

**GENERAL NOTES**

- THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED. COORDINATES BASED ON NAD '83/91, MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY, GEODETIC CONTROL. STATION NO. 3711 AND 37CA.
- 3711 N 564,004.699 E 1,381,586.920  
37CA N 564,321.638 E 1,382,742.840
- THIS PLAN IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC. NOVEMBER 2002.
- THE TOPOGRAPHY SHOWN HEREON IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY PREPARED BY POTOMAC AERIAL SURVEYS, DATED FEBRUARY 2004.
- SOIL TYPES SHOWN HEREON ARE IN ACCORDANCE WITH THE WEB SOIL SURVEY - HOWARD COUNTY, MARYLAND.
- 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.
- NO FLOODPLAINS EXIST ON-SITE.
- NO STEEP SLOPES EXIST ON-SITE.
- NO WETLANDS AND/OR STREAMS EXIST ON-SITE AS CONFIRMED BY ECO-SCIENCE PROFESSIONALS, INC. DATED DECEMBER 20, 2012.
- THE SUBJECT PROPERTY IS ZONED R-ED PER THE 02/02/2004 COMPREHENSIVE ZONING PLAN, AND THE COMPREHENSIVE LITE ZONING AMENDMENTS 07/28/2006.
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO ISSUANCE OF A USE AND OCCUPANCY PERMIT FOR ANY NEW DWELLINGS TO ENSURE SAFE ACCESS FOR FIRE EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:  
A. WIDTH --- 12' (16' SERVING MORE THAN ONE RESIDENCE);  
B. SURFACE --- 6" OF COMPACTED CRUSHER RUN BASE WITH AND CHIP COATING (1-1/2" MIN.);  
C. GEOMETRY --- MAX. 15% GRADE, MAX. 10' GRADE CHANGE AND MIN. 45' 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 OF DEPTH OVER DRIVEWAY SURFACE;  
F. MAINTENANCE --- SUFFICIENT TO ENSURE ALL WEATHER USE.
- FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT-OF-WAY LINE AND NOT TO THE PIPESTEM LOT DRIVEWAY.
- THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
- WATER AND SEWER SERVICE TO THESE LOTS WILL BE GRANTED UNDER THE PROVISIONS OF SECTION 18.122.B OF THE HOWARD COUNTY CODE.
- WATER AND SEWER SERVICE FOR THIS PROJECT WILL BE PUBLIC. WATER WILL BE PROVIDED THROUGH CONTRACT NO. 14-4412-D. SEWER WILL BE PROVIDED THROUGH CONTRACT NO. 14-4412-D. UTILITY EXTENSIONS SHALL BE COMPLETED UNDER THE HOWARD COUNTY REDLINE PROCESS.
- PUBLIC WATER AND SEWER ALLOCATION WILL BE GRANTED AT THE TIME OF ISSUANCE OF THE BUILDING PERMIT IF CAPACITY IS AVAILABLE AT THAT TIME.
- A USE-IN-COMMON ACCESS MAINTENANCE AGREEMENT FOR THE BENEFIT OF LOTS 18, 19, 37, LOT 3 - GEELHAAR PROPERTY, NON-BUILDABLE BULK PARCEL "A" AND THE FUTURE RESUBDIVISION OF LOT 3 - GEELHAAR PROPERTY WAS RECORDED IN THE LAND RECORDS OF HOWARD COUNTY, MARYLAND AS L. 14679 F. 433 DEC. 2012, UNDER F-13-054.
- TO THE BEST OF OUR KNOWLEDGE AND BELIEF, THERE ARE NO HISTORIC STRUCTURES EXISTING ON THIS SITE.
- THIS PROJECT IS USING THE R-20 OPTION OF THE R-ED REGULATIONS IN ACCORDANCE WITH SECTION 107H.1.A OF THE ZONING REGULATIONS.  
DENSITY TABULATION (PROJECT): 1.4440 ACRES  
- DWELLING UNITS PER NET ACRE = 62903 SF / 20,000 SF = 3.14 OR 3 ALLOWED  
- DWELLING UNITS PROPOSED = 3 (1 EXISTING TO REMAIN AND 2 PROPOSED)
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAMS OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100-YEAR FLOODPLAIN.
- AS REQUIRED, GEOTECHNICAL INVESTIGATIONS SHALL BE COMPLETED AS PART OF THE SUBDIVISION PLAN PACKAGE.
- A FOREST STAND DELINEATION PLAN WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. DATED DECEMBER 20, 2012.
- FOREST CONSERVATION OBLIGATIONS FOR THE GROVEMONT SUBDIVISION HAS BEEN FULFILLED UNDER F-09-122 BY PLACEMENT OF 1.00 ACRES OF REFORESTATION AND 0.78 ACRES OF AFFORESTATION INTO ON-SITE EASEMENT AREAS.  
SURETY WAS POSTED WITH THE DEVELOPER AGREEMENT FOR F-09-122 (REFER TO PLATS 21469-21472)  
- UNDER F13-055, THE GROVEMONT SUBDIVISION FOREST CONSERVATION OBLIGATIONS WERE AMENDED WHICH PLACED 1.00 ACRE OF REFORESTATION (PLAT 21470, 0.45(SHEET 2) + PLAT 21472, 0.27(SHEET 4) + PLAT 21472, 0.28(SHEET 4)), 1.99 ACRES OF REFORESTATION (PLAT 22253) AND 0.66 ACRES OF AFFORESTATION (PLAT 22254) INTO EASEMENT AREAS.  
- REQUIRED OBLIGATION FOR THE ADDITION OF LOTS 4 TO 6 SHALL BE FULFILLED BY THE PAYMENT OF A FEE-IN-LIEU TO THE FOREST CONSERVATION FUND IN THE AMOUNT OF \$ 6,880.00 FOR THE 0.21 ACRES OF REQUIRED REFORESTATION (0.147 SF x 0.75)  
THE PROPOSED ACCESS SHALL BE PROVIDED BY THE EXISTING USE-IN-COMMON DRIVEWAY TO WEAVER WAY, GROVEMONT OVERLOOK PHASE 1 F09-122.
- FINANCIAL SURETY IN THE AMOUNT OF \$ 3,900.00 FOR 13 SHADE TREES SHALL BE DEFERRED UNTIL SITE DEVELOPMENT PLAN, AND WILL BE POSTED WITH THE GRADING PERMIT AS FOLLOWS:  
- LOT 5 SURETY FOR 3 SHADES = \$ 900 (CREDIT GIVEN FOR 2 EXISTING STRAIGHT TREES TO REMAIN)  
TOTAL LOT 5 SURETY = \$ 900.00 + LOT 4 (\$ 1800.00) = \$ 2,700.00  
\*SURETY FOR REQUIRED 6 SHADES ON LOT 4 (EXISTING HOUSE) WILL BE PROVIDED WITH THE GRADING PERMIT FOR LOTS 4 & 5 (3 TREES x \$ 300.00) = \$ 9,000.00  
- LOT 6 - SURETY FOR 4 SHADE = \$ 1,200.00  
- TRASH PAD SCREENING FOR LOTS ON THIS SHARED USE-IN-COMMON EASEMENT HAS BEEN PROVIDED UNDER SDP-12-024.
- THE PROPOSED SUBDIVISION AND RELATED CONSTRUCTION WILL NOT IMPACT ENVIRONMENTAL FEATURES OR BUFFERS.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS OR CEMETERIES LOCATED ON THIS PROPERTY.
- THERE IS AN EXISTING DWELLING/STRUCTURE ON LOT 4 TO REMAIN. NO NEW BUILDINGS, EXTENSIONS OR ADDITIONS TO THE EXISTING DWELLING ARE TO BE CONSTRUCTED AT A DISTANCE LESS THAN THE ZONING REGULATIONS REQUIREMENTS.
- OPEN SPACE REQUIREMENTS FOR THIS R-ED PROJECT SHALL BE MET THROUGH A PAYMENT OF FEE-IN-LIEU FOR THE TWO PROPOSED LOTS IN THE AMOUNT OF \$ 3,000.00.
- THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF ALTERNATIVE SURFACES AND MICRO-SCALE PRACTICES IN ACCORDANCE WITH ENVIRONMENTAL SITE DESIGN CRITERIA. MICRO-SCALE PRACTICES INCLUDE A DRYWELL MICRO-BIORETENTION. ALTERNATIVE SURFACES INCLUDE PERMEABLE SURFACES. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- 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) DAYS PRIOR TO START OF WORK.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARD AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL OF STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO PLACEMENT OF ANY ASPHALT.
- THE PROPOSED SUBDIVISION AND RELATED CONSTRUCTION WILL NOT AFFECT ENVIRONMENTAL FEATURES OR BUFFER.
- DEVIATIONS FROM THESE PLANS AND SPECIFICATIONS WITHOUT PRIOR WRITTEN CONSENT OF THE CIVIL ENGINEER MAY CAUSE THE WORK TO BE UNACCEPTABLE.
- ANY DAMAGE TO PUBLIC RIGHT-OF-WAYS OR PAVED PUBLIC ROADS SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTORS EXPENSE IN ACCORDANCE WITH THE HOWARD COUNTY STANDARDS AND SPECIFICATIONS.
- LOTS 4 TO 6 ARE SUBJECT TO THE COVENANTS AND RESTRICTIONS OF THE GROVEMONT OVERLOOK HOMEOWNERS ASSOCIATION AS RECORDED IN L.13065 F. 009 DECEMBER 9, 2010.
- THE HOMEOWNERS ASSOCIATION ARTICLES OF INCORPORATION HAVE BEEN RECORDED WITH THE MARYLAND DEPARTMENT OF ASSESSMENTS AND TAXATION ON FEBRUARY 26, 2010 AS RECORDED REFERENCE NUMBER D1345538.
- A PRIVATE RANGE OF ADDRESS SIGN ASSEMBLY SHALL BE FABRICATED AND INSTALLED AT THE LOCATION SHOWN ON SHEET 2 BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5752 FOR DETAILS AND COST ESTIMATES.
- THIS PROJECT IS SUBJECT TO APPROVAL OF A WAIVER PETITION TO SECTION 16.1205(A)(7) FOR THE REMOVAL OF ONE (1) SPECIMEN TREE. THIS WAIVER WILL BE FILED UNDER THE PROCESSING OF THE SITE DEVELOPMENT PLAN (SDP-13-081).

