

AUTUMN RIVER - PHASE IV

TOWNHOUSES

L. 5546 F.30

ENVIRONMENTAL CONCEPT PLAN

GENERAL NOTES

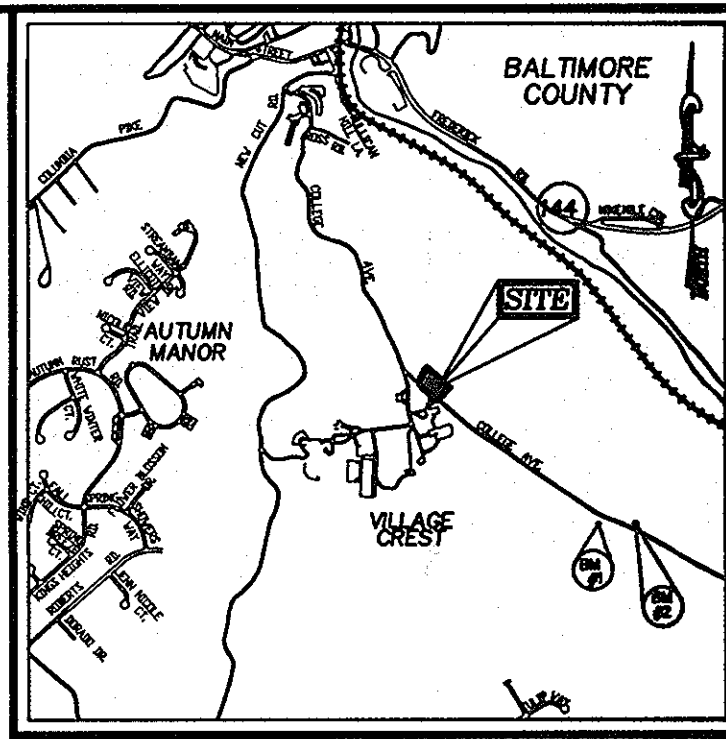
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR IS TO NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE DAYS BEFORE STARTING WORK ON THESE DRAWINGS:
 - MISS UTILITY: 1-800-257-7777
 - VERIZON TELEPHONE COMPANY: 1-410-954-6281
 - HOWARD COUNTY BUREAU OF UTILITIES: 410-313-2366
 - AV&T CABLE LOCATION DIVISION: 1-800-393-3533
 - B.G.A.E. CO. CONTRACTOR SERVICES: 410-850-4820
 - B.G.A.E. CO. UNDERGROUND DAMAGE CONTROL: 410-187-4620
 - STATE HIGHWAY ADMINISTRATION: 410-531-5533
- THE TOPOGRAPHY SHOWN HEREON IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY PREPARED BY WINGS AERIAL MAPPING COMPANY, INC. PHOTOGRAPHED MARCH 1995.
- THE PROJECT BOUNDARY SHOWN HEREON IS BASED ON A BOUNDARY SURVEY PREPARED BY FISHER, COLLINS & CARTER, INC. DATED FEBRUARY 14, 2000, WHICH WAS VERIFIED AS CORRECT BY ROBERT H. VOGEL ENGINEERING, INC. IN MARCH 2010.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO START OF WORK.
- ANY DAMAGE TO PUBLIC RIGHT-OF-WAY, PAVING, OR EXISTING UTILITIES WILL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO CEMETERIES OR GRAVE SITES LOCATED ON THE SUBJECT PROPERTY.
- STORM WATER MANAGEMENT TO BE PROVIDED FOR THIS DEVELOPMENT BY ENVIRONMENTAL SITE DESIGN UTILIZING (2) MICRO BIO-RETENTION FACILITIES AND ROOFTOP DISCONNECTS.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE LAYMENT OF ANY ASPHALT.
- THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. DEVELOPMENT OR CONSTRUCTION OF THESE LOTS MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION, OR BUILDING AND GRADING PERMITS.
- THE SUBDIVISION PLAN IS SUBJECT TO THE FOLLOWING DPZ FILES:
 - S-98-16, P-98-16, F-00-131 F-01-08, P.B. 325, P.B. 148, PLAT# 15794, & 15795 PLAT# 14513 TO 14515, P-07-016, P-08-006, WP-09-063, F-09-021, S-02-004, F-10-067.
- THE SUBJECT PROPERTY IS ZONED "R-ED" IN ACCORDANCE WITH THE 2/2/04 COMPREHENSIVE ZONING PLAN AND THE COMP. LITE. ZONING REGULATIONS EFFECTIVE ON 7/28/06.
- A TRAFFIC IMPACT ANALYSIS WAS PREPARED BY THE TRAFFIC GROUP AND APPROVED ON FEBRUARY 8, 1999 UNDER S-98-16.
- STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME II (2008) SECTION 5.5.A. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
- ANY EXISTING STREET TREES DAMAGED OR DESTROYED DURING CONSTRUCTION WILL BE REPLACED BY THE CONTRACTOR.
- THIS SITE IS NOT LOCATED IN A HISTORIC DISTRICT.
- ALL DRIVEWAY ENTRANCES SHALL UTILIZE HOWARD COUNTY STANDARD DETAIL NO. R-6-06.
