

**GENERAL NOTES:**

1. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED SEPTEMBER 17, 2009. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
3. THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC., DATED JULY, 2014.
4. 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. 301F AND 301E WERE USED FOR THIS PROJECT.
5. THE SUBJECT PROPERTY IS ZONED "NT" IN ACCORDANCE WITH THE 10/6/13 COMPREHENSIVE ZONING PLAN.
6. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAM(S) OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
7. THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
8. WATER FOR THIS PROJECT IS TO BE PUBLIC EXTENSIONS OF CONTRACT NO. 165-WS.
9. SEWER FOR THIS PROJECT IS TO BE PUBLIC EXTENSIONS OF CONTRACT NO. 165-WS.
10. 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 MAINTAIN UNINTERRUPTED SERVICE.
11. THERE IS NO 100-YEAR FLOOD PLAN LOCATED ON THE SUBJECT PROPERTY AND THE SITE DISCHARGES TO A TRIBUTARY OF THE LITTLE PATUXENT RIVER WHICH IS USE IV-P. THE SITE WAS PREVIOUSLY CLEARED AND GRADED AND THERE IS NO FOREST, WETLANDS OR STREAMS LOCATED ON THE SITE.
12. NO STEEP SLOPES OVER 20,000 SF CONTIGUOUS AREA ARE LOCATED ON-SITE.
13. THIS PROJECT IS EXEMPT FROM FOREST CONSERVATION IN ACCORDANCE WITH SECTION 16.1202(b)(1)(iv) OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION MANUAL SINCE IT IS A PLANNED UNIT DEVELOPMENT WHICH HAS PRELIMINARY PLAN APPROVAL AND 50% OR MORE OF THE LAND IS RECORDED AND SUBSTANTIALLY DEVELOPED BEFORE DECEMBER 31, 1992.
14. THERE ARE NO FOREST, WETLANDS, STREAMS OR ASSOCIATED BUFFERS LOCATED ON-SITE BASED ON ECO-SCIENCE PROFESSIONALS, INC. LETTER DATED SEPTEMBER 17, 2014.
15. THE OPEN SPACE REQUIREMENT FOR THIS NT DEVELOPMENT WAS PREVIOUSLY ADDRESSED.
16. IN ACCORDANCE WITH SECTION 16.121(A)(4) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, THIS PROJECT IS EXEMPT FROM RECREATIONAL OPEN SPACE.
17. A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
18. RED BRANCH ROAD IS CLASSIFIED AS A MAJOR COLLECTOR.
19. TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
20. THE PROPOSED BUILDING SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
21. THERE IS NO SPECIMEN TREES LOCATED ON SITE.
22. SIGNAGE SHALL BE PROVIDED ON THE BUILDING IDENTIFYING THE BUILDING ADDRESS, AND EACH SUITE SEPARATED BY LETTER.
23. STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY PERVIOUS PAVING AND A COMTECH STORMFILTER VAULT.
24. 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 AFFECT THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
25. 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.