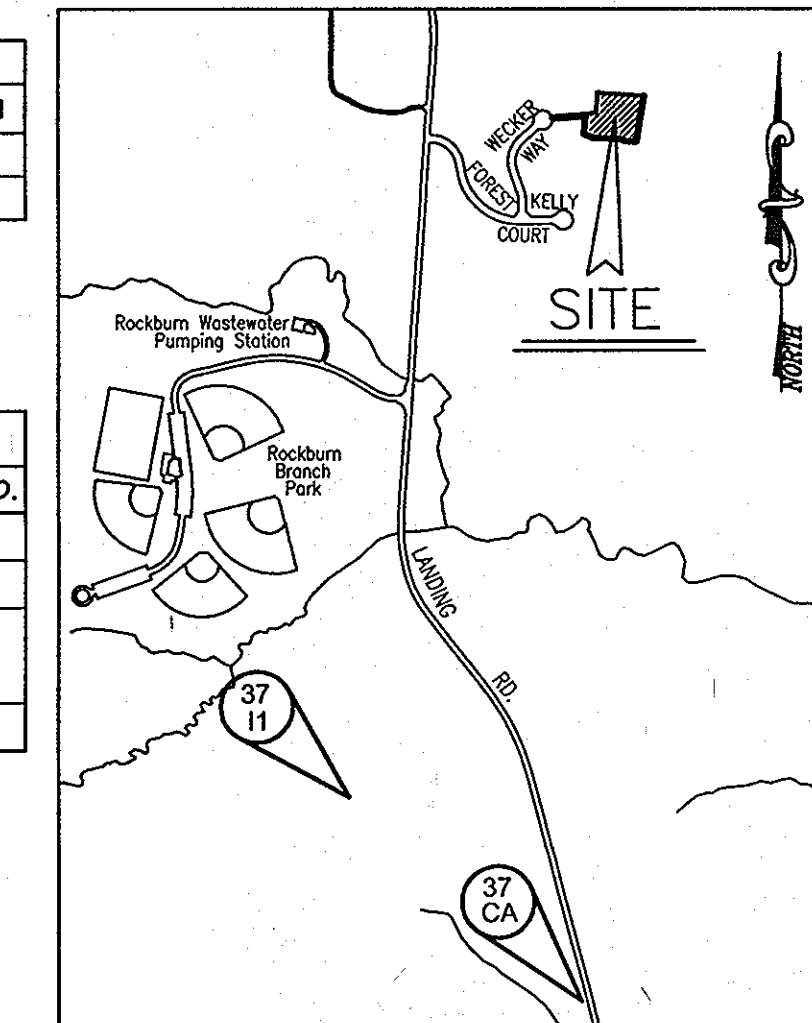
# SUPPLEMENTAL INFORMATION PLAN GROVEMONT OVERLOOK - II

(SFD RESIDENTIAL)  
LOTS 4-6

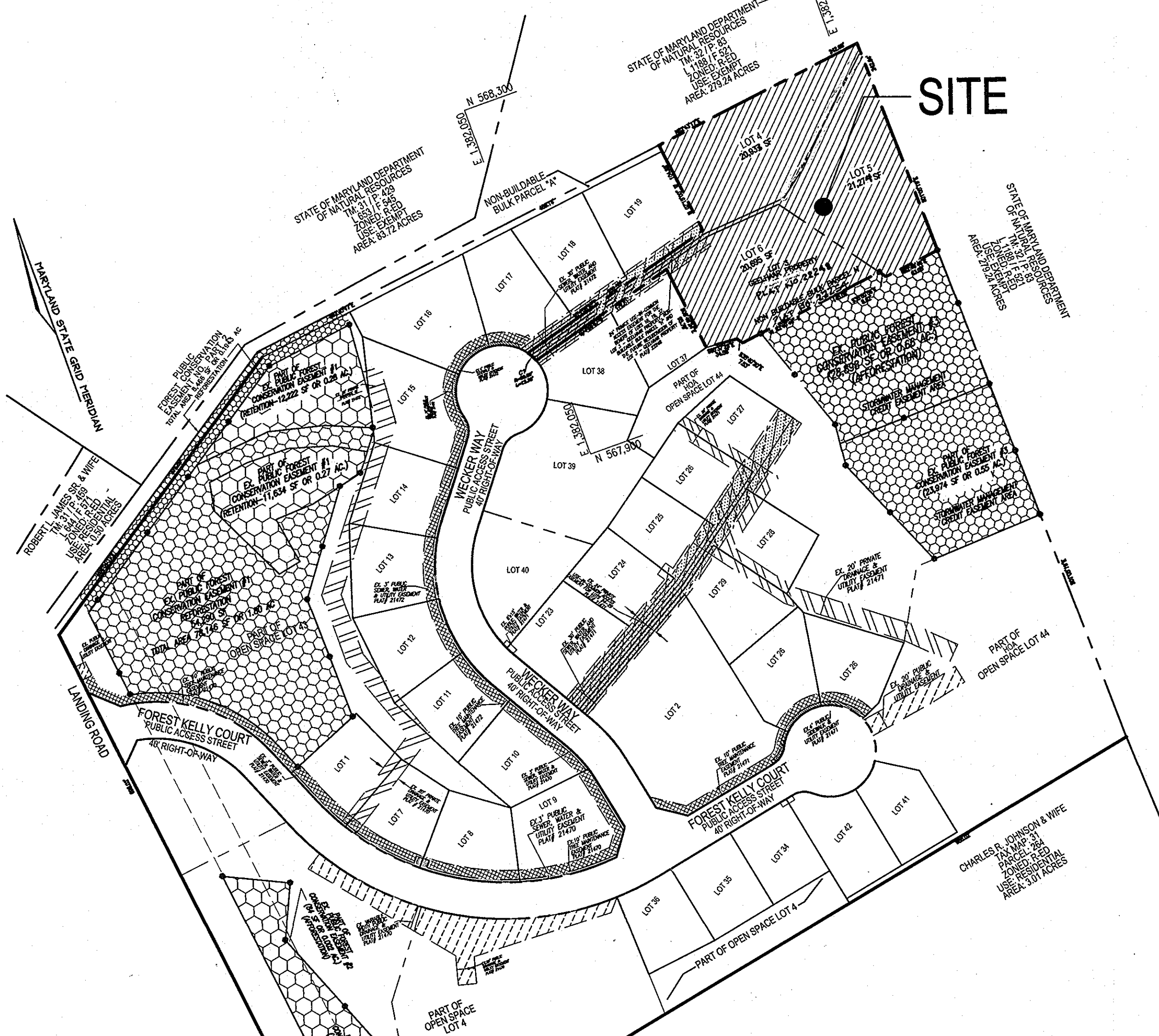
A RESUBDIVISION OF "GEELHAAR PROPERTY", LOT 3 AND "GROVEMONT OVERLOOK", PHASE 2, NON BUILDABLE BULK PARCEL H  
HOWARD COUNTY, MARYLAND

BENCHMARKS			
	NORTHING	EASTING	ELEVATION
37CA	564,321.638	1,382,742.840	257.684'
3111	565,004.699	1,381,586.92	306.017'

SHEET INDEX	
DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 4
LAYOUT AND LANDSCAPE PLAN	2 OF 4
GRADING, SOIL EROSION AND SEDIMENT CONTROL AND FOREST CONSERVATION PLAN	3 OF 4
STORMWATER MANAGEMENT NOTES AND DETAILS	4 OF 4



VICINITY MAP  
SCALE: 1" = 1000'  
ADC MAP: 4986 K 485



LOCATION MAP  
1" = 100'

