

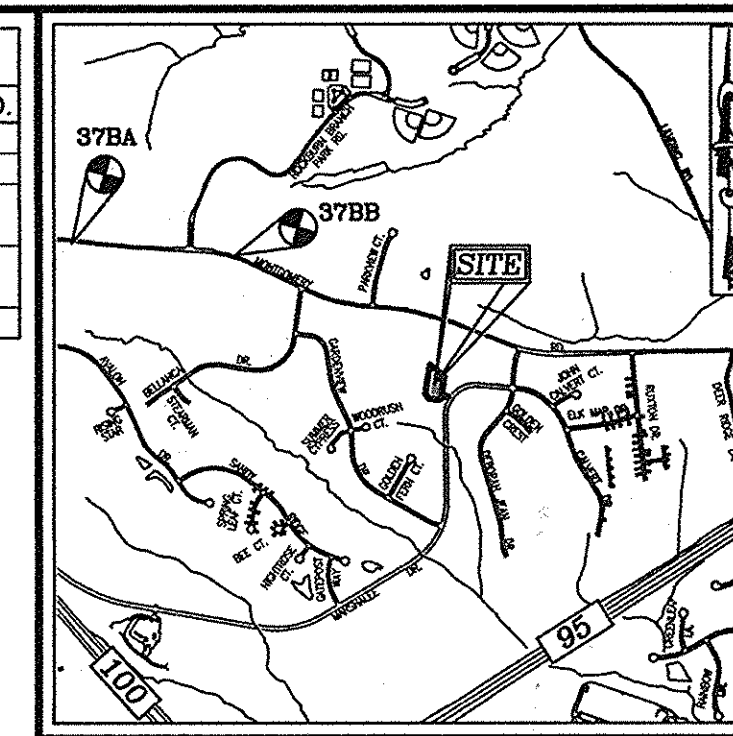
GENERAL NOTES

- PROJECT BACKGROUND:
 - LOCATION: TAX MAP 37 GRID 5
 - PARCELS: 320 & 354
 - ZONING: R-20 / R-12
 - SUBDIVISION: MONTGOMERY CROSSING
 - TOTAL LOT AREA: 0.60 AC.
 - DISTURBED AREA: 0.60 AC.
 - AREA OF PLAN SUBMISSION: 0.60 AC.
 - MINIMUM LOT SIZE: 12,000 SF
 - PROPOSED USE FOR SITE: RESIDENTIAL
 - TOTAL NUMBER OF UNITS: SFD
 - TYPE OF PROPOSED UNIT: SFD
 - DEED REFERENCES: LIBER 13552 FOLIO 512 & LIBER 13552 FOLIO 519
 - DPZ REFERENCES: PLATS #17089-17093, F-04-095, F-96-066, F-96-062, F-96-030, SDP-10-078, S-88-86, S-89-80, S-89-10, P-90-28, F-92-17, F-93-36, WP-91-90, WP-94-99, F-95-19, F-94-101, WP-94-90, F-95-182, F-97-124, SP-98-06, SP-11-002, F-10-080, F-13-039, GP 13-060.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 513-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
- ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- THE EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON AERIAL TOPOGRAPHY PERFORMED BY WINGS AERIAL MAPPING, DATED DECEMBER 2009 AND FIELD TOPOGRAPHY COMPILED BY ROBERT H. VOGEL ENGINEERING, INC. FEBRUARY 2013. IN ADDITION MASS GRADES PER GP 13-060 ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY.
- THE PROJECT BOUNDARY IS BASED ON A FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED BY MILDENBERG, BOENDER, AND ASSOCIATES, ON OR ABOUT FEBRUARY 2010.
- 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. 37BA AND 37BB WERE USED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED "R-12 & R-20" IN ACCORDANCE WITH THE 2/2/04 COMPREHENSIVE ZONING PLAN AND THE COMP. LITE ZONING REGULATIONS EFFECTIVE ON COMPREHENSIVE ZONING PLAN AND THE COMP. LITE ZONING REGULATIONS EFFECTIVE ON 7/28/06, AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003.
- STORMWATER MANAGEMENT REQUIREMENTS HAVE BEEN SATISFIED UNDER APPROVED F-96-30, EOP 11-034 AND PER F-13-039 THRU THE USE OF PRIVATELY OWNED AND MAINTAINED PERMEABLE SUPRACE DRIVEWAYS A-2 AND MICRO-BIORETENTION / RAINGARDEN M-7.
- EXISTING UTILITIES ARE BASED ON HOWARD COUNTY RECORDS, FIELD SURVEY, ROAD CONSTRUCTION PLANS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTORS INFORMATION. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE.
- ANY DAMAGE TO THE COUNTY'S RIGHTS-OF-WAY, PAVING, OR EXISTING UTILITIES SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- ALL DRIVEWAY ENTRANCES SHALL UTILIZE HOWARD COUNTY STANDARD DETAIL NO. R-6.06 UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS TO NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE DAYS BEFORE STARTING:
 - AT&T 1-800-252-1133
 - BGE (CONSTRUCTION SERVICES) 410-637-8713
 - BGE (EMERGENCY) 410-685-0123
 - BUREAU OF UTILITIES 410-313-4900
 - COLONIAL PIPELINE CO 410-795-1390
 - MISS UTILITY 1-800-257-7777
 - STATE HIGHWAY ADMINISTRATION 410-531-5533
 - VERIZON 1-800-743-0033
- 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.
- PER F13-039: NO WETLANDS, STREAMS, 25% STEEP SLOPES OR FLOODPLAINS EXIST ON SITE.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
- WATER AND SEWER SERVICE FOR THIS PROJECT WILL BE PUBLIC. WATER AND SEWER WILL BE PROVIDED THROUGH CONTRACT NO. 14-4697-D.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
- THE PROPOSED UNITS SHALL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
- NO STEEP SLOPES OVER 20,000 SF CONTIGUOUS ARE LOCATED ONSITE.
- FOREST CONSERVATION OBLIGATIONS IN ACCORDANCE WITH SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION ACT FOR THIS SUBDIVISION HAVE BEEN FULFILLED UNDER APPROVED F-96-030, F-96-062, F-96-066 AND PAYMENT OF FEE IN LIEU WITH F13-039 FOR THE REQUIRED 0.26 ACRE OBLIGATION.
- THE LANDSCAPE PLAN, IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY LANDSCAPE MANUAL, WAS APPROVED UNDER F-13-039. FINANCIAL SURETY IN THE AMOUNT OF \$1,950.00 SHALL BE POSTED WITH THE BUILDERS GRADING PERMIT.
- ESTIMATES OF EARTHWORK QUANTITIES ARE PROVIDED SOLELY FOR THE PURPOSE OF CALCULATING FEES AND ARE BASED UPON EXISTING AND PROPOSED CONTOURS.
- ALL SINGLE FAMILY DWELLINGS WILL HAVE A MINIMUM OF A 1-1/2" WHC WITH A 1" OUTSIDE METER SETTING.
- DRIVEWAYS 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 (16 FEET IF SERVING MORE THAN ONE RESIDENCE)
 - B) SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-3" MIN.)
 - C) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM OF 45-FOOT 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 65 dBA NOISE CONTOUR LINE DRAWN ON THIS DEVELOPMENT PLAN IS ADVISORY AS REQUIRED BY THE HOWARD COUNTY DESIGN MANUAL, CHAPTER 5, REVISED FEBRUARY, 1992, AND CANNOT BE CONSIDERED TO EXACTLY LOCATE THE 65 dBA NOISE EXPOSURE. THE 65dBA NOISE LINE WAS ESTABLISHED BY HOWARD COUNTY TO ALERT DEVELOPERS, BUILDERS AND FUTURE RESIDENTS THAT AREAS BEYOND THIS THRESHOLD MAY EXCEED GENERALLY ACCEPTED NOISE LEVELS ESTABLISHED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, ESTABLISHED UNDER PLAT NO. XXXXXX, F13-039.
- CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES ON SITE PRIOR TO COMMENCING CONSTRUCTION.
- THE OWNER, TENANT, AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING AND ALL 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 OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
- A PRIVATE RANGE OF ADDRESS SIGN ASSEMBLY SHALL BE FABRICATED AND INSTALLED 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.
- A DECLARATION OF MAINTENANCE OBLIGATIONS FOR THE USE-IN-COMMON ACCESS AREA WAS APPROVED UNDER F-96-066 (PLATS 12461-12463) AND RECORDED IN THE LAND RECORDS OF HOWARD COUNTY, MD IN LIBER 3817 FOLIO 251, AND WAS AMENDED UNDER A RESOLUTION RECORDED IN LIBER 8821 FOLIO 004, F-04-095 (PLATS 17089-17093).
- FOREST STAND DELINEATION WAS COMPLETED BY MILDENBERG, BOENDER AND ASSOCIATES, INC. UNDER SP11-002/F13-039.
- AN 85TH PERCENTILE SPEED STUDY AND SIGHT DISTANCE ANALYSIS WAS COMPLETED BY MILDENBERG, BOENDER AND ASSOCIATES, INC. UNDER SP11-002 / F13-039.