- "DRIVEWAY(S)" SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
 - a) WIDTH - 12 FEET SERVING MORE THAN ONE RESIDENCE.
 - b) SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CLIP COATING.
 - c) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% CHANGE AND MINIMUM OF 45-FOOT DEPTH TURNING RADIUS.
 - d) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
 - e) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE.
 - f) STRUCTURE CLEARANCES - MINIMUM 12 FEET.
 - g) MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.
- THE PROPOSED SUBDIVISION AND RELATED CONSTRUCTION WILL NOT AFFECT ENVIRONMENTAL FEATURES OR BUFFERS.
- THE FOREST CONSERVATION OBLIGATION FOR THIS PLAN WILL BE MET BY PROVIDING A FEE IN LIEU PAYMENT OF \$21,235.50 TO THE HO. CO. FOREST CONSERVATION FUND FOR THE 0.17 AC. OF AFFORESTATION OBLIGATION (0.17 AC. x 7,405.20 SF. x \$0.75 = \$5,554.00).
- EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND SEWER EXHIBITS 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.
- WATER AND SEWER FOR THIS PROJECT WILL BE PUBLIC. WATER WILL BE PROVIDED THROUGH CONTACT WITH SEWER WILL BE PROVIDED THROUGH CONTACT WITH PROJECT.
- PUBLIC WATER AVAILABLE THROUGH CONTRACT NO. 14-4463-D.
- PUBLIC SEWER AVAILABLE THROUGH CONTRACT NO. 14-4463-D.
- 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. 3044005R AND 3044004R WERE USED FOR THIS PROJECT.
- NO RARE, THREATENED OR ENDANGERED SPECIES WERE OBSERVED ON THE PROPERTY.
- THERE IS NO 100YR FLOODPLAIN, WETLANDS, STREAMS, OR STEEP SLOPES ON SITE.
- ALL SIGN POST 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 THE TOP OF EACH POST.
- SEDIMENT AND EROSION CONTROL WILL BE PROVIDED FOR THIS SITE.
- A NOISE STUDY IS NOT REQUIRED FOR THIS SUBDIVISION.
- THERE ARE EXISTING STRUCTURES LOCATED ON SITE AND SHALL BE REMOVED PRIOR TO SIGNATURES ON FINAL PLAN.
- COLLEGE AVENUE IS A SCENIC ROAD. 35' WIDE FOREST BUFFER WILL BE RETAINED WHERE IT CURRENTLY EXISTS AND A TYPE 'B' LANDSCAPE BUFFER WERE ADDED IN AREAS WHERE A 35' FOREST WERE NOT EXIST. SPECIES TYPICALLY OCCURRING IN THE EXISTING FORESTED AREA ALONG THE ROADWAY WILL BE USED FOR THE TYPE 'B' LANDSCAPE BUFFER.
- IN ACCORDANCE WITH SECTION 128 OF THE HOWARD COUNTY ZONING REGULATIONS, BAY WINDOWS, CHIMNEYS, OR EXTERIOR STAIRWAYS NOT MORE THAN 16 FEET IN WIDTH MAY PROJECT NOT MORE THAN 4 FEET INTO ANY SETBACKS, PORCHES OR DECKS, OPEN OR ENCLOSED MAY PROJECT NOT MORE THAN 10 FEET INTO THE FRONT FRONT OR REAR YARD SETBACK.

