

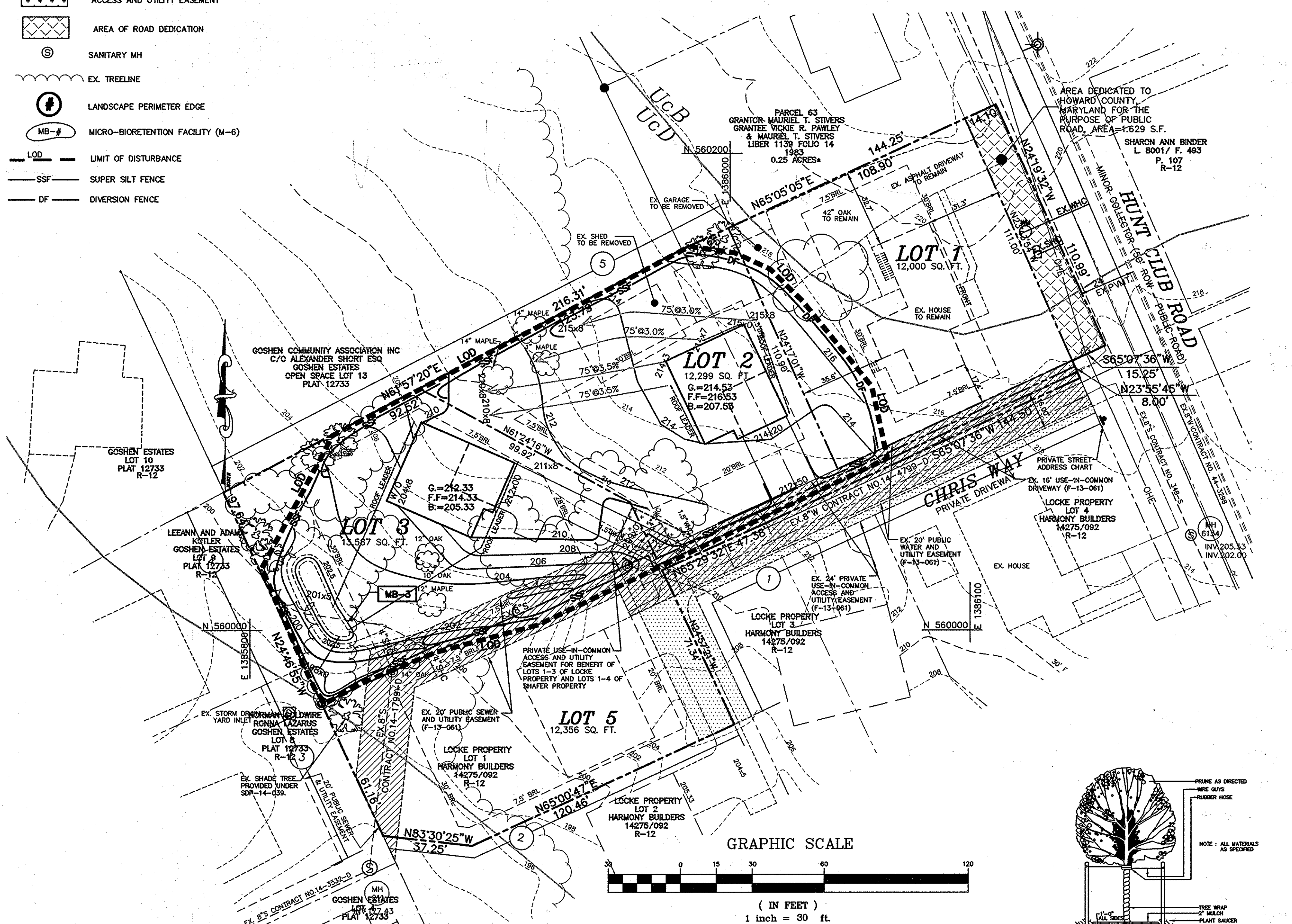
SOILS DESCRIPTION

UCB - (D) - URBAN LAND-CHILLUM-BELTSVILLE COMPLEX, 0-5% SLOPES
 UCD - (D) - URBAN LAND-CHILLUM-BELTSVILLE COMPLEX, 5-15% SLOPES