**SITE ANALYSIS DATA**

A. TOTAL PROJECT AREA:	1.4440 AC.
B. AREA OF FLAG SUBDIVISION:	0.92 AC. (LOTS 5, 6 & U.I.C. DRIVEWAY)
C. AREA OF WETLANDS AND BUFFERS:	0.00 AC.
D. AREA OF FLOODPLAIN:	0.00 AC.
E. AREA OF FOREST:	0.00 AC.
F. AREA OF STEEP SLOPES:	0.00 AC.
G. ERODIBLE SOILS:	0.44 AC.
H. LIMIT OF DISTURBED AREA:	0.87 AC.
I. PROPOSED USES FOR SITE AND STRUCTURES:	RESIDENTIAL SINGLE FAMILY DETACHED HOMES
J. GREEN OPEN AREA:	1.18 AC.
K. PROPOSED IMPERVIOUS AREA:	0.26 AC.
L. PRESENT ZONING DESIGNATION:	R-ED (RESIDENTIAL: ENVIRONMENTAL DEVELOPMENT) DISTRICT
M. OPEN SPACE REQUIRED:	1.4440 AC. GROSS AREA x 50% = 0.72 AC.
N. TOTAL NUMBER OF UNITS ALLOWED:	THIS PROJECT IS USING THE R-20 OPTION OF THE R-ED REGULATIONS. DENSITY TABULATION (PROJECT): 1.4440 ACRES = 3.14 OR 3 ALLOWED
O. TOTAL NUMBER OF UNITS PROPOSED:	3 (2 PROPOSED + 1 EXISTING TO REMAIN) VP-83-84, F-84-214/GEELHAAR PROPERTY, LOT 1, PLAT 5941, F-13-054, ECP-13-046, F-09-122, SDP-12-024
P. DPZ FILE REFERENCES:	VP-83-84, F-84-214/GEELHAAR PROPERTY, LOT 1, PLAT 5941, F-13-054, ECP-13-046, F-09-122, SDP-12-024

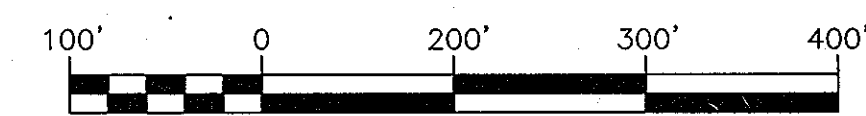
PERMIT INFORMATION CHART					
SUBDIVISION NAME	SECTION/ AREA				
GROVEMONT OVERLOOK II - LOTS 4-6	N/A				
LOT/ PARCELS	P/O 749 & 619				
F-13-054 GEELHAAR PROPERTY - LOT 3 AND NON BUILD. BULK PARCEL "A"					
F-13-055 GROVEMONT OVERLOOK PHASE 2 LOTS 37-42, OPEN SPACE LOTS 43-44					
PLAT REF #	BLOCK NO	ZONE	TAX MAP	ELECT DIST	CENSUS TR
22248 (F-13-054)	24	R-ED	31	1	6011.01
22252-22254 (F-13-055)					
WATER / SEWER #	14-4412-D.				

MINIMUM LOT SIZE CHART			
LOT #	GROSS AREA	PIPESTEM AREA	NET AREA
4	20,923.19 SQ FT	976.46 SF	20,006.72 SF
5	21,274.04 SF	1,264.67 SF	20,009.37 SF
6	20,625.46 SF	662.38 SF	20,003.08 SF

STORMWATER MANAGEMENT PRACTICES CHART		
LOT #	IMP. AREA	ESD PRACTICE
LOT 5	HOUSE	(2) MICRO-BIORETENTION (M-6)
	DRIVEWAY	PERMEABLE SURFACE (A-2)
LOT 6	HOUSE	MICRO-BIORETENTION (M-6)
		DRY WELL (M-5)
	DRIVEWAY	PERMEABLE SURFACE (A-2)
	USE-IN-COMMON DRIVEWAY	MICRO-BIORETENTION (M-6)

MAPPED SOILS TYPES							
SYMBOL	NAME / DESCRIPTION	GROUP	HYDRIC	PERCENT PERCENTAGE	K-FACTOR	PERCENT PERCENTAGE	
CsB	CHILLUM LOAM, 2 TO 5 PERCENT SLOPES	B	NO	NO	0.28	YES	NO
CcC	CHILLUM LOAM, 5 TO 10 PERCENT SLOPES	B	NO	NO	0.28	YES	NO
SdD	SASSAFRAS AND CROON, 10 TO 15 PERCENT SLOPES	B	NO	NO	0.37	NO	YES

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY  
K-FACTOR = Kw @ 0'-4" DEPTH  
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



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*[Signature]* 10/1/13  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*[Signature]* 10/16/13  
CHIEF, DIVISION OF LAND DEVELOPMENT

**SUPPLEMENTAL INFORMATION PLAN**  
**COVER SHEET**  
**GROVEMONT OVERLOOK - II**  
(SFD RESIDENTIAL)  
LOTS 4-6  
A RESUBDIVISION OF "GEELHAAR PROPERTY", LOT 3 AND "GROVEMONT OVERLOOK", PHASE 2, NON BUILDABLE BULK PARCEL H

1ST ELECTION DISTRICT: TAX MAP: 31, GRID: 24, DPZ REF: PLAT 5941, F-13-054, ECP-13-046, F-09-122, SDP-12-024  
ZONED: R-ED, PARCEL: 619 & 749, 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

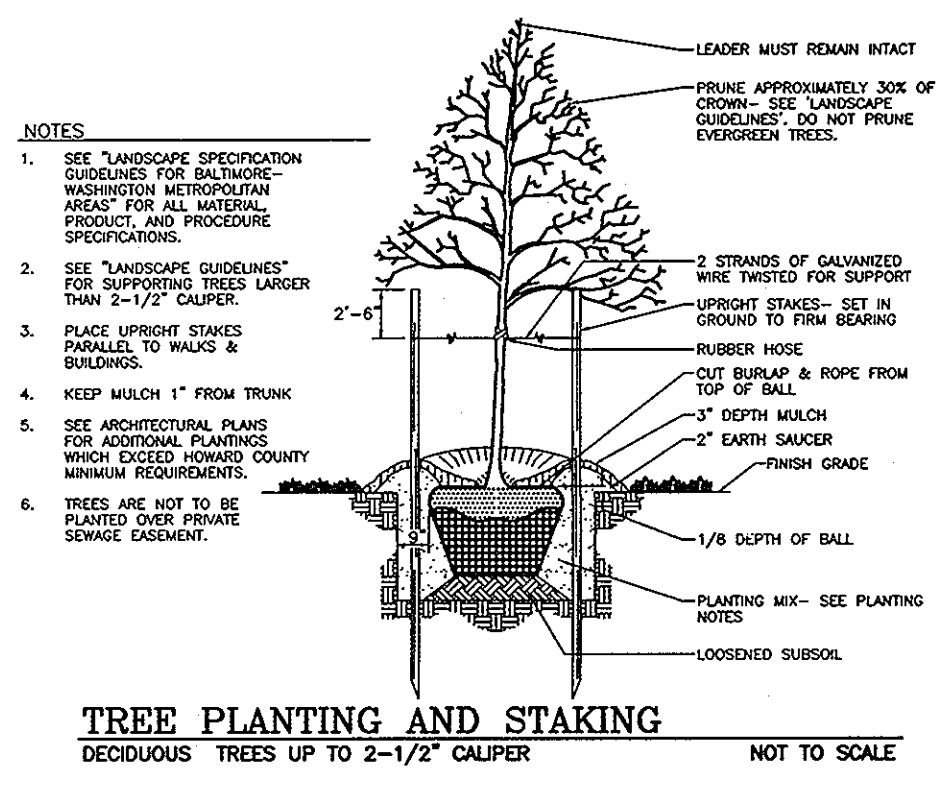
OWNER: ROBERT T. GEELHAAR AND TERRI M. GEELHAAR, 5295 LANDING ROAD, ELK RIDGE, MD 21075-5715, PHONE: (410) 367-0422  
DEVELOPER: ELLICOTT CITY LAND HOLDING INC., 5300 DORSEY HALL DRIVE, SUITE 102, ELLICOTT CITY, MD 21042-7819, PHONE: (410) 367-0422

DESIGN BY: RHV / EDS  
DRAWN BY: JER  
CHECKED BY: RHV  
DATE: JULY, 2013  
SCALE: AS SHOWN  
W.O. NO.: 04-57

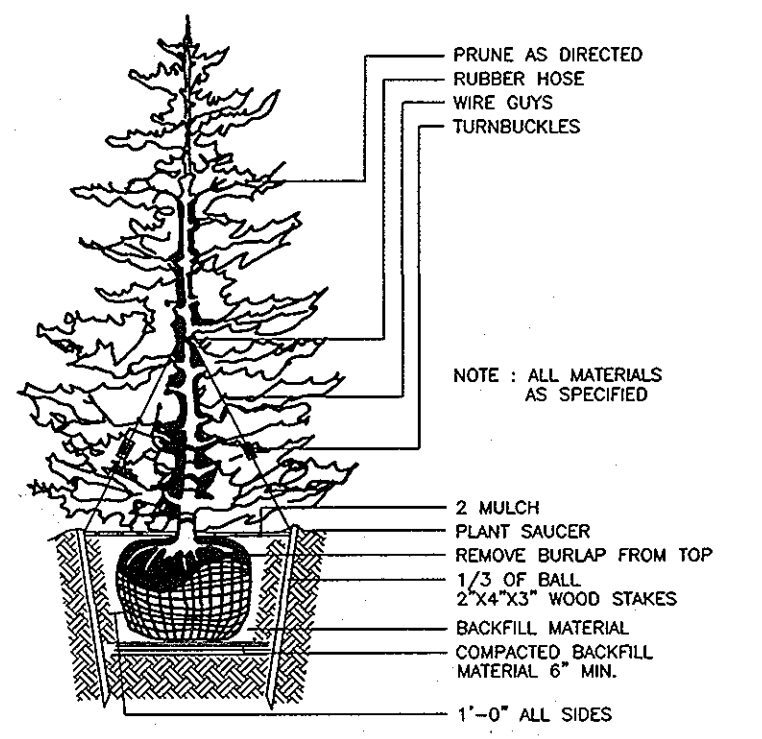
PROFESSIONAL CERTIFICATE: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 161183, EXPIRATION DATE: 09-27-2014

1 SHEET OF 4





**TREE PLANTING AND STAKING**  
DECIDUOUS TREES UP TO 2-1/2" CALIPER NOT TO SCALE



**TYPICAL EVERGREEN TREE PLANTING DETAIL**  
NOT TO SCALE

**SPECIMEN TREES:**

Key	Species, Size (dbh)	Condition	Critical Root Zone (radius)
A	Ginkgo, 42"	Good, non-native	63'
B	Silver maple, 38"	Good	57'
C	Black locust, 42"	Fair, poor shape, leaning over house	63'
D	Silver maple, 31"	Fair, some dieback notes, power lines run through canopy, leaning	46.5'

**NOTES:**  
1. THIS PROJECT IS SUBJECT TO APPROVAL OF WAIVER PETITION TO SECTION 16.124 OF THE HOWARD COUNTY ZONING AND SUBDIVISION ACT. THIS WAIVER WILL BE FILED UNDER THE PROCESSING OF THE SITE DEVELOPMENT PLAN (SDP-13-081).