SITE DATA

LOCATION: TAX MAP 25, BLOCK 14, PARCEL 159
 DPZ REFERENCES: L. 5546 F.30
 2ND ELECTION DISTRICT
 PRESENT ZONING: R-ED
 GROSS AREA OF PROJECT: 1.15 AC.
 TOTAL PROJECT AREA: 1.15 AC.
 LIMIT OF DISTURBANCE: 1.07 AC.
 PROPOSED USE OF SITE: RESIDENTIAL (SFA)
 NUMBER OF RESIDENTIAL LOTS PROPOSED: 7 LOTS
 GREEN OPEN AREA: 0.77 AC.
 IMPERVIOUS AREA: 0.38 AC.
 AREA OF FLOODPLAIN: 0.00 AC.
 AREA OF WETLANDS/BUFFER: 0.00 AC.
 AREA OF STEEP SLOPES: 0.00 AC.

BENCHMARKS

BENCHMARK NO. 1: COUNTY CONTROL #3044005R
 3/4" REBAR 0.8' BELOW SURFACE
 N. 578233.92, E. 1473142.33
 ELEV. = 374.369
 BENCHMARK NO. 2: COUNTY CONTROL #3044004R
 3/4" REBAR 0.6' BELOW SURFACE
 N. 578128.03, E. 1473460.71
 ELEV. = 362.575



VICINITY MAP
 SCALE: 1"=2000'
 ADC MAP/GRID NO.: 4816 D9

LEGEND

	PROPERTY LINE		PROPOSED CONTOUR
	RIGHT-OF-WAY LINE		EXISTING CONTOUR
	ADJACENT PROPERTY LINE		PROPOSED SPOT ELEVATION
	EXISTING UTILITY POLE		EXISTING SPOT ELEVATION
	EXISTING LIGHT POLE		EXISTING CURB AND GUTTER
	EXISTING SIGN		PROPOSED CURB AND GUTTER
	USE-IN-COMMON ACCESS EASEMENT		EXISTING MAILBOX
	PROPOSED SIDEWALK		EXISTING SANITARY MANHOLE
	20' PRIVATE DRAINAGE AND UTILITY EASEMENT		EXISTING SANITARY LINE
	EX 10' PUBLIC DRAINAGE TREE MAINTENANCE & UTILITY EASEMENT		EXISTING CLEANOUT
	EXISTING FENCE		EXISTING FIRE HYDRANT
	SOILS BOUNDARY		EXISTING WATER LINE
	SUPER SILT FENCE		EXISTING TREELINE
	LIMIT OF DISTURBANCE		PROPOSED TREELINE

ADDRESS CHART

LOT NO.	STREET ADDRESS
10	BENDING SKY WAY
11	BENDING SKY WAY
12	BENDING SKY WAY
13	BENDING SKY WAY
14	BENDING SKY WAY
15	BENDING SKY WAY
16	BENDING SKY WAY

COORDINATE TABLE

POINT	NORTHING	EASTING
187	579826.6191	1371310.5660
188	579818.4863	1371549.3135
701	579498.2568	1371444.5018

SHEET INDEX

DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 2
DETAIL SHEET	2 OF 2

OWNER

HISTORIC ELLICOTT PROPERTIES, INC.
 4100 COLLEGE AVE.
 ELLICOTT CITY, MD 21042-7819
 21043 - 5506
 (410) 465-3500

DEVELOPER

AUTUMN DEVELOPMENT CORPORATION
 C/O LAND DESIGN & DEVELOPMENT, INC.
 5300 DORSEY HALL DR. STE. 102
 ELLICOTT CITY, MD 21042-7819
 ATTN: MR. DONALD R. REUWER
 (443) 367-0422

FOREST CONSERVATION WORKSHEET

NET TRACT AREA:

A. Total tract area	1.15
B. Land dedication area (parks, county facility, etc.)	0.00
C. Land dedication for roads or utilities (not being constructed by this plan)	0.00
D. Area to remain in commercial agricultural production/use	0.00
E. Other deductions (specify)	0.00
F. Net Tract Area	1.15

LAND USE CATEGORY: (from Trees Technical Manual)
 Input the number "1" under the appropriate land use, limit to only one entry.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	0	1	0	0

G. Afforestation Threshold ... 15% x F = 0.17
 H. Conservation Threshold ... 20% x F = 0.23

EXISTING FOREST COVER:

L. Existing forest cover	0.00
J. Area of forest above afforestation threshold	0.00
K. Area of forest above conservation threshold	0.00

BREAK EVEN POINT:

L. Forest retention above threshold with no mitigation	0.00
M. Clearing permitted without mitigation	0.00

PROPOSED FOREST CLEARING:

N. Total area of forest to be cleared	0.00
O. Total area of forest to be retained	0.00

PLANTING REQUIREMENTS:

P. Reforestation for clearing above conservation threshold	0.00
Q. Reforestation for clearing below conservation threshold	0.00
R. Credit for retention above conservation threshold	0.00
S. Total reforestation required	0.00
T. Total afforestation required	0.17
U. Credit for landscaping (may not exceed 20% of "S")	0.00
V. Total reforestation and afforestation required	0.17

SWM NARRATIVE

THE STORMWATER MANAGEMENT FOR THIS SITE WAS DESIGN TO PRESERVE THE NATURAL RESOURCES OF THIS SITE TO THE MAXIMUM EXTENT POSSIBLE. STRUCTURAL PRACTICES HAVE BEEN MINIMIZED WHILE ROOFTOP DISCONNECTS AND 2 MICRO-BIOTRETION FACILITIES HAVE BEEN UTILIZED THROUGHOUT THE SITE. THIS SITE WILL BECOME PART OF THE AUTUMN RIVER SUBDIVISION WHICH HAS FOREST CONSERVATION EASEMENTS FOR FOREST RETENTION AS WELL AS OPEN SPACE THAT INCLUDE STREAMS, WETLANDS AND THEIR BUFFERS. SEDIMENT CONTROL FOR THESE LOTS WILL BE ACHIEVED BY USING SUPER SILT FENCE WHICH WILL MINIMIZE DISTURBANCE AND PRESERVE NATURAL SHEETFLOW.