LEGEND

- EX. PUBLIC WATER, SEWER AND UTILITY EASEMENT
- EX. PRIVATE USE-IN-COMMON ACCESS AND UTILITY EASEMENT
- PRIVATE USE-IN-COMMON ACCESS AND UTILITY EASEMENT
- AREA OF ROAD DEDICATION
- SANITARY MH
- EX. TRENLINE
- LANDSCAPE PERIMETER EDGE
- MICRO-BIORETENTION FACILITY (M-6)
- LOD - LIMIT OF DISTURBANCE
- SSF - SUPER SILT FENCE
- DF - DIVERSION FENCE

STORMWATER MANAGEMENT PRACTICES																
LOT #	ADDRESS	GREEN ROOF (Y/N)	PERMEABLE PAVEMENTS (Y/N)	REINFORCED TURF (Y/N)	DISCONNECTION OF ROOFTOP RUNOFF (NUMBER)	DISCONNECTION OF NON-ROOFTOP RUNOFF (Y/N)	SHEETFLOW TO CONSERVATION AREAS (Y/N)	RAINWATER HARVESTING (NUMBER)	SUMMERGRAVEL WETLANDS (NUMBER)	LANDSCAPE INFILTRATION (NUMBER)	INFILTRATION BASINS (NUMBER)	DRY WELLS (NUMBER)	MICRO-BIORETENTION (NUMBER)	RAIN GARDENS (NUMBER)	SWALES (NUMBER)	ENHANCED FIELDS (NUMBER)
2	6006 CHRIS WAY	A-1 (Y/N)	A-2 (Y/N)	A-3 (Y/N)	N-1 (NUMBER)	N-2 (Y/N)	N-3 (Y/N)	M-1 (NUMBER)	M-2 (NUMBER)	M-3 (NUMBER)	M-4 (NUMBER)	M-5 (NUMBER)	M-6 (NUMBER)	M-7 (NUMBER)	M-8 (NUMBER)	M-9 (NUMBER)
3	6010 CHRIS WAY															



FOREST CONSERVATION WORKSHEET
VERSION 1.0

NET TRACT AREA:

A. Total tract area.....	=1.19
B. Area within 100 year floodplain.....	=0.00
C. Area to remain in agricultural production.....	=0.00
D. Net tract area.....	=1.19

LAND USE CATEGORY:

(from table 3.2.1, page 40, Manual) Input the number "1" under the appropriate land use zoning, and limit to only one entry.

ARA	MDR	IDA	HDR	MPD	GIA
0	0	0	1	0	0

EXISTING FOREST COVER:

G. Existing forest cover (excluding floodplain).....	=0.00
H. Area of forest above afforestation threshold.....	=0.00
I. Area of forest above conservation threshold.....	=0.00

BREAK EVEN POINT:

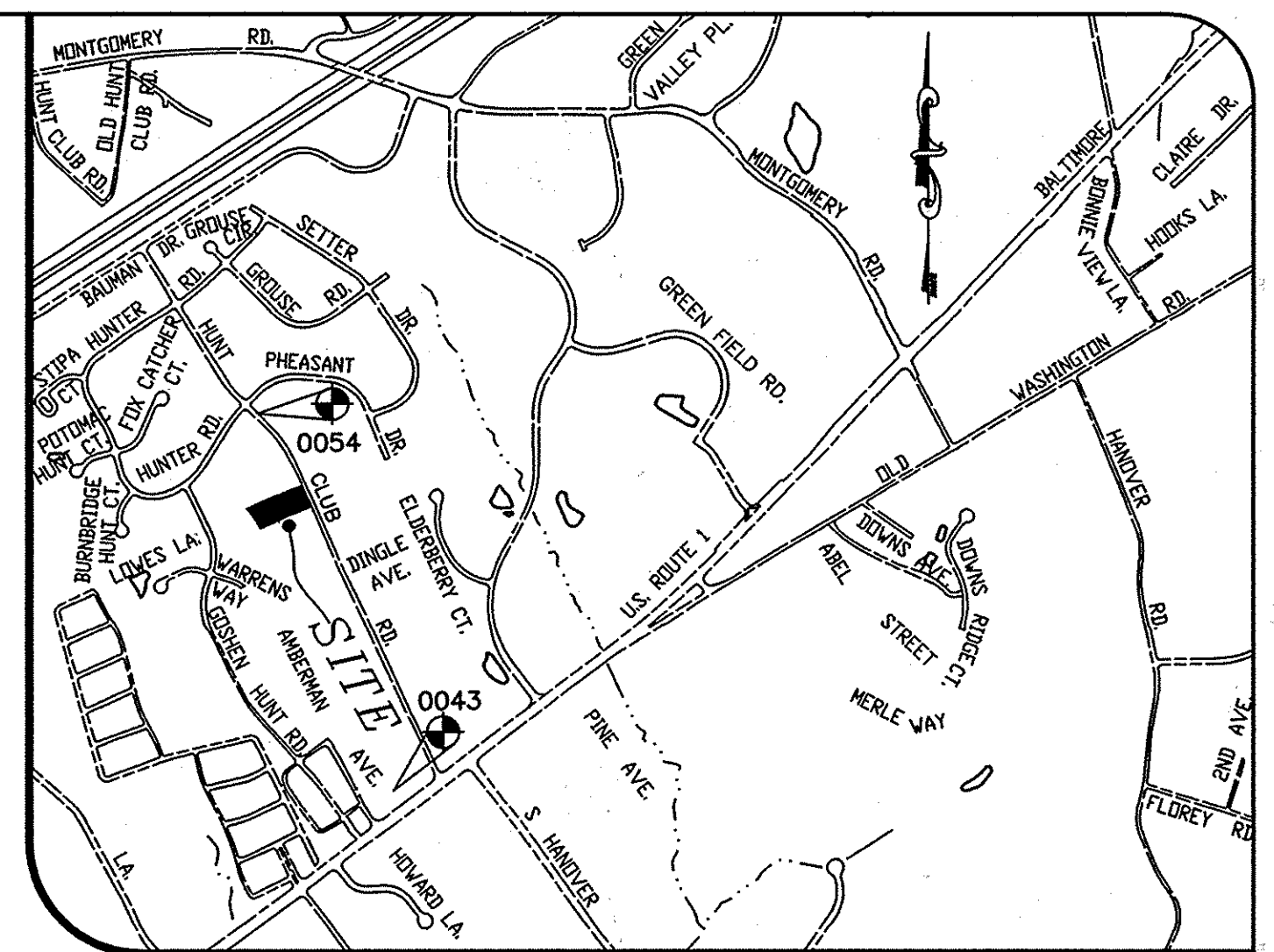
J. Forest retention above threshold with no mitigation.....	=0.00
K. Clearing permitted without mitigation.....	=0.00

PROPOSED FOREST CLEARING:

L. Total area of forest to be cleared.....	=0.00
M. Total area of forest to be retained.....	=0.00

PLANTING REQUIREMENTS:

N. Reforestation for clearing above conservation threshold.....	=0.00
P. Reforestation for clearing below conservation threshold.....	=0.00
Q. Credit for retention above conservation threshold.....	=0.00
R. Total reforestation required.....	=0.00
S. Total afforestation required.....	=0.18
T. Total reforestation and afforestation required.....	=0.18