**LANDSCAPE NOTES:**

- THE OWNER, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
- SHOULD ANY TREE DESIGNATED FOR PRESERVATION FOR WHICH LANDSCAPING CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD, AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE HOWARD COUNTY LANDSCAPE MANUAL.
- PLANTINGS SHOWN HEREON ARE THE RESPONSIBILITY OF THE BUILDER TO INSTALL DURING THE CONSTRUCTION OF THE HOME ON LOT 5 & 6.

**LANDSCAPE SCHEDULE NOTE:**

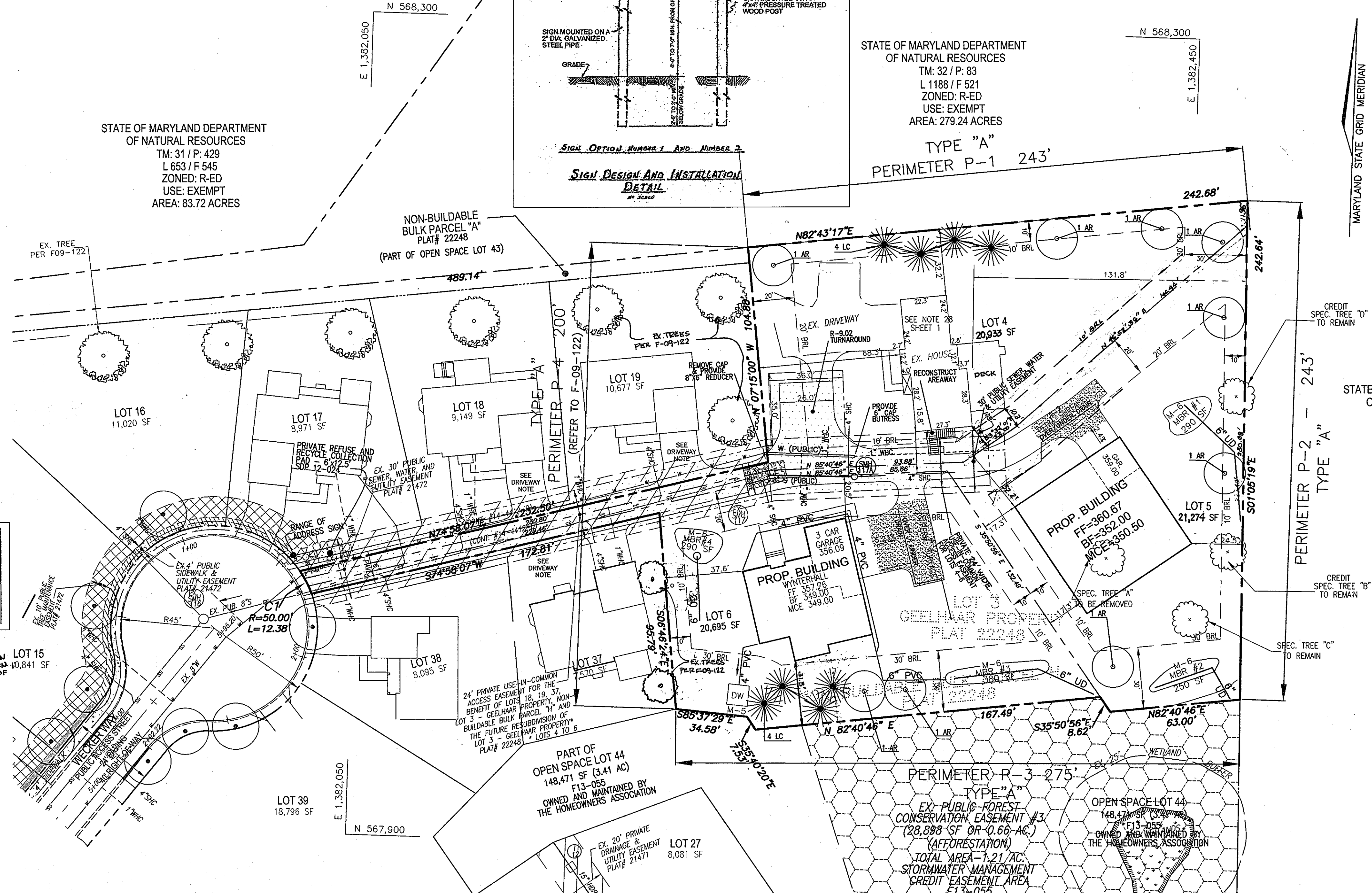
- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HRD PLANTING SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
- FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
- CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 10/16/13

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 10/16/13

STATE OF MARYLAND DEPARTMENT OF NATURAL RESOURCES  
TM: 31 / P: 429  
L 653 / F 545  
ZONED: R-ED  
USE: EXEMPT  
AREA: 83.72 ACRES



**GENERAL NOTES:**

- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF \$ 3,900 FOR THE REQUIRED 13 SHADE TREES SHALL BE OBTAINED UNTIL SITE DEVELOPMENT PLAN AND WILL BE POSTED WITH THE GRADING PERMIT AS FOLLOWS:  
LOT 5 - SURETY FOR 8 SHADE = \$3000.00 (CREDIT GIVEN FOR 2:1 SUB FOR SHADE TO REMAIN)  
TOTAL LOT 5 SURETY = \$1,800.00 \*\* = \$ 2,700.00  
\*\*SURETY FOR REQUIRED 6 SHADES ON LOT 4 (EXISTING HOUSE) WILL BE PROVIDED WITH THE GRADING PERMIT FOR LOTS 4 & 5 (8 TREES @ \$300.00) = \$ 2,700.00  
LOT 6 - SURETY FOR 8 SHADE = \$ 2,400.00
- PUBLIC STREET TREES WERE PROVIDED FOR THIS PROJECT IN ACCORDANCE WITH SECTION 16.124(6)(1) OF THE SUBDIVISION REGULATIONS AND THE LANDSCAPE MANUAL UNDER F 09-122.
- THE OWNER, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, PLANT MATERIALS, BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
- AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS LISTED HEREWITH AND APPROVED FOR THIS SITE SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, WETLANDS BUFFER, STREAM BANK BUFFER OR FOREST CONSERVATION EASEMENTS.
- A WAIVER PETITION APPLICATION SHALL BE REQUIRED FOR THE REMOVAL OF SPECIMEN TREES WITH A DIAMETER OF 30" OR GREATER PRIOR TO THE FILING OF A GRADING PERMIT ON THIS SITE. A WAIVER PETITION WILL BE REQUIRED TO BE FILED PRIOR TO SIGNATURE APPROVAL OF THE SITE DEVELOPMENT PLAN ORIGINALS.
- TRASH PAD SCREENING FOR LOTS ON THE USE-IN-COMMON SHARED ACCESS EASEMENT SHALL BE PROVIDED UNDER SDP 12-024.

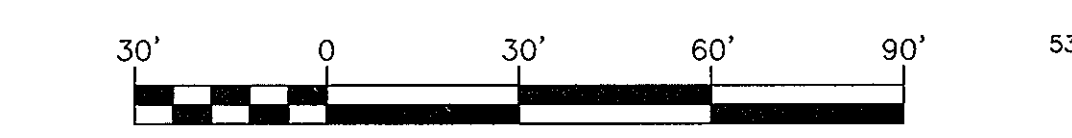
**LAYOUT PLAN**  
SCALE: 1"=30'

**SCHEDULE 'A' - PERIMETER LANDSCAPE EDGE**

CATEGORY	ADJACENT TO PERIMETER PROPERTIES				TOTAL
	P-1	P-2	P-3	P-4	
PERIMETER NUMBER					
LANDSCAPE TYPE	A	A	A	A	
LF OF ROADWAY FRONTAGE / PERIMETER	243 LF	243 LF	275 LF	200 LF	
NUMBER OF PLANTS REQUIRED					
SHADE TREES	5	5	5	4	19
EVERGREEN TREES	-	-	-	-	-
CREDIT FOR EXISTING VEGETATION YES/NO	NO	YES(2)	NO	YES(1)	-
SHADE TREES	-	2	-	4	6
ORNAMENTAL (2:1 SUB FOR SHADE)	-	-	-	-	-
EVERGREEN TREES	-	-	-	-	-
NUMBER OF PLANTS PROVIDED					
SHADE TREES	3	3	3	-	9
ORNAMENTAL (2:1 SUB FOR SHADE)	-	-	-	-	-
EVERGREEN TREES (2:1 SUB FOR SHADE)	4*	-	4**	-	8
*P-1 - SUBSTITUTION: 4 EVERGREEN FOR 2 SHADE TREE					
**P-3 - SUBSTITUTION: 4 EVERGREEN FOR 2 SHADE TREE					
(*) - PROVIDED UNDER F-09-122 (2) - SPECIMEN TREES TO REMAIN FOR CREDIT (B-D)					

