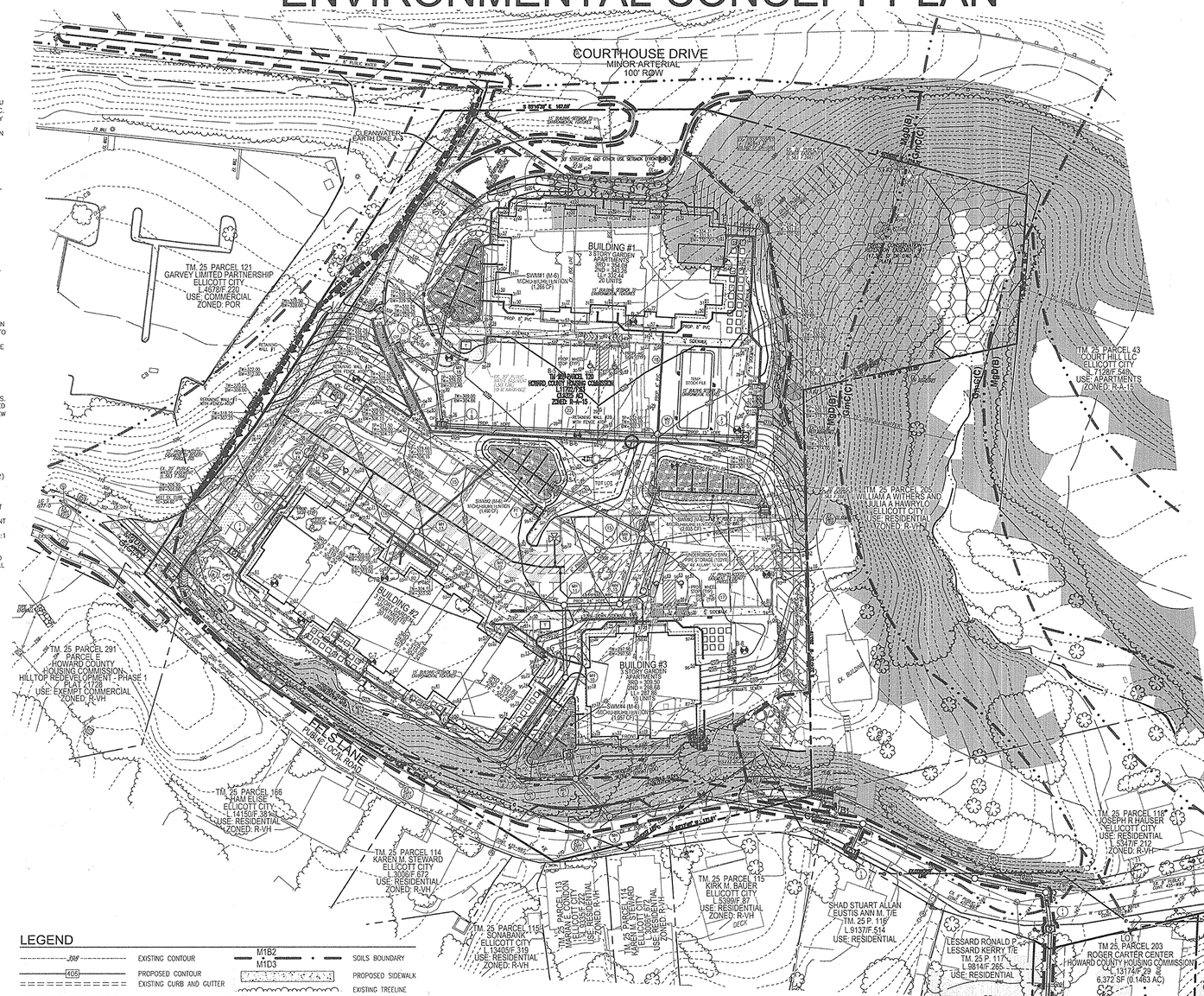
BURGESS MILL STATION - PHASE II

APARTMENTS
PARCELS 120
ENVIRONMENTAL CONCEPT PLAN

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY STANDARDS AND SPECIFICATIONS. ALL WORK AND MATERIALS SHALL COMPLY WITH O.S.H.A. STANDARDS.
2. EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND AND SEWER EXTENSION PLANS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTORS INFORMATION. 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, ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
3. THE EXISTING TOPOGRAPHY SHOWN HEREON IS TAKEN FROM AN AERIAL TOPOGRAPHIC SURVEY PREPARED BY POTOMAC AERIAL SURVEYS, DATED MAY 15, 2010; AND FROM A FIELD RUN TOPOGRAPHIC SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC. DATED DECEMBER 2013.
4. COORDINATES AND ELEVATIONS ARE BASED ON MARYLAND COORDINATE SYSTEM – NAD83(1991) AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS 25A1 AND 25A2.
5. THE PROPERTY LINES SHOWN HEREON IS BASED ON A FIELD–RUN BOUNDARY SURVEY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC. DATED OCTOBER 31, 2012.
6. ALL ELEVATIONS ARE TO FLOWLINE/BOTTOM OF CURB UNLESS OTHERWISE NOTED.
7. THE GEOTECHNICAL ENGINEER TO CONFIRM PAVING SECTION PRIOR TO CONSTRUCTION. ALL PAVING TO BE PAVING PER GEOTECHNICAL RECOMMENDATIONS.
8. THE SUBJECT PROPERTY IS ZONED R–A–15 IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
9. PUBLIC WATER CONNECTIONS AVAILABLE THROUGH CONTRACTS 425–W&S AND 9–W. PUBLIC SEWER CONNECTION AVAILABLE THROUGH CONTRACT 425–W&S.
10. THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
11. ANY EXISTING STREET TREES DAMAGED OR DESTROYED DURING CONSTRUCTION WILL BE REPLACED BY THE CONTRACTOR.
12. THE FOREST STAND DELINEATION WAS PREPARED BY ECO–SCIENCE PROFESSIONALS, INC., DATED OCTOBER 22, 2013.
13. THE FOREST CONSERVATION OBLIGATION FOR THIS PLAN WILL BEEN MET BY THE RETENTION OF 0.40 ACRES OF FOREST WITHIN A FOREST CONSERVATION EASEMENT AND PROVIDING A FEE IN LIEU PAYMENT OF $10,781.10 TO THE HOWARD COUNTY FOREST CONSERVATION FUND FOR THE 0.40 AC. OF REFORESTATION OBLIGATION (0.40 AC. x 43560 = 17,424 SF x $0.95 = $16,552.80). SURETY IS NOT REQUIRED FOR THE ON–SITE RETENTION.