# ENVIRONMENTAL CONCEPT PLAN

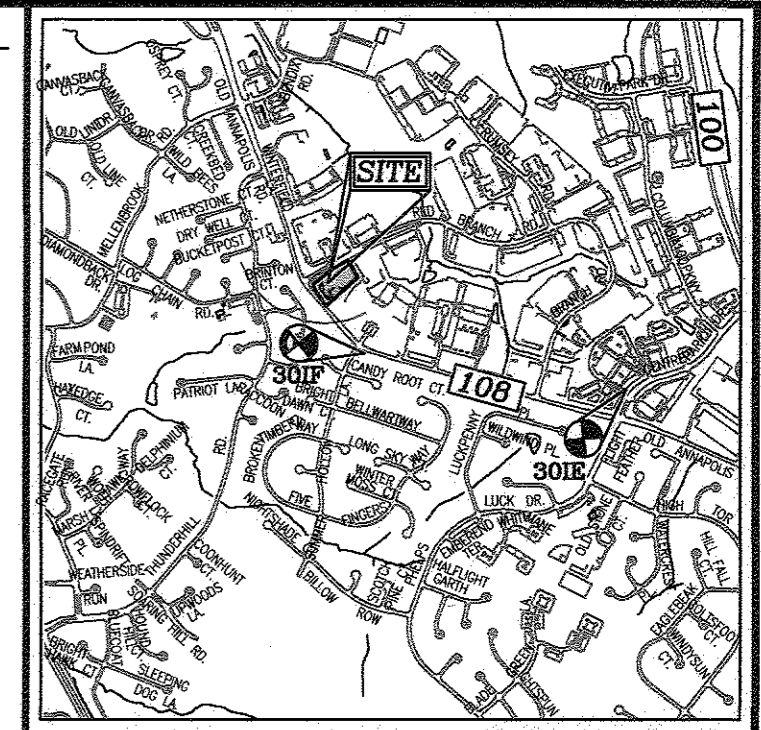
## 9199 RED BRANCH ROAD

### (PB. 12-65) L.15428/F.351

## COLUMBIA, OAKLAND RIDGE INDUSTRIAL PARK

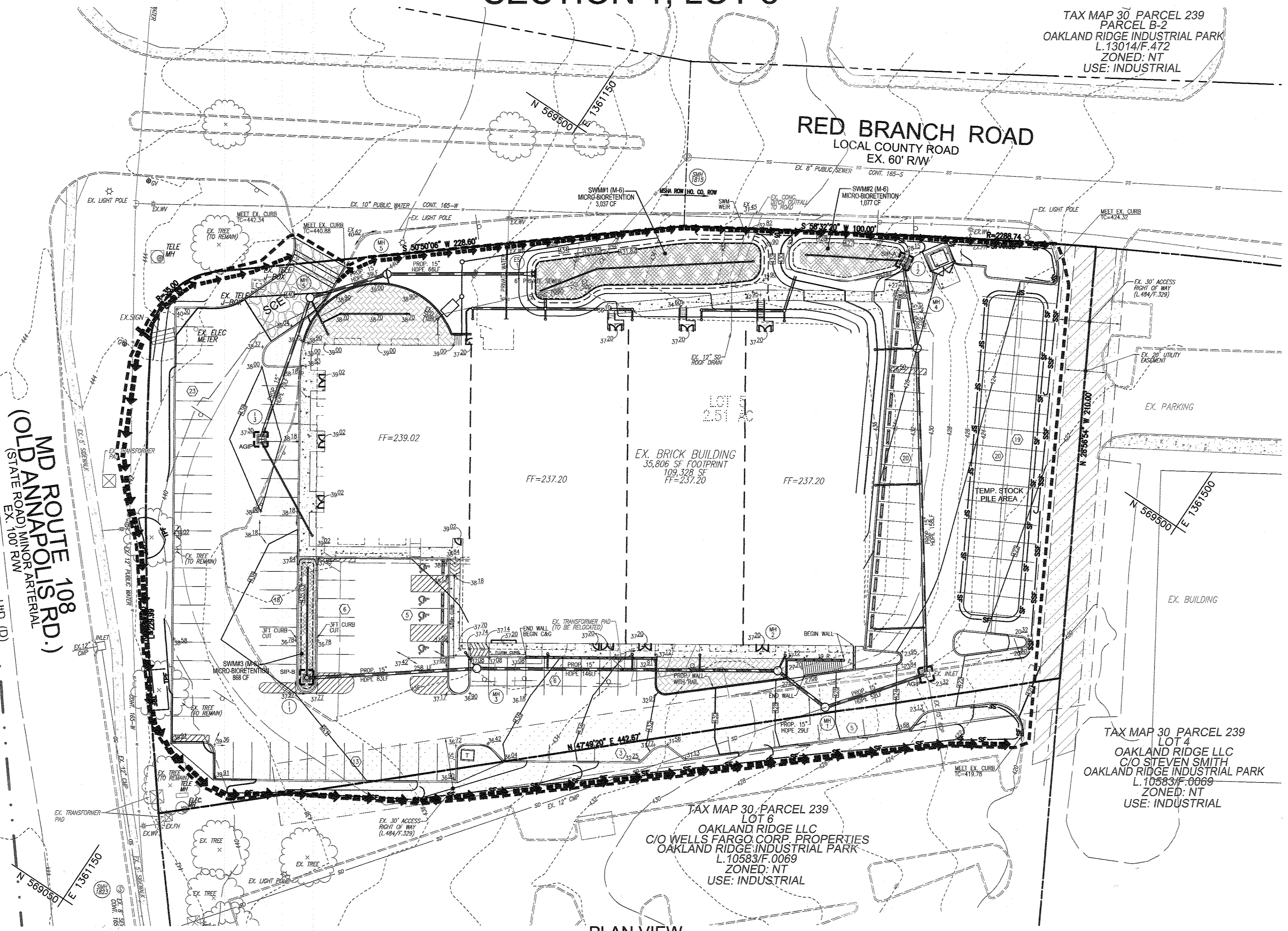
### SECTION 1, LOT 5

**BENCHMARKS**  
 HOWARD COUNTY BENCHMARK 301E  
 N 568536.34 E 1363958.61 ELEV.: 504.10'  
 HOWARD COUNTY BENCHMARK 301F  
 N 568033.11 E 1363934.26 ELEV.: 473.36'



**VICINITY MAP**  
 SCALE: 1"=2000'  
 ADC MAP COORDINATE: 27/D6

- LEGEND:**
- PROPERTY LINE
  - - - RIGHT-OF-WAY LINE
  - ADJACENT PROPERTY LINE
  - EXISTING 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
  - EXISTING 10' CONTOUR
  - EXISTING 2' CONTOUR
  - PROPOSED STORMDRAIN
  - PROPOSED STORMDRAIN INLET
  - PROPOSED SIDEWALK
  - PROPOSED 10' CONTOUR
  - PROPOSED 2' CONTOUR
  - PROPOSED SPOT ELEVATION
  - PROPOSED CURB
  - EXISTING 20' UTILITY EASEMENT
  - EXISTING 30' RIGHT OF WAY EASEMENT (LIBER 484 FOLIO 329)
  - PROPOSED MICRO-BIORETENTION FACILITY (M-6)
  - M1B2
  - M1D3
  - SOILS BOUNDARY
  - LIMIT OF DISTURBANCE
  - SILT FENCE