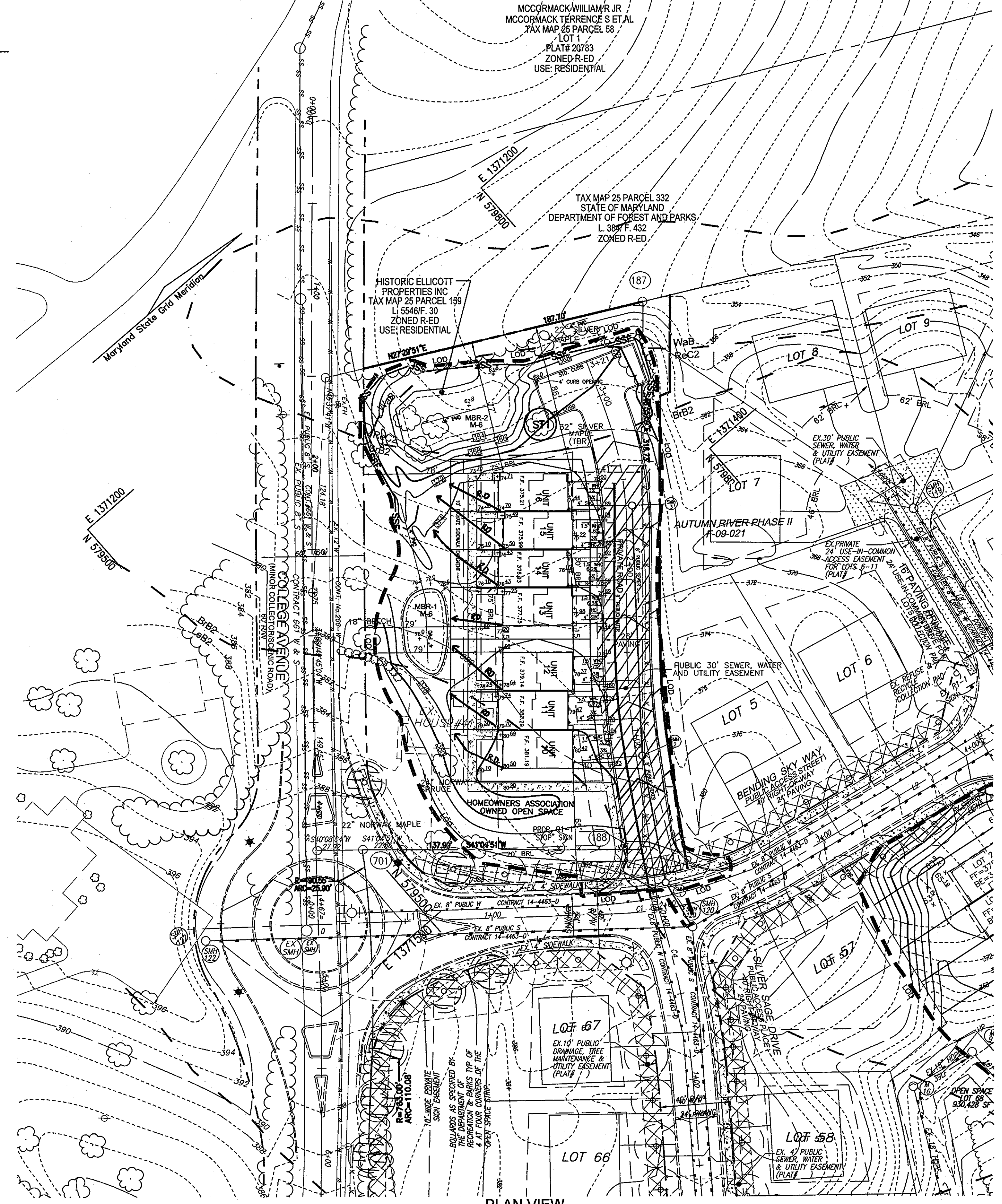
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION: *[Signature]* 8/2/11
 DATE: 8/01/11
 CHIEF, DIVISION OF LAND DEVELOPMENT: *[Signature]*
 DIRECTOR: *[Signature]* DATE: *[Signature]*

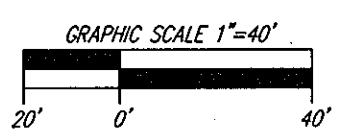
[Signature]
 J. CHRIS BEESE
 DNR QUALIFIED PROFESSIONAL

ECP NOTE

APPROVAL OF THIS PLAN 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 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.

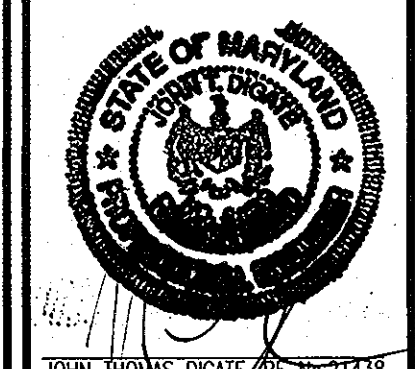


PLAN VIEW
 SCALE: 1"=40'



SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP
BrB2	BRANDYWINE LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
LaB2	LEONORE SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
ReC2	WATCHUNG SILT LOAM, 3 TO 8 PERCENT SLOPES	B
WoB	WATCHUNG SILT LOAM, 3 TO 8 PERCENT SLOPES	D