14. THIS PROJECT IS SUBJECT TO COMPLIANCE WITH THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. DEVELOPMENT OR CONSTRUCTION ON THIS PROPERTY MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION APPLICATION OR BUILDING/ GRADING PERMIT APPLICATIONS.
15. A KNOX BOX IS REQUIRED TO BE PLACED ON THE FRONT OF EACH BUILDING. IT SHALL BE PLACED TO THE RIGHT OF THE MAIN ENTRANCE AT A RANGE OF 4–5' IN HEIGHT AND NO MORE THAN 6' LATERALLY FROM THE DOOR. IT'S LOCATION IS SHOWN ON THESE PLANS. THE BOX SHALL BE ELECTRONICALLY SUPERVISED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSED (INTEGRATED WITH THE FIRE ALARM SYSTEM).
16. LANDSCAPING NOT PERMITTED WITHIN 7–1/2' OF EACH SIDE OF THE FIRE DEPARTMENT CONNECTION. PROVIDE A CLEAR UNOBSTRUCTED ACCESS PATH TO THE FIRE DEPARTMENT CONNECTION. NFPA–1 13.1.4.
17. FIRE LANES SHOULD BE PROVIDED IN THIS SITE TO ALLOW EMERGENCY VEHICLE ACCESS. EITHER FIRE LANE SIGNAGE SHOULD BE INSTALLED, OR THE CURBS SHOULD BE PAINTED IN RED AND STENCILED TO IDENTIFY THE ROAD AS A FIRE LANE.
18. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT–OF–WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2–1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) – 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
19. ALL EXTERIOR LIGHTING TO COMPLY WITH THE REQUIREMENTS FOUND IN ZONING SECTION 134 OF THE HOWARD COUNTY ZONING REGULATIONS. (DETAILS ON SHEET 2 AND 3)
20. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
21. STORMWATER MANAGEMENT FOR THIS PROJECT IS BEING PROVIDED BY ENVIRONMENTAL SITE DESIGN UTILIZING MICRO–BIORETENTION FACILITIES AND POROUS PAVING (WITH ADDITIONAL STONE DEPTH) TO ACCOMODATE THE TOTAL ESD VOLUME REQUIRED. SWM FACILITIES TO BE PRIVATELY OWNED AND MAINTAINED. 100–YEAR STORMWATER MANAGEMENT IS REQUIRED AND SHALL BE ADDRESSED BY THE ADDITION OF UNDERGROUND STORAGE PIPE WITH A CONTROL STRUCTURE.
22. TRASH AND RECYCLING COLLECTION TO BE PRIVATE.