  - SUPER SILT FENCE
  - AGIP
  - SIP
  - STANDARD INLET PROTECTION
  - STABILIZED CONSTRUCTION ENTRANCE
  - EARTH DIKE



SCALE: 1"=30'

SHEET INDEX		
DESCRIPTION	SHEET NO.	
COVER SHEET, ESDV PLAN	1 OF 2	
SWM DRAINAGE AREA MAP, SWM DETAILS	2 OF 2	

ADDRESS CHART			
LOT/PARCEL#	STREET ADDRESS		
LOT 5/PARCEL 239	9199 RED BRANCH ROAD		
PERMIT INFORMATION CHART			
SUBDIVISION NAME	SECTION/AREA	LOT/PARCEL#	
COLUMBIA, OAKLAND RIDGE INDUSTRIAL PARK	SECTION 1	LOT 5/PARCEL 239	
PLAT OR L/F	GRID NO.	ZONING	TAX MAP NO.
PB. 12-65	L.15428/F.351	17	NT
ELECT. DIST.	CENSUS TR.		
30	2ND	602302	

**OWNER/DEVELOPER**  
 TSC/9199 RED BRANCH ROAD, LLC  
 8600 SNOWDEN RIVER PKWY, SUITE 207  
 COLUMBIA, MD, 21045  
 C/O BRUCE LAITTE  
 (410) 953-0222

TAX MAP 30, PARCEL 239  
 LOT 4  
 OAKLAND RIDGE LLC  
 C/O STEVEN SMITH  
 OAKLAND RIDGE INDUSTRIAL PARK  
 L.10583/F.0069  
 ZONED: NT  
 USE: INDUSTRIAL

TAX MAP 30, PARCEL 239  
 LOT 6  
 OAKLAND RIDGE LLC  
 C/O WELLS FARGO CORP PROPERTIES  
 OAKLAND RIDGE INDUSTRIAL PARK  
 L.10583/F.0069  
 ZONED: NT  
 USE: INDUSTRIAL