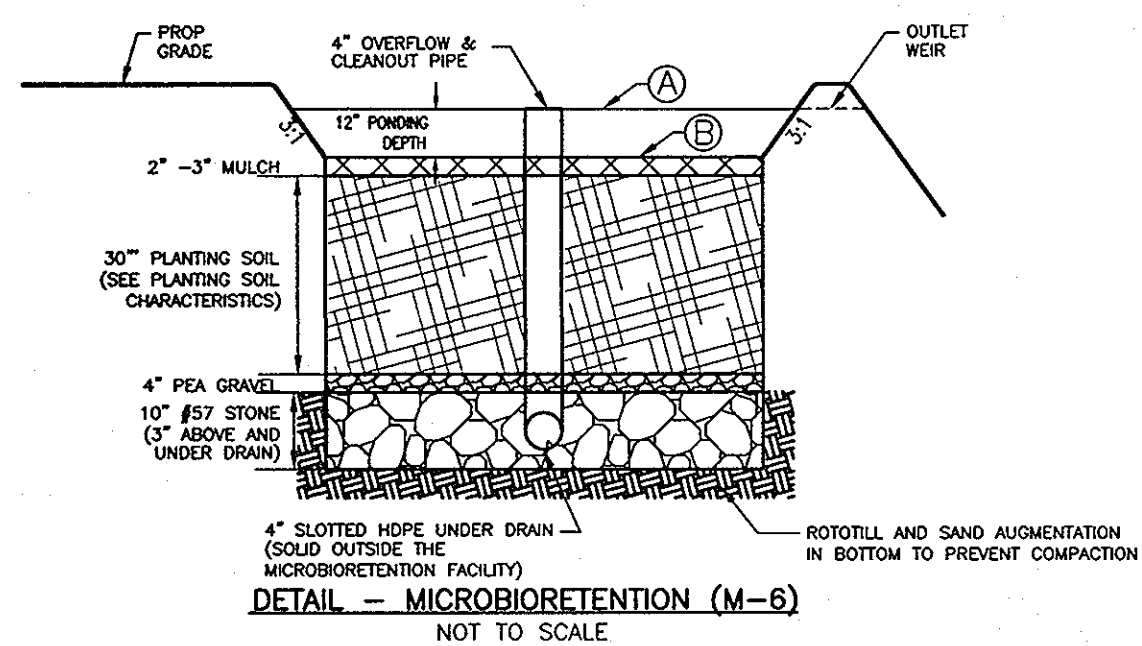


PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 2148, EXPIRATION DATE: 12-16-2012.

DESIGN BY: JTD
 DRAWN BY: JTD
 CHECKED BY: JTD
 DATE: JULY 2011
 SCALE: AS SHOWN
 W.O. NO.: 04-145

1 SHEET OF 2

MICROBIORETENTION PLANTING SCHEDULE				
KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
AR	2	ACER RUBRUM "OCTOBER GLORY" OCTOBER GLORY RED MAPLE	2 1/2"-3" CAL	B & B
IG	3	ILEX GLABRA HEDGE	2 1/2"-3" HT	CONT
PV	90	SWITCH GRASS Panicum virgatum	1 GALLON	24" O.C.
MD	50	BEE BALM MONARDA DIDYMA	1 GALLON	24" O.C.
EP	50	JOE PYE WOOD EUPATORIUM PURPUREUM	1 GALLON	48" O.C.



OPERATION AND MAINTENANCE SCHEDULE FOR MICROBIORETENTION 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 DEFICIENT STAKES AND WIRES.
- 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.

MICROBIORETENTION CHART				
FACILITY	(A) TOP ELEVATION	(B) BOTTOM DEPTH OF STONE BELOW (REV)	VOL. REQU. CF	VOL. PROV. CF
MBR#1	376.00	375.00	0	907
MBR#2	363.80	362.80	4"	863
				1356 (ABOVE) 491 (N STONE)

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 BERMOUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMPAR. 15.03.01.04.
THE PLANTING SOIL 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 (20%), AND COMPOST (40%).
* CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
* PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. ADJUSTMENTS (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 TEXTURE 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.