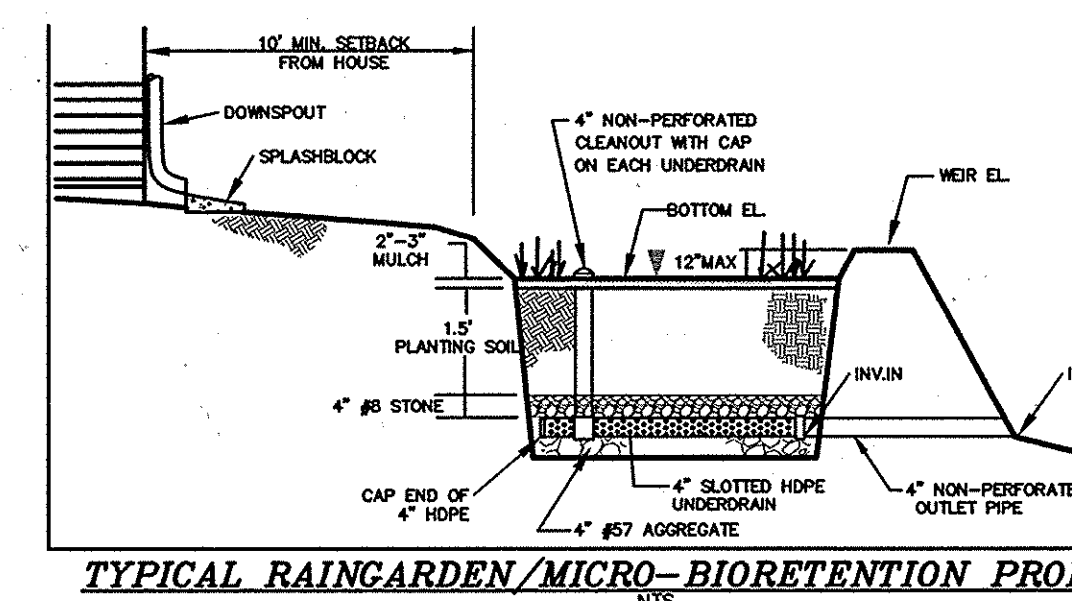
VICINITY MAP
SCALE: 1"=1000'
ADC MAP 35, GRID C-2

GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- PROJECT BACKGROUND:**
LOCATION: TAX MAP: 38 PARCEL: 64 GRID: 7
ELECTION DISTRICT: FIRST
ZONING: R-12
PROPOSED USE FOR SITE: RESIDENTIAL
TYPE OF PROPOSED UNIT: SFD
DPZ FILE NOS: CP-13-069, F-13-061
- AREA TABULATION:**
A. TOTAL TRACT AREA: 1.19 AC.±
B. NUMBER OF PROPOSED BUILDABLE LOTS: 4
C. NUMBER OF OPEN SPACE LOTS: 0
D. AREA OF PUBLIC RIGHT-OF-WAY: 1,629 S.F.±
E. AREA OF BUILDABLE LOTS: 1,163 AC.±
- ON-SITE TOPOGRAPHY SHOWN HEREON IS BASED ON A FIELD RUN SURVEY CONDUCTED BY MILDENBERG, BOENDER & ASSOCIATES ON OR ABOUT APRIL 2013.
- HORIZONTAL AND VERTICAL DATUMS ARE RELATED TO THE MARYLAND STATE PLANE COORDINATE SYSTEM AS PROJECTED FROM HOWARD COUNTY CONTROL STATIONS NO. 0043 AND 0054.
STATION NO. 0043 N 558479.008 E 1386842.060 EL. 189.501
STATION NO. 0054 N 568918.409 E 1385770.210 EL. 235.681
- PROJECT BOUNDARY IS BASED ON A FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED BY MILDENBERG, BOENDER & ASSOC., INC. ON OR ABOUT APRIL 2013.
- THE PROPOSED SUBDIVISION WILL CONSIST OF SINGLE FAMILY DETACHED DWELLINGS.
- THE SUBDIVISION IS IN THE METROPOLITAN DISTRICT.
- STEEP SLOPES OVER 20,000 SQ. FT. IN AREA DO NOT EXIST ON SITE.
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
A) WIDTH - 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE).
B) SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING.
C) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM OF 45-FOOT TURNING RADIUS.
D) STRUCTURES (OVERLY BRIDGES) - CAPABLE OF SUPPORTING 20 TONS (1255 LBS).
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 ENSURE ALL WEATHER USE.
- THE FOREST CONSERVATION OBLIGATIONS FOR THIS SUBDIVISION IS PROVIDED BY A PAYMENT FEE-IN-LIEU IN THE AMOUNT OF \$5,880.00 FOR LOTS 1 THRU 4.
- THIS SUBDIVISION IS IN COMPLIANCE WITH SECTION 16.124 OF HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- LANDSCAPING FOR THIS SUBDIVISION WILL BE DEFERRED UNTIL THE SITE DEVELOPMENT PLAN STATE FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED WITH THE GRADING PERMIT.
- 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.
- AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED 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.
- 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 MEET SIZE AND INSTALLATION REQUIREMENTS AS SPECIFIED IN THE LANDSCAPE MANUAL.
- NO CLEARING OF EXISTING VEGETATION IS PERMITTED WITHIN THE LANDSCAPED EDGE; HOWEVER, LANDSCAPE MAINTENANCE IS AUTHORIZED.
- DRIVEWAY ENTRANCE IS PER HOWARD COUNTY STANDARD DETAIL R-6.06.
- FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM LOT AND ROAD RIGHT OF WAY LINE AND NOT ONTO THE PIPESTEM LOT DRIVEWAY.
- STORMWATER MANAGEMENT IS PROVIDED VIA ROOFTOP DISCONNECTION (N-2) AND MICRO-BIORETENTION FACILITIES (M-6). ALL SWM PRACTICES WILL BE PRIVATELY OWNED AND MAINTAINED.
- A SITE DEVELOPMENT PLAN APPROVAL BY THE DEPARTMENT OF PLANNING AND ZONING IS REQUIRED PRIOR TO BUILDING PERMITS BEING ISSUED FOR THE CONSTRUCTION OF RESIDENTIAL DWELLINGS ON LOTS 2 & 3.
- THE OPEN SPACE REQUIREMENT FOR THIS SUBDIVISION IS MET BY A PAYMENT OF FEE-IN-LIEU IN THE AMOUNT OF \$3,000.00.
- THERE IS AN EXISTING STRUCTURE ON LOT 1 TO REMAIN, NO NEW BUILDINGS, EXTENSIONS OR ADDITIONS TO THE EXISTING DWELLING ARE TO BE CONSTRUCTED AT A DISTANCE LESS THAN THE ZONING REGULATION REQUIREMENTS. ALL OTHER STRUCTURES WILL BE REMOVED, UNLESS OTHERWISE NOTED.
- NO FOREST STAND OR WETLAND EXISTS ON SITE AS CERTIFIED BY MILDENBERG, BOENDER & ASSOC., INC.
- 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 THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- EXISTING UTILITIES ARE BASED ON AS-BUILT PLANS FOR WATER AND SEWER CONTRACTS 44-3298-D AND 14-3532-D, VERIFIED BY FIELD RUN SURVEY CONDUCTED BY MILDENBERG, BOENDER & ASSOC., INC. ON OR ABOUT APRIL 2013.
- FLOODPLAIN STUDY IS NOT REQUIRED FOR THIS SITE.
- NOISE STUDY IS NOT REQUIRED FOR THIS SITE.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT, IN ACCORDANCE WITH SECTION 16.1107(g)(2) MINOR SUBDIVISIONS ARE EXEMPT FROM THE REQUIREMENT TO PASS THE TEST FOR ADEQUATE ROAD FACILITIES.

MICRO-BIORETENTION DESIGN DATA

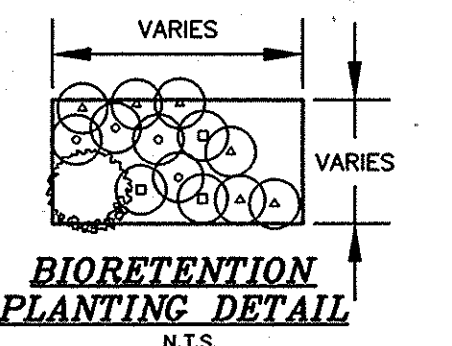
FACILITY LOT#	BOTTOM EL.	SURFACE AREA	PONDING DEPTH	WEIR ELEVATION	UNDERDRAIN INV. IN	UNDERDRAIN INV. OUT
3	201.5	240 S.F.	12"	202.5	199.0	298.5