23. THE PROPOSED BUILDINGS WILL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
24. SIGNAGE SHALL BE PROVIDED ON THE BUILDING IDENTIFYING THE BUILDING ADDRESS, AND EACH SUITE SEPARATED BY LETTER.
25. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED STREAM(S) OR THEIR BUFFERS AND FOREST CONSERVATION AREAS.
26. APPROVAL OF THIS 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 HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN STAGES 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.
27. THIS PLAN IS SUBJECT TO A WAIVER PETITION WP–16–018, APPROVED JANUARY 6, 2016 TO WAIVE THE FOLLOWING TWO SECTIONS OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS: (1) SECTION 16.116(b)(1) TO ALLOW GRADING/DISTURBANCE TO 0.49 ACRES OF STEEP SLOPES; AND (2) SECTION 16.1205(a)(7) TO ALLOW THE REMOVAL OF ONE SPECIMEN TREE (A 31" TULIP POPLAR) FROM THE SUBJECT SITE. APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
   A. NO ADDITIONAL DISTURBANCE OR GRADING SHALL OCCUR BEYOND THE LIMIT OF DISTURBANCE (LOD) OF THE 25% STEEP SLOPES THAT ARE DETAILED ON THE WAIVER PLAN EXHIBIT UNLESS IT CAN BE SUFFICIENTLY DEMONSTRATED TO BE WARRANTED OR JUSTIFIED.
   B. ENHANCED MANAGEMENT SUCH AS ACCELERATED STABILIZATION AND REDUNDANT EROSION SEDIMENT CONTROLS WILL BE REQUIRED, PER HOWARD SOIL CONSERVATION DISTRICT COMMENTS.
   C. THE REMOVAL OF THE ONE SPECIMEN TREE WILL REQUIRED MITIGATION WITH THE PLANTING OF 2:1 REPLACEMENT (2 TOTAL WITH A MINIMUM CALIPER NATIVE PLANT SPECIES. THE REPLACEMETN TREES SHALL BE BONDED AND SHOWN ON THE LANDSCAPE PLAN.
   D. ANY ADDITIONAL REMOVAL OF SPECIMEN TREES DURING CONSTRUCTION ACTIVITY SHALL REQUIRED THE SUBMITTAL OF A NEW WAIVER PETITION APPLICATION. ANY REMAINING SPECIMEN TREES SHALL BE SAVED AND PROTECTED DURING THE CONSTRUCTION ACTIVITY.
   E. PROVIDE A NOTE ON ALL FUTURE PLANS SUBMITTALS THAT INCLUDES THIS WAIVER'S FILE NUMBER, THE SECTIONS WAIVED, THE WAIVER DECISION, THE DTAE OF THE DECISION, AND ALL CONDITIONS OF APPROVAL.
   F. COMPLIANCE WITH THE DED COMMENTS.