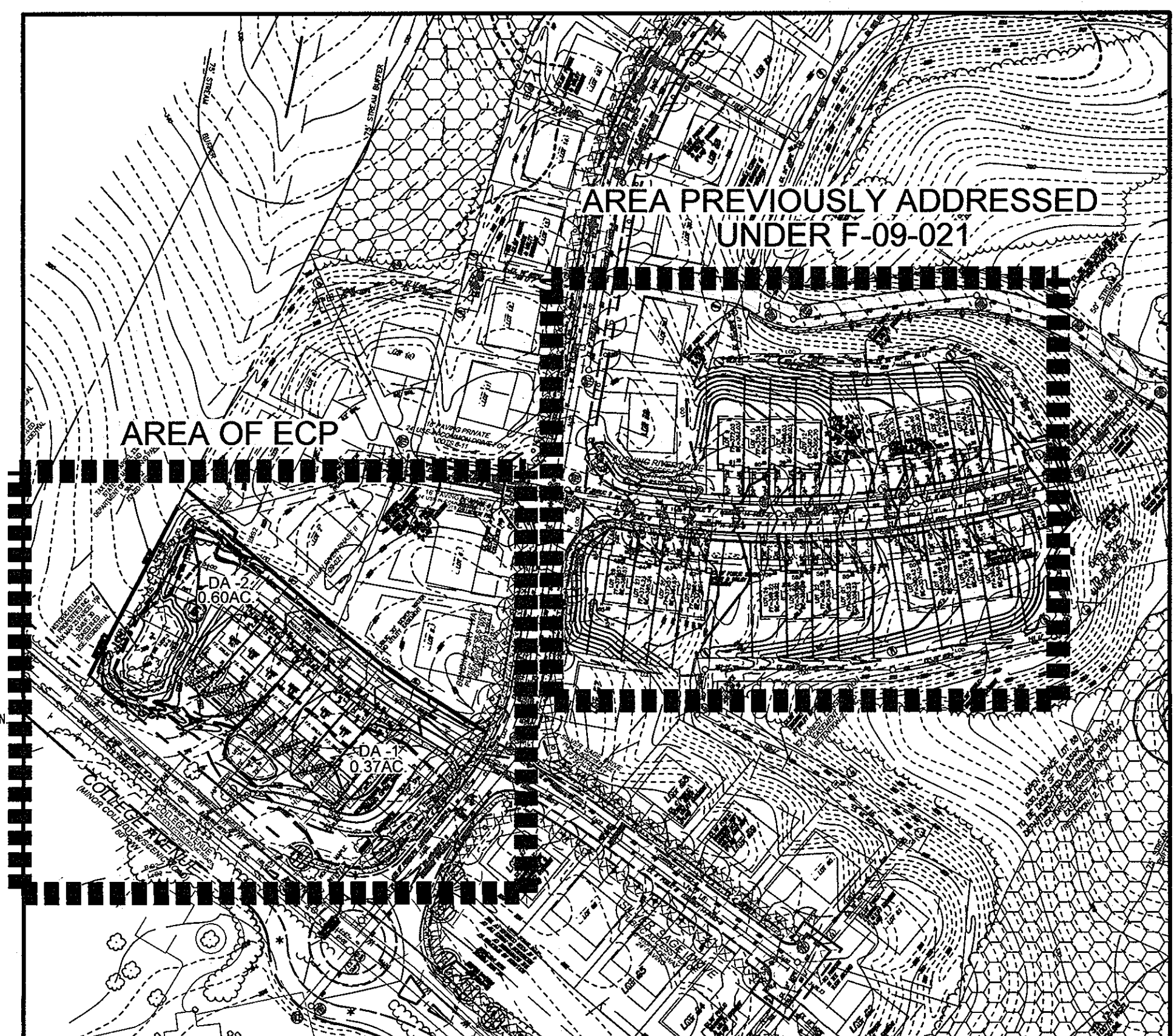
3. COMPACTION
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TUFF TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LOGS, 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, FLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS TO ROTOTILL 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 FINISH 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.