PLANT LIST

QUANTITY LOT 3	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
4	○	ILEX GLABRA	INK BERRY	2' - 3' HT.
12	○	LOBELIA SIPHILITICA	GREAT BLUE LOBELIA	1 GAL. CONTAINER
8	○	ONOCLEA SENSIBILIS	SENSITIVE FERN	1 GAL. CONTAINER
6	○	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	1 GAL. CONTAINER

TOTAL: 24 PERENNIALS, 4 SHRUBS



SCHEDULE A: PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO PERIMETER PROPERTIES					TOTAL
	A (PERIMETER 1)*	A (PERIMETER 2)*	A (PERIMETER 3)**	A (PERIMETER 4)	A (PERIMETER 5)	
LINEAR FEET OF PERIMETER	263.22 LF	157.71 LF	61.16 LF	97.64 LF	237.68 LF	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	N/A	N/A	PROVIDED UNDER SDP-14-039	NO	NO	
NUMBER OF PLANTS REQUIRED	0 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	0 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	0 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	2 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	4 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS	6 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED	0 SHADE TREES 0 EVERGREEN TREES 0 OTHER TREES (2:1 SUBSTITUTION) 0 SHRUBS (10:1 SUBSTITUTION)	0 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	0 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	2 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	4 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	6 SHADE TREES 0 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS

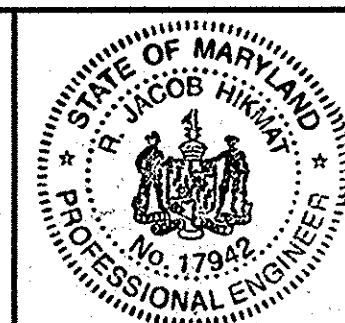
PERIMETERS 1 AND 2 ARE EXEMPT FROM LANDSCAPING SINCE THEY ARE INTERNAL PERIMETERS TO LOCKE PROPERTY (F-13-061) THAT IS BEING DEVELOPED BY THE SAME OWNER. LANDSCAPING FOR THIS PROJECT HAS BEEN DEFERRED UNTIL THE SITE DEVELOPMENT PLAN. EXACT NUMBER OF TREES REQUIRED AND A PLANTING SCHEDULE WILL BE PROVIDED WITH THE GRADING PERMIT FOR LOTS 2-3.

**LANDSCAPING FOR PERIMETER 3 IS PROVIDED UNDER SDP-14-039.

OWNER/DEVELOPER

HARMONY BUILDERS
4228 COLUMBIA ROAD
ELLICOTT CITY, MARYLAND 21042
410-461-0833

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 8/25/14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 8/27/14
 CHIEF, DIVISION OF LAND DEVELOPMENT



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. 17942, EXP. DATE 9/3/14.
 [Signature] 8/12/14
 JACOB HIKMAT, P.E.

Project: 13-006 AUG-2014
 Illustration: MAM
 Scale: 1"=30'
 Date: [blank]
 Description: [blank]
 Revisions: [blank]

Project: 13-006 AUG-2014
 Illustration: MAM
 Scale: 1"=30'
 Date: [blank]
 Description: [blank]
 Revisions: [blank]

SCHAFFER PROPERTY
 LOTS 1-3 AND LOCKE PROPERTY LOT 5
 TAX MAP 38 PARCEL 64 GRID 7
 FIRST ELECTION DISTRICT

HOWARD COUNTY
 SUPPLEMENTAL AND LANDSCAPE PLAN

MILDENBERG, BOENDER & ASSOC., INC.
 Engineers Planners Surveyors
 7850-B Grace Drive, Columbia, Maryland 21044
 (410) 997-0296 Fax

1 OF 2
 F-14-047

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DISCONNECTION OF ROOFTOP RUNOFF (N-1) AND DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)

A. MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA. IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

- 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.

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

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 1/2" thick with a load capacity capable of supporting the traffic and vehicle types that will be carried.

B.4.C Specifications for Micro-Bioretenion, Rain Gardens, 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-bioretenion practice that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05.

The planting soil shall be tested and shall meet the following criteria:

- Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)
- Organic 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 into the soil to increase or decrease pH.