PLAN VIEW
SCALE: 1"=40'

LEGEND

308	EXISTING CONTOUR
408	PROPOSED CONTOUR
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
S	EXISTING SANITARY MANHOLE
S	EXISTING SANITARY LINE
CO	EXISTING CLEANOUT
FH	EXISTING FIRE HYDRANT
W	EXISTING WATER LINE
x x	EXISTING FENCE
	PROPERTY LINE
	RIGHT–OF–WAY LINE
	MICRO–BIORETENTION
M1B2 / M1D3	SOILS BOUNDARY
	PROPOSED SIDEWALK
	EXISTING TREELINE
	PROPOSED TREELINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN DRAIN INLET
SF SF / SSF SSF	SILT FENCE / SUPER SILT FENCE
LOD LOD	LIMIT OF DISTURBANCE (CONSTRUCTION)
CIP	CURB INLET PROTECTION
AGIP	AT GRADE INLET PROTECTION
SIP	STANDARD INLET PROTECTION
	STABILIZED CONSTRUCTION ENTRANCE
	EX. STEEP SLOPES (25% OR GREATER)
	EX. MODERATE SLOPES (15%–24.99% OR GREATER)

SHEET INDEX

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 4.4.16

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1.21.16

BENCHMARKS

HOWARD COUNTY BENCHMARK 25A1
N 586,557.546 E 1,366,847.098 ELEV.: 396.343'
HOWARD COUNTY BENCHMARK 25A2
N 587502.729 E 1,366556.377 ELEV.: 348.145'

VICINITY MAP
SCALE: 1"=2000'
ADC MAP COORDINATES: 4816–B7

SITE DATA:

LOCATION: ELLICOTT CITY, MD.; TAX MAP 25, BLOCK 07, PARCEL 120
2ND ELECTION DISTRICT
PRESENT ZONING: R–A–15
PARCEL AREA: 3.93 AC.
NET AREA: 3.05 AC.
DPZ REFERENCES: L.11702/F.63
USE OF STRUCTURES: APARTMENTS
TOTAL BUILDING COVERAGE: 25,049 SF (0.58 AC. OR 14.76% OF GROSS AREA)
PAVED PARKING LOT/AREA ON SITE: 42,829 SF (0.98 AC. OR 24.94% OF GROSS AREA)
AREA OF LANDSCAPE ISLAND: 1,876 SF (0.04 AC. OR 1.02% OF GROSS AREA)
LIMIT OF DISTURBED AREA (CONSTRUCTION): 3.02 AC.
LIMIT OF DISTURBED AREA (FOR SWM CALCULATION): 2.80 AC.
WETLANDS ON SITE: 0.00 AC.
WETLAND BUFFERS ON SITE: 0.00 AC.
STREAMS AND THEIR BUFFERS ON SITE: 0.30 AC.
AREA OF ON–SITE 100 YEAR FLOODPLAIN: 0.00 AC.
AREA OF EXISTING FOREST ON SITE: 0.60 AC
AREA OF MODERATER SLOPES (15% TO 24.99%): 0.12 AC.
AREA OF STEEP SLOPES (25% OR GREATER): 0.88 AC
AREA OF ERODIBLE SOILS: 3.74 AC.
AREA MANAGED BY ESDV (*THIS PLAN): 1.28 AC.
*IMPERVIOUS AREA : 0.55 AC
*GREEN AREA: 0.73 AC

ENVIRONMENTAL SITE DESIGN NARRATIVE:

1. THE SITE DOES NOT CONTAIN JURISDICTIONAL WETLANDS; HOWEVER AN EPHEMERAL STREAM CHANNEL IS LOCATED ON THE FAR–EAST CORNER OF THE PROPERTY. THE SITE NATURALLY SLOPES FROM NORTH TO SOUTH. THE PROPERTY HAS STEEP SLOPES SURROUNDING THE EASTERN AND SOUTHERN AREAS OF THE BOUNDARY. THE PROPERTY CURRENTLY HAS APARTMENT BUILDINGS BUILT ON A LOWER LEVEL THAT IS ACCESSED FROM FELS LANE AND AN UPPER SECTION THAT IS ACCESSED OFF OF COURTHOUSE DRIVE. ALL OF THE APARTMENT BUILDINGS ARE TO BE REMOVED AND REPLACED WITH THREE NEW RESIDENTIAL APARTMENT BUILDINGS WITH THE PROPOSED DEVELOPMENT. THERE IS FOREST LOCATED ON EASTERN CORNER THIS PROJECT, WHICH SHALL BE PLACED INTO A FOREST CONSERVATION EASEMENT. NO IMPACTS TO THE ENVIRONMENTAL RESOURCES SHALL BE THE LEAST NECESSARY FOR THE DEVELOPMENT OF THIS PROJECT.

2. THE SITE NATURALLY SLOPES FROM NORTH TO SOUTH. THE SITE HAS BEEN DESIGNED TO MAINTAIN THE NATURAL DRAINAGE PATTERNS.

3. 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 ENVIRONMENTAL SITE DESIGN FOR THIS PROJECT WILL REFLECT "WOODS IN GOOD CONDITION". THIS PLAN UTILIZES MICRO–BIORETENTION AREAS (M–6) TO ACCOMMODATE THE TOTAL ESD VOLUME REQUIRED FOR THE PROJECT. THE TARGET REQUIRED/PROVIDED Pe=1.0" (EXISTING) AND Pe=2.6" (POST–DEVELOPMENT). THE ESDv REQUIRED IS 5,786 CF, AND ESDv PROVIDED IS 4,460 CF*. (*PROVIDED VOLUME IS LESS THAN ESDV REQUIRED BECAUSE MICRO–BIORETENTION UTILIZED IN EACH SUBAREA AT THE RATE OF 75 %)

4. SEDIMENT CONTROL FOR THIS SPECIFIC SITE PLAN WILL BE PROVIDED THROUGH THE USE OF PERIMETER CONTROLS (SILT FENCE, SUPER SILT FENCE & EARTH DIKES) AND INLET PROTECTION. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH THE CURRENT REQUIREMENTS AND SHALL BE APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT.

5. STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO–BIORETENTION AREAS (M–6). THE PROPOSED PRACTICE HAS BEEN MAXIMIZED TO THE EXTENT PRACTICAL.

OWNER	DEVELOPER
HOWARD COUNTY HOUSING COMMISSION C/O THOMAS CARBO 6751 COLUMBIA GATEWAY DR. 3RD FLOOR COLUMBIA, MD 21046 (410) 313–6320	STAVROU ASSOCIATES, INC. 2661 RIVA ROAD SUITE 320 ANNAPOLIS, MD 21401 C/O SCOTT N. LINK (410) 571–6610

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

COVER SHEET AND ENVIRONMENTAL CONCEPT PLAN

BURGESS MILL STATION PH II
APARTMENTS
3570 COURT HOUSE DRIVE

TAX MAP 25 BLOCK 7 — ZONED: R-A-15 — PARCELS 120
2ND ELECTION DISTRICT — L.11702/F.63 — HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET ELLICOTT CITY, MD 21043
TEL: 410.461.7666 FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO. 16193 — REGISTERED PROFESSIONAL ENGINEER — 1/21/16