QUAN.	BOTANICAL NAME	SIZE	REM.
9	ACER RUBRUM 'AUTUMN FLAME' / AUTUMN FLAME RED MAPLE	2 1/2"-3" CAL.	B & B
8	LEYLAND CYPRESS / CUPRESSOCYPARIS LEYLANDI	5'-6" HT	B & B

**Eco-Science Professionals, Inc.**  
Consulting Ecologists  
P.O. Box 5906 Glen Arms, Maryland 21057 Telephone (410) 832-2488 Fax (410) 832-2488



**DEVELOPER'S/BUILDER'S CERTIFICATE**  
I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.  
SIGNATURE OF DEVELOPER: [Signature]  
DATE: 7/30/13

**LEGEND:**

- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING STORM DRAIN
- DIRECTION OF FLOW
- EXISTING TREETRANSECT
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- EXISTING SIDEWALK
- EXISTING STREET TREE
- EXISTING SEWER CONNECTION
- EXISTING WATER CONNECTION
- EX. PUBLIC FOREST CONSERVATION EASEMENT (AFFORESTATION) (F-13-055)
- EX. 10' PUBLIC TREE MAINTENANCE EASEMENT (F-09-122)
- EX. PRIVATE DRAINAGE EASEMENT (F-09-122)
- EX. PUBLIC 4' SIDEWALK AND UTILITY EASEMENT (F-09-122)
- EX. 24' PRIVATE ACCESS EASEMENT (F-13-055)
- EX. 30' PUBLIC SEWER, WATER AND UTILITY EASEMENT (F-09-122)
- EX. 3' PUBLIC WATER AND UTILITY EASEMENT (F-09-122)
- EXISTING WETLAND
- EXISTING WETLANDS BUFFER
- PERMEABLE SURFACE
- PROPOSED DRYWELL
- PROPOSED MICRO-BIORETENTION

**NOTES:**  
1. THE PUBLIC UTILITIES WILL BE EXTENDED VIA THE HOWARD COUNTY ADD PROCESS. REFER TO SDP-13-081 FOR THE LOCATION OF CHIEF ENGINEER'S TREE. THIS WAIVER WILL BE FILED UNDER THE PROCESSING OF THE SITE DEVELOPMENT PLAN (SDP-13-081).  
2. TRASH PAD SCREENING FOR LOTS ON THIS SHARED USE-IN-COMMON EASEMENT HAS BEEN PROVIDED UNDER SDP-12-024.

**SUPPLEMENTAL INFORMATION PLAN**  
LAYOUT AND LANDSCAPE PLAN  
**GROVEMONT OVERLOOK - II**  
(SFD RESIDENTIAL)  
LOTS 4-6  
A RESUBDIVISION OF "GELHAAR PROPERTY", LOT 3 AND "GROVEMONT OVERLOOK", PHASE 2, NON-BUILDABLE BULK PARCEL #

1ST ELECTION DISTRICT TAX MAP: 31 GRID: 24 DPZ REFS: PLAT 5947, F-13-054, ECP-13-046, F-09-122, SDP-12-024 ZONED: R-ED PARCEL: 619 & 749 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

DESIGN BY: RHW / EDS  
DRAWN BY: JER  
CHECKED BY: RHW  
DATE: JULY, 2013  
SCALE: AS SHOWN  
W.O. NO.: 04-57

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: 07-27-2014

2 SHEET OF 4



**LEGEND:**

- 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 STORM DRAIN
- DIRECTION OF FLOW
- EXISTING TREELINE
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- EXISTING SIDEWALK
- EXISTING STREET TREE
- EXISTING SEWER CONNECTION
- EXISTING WATER CONNECTION
- EX. PUBLIC FOREST CONSERVATION EASEMENT (AFFORESTATION) (F-13)
- EX. 10' PUBLIC TREE MAINTENANCE EASEMENT (F-09-122)
- EX. PRIVATE DRAINAGE AND UTILITY EASEMENT (F-09-122)
- EX. PUBLIC SIDEWALK AND UTILITY EASEMENT (F-09-122)
- EX. 24' PRIVATE ACCESS EASEMENT (F-13)
- EX. 30' PUBLIC SEWER WATER AND UTILITY EASEMENT (F-09-122)
- EX. 3' PUBLIC WATER AND UTILITY EASEMENT (F-09-122)
- EXISTING WETLAND
- EXISTING WETLANDS BUFFER
- SUPER SILT FENCE
- LIMITS OF DISTURBANCE
- PERMEABLE SURFACE
- PROPOSED 10FT CONTOUR
- PROPOSED 2FT CONTOUR
- SPOT ELEVATION
- PROPOSED DRYWELL
- PROPOSED MICRO-BIORETENTION
- DIVERSION FENCE
- SILT FENCE
- MODERATE SLOPES 15% - 24%
- 25% OR GREATER SLOPES



**Forest Conservation Worksheet 2.2**

Net Tract Area		A = 1.40			
A. Total Tract Area					
B. Deductions		B = 0.00			
C. Net Tract Area		C = 1.40			
Land Use Category					
Input the number "1" under the appropriate land use zoning, and limit to only one entry					
ARA	MDR	IDA	HDR	MPD	CA
0	0	0	1	0	0
D. Afforestation Threshold ( Net Tract Area x 15% )		D = 0.21			
E. Conservation Threshold ( Net Tract Area x 20% )		E = 0.28			
Existing Forest Cover					
F. Existing Forest Cover within the Net Tract Area		F = 0.00			
G. Area of Forest Above Conservation Threshold		G = 0.00			
Break Even Point					
H. Break Even Point		H = 0.00			
I. Forest Clearing Permitted Without Mitigation		I = 0.00			
Proposed Forest Clearing					
J. Total Area of Forest to be Cleared		J = 0.00			
K. Total Area of Forest to be Retained		K = 0.00			
Planting Requirements					
L. Reforestation for Clearing Above the Conservation Threshold		L = 0.00			
M. Reforestation for Clearing Below the Conservation Threshold		M = 0.00			
N. Credit for Retention above the Conservation Threshold		N = 0.00			
P. Total Reforestation Required		P = 0.00			
Q. Total Afforestation Required		Q = 0.21			
R. Total Planting Requirement		R = 0.21			

FOREST CONSERVATION EASEMENT HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY FOREST CONSERVATION MANUAL.

FOREST CONSERVATION OBLIGATIONS FOR THE GROVEMONT SUBDIVISION HAS BEEN FILED UNDER F-09-122 BY PLACEMENT OF 1.00 ACRES OF RETENTION, 1.80 ACRES OF REFORESTATION AND 0.78 ACRES OF AFFORESTATION INTO ON-SITE EASEMENT AREAS. SURETY WAS POSTED WITH THE DEVELOPER AGREEMENT FOR F-09-122 (REFER TO PLATS 21449-21472).

UNDER F13-055, THE GROVEMONT SUBDIVISION FOREST CONSERVATION OBLIGATIONS WERE AMENDED WHICH PLACED 1.00 ACRES OF RETENTION (PLAT 21470, 0.45 SHEET 2) + PLAT 21472, 0.27 SHEET 4) + PLAT 21472, 0.28 (SHEET 4), 1.99 ACRES OF REFORESTATION (PLAT 22253) AND 0.66 ACRES OF AFFORESTATION (PLAT 22254) INTO EASEMENT AREAS.

A FOREST STAND DELINEATION PLAN WAS PREPARED FOR LOTS 4 TO 6 BY ECO-SCIENCE PROFESSIONALS, INC. DATED DECEMBER 20, 2012.

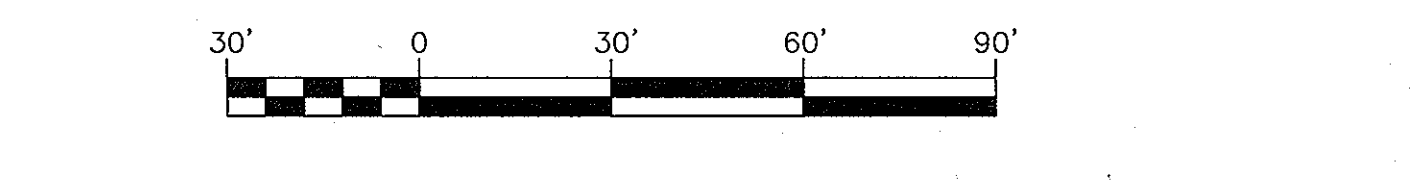
REQUIRED OBLIGATION FOR THE ADDITION OF LOTS 4 TO 6 SHALL BE FULFILLED BY THE PAYMENT OF A FEE-IN-LIEU TO THE FOREST CONSERVATION FUND IN THE AMOUNT OF \$ 8,800.00 FOR THE 0.21 ACRES OF REQUIRED AFFORESTATION (9,147 SF x 0.75).

- NOTES**
- SUPER SILT FENCE CAN BE SUBSTITUTED WITH STANDARD SILT FENCE WITH PERMISSION FROM SEDIMENT CONTROL INSPECTOR.