SITE DEVELOPMENT PLAN MONTGOMERY CROSSING PHASE 1

LOT 1 AND 2
AND NON-BUILDABLE BULK PARCEL B
L. 13552 / F. 526
HOWARD COUNTY, MARYLAND

SHEET INDEX		
DESCRIPTION	SHEET NO.	
COVER SHEET	1 OF 5	
SITE LAYOUT AND LANDSCAPE PLAN	2 OF 5	
SOILS MAP, GRADING, SOIL EROSION AND SEDIMENT CONTROL PLAN	3 OF 5	
GRADING, SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	4 OF 5	
HOUSE TYPE AND STORMWATER MANAGEMENT DETAILS	5 OF 5	



VICINITY MAP

SCALE: 1"=200'
ADC MAP COORDINATE: PG. 4936 J7

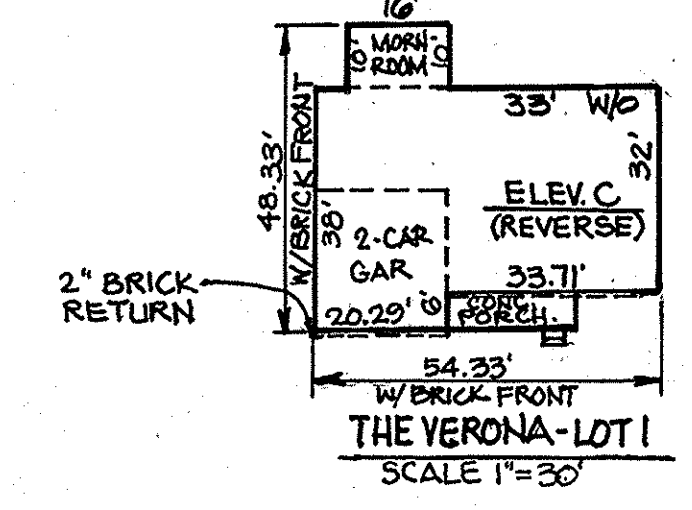
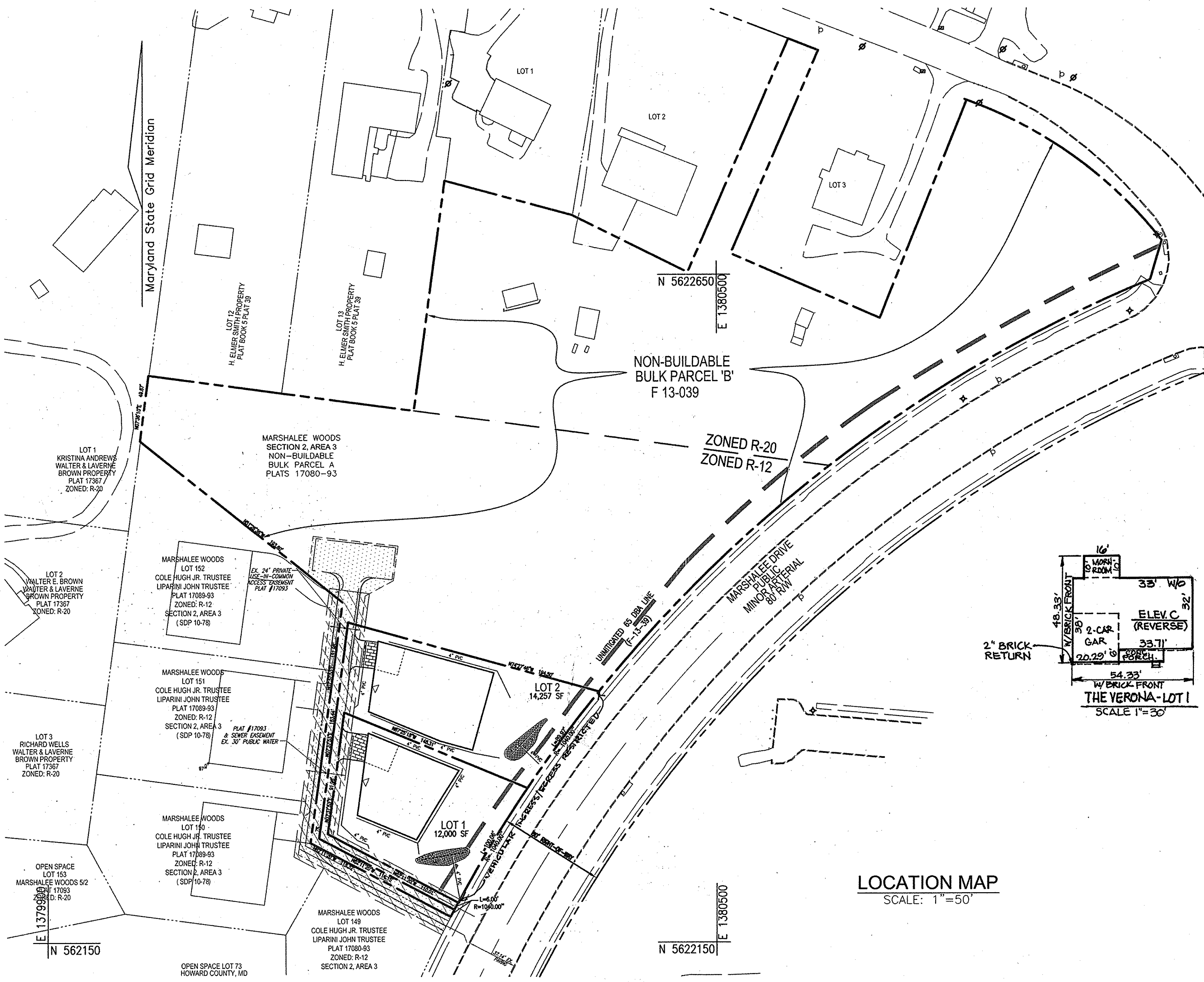
BENCHMARKS