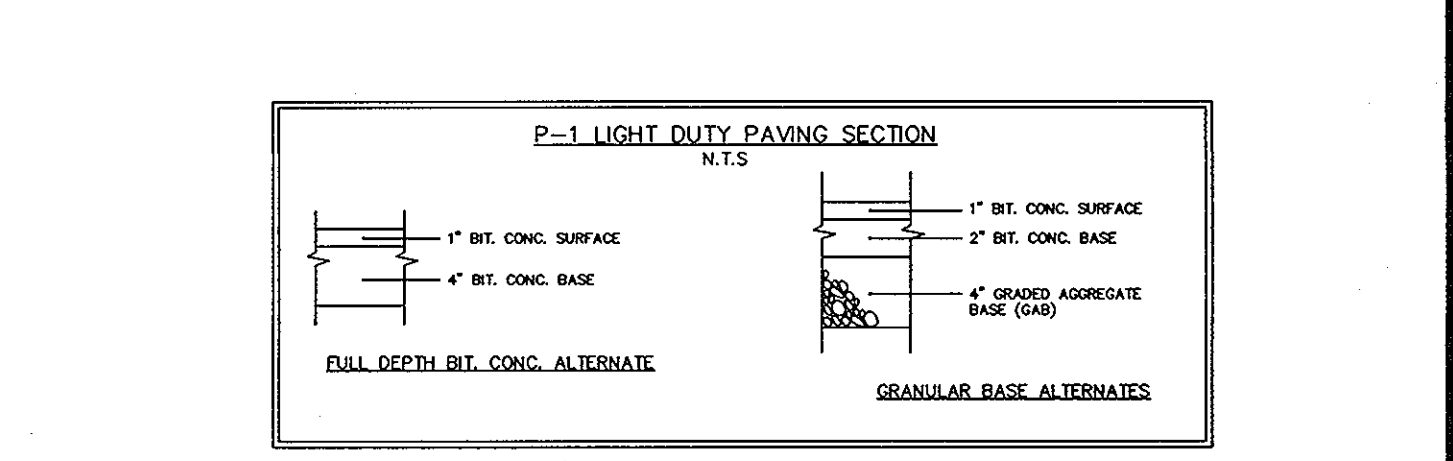
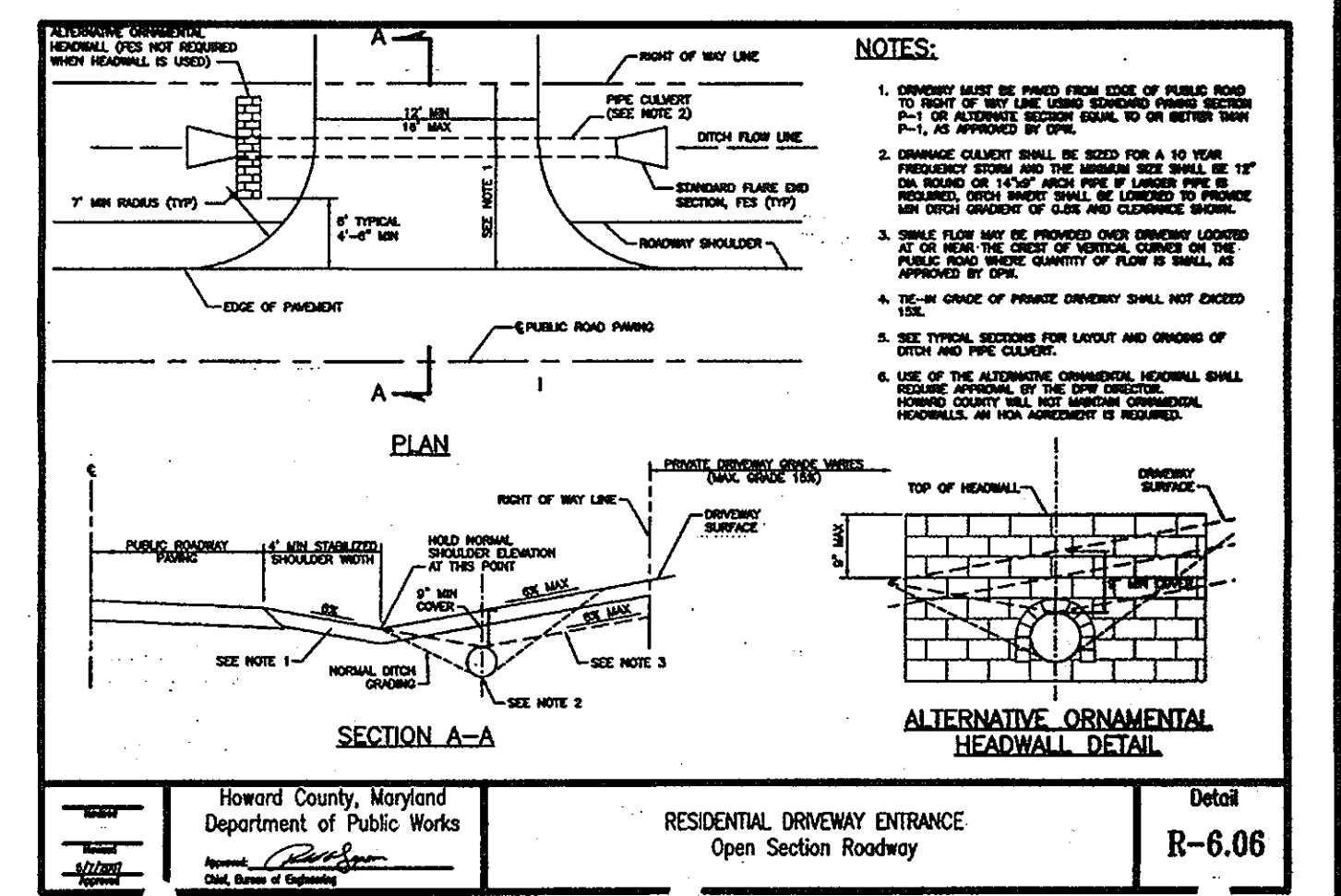
5. PLANT INSTALLATION
COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. FINE MULCH AND WOOD 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.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/3RD 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.

6. UNDERDRAINS
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
* PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G. PVC OF HOPE).
* PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 9" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4#) GALVANIZED HARDWARE CLOTH.
* GRAVEL - THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAN.
* 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 FILTER.
* A 4" LAYER OF PEA GRAVEL (1/2" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".
THIS MAIN COLLECTOR PIPE FOR UNDERDRAN 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.