ROBERT H. VOGEL, PE No.16193

DESIGN BY:	DZE
DRAWN BY:	DZE/MR
CHECKED BY:	RHV
DATE:	JAN 2016
SCALE:	AS SHOWN
W.O. NO.:	12–53

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: 09–27–2016

SHEET 1 OF 2

ECP-15-087

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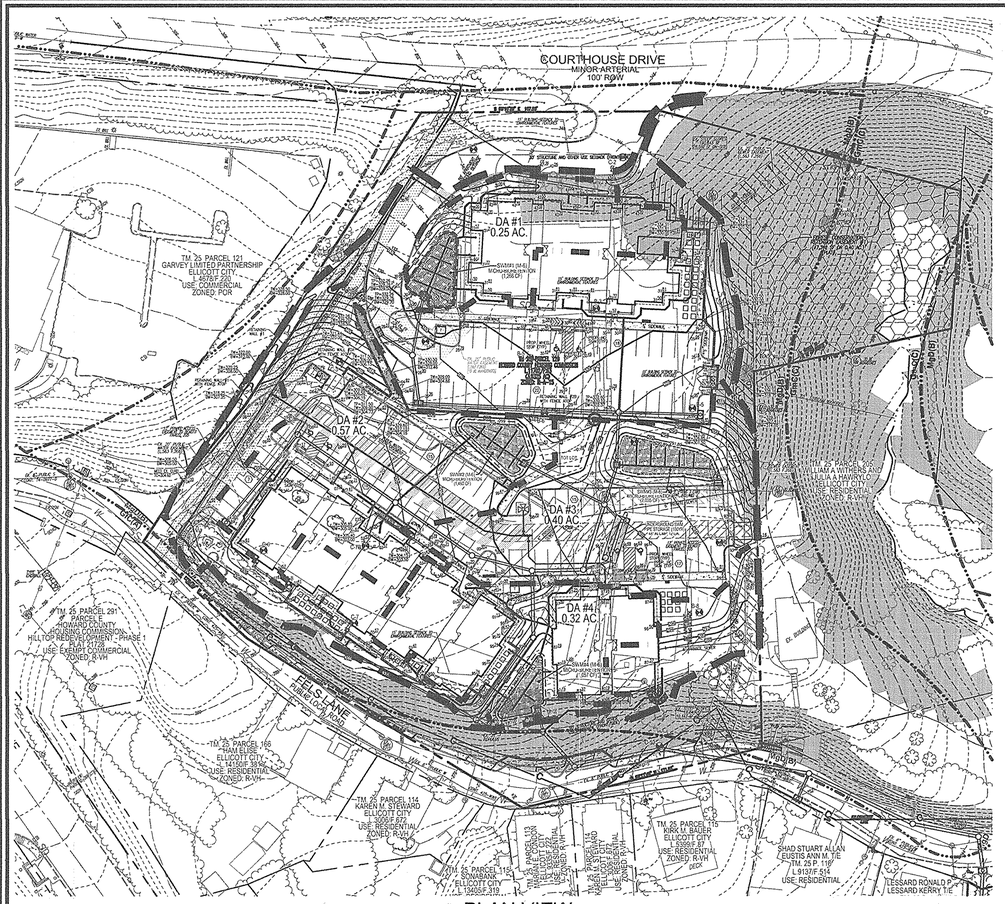


PLAN VIEW
SCALE: 1"=50'

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

SOILS LEGEND
HOWARD COUNTY SOILS MAP #14

SYMBOL	NAME / DESCRIPTION	GROUP	K FACTOR	ERODIBLE
GfC	GLADSTONE–URBAN LAND COMPLEX, 8 TO 10 PERCENT SLOPES	A	0.24	NO
MgD	MANOR–BANNERTOWN SANDY LOAMS, 15 TO 25 PERCENT SLOPES, ROCKY	B	0.24	YES
GmC	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	C	0.43	YES

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

1. MATERIAL SPECIFICATIONS
THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO–BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, 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 CONTEN – 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 STOCKPILED TOPSOIL IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADER, 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 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 REFRACTURE 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 BIORETENION 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". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON–SITE STORAGE. THE PLANT 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 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 SUFFICIENT ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
- PIPE – SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTMF 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 A 1/4" (NO. 4 OR 4x4) GALVANIZED HARDWARE CLOTH.
- GRAVEL – THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
- THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
- A RIGID, NON–PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,0000 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 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 1000 SQUARE FEET OF SURFACE AREA).