HOWARD COUNTY BENCHMARK - 37BA (CONC. MONUMENT)
N 563785.6421 E 1376343.2088 ELEV. 393.94
LOCATION: MONTGOMERY ROAD 0.4 MILES EAST OF MEADOWBRIDGE ROAD

HOWARD COUNTY BENCHMARK - 37BB (CONC. MONUMENT)
N 563663.4488 E 1378040.5059 ELEV. 373.01
LOCATION: MONTGOMERY ROAD BY ROCKBURN ELEMENTARY SCHOOL

LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- CENTERLINE OF EXISTING STREAM
- EX. 24' PRIVATE USE-IN-COMMON ACCESS EASEMENT PLAT #17093
- EX. 30' PUBLIC WATER & SEWER EASEMENT PLAT #17093
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN



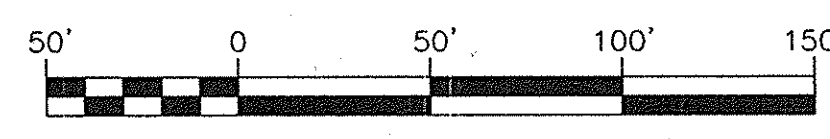
ADDRESS CHART

LOT NO	STREET ADDRESS
1	6505 MARSHALEE DRIVE
2	6503 MARSHALEE DRIVE

PERMIT INFORMATION CHART

SUBDIVISION NAME	SECTION/AREA	LOTS
MONTGOMERY CROSSING PHASE 1	F13-039	2/5
PLAT REF.	BLOCK NO	ZONE
22557-22558	5	R-12/R-20
TAX MAP	ELECT DIST.	CENSUS TR.
37	1ST.	6011.01

LOCATION MAP
SCALE: 1"=50'



SITE ANALYSIS DATA

A. TOTAL PROJECT AREA:	0.60 AC
B. AREA OF PLAN SUBMISSION:	0.60 AC (LOTS 1 & 2)
C. LIMIT OF DISTURBANCE:	0.60 AC
D. PRESENT ZONING DESIGNATION:	R-12 / R-20
E. PROPOSED USES FOR SITE AND STRUCTURES:	SINGLE FAMILY DETACHED
F. FLOOR SPACE ON EACH LEVEL OF BUILDING PER USE:	N/A
G. TOTAL NUMBER OF UNITS ALLOWED FOR PROJECT AS SHOWN ON FINAL PLAT:	2 BUILDABLE LOTS TOTAL
H. TOTAL NUMBER OF UNITS PROPOSED ON SUBMISSION:	2
I. MAXIMUM NUMBER OF EMPLOYEES, TENANTS OR SITE PER USE:	N/A
J. NUMBER OF PARKING SPACES REQUIRED BY HO. CO. ZONING REGULATIONS:	2 PER SFD HOUSE
K. NUMBER OF PARKING SPACES PROVIDED ON SITE:	2 PER SFD HOUSE
L. OPEN SPACE ON SITE:	PER FEE IN LIEU F-13-039
M. AREA OF RECREATION OPEN SPACE REQUIRED BY SUBDIVISION & LAND DEVELOPMENT REGULATIONS:	N/A
N. APPLICABLE DPZ FILE REFERENCES:	SEE NOTE 1
O. ANY OTHER INFORMATION WHICH MAY BE RELEVANT:	TAX MAP 37, GRID 5, PARCELS 320, 354 AND 682 1ST ELECTION DISTRICT
Q. FLOOR AREA RATIO:	N/A

SOILS LEGEND		
SYMBOL	DESCRIPTION	TYPE
C&B	CHILLUM LOAM, 2 TO 5 PERCENT SLOPES	B
SrC	SASSAFRAS AND CROOM SOILS, 5 TO 10 PERCENT SLOPES	B/C
Sd	SASSAFRAS AND CROOM SOILS, 10 TO 15 PERCENT SLOPES	B/C

BUILDER
KEVIN BOWSER
RYAN HOMES
9720 PATUXENT WOODS DRIVE
COLUMBIA, MD. 21046
(410) 796-0908

OWNER/DEVELOPER
COLUMBIA HOWARD PROPERTIES, LLC
7310 ESQUIRE CT., STE 14
ELK RIDGE, MD 21075
PHONE: (410) 379-8881

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

John Edman 2/7/14
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE

Kevin Bowser 2/12/14
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE

Mark A. Wagle 2/10/14
DIRECTOR
DATE

SITE DEVELOPMENT PLAN
COVER SHEET
MONTGOMERY CROSSING PHASE 1
(SFD RESIDENTIAL)
LOT 1 AND 2
AND NON-BUILDABLE BULK PARCEL B
L. 13552 / F. 526