**SITE DATA**  
 LOCATION: COLUMBIA, MD; TAX MAP 30, BLOCK 17, PARCEL 239  
 2ND ELECTION DISTRICT  
 PRESENT ZONING: INDUSTRIAL CONTROL SCHEME. THE FINAL PLAN SHALL USE OF STRUCTURES: RETAIL SHOPPING CENTER  
 PARCEL AREA: 2.51 AC.  
 DPZ/DEED REFERENCES: PB. 12-24, PB. 12-65, FDP-3A, L.15428/F.351  
 TOTAL BUILDING COVERAGE: 35,806 SF (0.82 AC. OR 32.67% OF GROSS AREA)  
 PAVED PARKING LOT/AREA ON SITE: 46,852 SF (1.08 AC. OR 43.03% OF GROSS AREA)  
 AREA OF LANDSCAPE ISLAND: 2,265 SF (0.05 AC. OR 1.99% OF GROSS AREA)  
 LIMIT OF DISTURBED AREA (CONSTRUCTION): 114,515 SF (OR 2.63 AC)  
 LIMIT OF DISTURBED AREA (FOR SWM): 112,457 SF (OR 2.58 AC)  
 WETLANDS ON SITE: 0.00 AC.  
 WETLAND BUFFERS ON SITE: 0.00 AC.  
 STREAMS AND THEIR BUFFERS ON SITE: 0.00 AC.  
 AREA OF ON-SITE 100-YEAR FLOODPLAIN: 0.00 AC.  
 AREA OF EXISTING FOREST ON SITE: 0.00 AC.  
 AREA OF STEEP SLOPES (1% OR GREATER): 0.00 AC.  
 AREA OF ERODIBLE SOILS: 0.00 AC.  
 AREA MANAGED BY ESDV (THIS PLAN): 0.96 AC.  
 \*IMPERVIOUS AREA: 0.66 AC.  
 \*GREEN AREA: 0.30 AC.

**ENVIRONMENTAL SITE DESIGN NARRATIVE**

1. THE SITE'S NATURALLY SLOPES FROM WEST TO EAST. THE SITE HAS BEEN DESIGNED TO ALSO MAINTAIN THESE NATURAL FLOW PATTERNS.
2. 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 ESD CONCEPT PROPOSES THE USE OF MICRO-BIORETENTION FACILITIES (M-6). THE FACILITIES WILL DISCHARGE THE STORM DRAIN SYSTEM WHICH OUTFALLS AT THE SOUTH EAST CORNER OF THE SITE. THE PROPOSED ESD PRACTICES SHALL BE PRIVATELY OWNED AND MAINTAINED.
3. 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.
4. AS STATED IN #3 ABOVE, STORMWATER MANAGEMENT FOR THE PROJECT SHALL BE MET THROUGH THE USE OF MICRO-BIORETENTION FACILITIES (M-6).
5. NO WAIVERS ARE ANTICIPATED TO FULFILL THIS CONCEPT.
6. THERE ARE NO NATURAL RESOURCES SUCH AS WETLANDS, STREAMS, THEIR BUFFERS, FLOOD PLAIN, STEEP SLOPES, FOREST CONSERVATION, OR SPECIMEN TREES ON SITE THAT REQUIRED PROTECTION OR ENHANCEMENT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Phil P. ...* 5-3-17  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Karl ...* 5-01-17  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

NO.	REVISION	DATE

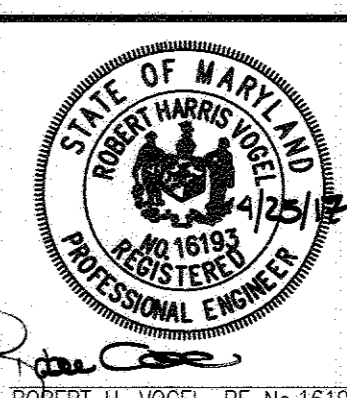
ENVIRONMENTAL CONCEPT PLAN

**COVER SHEET AND ESDV CONCEPT PLAN**

9199 RED BRANCH ROAD  
 COLUMBIA, OAKLAND RIDGE INDUSTRIAL PARK  
 SECTION 1, LOT 5  
 RETAIL SHOPPING CENTER  
 (PB. 12-65) L.15428/F.351 HOWARD COUNTY, MARYLAND