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

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%), 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)		
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	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 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with ¼-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; ready-mixed 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.R-89; vertical loading [H-10 or H-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 carbonated 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, MULTCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.

2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REMOVE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE 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 MAINTAINANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED UNDERGROUND FACILITIES

A. THE UNDERGROUND STORMWATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN IT'S OPERATION AND FUNCTION.
B. THE UNDERGROUND STORMWATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVEN'S.
C. WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHA.L BE CLEANED.
D. THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEANUP OPERATION.
E. THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORMWATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
F. THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTION.S AT LEAST ONCE EVERY SIX (6) MONTHS. IF OBSTRUCTION.S ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.

LEGEND:

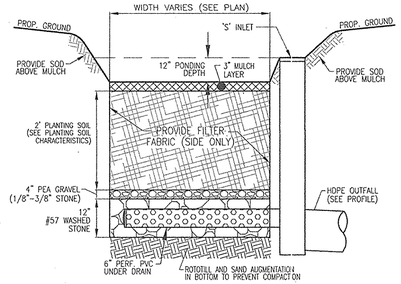
EXISTING CONTOUR
PROPOSED CONTOUR
PROPOSED SPOT ELEVATION
EXISTING SPOT ELEVATION
EXISTING CURB AND GUTTER
PROPOSED CURB AND GUTTER
EXISTING UTILITY POLE
EXISTING LIGHT POLE
EXISTING MAILBOX
EXISTING SIGN
EXISTING SANITARY MANHOLE
EXISTING SANITARY LINE
EXISTING CLEANOUT
EXISTING FIRE HYDRANT
EXISTING WATER LINE
PROPOSED STORM DRAIN
PROPOSED STORM DRAIN INLET
EXISTING TREES (FIELD LOCATED)
EXISTING TREELINE (FIELD LOCATED)
EXISTING FENCE
PROPERTY LINE
RIGHT-OF-WAY LINE
M1B2
M1D3
SOILS BOUNDARY
PROPOSED SIDEWALK
MICRO-BIORETENTION
EX. STEEP SLOPES (25% OR GREATER)
EX. MODERATE SLOPES (15%-24.99% OR GREATER)
LIMIT OF DISTURBANCE (FOR SWM CALCULATION)
DRAINAGE DIVIDE

Pe= 2.60
ESDv=(PexRvxA)/12
Rv=0.05+0.009xI
V min=1.0" rainfall (1.0xRvxA)/12
Vmax= 1yr rainfall=2.6" (2.6xRvxA)/12

DA	% IMPERV	Rv	DA	ESDv REQ	MINIMUM VOLUME	MAXIMUM VOLUME	TOTAL VOL PROVIDED	SWM PRACTICE	SURFACE AREA	STORAGE DEPTH (FT)	MBR VOLUME	STONE DEPTH BELOW MBR	STONE VOLUME	AREA SF	PERV AREA	IMP AREA
1	56	0.56	0.25	1327	510	1327	**1266**	MICRO-BIORETENTION	1013	1.0	1266	0.00	0	10969.96	4773.93	6196.03
2	73	0.71	0.57	3777	1453	3777	**1460**	MICRO-BIORETENTION	942	1.0	1178	1.00	283	24633.97	6633.28	18000.69
3	59	0.58	0.49	2715	1044	2715	**2035**	MICRO-BIORETENTION	1313	1.0	1641	1.00	394	21454.93	8722.72	12732.21
4	73	0.71	0.32	2172	835	2172	**1057**	MICRO-BIORETENTION	682	1.0	853	1.00	205	14093	3739.58	10353.42
TOTAL ESDv BY SUBAREA		1.63	9991				**5819**				4938		881	71151.86	23869.51	47282.35
														1.63	0.55	1.09