1ST ELECTION DISTRICT: 1ST
TAX MAP: 37 GRID: 05
DPZ REFS: (SEE GENERAL NOTE 1 ON COVER SHEET)

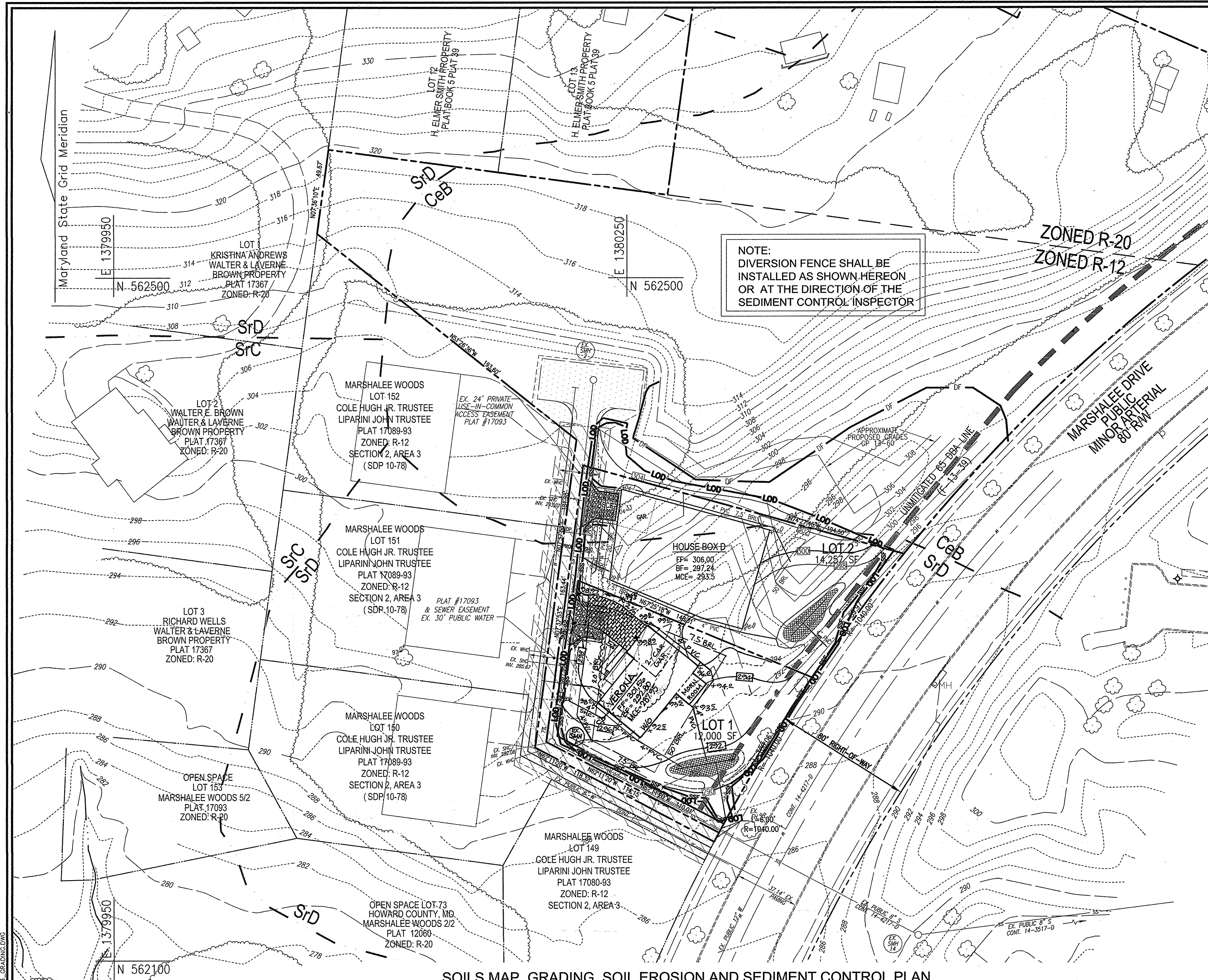
ZONED: R-12/R-20
PARCEL: 682
HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193
EXPIRATION DATE: 09-27-2014

DESIGN BY: EDS
DRAWN BY: JER
CHECKED BY: RHV
DATE: DECEMBER 2013
SCALE: AS SHOWN
W.O. NO.: 12-42

1 SHEET OF 5



NOTE:
DIVERSION FENCE SHALL BE
INSTALLED AS SHOWN HEREON
OR AT THE DIRECTION OF THE
SEDIMENT CONTROL INSPECTOR

NOTE:
STABILIZATION IS TO BE DONE AT
THE DIRECTION OF THE SEDIMENT
CONTROL INSPECTOR OR AT THE
INTERVALS REQUIRED BY THE 2011
STDS. & SPECS. WHICHEVER IS
MORE RESTRICTIVE.

Standard Stabilization Note
Following initial soil disturbance or re-disturbance, permanent or temporary stabilization must be completed within:
a) 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
b) Seven (7) calendar days as to all other disturbed or graded areas on the project site not under active grading.

LEGEND:

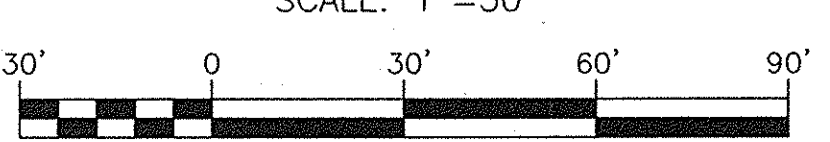
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREELINE
- EXISTING TREES
- EXISTING FENCE
- CENTERLINE OF EXISTING STREAM
- PROPOSED TREELINE
- EX. 24' PRIVATE USE-IN-COMMON ACCESS EASEMENT PLAT #17093
- EX. 30' PUBLIC WATER & SEWER EASEMENT PLAT #17093
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED SILT FENCE
- PROPOSED SUPER SILT FENCE
- PROPOSED DIVERSION FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED 2' CONTOUR GP 13-080

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate ^{1/}		Seeding Depth ^{2/} (inches)	Recommended Seeding Dates by Plant Hardiness Zone ^{3/}		
	lb/ac	lb/1000 ft ²		5b and 6a	6b	7a and 7b
Cool-Season Grasses						
Annual Ryegrass (<i>Lolium perenne</i> spp. <i>multiclavatum</i>)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Nov 30
Hardy (<i>Lolium vulgare</i>)	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Nov 30
Oats (<i>Avena sativa</i>)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Nov 30
Wheat (<i>Triticum aestivum</i>)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Nov 30
Cereal Rye (<i>Secale cereale</i>)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31	Mar 1 to May 15; Aug 1 to Nov 15	Feb 15 to Apr 30; Aug 1 to Dec 15
Warm-Season Grasses						
Florida Millet (<i>Echinochloa polystachya</i>)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Pearl Millet (<i>Pennisetum glaucum</i>)	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

NOTES:
1/ Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual seeding rates shall be adjusted to reflect percent seed germination and purity, as noted. Adjustments are usually not needed for the cool-season grasses.
2/ Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for the nurse crop, and when planted with permanent seed mixes, use 1/3 of the seeding rate listed above for the nurse crop. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.
3/ Oats are the recommended nurse crop for warm-season grasses.
4/ For sandy soils, plant seeds to twice the depth listed above.
5/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

SOILS MAP, GRADING, SOIL EROSION AND SEDIMENT CONTROL PLAN



NOTE: STOCKPILING WILL BE PERMITTED ON EACH LOT ONLY.