**Standard Stabilization Note**

Following initial soil disturbance or re-disturbance, permanent or temporary stabilization must be completed within:

- Three (3) calendar days as to the surface of all perimeter dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and
- Seven (7) calendar days as to all other disturbed or graded areas on the project site not under active grading.



**MAPPED SOILS TYPES**

SYMBOL NAME / DESCRIPTION	GROUP	HYDRO	HYDROLOGICAL	K-FACTOR	PERM. PAVEMENT	CITY SOIL DISTRIBUTION
CeB CHILLUM LOAM, 2 TO 5 PERCENT SLOPES	B	NO	NO	0.28	YES	NO
CeC CHILLUM LOAM, 5 TO 10 PERCENT SLOPES	B	NO	NO	0.28	YES	NO
SdC SASSPARAS AND CROOM, 10 TO 15 PERCENT SLOPES	B	NO	NO	0.37	NO	YES

TAKEN FROM: USDA, SCS-WEB SOIL SURVEY, HOWARD COUNTY  
K-FACTOR = k x 0.4 - 4" DEPTH

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

\_\_\_\_\_  
CHIEF, DEVELOPMENT ENGINEERING DIVISION 66  
10/14/13  
DATE

\_\_\_\_\_  
K. J. DeLush  
CHIEF, DIVISION OF LAND DEVELOPMENT 68  
10/16/13  
DATE

NOTE: STOCKPILING WILL BE PERMITTED ON EACH LOT ONLY.

NOTE:  
- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
- SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 35 FEET APART  
- DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

**OWNER**  
ROBERT T. GEELHAAR  
AND TERRI M. GEELHAAR  
5295 LANDING ROAD  
ELK RIDGE, MD 21075-5715  
PHONE: (410) 367-0422

**DEVELOPER**  
ELICOTT CITY LAND HOLDING INC.  
5300 DORSEY HALL DRIVE, SUITE 102  
ELICOTT CITY, MD 21042-7819  
PHONE: (410) 367-0422

NO. \_\_\_\_\_ REVISION \_\_\_\_\_ DATE \_\_\_\_\_

**SUPPLEMENTAL INFORMATION PLAN**  
GRADING, SOIL EROSION AND SEDIMENT CONTROL  
AND FOREST CONSERVATION PLAN

**GROVEMONT OVERLOOK - II**  
(SFD RESIDENTIAL)  
LOTS 4-6  
A RESUBDIVISION OF "GEELEAR PROPERTY", LOT 3 AND  
"GROVEMONT OVERLOOK", PHASE 2, NON-BUILDABLE BULK PARCEL H

1ST ELECTION DISTRICT TAX MAP: 31 GRID: 24 DPZ REF: PLAT 5847, F-13-054, ECP-13-046, F-09-122, SDP-12-024 HOWARD COUNTY, MARYLAND ZONED: R-ED PARCEL: 619 & 749

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DESIGN BY: RHV / EDS  
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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: 06-27-2014

PROFESSIONAL CERTIFICATE

3 SHEET OF 4

F-13-091



**B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF**

THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE OR LIMITING. THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.

**1. PERVIOUS CONCRETE SPECIFICATIONS**

**DESIGN THICKNESS** - PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, ACI 325.9R, ACI 330R) OR USING STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.

**MIX & INSTALLATION** - TRADITIONAL PORTLAND CEMENTS (ASTM C 150, C 1157) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHORUS ADMIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TRIAL BATCHING) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTLING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.

**AGGREGATE** - PERVIOUS CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4 IN. TO NO. 4), NO. 8 (3/8 IN. TO NO.16) AND NO. 89 (3/8 IN. TO NO.50) SIEVES. SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.

**WATER CONTENT** - WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL ADMIXTURES. WATER QUALITY SHOULD MEET ACI 308. AS A GENERAL RULE, POTABLE WATER SHOULD BE USED, ALTHOUGH RECYCLED CONCRETE PRODUCTION WATER MEETING ASTM C 94 OR AASHTO M 157 MAY ALSO BE USED.

**ADMIXTURES** - CHEMICAL ADMIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES. PERVIOUS CONCRETE USE OF ADMIXTURES SHOULD MEET ASTM C 494 (CHEMICAL ADMIXTURES) AND ASTM C 260 (AIR ENTRAINING ADMIXTURES) AND CLOSELY FOLLOW MANUFACTURER'S RECOMMENDATIONS.

**BASE COURSE** - THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

**2. PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)**

**PAVER BLOCKS** - BLOCKS SHOULD BE EITHER 3" IN. OR 4" IN. THICK, AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (40% PREFERRED) OF THE SURFACE AREA OPEN. INSTALLATION SHOULD FOLLOW MANUFACTURER'S INSTRUCTIONS, EXCEPT THAT INFILL AND BASE COURSE MATERIALS AND DIMENSIONS SPECIFIED IN THIS APPENDIX SHALL BE FOLLOWED.

**INFILL MATERIALS AND LEVELING COURSE** - OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND. **BASE COURSE** - THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

**3. REINFORCED TURF**

**REINFORCED GRASS PAVEMENT (RGP)** - WHETHER USED WITH GRASS OR GRAVEL, THE RGP THICKNESS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.

**A-2. PERMEABLE PAVEMENTS**

**CONSTRUCTION CRITERIA:**

THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING CONSTRUCTION OF PROJECTS WITH PERMEABLE PAVEMENT:

- **EROSION AND SEDIMENT CONTROL:** FINAL GRADING FOR INSTALLATION SHOULD NOT TAKE PLACE UNTIL THE SURROUNDING SITE IS STABILIZED. IF THIS CANNOT BE ACCOMPLISHED, RUNOFF FROM DISTURBED AREAS SHALL BE DIVERTED AROUND PROPOSED PAVEMENT LOCATIONS.
- **SOIL COMPACTION:** SUB SOILS SHALL NOT BE COMPACTED. CONSTRUCTION SHOULD BE PERFORMED WITH LIGHTWEIGHT, WIDE TRACKED EQUIPMENT TO MINIMIZE COMPACTION. EXCAVATED MATERIALS SHOULD BE PLACED IN A CONTAINED AREA.
- **DISTRIBUTION SYSTEMS:** OVERDRAIN, UNDERDRAIN, AND DISTRIBUTION PIPES SHALL BE CHECKED TO ENSURE THAT BOTH THE MATERIAL AND PERFORATIONS MEET SPECIFICATIONS (SEE APPENDIX B. 4). THE UPSTREAM ENDS OF PIPES SHOULD BE CAPPED PRIOR TO INSTALLATION. ALL UNDERDRAIN OR DISTRIBUTION PIPES USED SHOULD BE INSTALLED FLAT ALONG THE BED BOTTOM.
- **SUBBASE INSTALLATION:** SUBBASE AGGREGATE SHALL BE CLEAN AND FREE OF FINES. THE SUBBASE SHALL BE PLACED IN LIFTS AND LIGHTLY ROLLED ACCORDING TO THE SPECIFICATIONS (SEE APPENDIX B.4).

**INSPECTION:**

REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:

- DURING EXCAVATION TO SUB GRADE.
- DURING PLACEMENT AND BACKFILL OF ANY DRAINAGE OR DISTRIBUTION SYSTEM(S).
- DURING PLACEMENT OF THE CRUSHED STONE SUBBASE MATERIAL.
- DURING PLACEMENT OF THE SURFACE MATERIAL.
- UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

**MAINTENANCE CRITERIA:**

THE FOLLOWING PROCEDURES SHOULD BE CONSIDERED ESSENTIAL FOR MAINTAINING PERMEABLE PAVEMENT SYSTEMS:

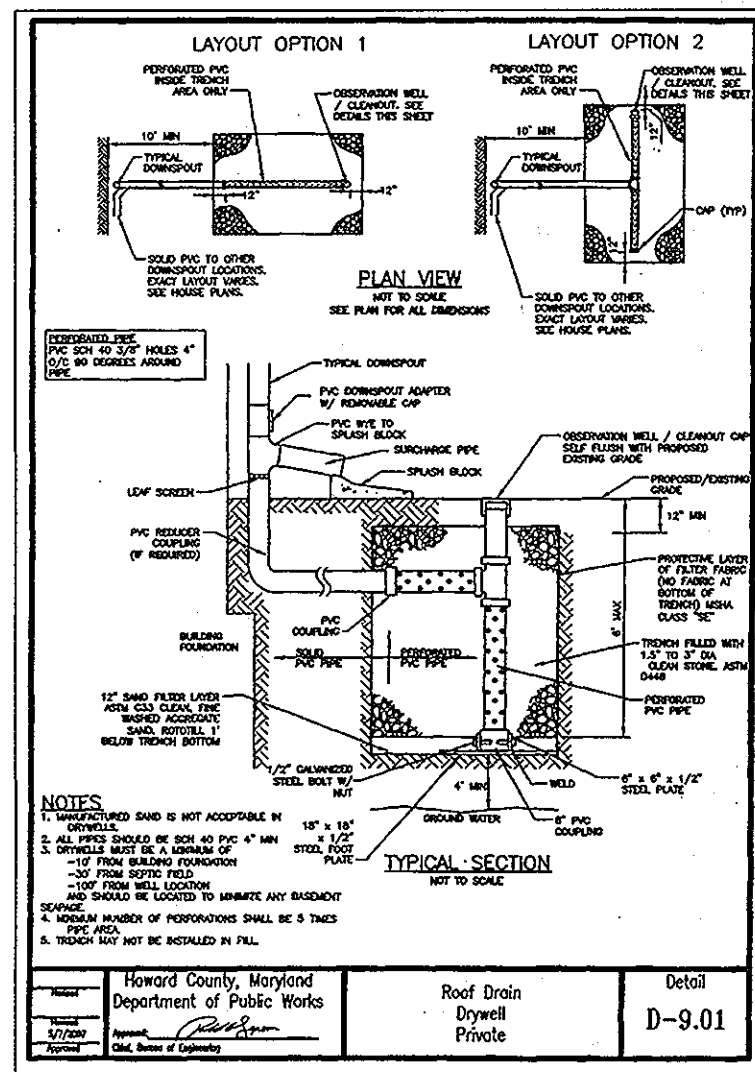
- PAVEMENTS SHOULD BE USED ONLY WHERE REGULAR MAINTENANCE CAN BE PERFORMED. MAINTENANCE AGREEMENTS SHOULD CLEARLY SPECIFY HOW TO CONDUCT ROUTINE TASKS TO ENSURE LONG-TERM PERFORMANCE.
- PAVEMENT SURFACES SHOULD BE SWEEPED AND VACUUMED TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. WASHING SYSTEMS AND COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
- DRAINAGE PIPES, INLETS, STONE EDGE DRAINS, AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE SHOULD BE CLEANED OUT AT REGULAR INTERVALS.
- TRUCKS AND OTHER HEAVY VEHICLES CAN GRIND DIRT AND GRIT INTO THE POROUS SURFACES, LEADING TO CLOGGING AND PREMATURE FAILURE. THESE VEHICLES SHOULD BE PREVENTED FROM TRACKING AND SPILLING MATERIAL ONTO THE PAVEMENT.
- DEICERS SHOULD BE USED IN MODERATION. WHEN USED, DEICERS SHOULD BE NON-TOXIC AND ORGANIC AND CAN BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT. SNOW PLOWING SHOULD BE DONE CAREFULLY WITH BLADES SET ONE-INCH HIGHER THAN NORMAL. PLOWED SNOW PILES AND SNOW MELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

**HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED PERMEABLE PAVEMENT (A-2)**

- THE OWNER SHALL PERIODICALLY SWEEP (OR VACUUM POROUS CONCRETE PAVEMENT) THE PAVEMENT SURFACES TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. WASHING OR COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
- THE OWNER SHALL PERIODICALLY CLEAN DRAINAGE PIPES, INLETS, STONE EDGE DRAINS AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE.
- THE OWNER SHALL USE DEICERS IN MODERATION. DEICERS SHOULD BE NON-TOXIC AND BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT.
- THE OWNER SHALL ENSURE SNOW PLOWING IS PERFORMED CAREFULLY WITH BLADES SET ONE-INCH ABOVE THE SURFACE. PLOWED SNOW PILES AND SNOW MELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

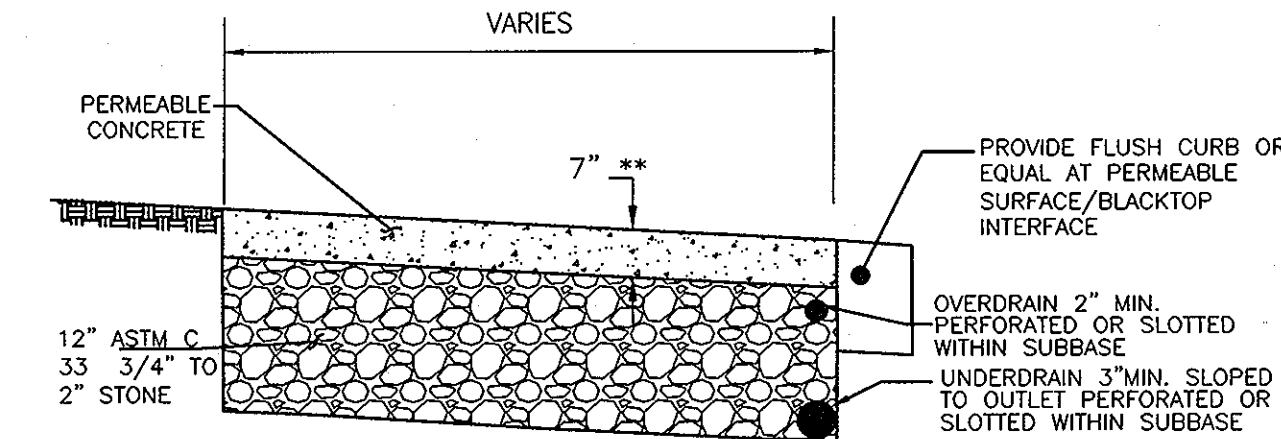
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

10/16/13  
 DATE  
 10/16/13  
 DATE



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

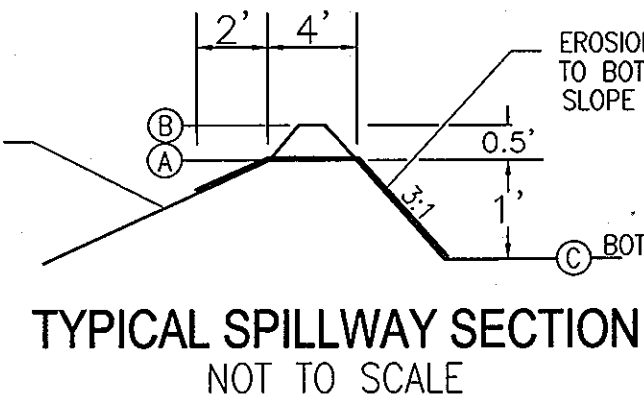
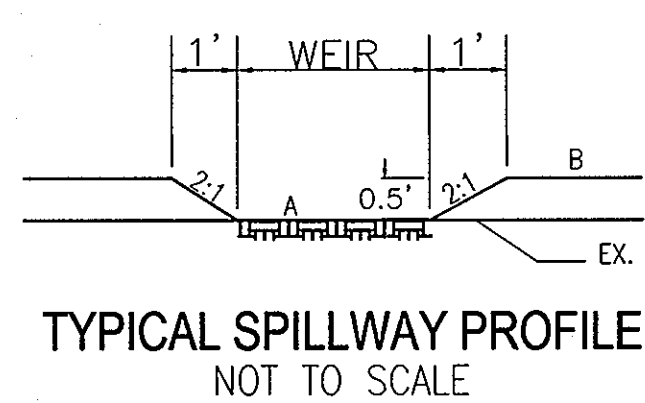
- THE OWNER SHALL INSPECT & CLEAN ANNUALLY, INCLUDING PIPES, GUTTERS, DOWNSPOUTS AND FILTERS.
- PONDING STANDING WATER OR ALGAL GROWTH ON THE TOP OF A DRYWELL MAY INDICATE FAILURE DUE TO SEDIMENTATION IN THE GRAVEL MEDIA. IF WATER PONDING FOR MORE THAN 48 HOURS AFTER A MAJOR STORM OR MORE THAN SIX INCHES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



**PAVEMENT CROSS SECTION TO BE CONFIRMED BY GEOTECHNICAL ENGINEER UNDERDRAIN SHALL BE LOCATED SUCH THAT IT CAN DAYLIGHT**

**DETAIL - PERMEABLE CONCRETE DRIVEWAY**

NOT TO SCALE  
 \*\* ALL PERMEABLE CONCRETE THICKNESS, MIX AND SUB-BASE TO BE DETERMINED BY GEOTECHNICAL ENGINEER ON-SITE.



**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 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 COMPOST REQUIREMENTS.

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 (LOAM, CLAY, SAND, LOAM) AND COMPOST (40%).  
 \* CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.  
 \* PH PHOSPHORUS - 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.

THIS 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 STOCKPILE TOPSOIL IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

**3. COMPACTION**

IF 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 TURF 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 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 THROUGHOUT THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REMOVE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT. ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDING WATER BEFORE PREPARING (ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINISH GRADE. 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 1/8TH 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 STORAGE 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 PLANTS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