DRAINAGE AREA #	AREA TREATED	FACILITY NUMBER	ENVIRONMENTAL SITE DESIGN PRACTICE: PERMEABLE PAVEMENT	STONE UNDER PERM. PAVE	LANDSCAPE INFILTRATION	PERVIOUS SIDEWALK	BIO SWALE	GRAVEL TRENCH	MICRO BIO RETENTION	STONE UNDER MBR	ESDv VOLUME
1	10970	SWM#1	0	0	0	0	0	0	1266	0	1266
		SUBTOTAL 1	**0**	**0**	**0**	**0**	**0**	**0**	**1266**	**0**	**1266**
2	24634	SWM#2	0	0	0	0	0	0	1178	283	1178
		SUBTOTAL 1	**0**	**0**	**0**	**0**	**0**	**0**	**1178**	**283**	**1460**
3	21455	SWM#3	0	0	0	0	0	0	1641	394	1641
		SUBTOTAL 1	**0**	**0**	**0**	**0**	**0**	**0**	**1641**	**394**	**2035**
4	14093	SWM#4	0	0	0	0	0	0	853	205	853
		SUBTOTAL 1	**0**	**0**	**0**	**0**	**0**	**0**	**853**	**205**	**1057**
		TOTALS:	**0**	**0**	**0**	**0**	**0**	**0**	**4938**	**881**	**5819**

TOTAL AREA 71152 SF — **TOTAL ESDv PROVIDED (cf): 5819**
1.63 AC



MICRO-BIORETENTION
NOT TO SCALE

MICROBIORETENTION NOTES:
1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE MBR TO FAIL AND THERFORE SHALL NOT BE INSTALLED.
2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.

NOTES:
1. APPROVAL OF THIS SIMPLIFIED ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED BUILDING AND/OR GRADING PERMIT
2. 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.
3. THERE IS A CLASS R2 EPHEMERAL STREAM WHICH CROSSES THE NORTHWEST CORNER OF THE SITE AND HAS A 100' STREAM BUFFER. A WETLAND ASSESSMENT FOUND NO WETLANDS ON SITE. THE TOPOGRAPHY DOES NOT RESULT IN ANY STEEP SLOPES. ACCORDING TO CURRENT DFIRM APPROVED BY FEMA AND HOWARD COUNTY, THERE IS NO 100YR FLOODPLAIN LOCATED ON THIS PROPERTY.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 4/4/16

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1.28.16

OWNER
HOWARD COUNTY HOUSING COMMISSION
C/O THOMAS CHARO
6751 COLUMBIA GATEWAY DR.
3RD FLOOR
COLUMBIA, MD 21046
(410) 313–6320

DEVELOPER
STAVROU ASSOCIATES, INC.
2661 RIVA ROAD
SUITE 320
ANNAPOLIS, MD 21401
C/O SCOTT N. LINK
(410) 571–6610

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

STORMWATER MANAGEMENT DRAINAGE AREA MAP; SWM DETAILS

BURGESS MILL STATION PH II
APARTMENTS
3570 COURT HOUSE DRIVE
TAX MAP 25 BLOCK 7 — ZONED: R-A-15 — PARCELS 120
2ND ELECTION DISTRICT — L.11702/F.63 — HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELLICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

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

DESIGN BY: DZE
DRAWN BY: DZE/MR
CHECKED BY: RHV
DATE: JAN 2016
SCALE: AS SHOWN
W.O. NO.: 12–53

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: 09–27–2016

SHEET 2 OF 2

ECP-15-067

K:\Projects\15-029\ENGR\engr\ECP-BURGESSMILL2NDCP_SV-SWMDRAINAREA.DWG, 1/4/2016 8:48:18 AM