NOTE:
SUPER SILT FENCE MAY BE REPLACED BY STANDARD SILT FENCE WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR

SOILS LEGEND

SYMBOL	DESCRIPTION	TYPE
CeB	CHILLUM LOAM, 2 TO 5 PERCENT SLOPES	B
SrC	SASSAFRAS AND CROOM SOILS, 5 TO 10 PERCENT SLOPES	B/C
SrD	SASSAFRAS AND CROOM SOILS, 10 TO 15 PERCENT SLOPES	B/C

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7310 ESQUIRE CT., STE 14
ELK RIDGE, MD 21075
PHONE: (410) 379-8681

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division J.R. DATE: 2-7-14
 Chief, Division of Land Development DATE: 2/12/14
 Director DATE: 2/18/14

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 Signature of Developer DATE: 2/11/14

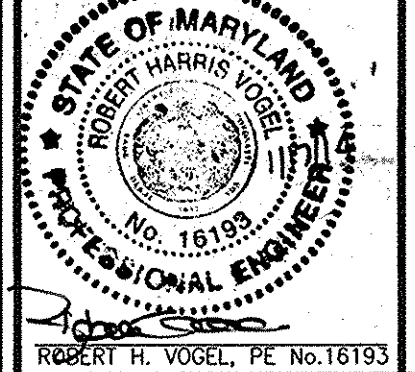
BY THE DEVELOPER:
 I HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.
 Signature of Developer DATE: 1/22/14

BY THE ENGINEER:
 I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
 Signature of Engineer DATE: 1/17/14

SITE DEVELOPMENT PLAN
 SOILS MAP, GRADING, SOIL EROSION AND SEDIMENT CONTROL PLAN
 MONTGOMERY CROSSING PHASE 1
 (SFD RESIDENTIAL)
 LOT 1 AND 2
 AND NON-BUILDABLE BULK PARCEL B
 L. 13552 / F. 526
 ZONED: R-12/R-20
 PARCEL: 682
 HOWARD COUNTY, MARYLAND

1ST ELECTION DISTRICT
 TAX MAP: 37 GRID: 05
 DPZ REF'S: (SEE GENERAL NOTE 1 ON COVER SHEET)