TAX MAP: 30 BLOCK: 17 ZONED: NT  
 2ND ELECTION DISTRICT PARCEL 239

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



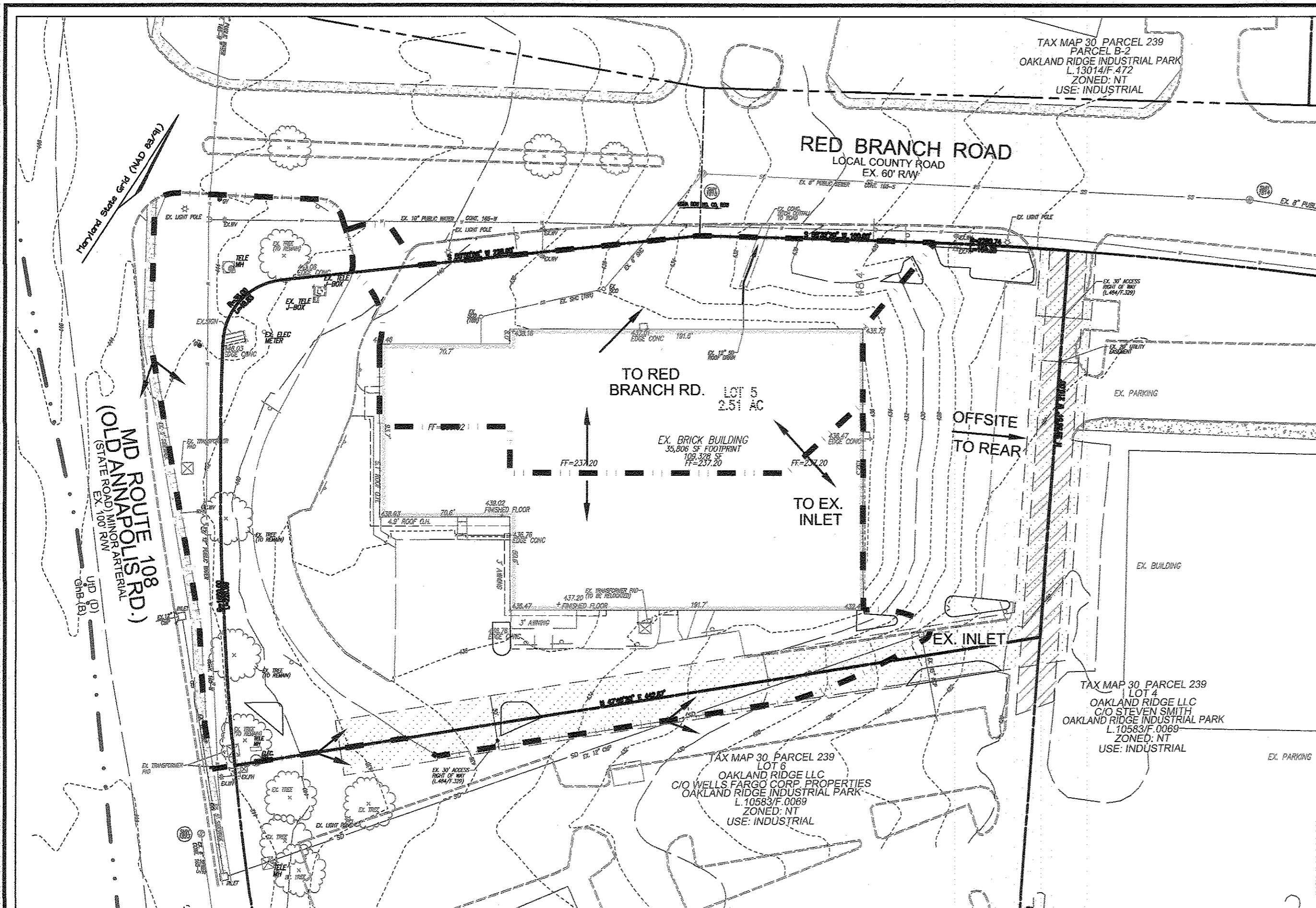
**PROFESSIONAL CERTIFICATE**

DESIGN BY: RHW/DZE  
 DRAWN BY: KS/DZE  
 CHECKED BY: RHW  
 DATE: APRIL 2017  
 SCALE: AS SHOWN  
 W.O. NO.: 11-43

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

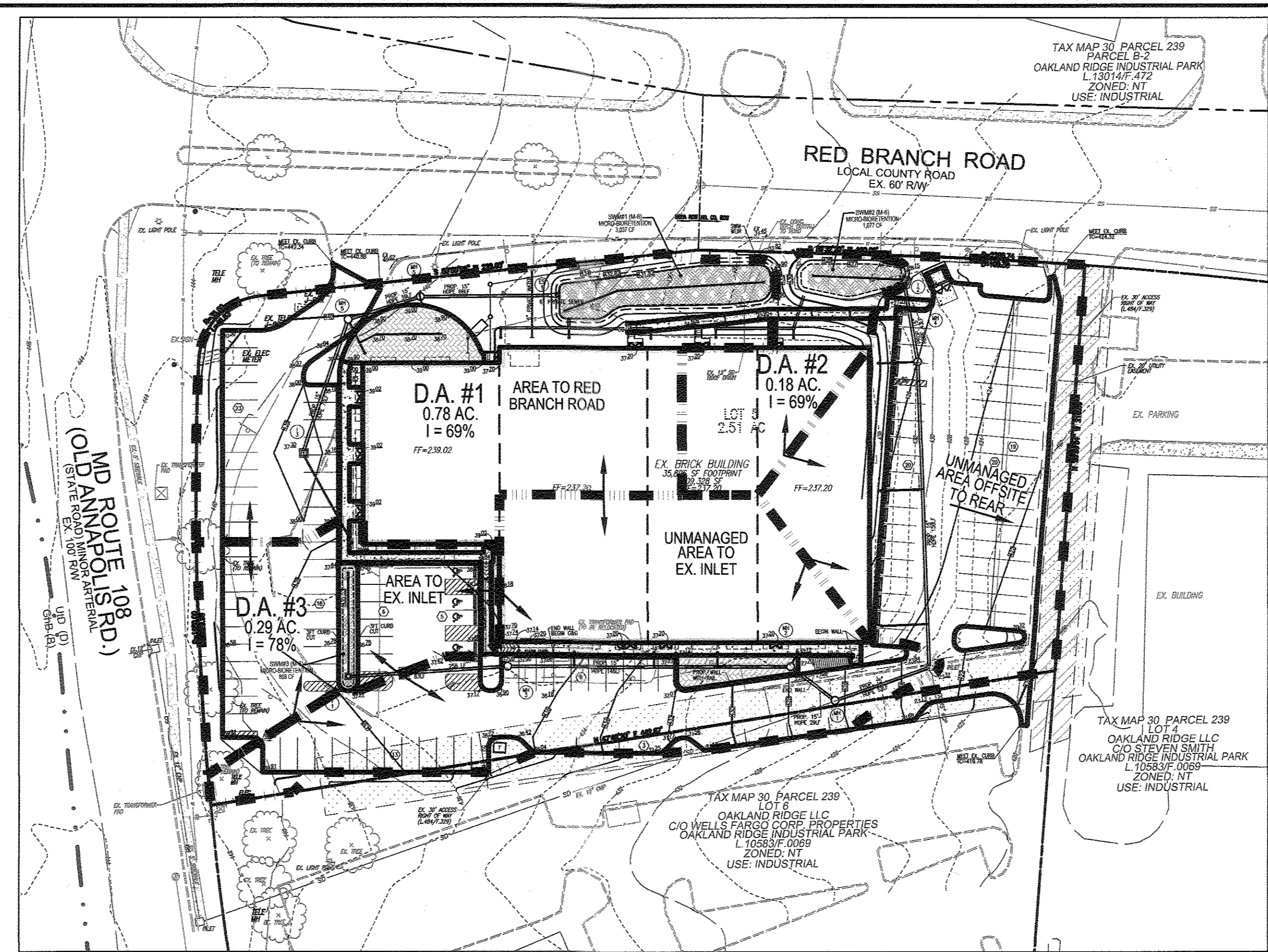
1 SHEET OF 2





EXISTING SWM DRAINAGE AREA MAP

SCALE: 1"=50'



PROPOSED SWM DRAINAGE AREA MAP

SCALE: 1"=50'

LEGEND:

- PROPERTY LINE
- RIGHT OF WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
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- EXISTING 30' RIGHT OF WAY EASEMENT (LIBER 484 FOLIO 329)
- PROPOSED MICRO-BIOTRETION FACILITY (M-6)
- SOILS BOUNDARY
- SW DRAINAGE DIVIDE

Total ESDv Required (Redevelopment) = 4,943 c.f.