There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.

3. Compaction

It is very important to minimize compaction of both the base of bioretention practices and the required backfill. When possible, use excavation hoes to remove original soil. If practices are

Supp. 1 B.4.4

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

excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

4. Plant Material

Recommended plant material for micro-bioretenion practices can be found in Appendix A, Section A.2.3.

5. Plant Installation

Compost is a better organic material source, is less likely to float, and should be placed in the invert and other low areas. Mulch should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8" 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.

B.4.5 Supp. 1

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

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

6. Underdrains

Underdrains should meet the following criteria:

- Pipe - Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or 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 0.5% 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 (3/8" to 3/4" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

7. Miscellaneous

These practices may not be constructed until all contributing drainage area has been stabilized

Supp. 1 B.4.6

Project	13-006	date	AUG-2014
Illustration	MMM	engineering	MMM
Scale	1"=30'	approval	JLS

no.	description	date	revisions
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SCHAFER PROPERTY
 LOTS 1-3 AND LOCKE PROPERTY LOT 5
 TAX MAP 38 PARCEL 64 GRID 7
 HOWARD COUNTY
 FIRST ELECTION DISTRICT
 SUPPLEMENTAL PLAN

MILDENBERG, BOENDER & ASSOC., INC.
 Engineers Planners Surveyors
 7850-B Grace Drive, Columbia, Maryland 21044
 (410) 997-0296 Fax

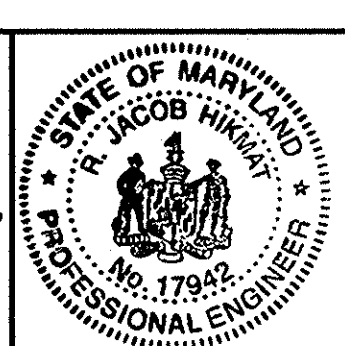
H:\13-006\0062\0062\13-006-FINAL PLANNING

OWNER/DEVELOPER
 HARMONY BUILDERS
 4228 COLUMBIA ROAD
 ELLICOTT CITY, MARYLAND 21042
 410-461-0833

APPROVED: DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 8/25/14

 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 8/27/14



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. 17942, EXP DATE 9/3/14.
 R. JACOB HIKMAT, P.E. DATE: 8/27/14

GE&T
 GEOTECHNICAL ENVIRONMENTAL TESTING CONSULTANTS, INC.

RO, Box 2071
 Columbia, MD 21045-2071
 Phone: (410) 381-5330
 Fax: (410) 381-1064
 e-mail: mounir54@yahoo.com

PRINCIPAL: Edward De Santis Eng. CE, PE * Dr. Jamal Tarfaoui Ph.D., PE
 CONSULTANTS: Edward De Santis Eng. CE, PE * Dr. Jamal Tarfaoui Ph.D., PE

October 26, 2013

Mildenberg, Boender & Associates, Inc.
 6800 Dorseth Road, Suite 150
 Elkridge, Maryland 21075

Attn: Ms. Maya M. Mildenberg
 Vice President

Ref: Limited Subsurface Exploration
 Proposed Development
 Schaffer Property
 Howard County, Maryland
 GE&T Project No. G-229

Dear Ms. Mildenberg:

On October 20th, 2013, GE&T Consultants, Inc. utilized a hand auger to bore two (2) soil borings at the locations shown on the attached Hand-Augers Location Map. The purpose of the hand augers was to evaluate the presence/absence of bedrock and groundwater at the locations shown, within 5-ft below existing site grades. The number, location, and depth of the borings were determined by others and the borings were staked-out in the field by others.

Our field observations are summarized in Table 1 below:

Boring No.	Depth to Groundwater (ft)	Depth to hand-auger refusal (ft)	Termination Depth (ft)
B-1	23	N/A	65
B-2	N/A	N/A*	60

*: Hand auger refusal was encountered at depths of 27" and 29" in early attempts.

Note: All depths are below existing site grades.

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

Table B.4.1 Materials Specifications for Micro-Bioretenion, Rain Gardens & Landscape Infiltration-

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 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 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.