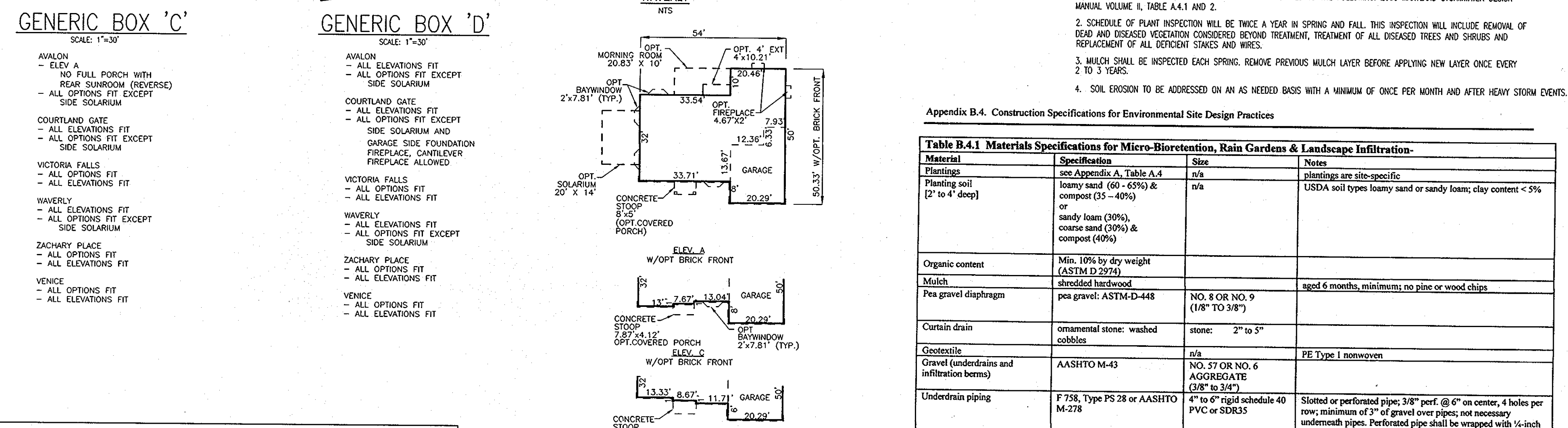
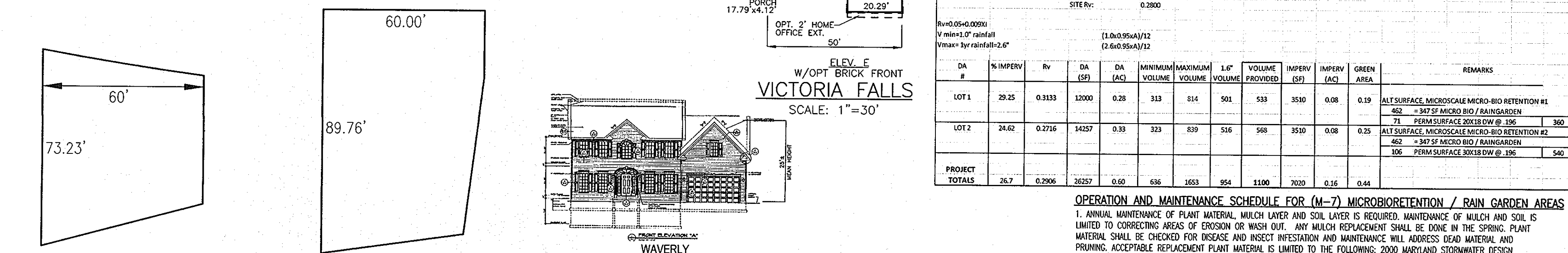
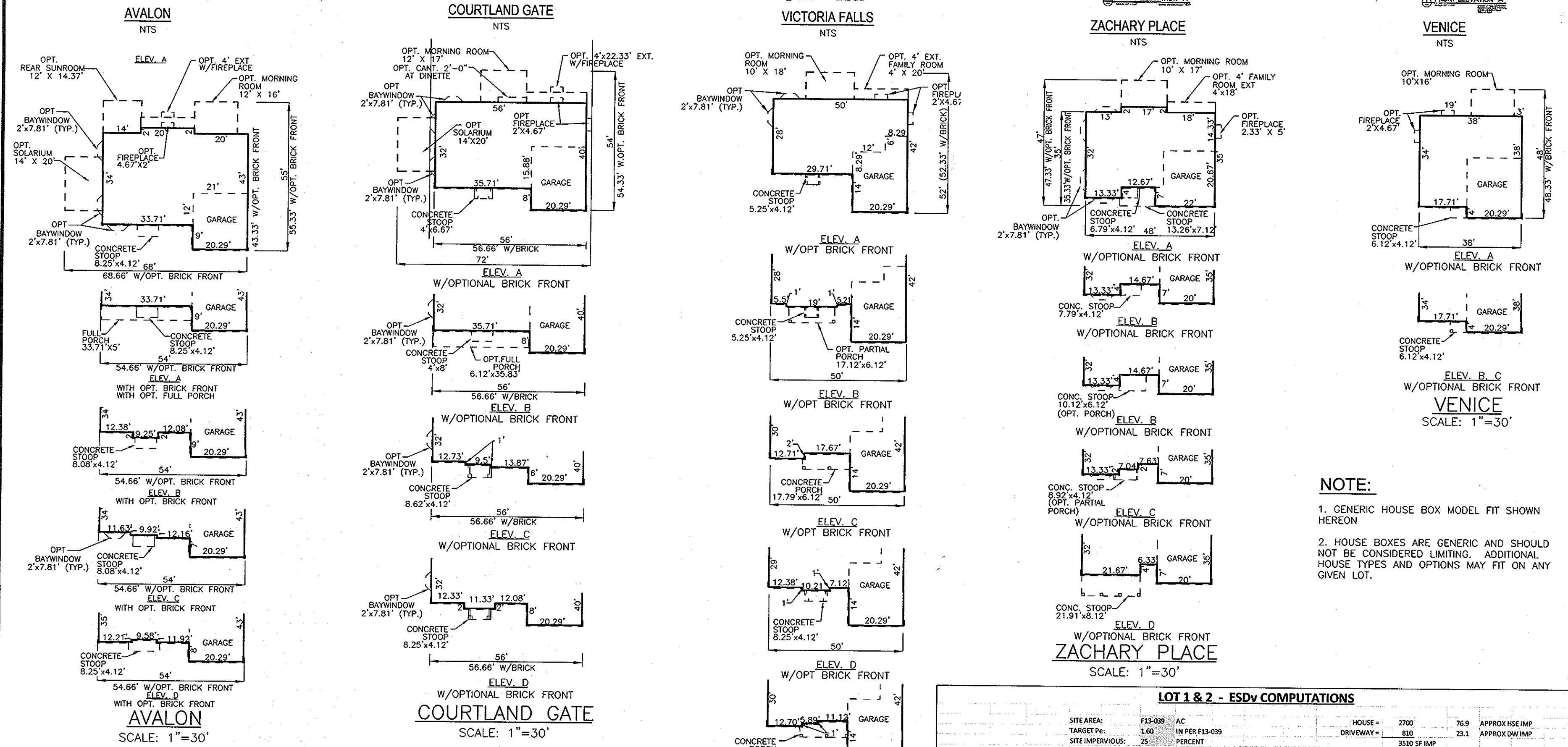
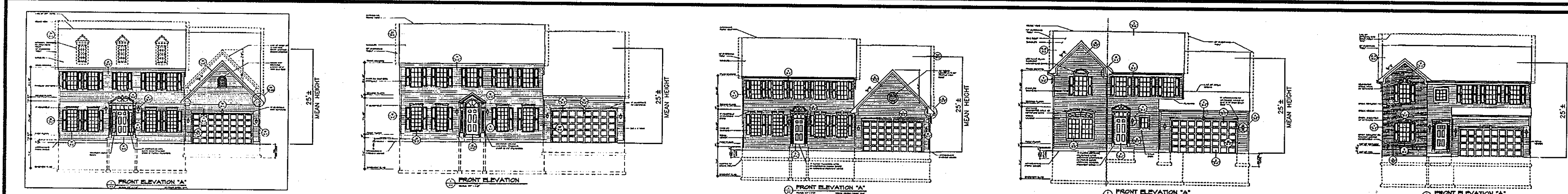
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DESIGN BY: EDS.
 DRAWN BY: JER.
 CHECKED BY: RHW.
 DATE: DECEMBER, 2013.
 SCALE: AS SHOWN
 W.O. NO.: 12-62

3 OF 5



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad E. Egan 2/7/14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Robert H. Vogel 2/12/14
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Robert H. Vogel 2/12/14
 DIRECTOR DATE

LOT 1 & 2 - ESDv COMPUTATIONS

DA #	IMPERV (%)	Rv	DA (AC)	DA (AC)	MINIMUM VOLUME	MAXIMUM VOLUME	1.0" IMPERV (%)	IMPERV (SF)	IMPERV (AC)	GREEN AREA	REMARKS	
LOT 1	28.25	0.333	12000	0.28	313	514	501	533	3510	0.08	0.19	ALT SURFACE MICROSCALE MICRO-BIO RETENTION #1 62' x 347' SF MICRO BIO / RAINGARDEN 71' PERM SURFACE 20X18 CW @ .196 360
LOT 2	34.62	0.375	14257	0.33	333	839	516	568	3510	0.08	0.25	ALT SURFACE MICROSCALE MICRO-BIO RETENTION #2 62' x 347' SF MICRO BIO / RAINGARDEN 106' PERM SURFACE 20X18 CW @ .196 540
PROJECT TOTALS	26.7	0.296	26257	0.60	646	1353	954	1100	7020	0.16	0.44	

OPERATION AND MAINTENANCE SCHEDULE FOR (M-7) MICROBIOTENTION / RAIN GARDEN 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 WEAR. 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 HARBORLAND 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

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	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-2922)	n/a	shredded hardwood
Mulch	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" to 3/8")	aged 6 months, minimum; no pine or wood chips
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile	n/a	n/a	PE Type I nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary 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, 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. Slab or local design to include meeting ACI Code 318.8.09; 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	0.075" to 0.04"	Sand substitutions such as Dabaco and Graystone (AASHTO #10 are not acceptable. No calcium carbide or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

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 MATERIALS AND PERFORATIONS MEET SPECIFICATIONS (SEE APPENDIX B.4). THE UPSTREAM ENDS OF PIPES SHOULD BE CAPPED PRIOR TO INSTALLATION. ALL UNDERDRAIN OR DISTRIBUTION PIPES 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 LOOSELY ROLLED ACCORDING TO THE SPECIFICATIONS (SEE APPENDIX B.4).