Pe = 1.80

ESDv = (PexRvxA)/12

Rv = 0.05 + 0.009xI

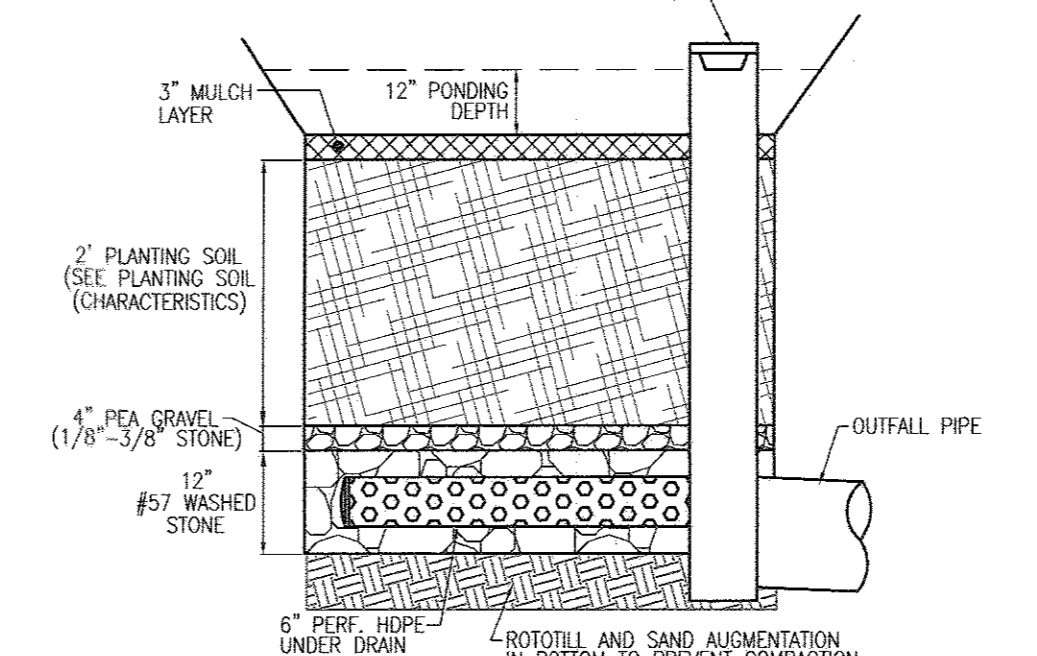
Vmin = 1.0" rainfall

Vmax = 1yr rainfall = 2.6"

DA	% IMPERV	Rv	DA	ESDv	MINIMUM VOLUME	MAXIMUM VOLUME	TOTAL VOL PROVIDED	SWM PRACTICE	SURFACE AREA	STORAGE DEPTH (FT)	ESDv VOLUME	ADD. STONE DEPTH BELOW	STONE VOLUME	AREA SF	PERV AREA	IMP AREA
1	69	0.67	0.78	3,419	1,900	4,939	3,037	MICRO-BIOTRETION	1959	1.0	2,449	1.00	588	33,890.92	10,446.02	23,444.90
2	69	0.67	0.18	796	442	1,149	1,077	MICRO-BIOTRETION	695	1.0	869	1.00	209	7,917.99	2,464.92	5,453.07
3	78	0.75	0.29	1,431	795	2,066	868	MICRO-BIOTRETION	560	1.0	700	1.00	168	12,644.53	2,749.72	9,894.81
TOTAL ESDv BY SUBAREA				0.96	4,215		4,982				4,018		964	41,808.91	12,910.94	28,897.97

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIOTRETION, 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 SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR BLENDED WITHIN THE MICRO-BIOTRETION PRACTICE THAT MAY BE HINDERANCE TO PLANT GROWTH, OR PROVE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERBERIS GRASS, QUICKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER ITEM 15.03.01.02. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:  
  - SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
  - ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
  - CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
  - PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G. LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.
  - 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.
- COMPACTION**  
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIOTRETION 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 TWIN TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION, RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.  
COMPACTION CAN BE ALLEVATED AT THE BASE OF THE BIOTRETION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL FLOW, 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 BIOTRETION 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 BIOTRETION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIOTRETION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIOTRETION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.
- PLANT MATERIAL**  
RECOMMENDED PLANT MATERIAL FOR MICRO-BIOTRETION 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. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIOTRETION 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 ROOT BALL SHALL BE PLANTED SO 1 FEET 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 STAKE THROUGH 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 PROVIDED ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIOTRETION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS, DEFOLIANTS, 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.
- 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 HDPE).
  - 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 0.2% SLOPE.
  - A RIGID, NON-PERFORATED PIPE OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
  - A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".
- MISCELLANEOUS**  
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.