**6. UNDERDRAINS**

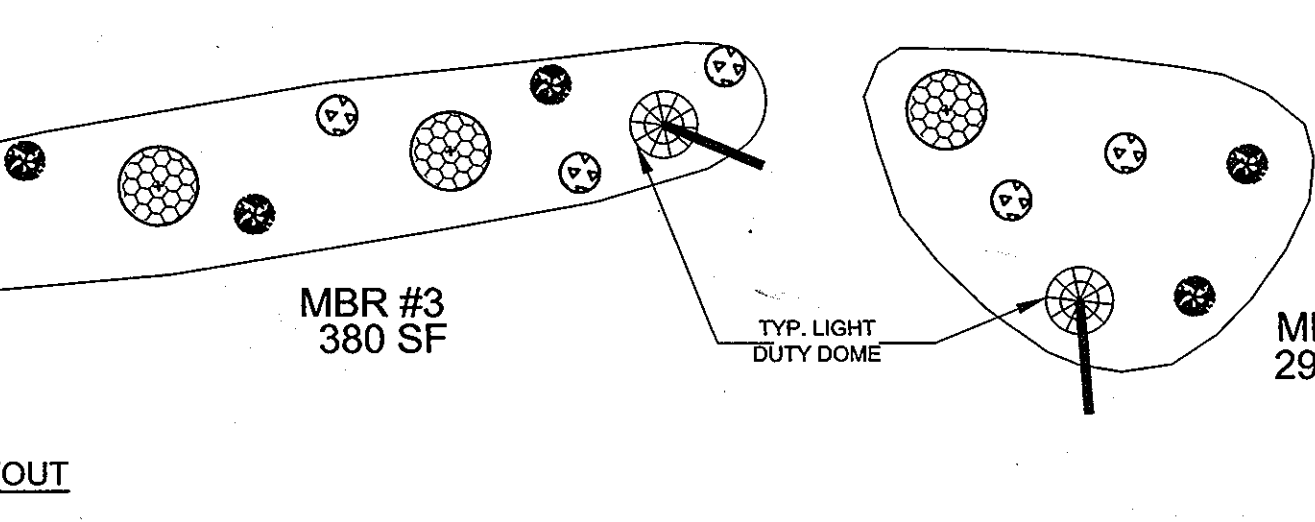
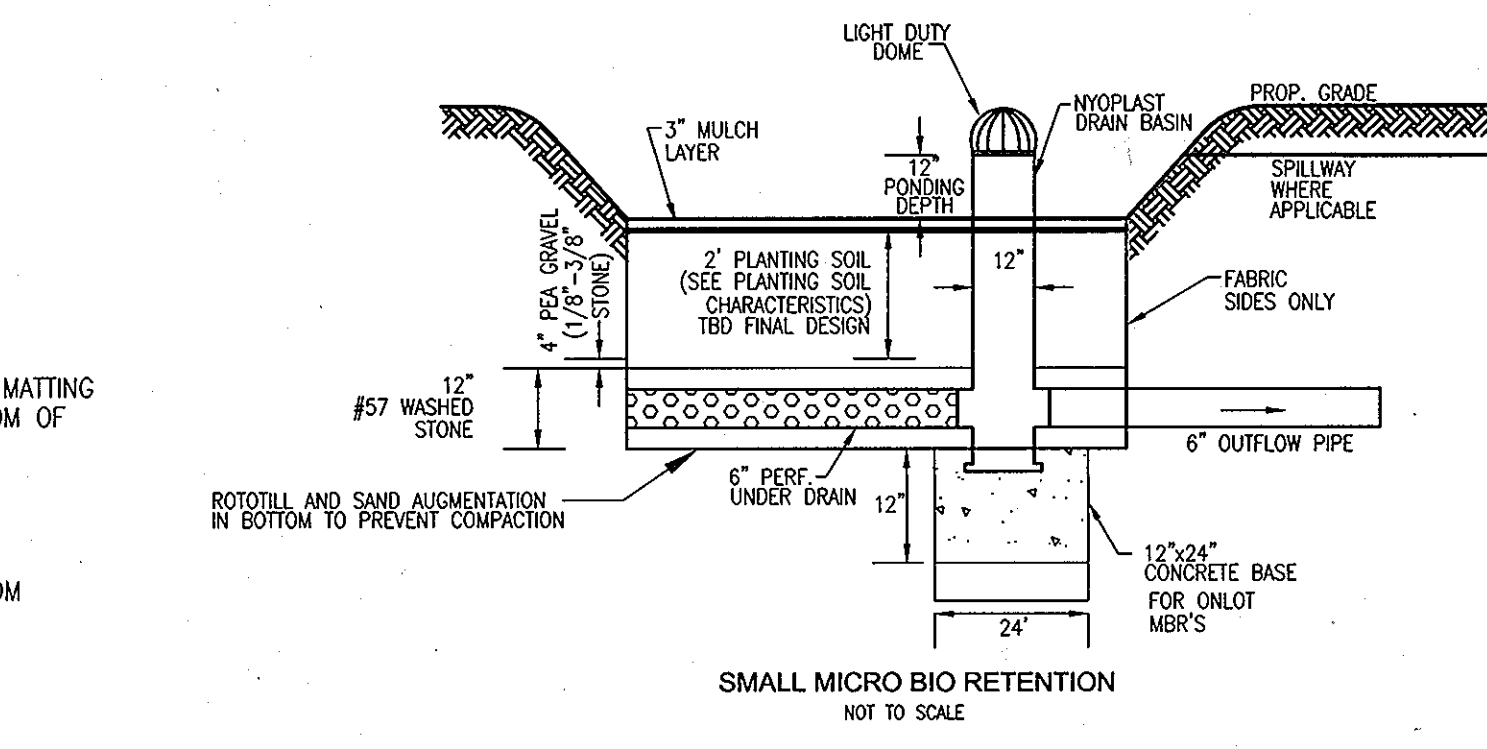
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:  
 \* PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).  
 \* PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 1/2" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE PROTECTED WITH A 1/4" (NO. 4 OR 6) GALVANIZED STEEL 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 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.  
 \* A 4" LAYER OF PEEL 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).

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

**OPERATION AND MAINTENANCE SCHEDULE FOR MICROBIORETENTION (M-6) AREAS**

- 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 AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME 8, TABLE A.4.1 AND 2.
- THE OWNER SHALL PERFORM A PLANT INSPECTION 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 OF 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.



**BIORETENTION PLANTING SCHEDULE NOTES:**

- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HRD PLANTING SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
- FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
- CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.
- SEE THIS SHEET FOR TYPICAL PLANTING DETAILS.

TYPICAL BIORETENTION PLANTING SCHEDULE PER 250 SF AREA				PER FACILITY				
KEY	QTY	BOTANICAL NAME/Common Name	SIZE	REMARKS	MBR #1	MBR #2	MBR #3	MBR #4
(Symbol)	1	ILEX GLABRA INKBERRY	3 GALLON	CONT	1	2	3	1
(Symbol)	1	VACCINIUM CORYMBOSUM HIGHBUSH BLUEBERRY	3 GALLON	CONT	2	2	3	2
(Symbol)	1	LOBELIA SIPHERLIDA GREAT BLUE LOBELIA	3 GALLON	CONT	2	2	3	2

A MINIMUM DENSITY OF 1000 STEMS PER PLANTED BIORETENTION AREAS ARE TO BE PLANTED BASED ON ACRE (1,029 STEMS PER SQUARE FOOT). ABOVE PLANTING RATIOS ARE TO BE APPLIED TO THE AREAS PROVIDED IN THE ESDV SUMMARY. ROUND UP FOR QUANTITY.

**FINAL ESD DESIGN - SWM CONCEPT PER LOT**

ON LOT PRACTICES ARE SUBJECT TO CHANGE DURING FINAL DESIGN

PROJECT:		GEEHAR PROPERTY - SITE DATA									
TOTAL AREA (LOD):		AC NEW DEVELOPMENT									
TARGET Pp:		1.60 IN									
IMPERVIOUS:		28.76 PERCENT									
SITE RV:		0.31									
SITE ESDV:		1650 CF									
LOT AREA	IMPERVIOUS AREA*	GRASS AREA	TOTAL AREA	PERCENT IMPERVIOUS	RV	ESDv	ESDv	ESDv	PERCENT OF SITE	ESDv	CF REQ.
4	3740	16271	20011	0.19	0.22	N/A	N/A	N/A	N/A	N/A	CF REQ.
<b>NOTE:</b>											
1. Lot 4 contains an existing home and driveway to remain. Stormwater management for this lot is not required.											
5	4100	15905	20005	0.20	0.23	391	1016	547	0.50		
						PERMEABLE SURFACE DRIVEWAY	590 SF	0.196	116	CF	
						MICRO BIORETENTION 1' POND	290 SF		290	CF	
						MICRO BIORETENTION 1' POND	250 SF		250	CF	
									656	CF PROV.	
6	4805	15198	20003	0.24	0.27	444	1154	621	0.50		
						PERMEABLE SURFACE DRIVEWAY	1050 SF	0.196	206	CF	
						DRYWELL	10	4	0.3	120	CF
						MICRO BIORETENTION 1' POND	380 SF		380	CF	
									706	CF PROV.	
UIC DRIVE	2600	0	2600	1.00	0.95	206	535	288	0.06		
						MICRO BIORETENTION 1' POND	290 SF		290	CF	
									290	CF PROV.	
11505	TOTAL AREA		40008 SF							1651	CF PROV.
										0.92 AC	

**APPENDIX B.4. - CONSTRUCTION SPECIFICATIONS**

**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	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%
Planting depth	4" to 6" deep	n/a	
Organic content	Min. 10% by dry weight (ASTM D 2974)	n/a	
Mulch	shredded hardwood	n/a	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" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipe; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-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 symmetry) and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Gypsstone (AASHTO) #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

NO.	REVISION	DATE

**SUPPLEMENTAL INFORMATION PLAN**  
**STORMWATER MANAGEMENT NOTES AND DETAILS**  
**GROVEMONT OVERLOOK - II**  
 (SFD RESIDENTIAL)  
 LOTS 4-6  
 A RESUBDIVISION OF "GEEHAR PROPERTY", LOT 3 AND "GROVEMONT OVERLOOK", PHASE 2, NON BUILDABLE BULK PARCEL H

1ST ELECTION DISTRICT TAX MAP: 31 GRID: 24 DPZ REF: PLAT 5947, F-13-054, ECP-13-046, F-09-122, SDP-12-024

ZONED: R-ED PARCEL: 619 & 749 HOWARD COUNTY, MARYLAND

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DESIGN BY: R/VH / EDS  
 DRAWN BY: JHR  
 CHECKED BY: JHR  
 DATE: JULY, 2013  
 SCALE: AS SHOWN  
 W.O. NO.: 04-57

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 08-27-2014

4 SHEET OF 4