INSPECTION:

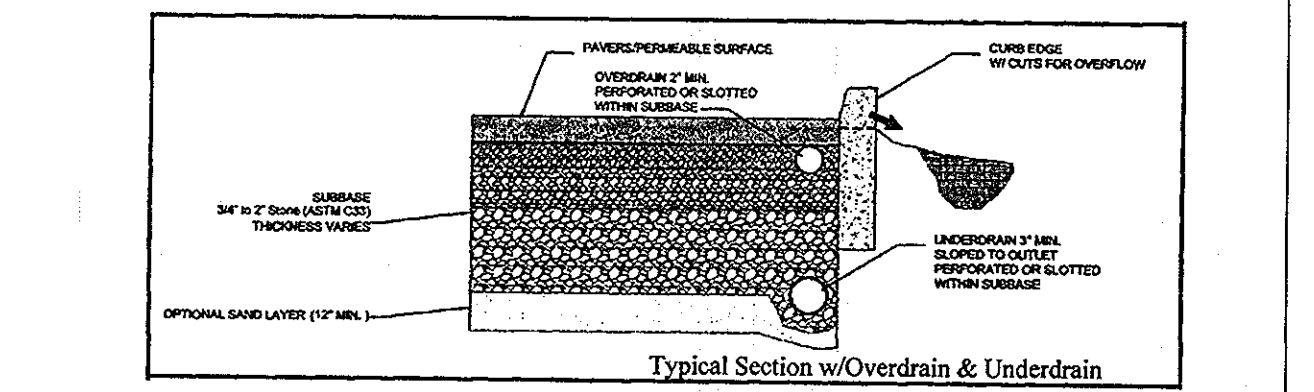
REGULAR INSPECTION SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:

- DURING EXCAVATION TO SUB GRADE.
- DURING PLACEMENT AND BACKFILL OF ANY DRAINAGE OR DISTRIBUTION SYSTEM(S).
- DURING PLACEMENT OF THE CRUSHED STONE SUBBASE MATERIAL.
- UPON COMPLETION 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:

- PAYMENTS SHOULD BE USED ONLY WHEN 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 CLOSING AND PREMATURE FAILURE. THESE VEHICLES SHOULD BE PREVENTED FROM TRACKING AND SPLASHING 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 AND SLUSH SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.



PERMEABLE SURFACE TYPICAL SECTION NOT TO SCALE

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 SLUSH SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

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 SUB-SLAB SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, AFD 329.8R, AFD 330R) OR USING STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.

MIX & INSTALLATION - TRADITIONAL PORTLAND CEMENTS (ASTM C 150, C 1150) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHORUS ADMITTRES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TWA BATCHING) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTING TIME, STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.

AGGREGATE - PERVIOUS CONCRETE CONSUMES A LIMITED THE AGGREGATE CONTENT. COMMONLY USED AGGREGATES INCLUDE ASTM C 33 NO. 67 (3/4 IN. TO NO. 4), NO. 8 (3/8 IN. TO NO.18) AND NO. 89 (5/8 IN. TO NO.50) SEVES. 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 ADMITTRES. WATER QUALITY SHOULD MEET AFD 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.

ADMITTRES - CHEMICAL ADMITTRES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES IN PERVIOUS CONCRETE. USE OF ADMITTRES SHOULD MEET ASTM C 494 (CHEMICAL ADMITTRES) AND ASTM C 260 (AIR ENTRAINING ADMITTRES) 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. PERVIOUS INTERLOCKING CONCRETE PAVEMENTS (PICP)

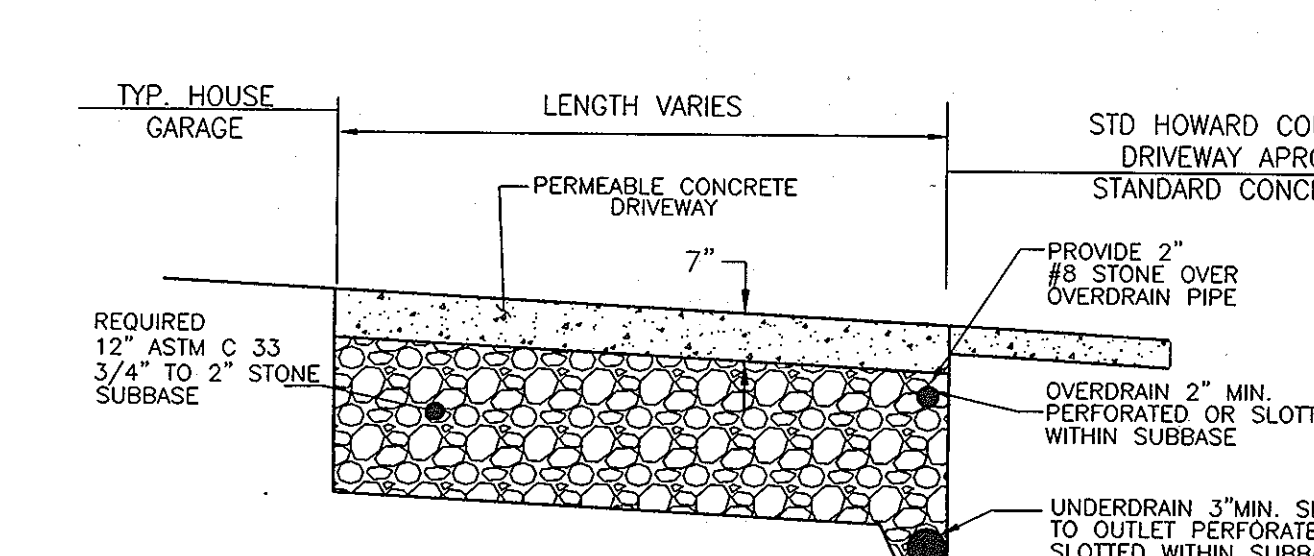
POWER BLOCKS - BLOCKS SHOULD BE EITHER 57 IN. OR 4 IN. THICK, AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (40% PREFERRED) OF THE SURFACE AREA OPEN. INSTALLATION SHOULD FOLLOW MANUFACTURER'S INSTRUCTIONS, EXCEPT THAT INFILL AND BASE COURSE MATERIALS AND DIMENSIONS SPECIFIED IN THIS APPENDIX SHALL BE FOLLOWED.