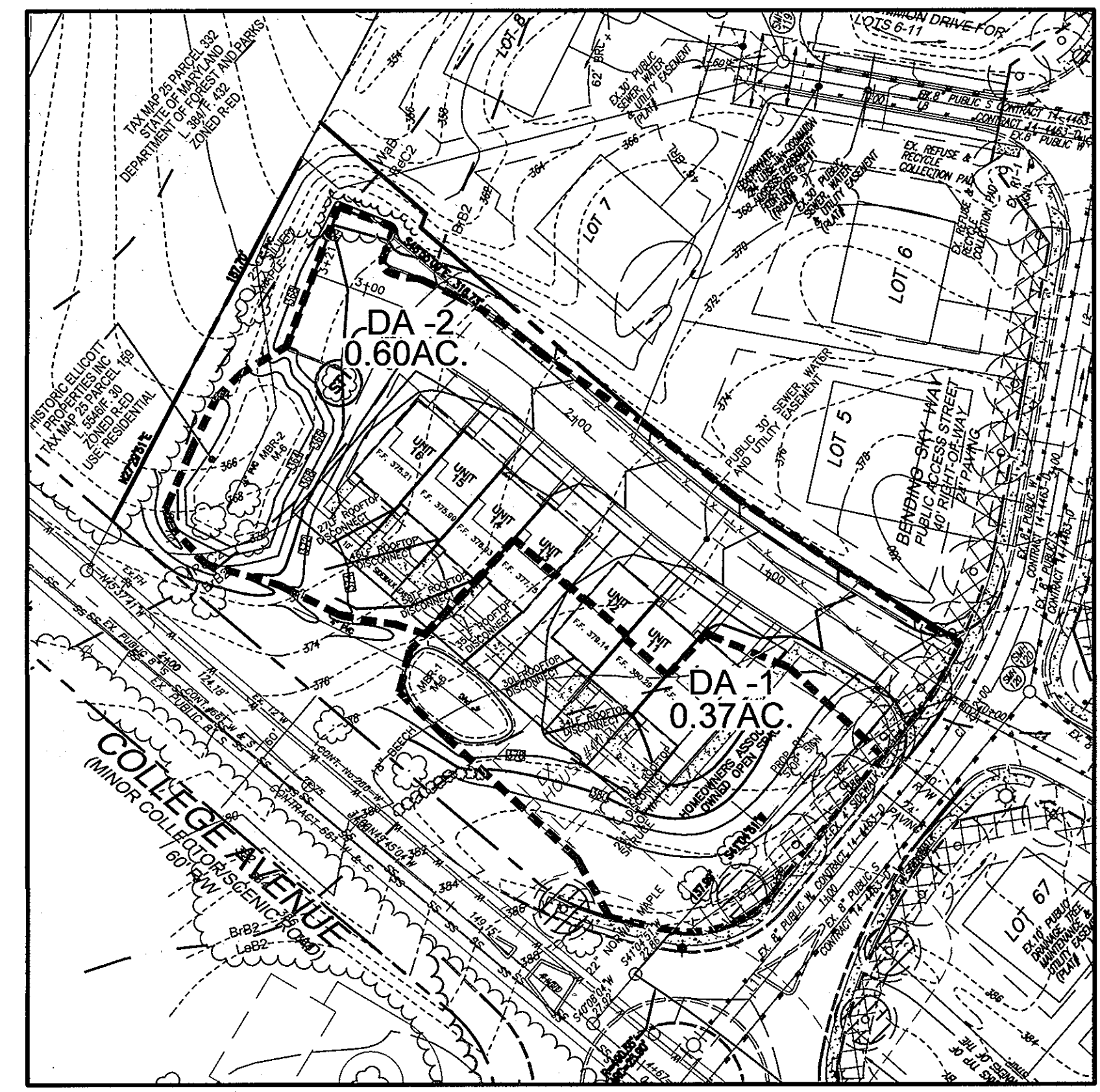


LIMIT OF PHASE IV SUBMISSION
SCALE: 1"=100'



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

Materials	Specifications	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 pipe; 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, all-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 ACT Code 350.829; 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 Dolomite and Crystalline (AASHTO) #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.



SWI DRAINAGE AREA MAP
SCALE: 1"=50'

OWNER
HISTORIC ELLICOTT PROPERTIES, INC.
4100 COLLEGE AVE.
ELLICOTT CITY, MD 21042-7819
21043 - 5506
(410) 465-3500

DEVELOPER
AUTUMN DEVELOPMENT CORPORATION
C/O LAND DESIGN & DEVELOPMENT, INC.
5300 DORSEY HALL DR. STE. 102
ELLICOTT CITY, MD 21042-7819
ATTN: MR. DONALD R. REUWER
(443) 367-0422

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN
DETAIL SHEET AND SOILS MAP
AUTUMN RIVER - PHASE IV
TOWNHOUSES**
L. 5546 F.30

DPZ REF'S: S-88-16, P-89-18, F-90-131 F-01-08,
P.B. 325, P.B. 148, PLAT 15794 & 15795 PLAT 14513-14515,
P-07-016, P-08-006, WP-09-063, F-09-021, S-02-004, F-10-067.

ZONING: R-ED
PARCELS 159
HOWARD COUNTY, MARYLAND

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

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. 21433 EXPIRATION DATE: 12-16-2012

DESIGN BY: JTD
DRAWN BY: KG
CHECKED BY: JTD
DATE: JULY 2011
SCALE: AS SHOWN
W.O. NO.: 04-145

2 SHEET OF 2

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 8/2/11
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 8/10/11
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] DATE

ECP-11-054