MICRO-BIOTRETION NOT TO SCALE

SOILS LEGEND HOWARD COUNTY SOILS #18

SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	ERODIBLE	Kw
UID	URBAN LAND-UDORTHERM'S COMPLEX, 0 TO 15 PERCENT SLOPES	D	NO	NO	0.28

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY  
 \* BASED UPON ESTIMATED CUTS

NOTE: 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

**OWNER/DEVELOPER**  
 TSC/9199 RED BRANCH ROAD, LLC  
 8600 SNOWDEN RIVER PKWY, SUITE 207  
 COLUMBIA, MD, 21045  
 C/O BRUCE JAFFE  
 (410) 953-0222

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	ADD STONE UNDER MBR	ESDv VOLUME	PERMEABLE PAVEMENT	STONE UNDER PERM. PAVE	LANDSCAPE INFILTRATION	PERVIOUS SIDEWALK	BIO SWALE	GRAVEL TRENCH	MICRO BIO RETENTION
1	33,891	SWM#1	0	0	0	0	0	0	0	2,449	588	2,449						
		SUBTOTAL 1	0	0	0	0	0	0	0	2,449	588	3,037						
2	7,918	SWM#2	0	0	0	0	0	0	0	869	209	869						
		SUBTOTAL 1	0	0	0	0	0	0	0	869	209	1,077						
3	12,645	SWM#3	0	0	0	0	0	0	0	700	168	700						
		SUBTOTAL 1	0	0	0	0	0	0	0	700	168	868						
TOTALS:			0	0	0	0	0	0	4,018	964	4,982							

TOTAL AREA 41,809 SF  
 0.96 AC

TOTAL ESDv PROVIDED (cf) = 4,982  
 TOTAL ESDv REQUIRED (cf) = 4,943

- NOTES:**
- APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN DOES NOT CONSTITUTE ANY APPROVAL OF SUBSEQUENT SUBDIVISION OR SITE DEVELOPMENT PLANS. FURTHER COMMENTS WILL BE GENERATED UPON REVIEW OF THE APPLICABLE DEVELOPMENT PLANS IN ACCORDANCE WITH THE SUBDIVISION AND ZONING REGULATIONS.
  - REVIEW OF THIS PLAN FOR COMPLIANCE WITH ZONING AND SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION, SITE DEVELOPMENT PLAN, AND/OR PERMIT STAGES; THEREFORE, THIS PLAN IS SUBJECT TO ADDITIONAL AND MORE DETAILED COMMENTS AS THIS PLAN IS PROCESSED THROUGH THESE STAGES.
  - THERE ARE NO ENVIRONMENTAL FEATURES: FLOODPLAIN, WETLANDS, STREAMS OR FOREST THAT EXISTS ON THIS PROPERTY OR WITHIN THE DEVELOPED AREA.

OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3), MICRO-BIOTRETION (M-6), RAIN GARDENS (M-7), BIOTRETION SWALE (M-8), AND ENHANCED FILTERS (M-9)

- THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.
- THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT. REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
- THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
- THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chad...* 5-3-17  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*...* 6-01-17  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

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

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 I 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 underman 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 350.8/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressure); 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.

ENVIRONMENTAL CONCEPT PLAN

**SWM DRAINAGE AREA MAP NOTES AND DETAILS**

9199 RED BRANCH ROAD  
 COLUMBIA, OAKLAND RIDGE INDUSTRIAL PARK  
 SECTION 1, LOT 5  
 RETAIL SHOPPING CENTER  
 (Pb. 12-65) L 15428F.351 HOWARD COUNTY, MARYLAND

TAX MAP: 30 BLOCK: 17 ZONED: NT PARCEL 239  
 2ND ELECTION DISTRICT

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

DESIGN BY: RHW/DZE  
 DRAWN BY: KG/DZE  
 CHECKED BY: RHW  
 DATE: APRIL 2017  
 SCALE: AS SHOWN  
 W.O. NO.: 11-43

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

2 SHEET OF 2