Joints, MATERIALS AND LEVELING COURSE - JOINTS SHALL BE FILLED WITH ASTM C-33 GRAD 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 1-1/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.



DETAIL - A-2 PERMEABLE CONCRETE DRIVEWAY - 5% OR LESS

NOT TO SCALE

ALL PERMEABLE CONCRETE THICKNESS, MIX AND SUB-BASE TO BE DETERMINED BY GEOTECHNICAL ENGINEER ON-SITE.

BUILDER
 KEVIN BOWSER
 RYAN HOMES
 9720 PATUXENT WOODS DRIVE
 COLUMBIA, MD, 21046
 (410) 796-0908

OWNER/DEVELOPER
 COLUMBIA HOWARD PROPERTIES, LLC
 7310 ESQUIRE CT., STE 14
 ELLENBORO, MD 21075
 PHONE: (410) 379-8681

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 FINEST MIXTURE 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 TRUCK A HURDLE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERBERIS GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOxious WEEDS AS SPECIFIED UNDER COMAR 15.06.01.02.

OR OTHER NOxious WEEDS AS SPECIFIED UNDER COMAR 15.06.01.02.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

- SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION).
- ORGANIC CONTENT - MINIMUM 10% BY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (30% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (30%).
- CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
- PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH AND ADDITIONAL TESTS OF ORGANIC MATTER AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, 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 AVOIDED 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 DEEPER 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 POUNDED WATER BEFORE 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 FULL 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 FILL 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". SHREDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL PLANT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDED 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 PLANT ROOT 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 PLUS 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, UPSETS THE GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. FERTILIZER UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:

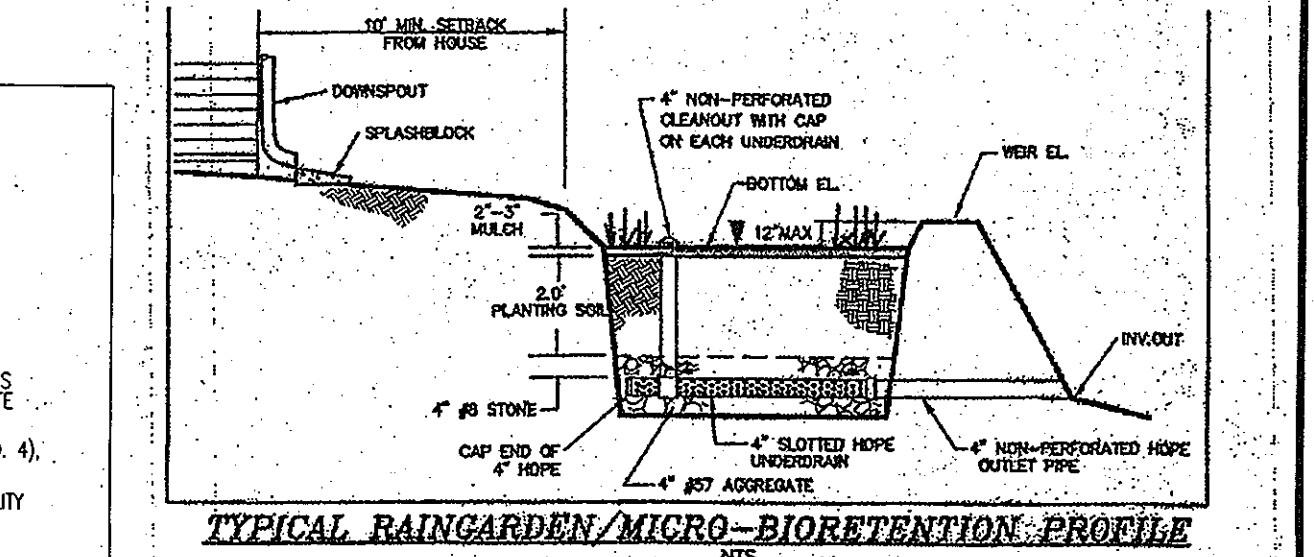
- PIPE - SHOULD BE 4" TO 6" DIAMETER SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).
- PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER INCH. PIPE SHALL BE COVERED WITH 1/4" (NO. 4 OR 44) GRAVISED HOLLOW CORE CEMENT OR POLYESTER CONCRETE.
- 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 4" LAYER OF P28 GRAVEL (1/4" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN THICKNESS EXCEEDS 2".

THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS

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

F13-039 M-7 RAINGARDEN/MICRO-BIORETENTION DETAILS



TYPICAL RAINGARDEN/MICRO-BIORETENTION PROFILE

STORMWATER MANAGEMENT / M-7 MBR / RAIN GARDEN DATA CHART

SWAMP NO.	RG APPROX. SIZE (AREA)	PONDING DEPTH	PLANTING MEDIA	UNDERDRAIN SIZE	MULCH ELEV.	OUTFALL ELEV.
1	SEE PLAN (347 SF)	1.0' PONDING	2' PLANTING MEDIA	4" PERFOR. HDPE	290.9	288.0
2	SEE PLAN (347 SF)	1.0' PONDING	2' PLANTING MEDIA	4" PERFOR. HDPE	295.0	292.1

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

HOUSE TYPE DETAILS

MONTGOMERY CROSSING PHASE 1

(SFD RESIDENTIAL)

LOT 1 AND 2

AND NON-BUILDABLE BULK PARCEL B

L. 13552 / F. 526

1ST ELECTION DISTRICT
 TAX MAP: 17 GRID: 05
 DPZ REF: (SEE GENERAL NOTE 1)

ZONED: R-12/R-20
 PARCEL: 682
 HOWARD COUNTY, MARYLAND
 (ON COVER SHEET)

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS

8407 MAAS STREET
 ELLICOTT CITY, MD 21043

TEL: 410.461.7666
 FAX: 410.461.1856

DESIGN BY: EDS.
 DRAWN BY: JER.
 CHECKED BY: RHV.
 DATE: DECEMBER, 2013.
 SCALE: AS SHOWN.
 W.O. NO.: 12-42.

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 16193
 EXPIRATION DATE: 09-27-2014

5 SHEET OF 5