ENVIRONMENTAL CONCEPT PLAN
GRAY ROCK - SECTION TWO - LOT 23
PARCEL 660 (L. 16330 / F. 42)
3630 BLUE HILL COURT
ELLICOTT CITY, MD 21042

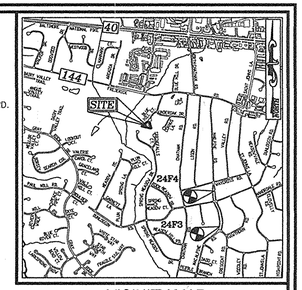
SITE DATA

LOCATION: TAX MAP 24, BLOCK 10
PARCEL: 660
2ND ELECTION DISTRICT
PRESENT ZONING: R-20
GROSS AREA OF PROJECT: 0.58 AC.
AREA OF RIGHT-OF-WAY DEDICATION: 0.00 AC.
LIMIT OF DISTURBANCE: 0.44 AC.
PROPOSED USE OF SITE: RESIDENTIAL (SFD)
NUMBER OF RESIDENTIAL LOTS PROPOSED: 1 LOTS
AREA OF RESIDENTIAL LOTS PROPOSED: 0.58 AC.
OPEN SPACE REQUIRED: 0.00 AC.
OPEN SPACE PROVIDED: 0.00 AC.
IMPERVIOUS AREA: 0.10 AC.
AREA OF STREAM/BUFFER: 0.00 AC.
AREA OF WETLANDS/BUFFER: 0.00 AC.
AREA OF MODERATE SLOPES (15% - 24.99%): 0.02 AC.
AREA OF STEEP SLOPES (25% OR GREATER): 0.00 AC.
AREA OF FLOOD PLAIN: 0.00 AC.
NET PROJECT AREA: 0.58 AC.
AREA OF EXISTING FOREST COVER: 0.48 AC.
AREA OF ERODIBLE SOILS: 0.00 AC.
AREA MANAGED BY ESDV (*THIS PLAN): 0.44 AC.
*IMPERVIOUS AREA: 0.10 AC.
*GREEN AREA: 0.34 AC.

BENCHMARKS

HOWARD COUNTY BENCHMARK 24F3 (CONC. MON.)
N 581299.84 E 1360713.73 ELEV. 365.41
LOCATION: ISLE OF MACALPINE RD. +/- 120' N. OF CRESCENT RD.

HOWARD COUNTY BENCHMARK 24F4 (CONC. MON.)
N 582298.62 E 1360570.97 ELEV. 386.19
LOCATION: MACALPINE ROAD, SOUTH OF WAYCROSS RD.



VICINITY MAP
SCALE: 1"=2,000'
ADC MAP COORDINATE: MAP: 20, GRID: D-8

LEGEND:

PROPERTY LINE
RIGHT-OF-WAY LINE
ADJACENT PROPERTY LINE
EXISTING CURB AND GUTTER
EXISTING EDGE OF PAVING
EXISTING SANITARY MANHOLE
EXISTING SANITARY LINE
EXISTING WATER LINE
EXISTING TREELINE
EXISTING TREES
EXISTING WOOD FENCE
PROPOSED TREELINE
PROPOSED MICRO-BIORETENTION FACILITY (M-6)
EX. 15' DRAINAGE & UTILITY EASEMENT (PLAT BOOK 779)

GENERAL NOTES

1. STORM WATER MANAGEMENT TO BE PROVIDED FOR THIS DEVELOPMENT BY ENVIRONMENTAL SITE DESIGN UTILIZING MICRO-BIORETENTION FACILITIES (M-6), AND A GRAVEL TRENCH TO TREAT DRIVEWAY RUNOFF. MICRO-BIORETENTIONS AND THE GRAVEL TRENCH ARE TO BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNER. REFERENCE 2010 MDE STORMWATER DESIGN MANUAL (CHAPTER 5).
2. THE SUBJECT PROPERTY IS ZONED "R-20" IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.
3. THIS SITE IS NOT LOCATED IN A HISTORIC DISTRICT.
4. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 24F3 AND 24F4 WERE USED FOR THIS PROJECT.
5. NO RARE, THREATENED OR ENDANGERED SPECIES OR THEIR HABITATS WERE OBSERVED ON THE PROPERTY.
6. THERE IS NO 100-YR FLOODPLAIN LOCATED WITHIN THE LIMITS OF THIS SITE.
7. SEDIMENT AND EROSION CONTROL WILL BE PROVIDED FOR THIS SITE.
8. THERE ARE NO STREAMS, OR STREAM BUFFERS LOCATED WITHIN THE LIMITS OF THIS SITE.
9. THERE ARE NO WETLANDS, OR WETLAND BUFFERS LOCATED WITHIN THE LIMITS OF THIS SITE.
10. THERE ARE NO STEEP SLOPES LOCATED ON THIS SITE.
11. APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
12. 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 THESE LOTS.
13. PUBLIC WATER AVAILABLE THROUGH CONTRACT NO. 11-W AND PUBLIC SEWER AVAILABLE THROUGH CONTRACT NO. 129-S. WATER AND SEWER SERVICE WILL BE GRANTED UNDER THE PROVISIONS OF SECTION 18.122B OF THE HOWARD COUNTY CODE.
14. THIS PROPERTY IS EXEMPT FROM FOREST CONSERVATION PER SECTION 16.1202(b)(1)(i) OF THE HOWARD COUNTY CODE FOR DEVELOPMENT OF LAND LESS THAN 40,000 SF IN SIZE.

ECP NARRATIVE – GRAY ROCK, LOT 23

The subject lot is zoned R-20 and is located in the developed Gray Rock community in Ellicott City, Maryland. The subject lot is the only undeveloped lot located in this neighborhood. The lot is partially wooded (less than 10,000 square feet) and is exempt from Forest Conservation because the property is less than 40,000 sf in size. There are 6 specimen oak trees located on the lot and the lot layout and grading was designed to retain 3 of the specimen oak trees. The property does not contain any steep or moderate slopes which are sustained over 10' vertical. The soils are classified as Hydraulic Soil Group 'B' and consist of Legore-Montalto-Urban land complex soil types.

The Environmental Site Design is provided by utilizing two raingardens to treat the proposed house rooftop utilizing a $P_E = 1.0$". The driveway is treated utilizing a gravel trench adjacent to the low side of the driveway which is also designed based on $P_E = 1.0$". The proposed micro practices treat all impervious surfaces and provide ESDv to the maximum extent possible.

The plan limits the extent of disturbance and sediment control is provided in accordance with 2011 Sediment and Erosion Control Standards. The runoff from the subject site flows directly to Blue Hill Court and does not discharge to adjacent properties.

There is no 100-year floodplain located on the subject lot and there are no vicinal streams or wetlands. The existing Gray Rock storm drainage discharges to the Plumtree Branch which eventually flows to the Little Patuxent River which is a use IV stream. The proposed site development is exempt from forest conservation per Section 16.1202(B)(1)(I) of the Howard County Code for development of land less than 40,000 sf in size.

OWNER/DEVELOPER

VIKING CUSTOM HOMES
C/O CARY CUMBERLAND
12800 FREDERICK ROAD
WEST FRIENDSHIP, MD 21794
(410) 489-6728

NO.	REVISION	DATE

Maryland State Grid Meridian
E 1358400
N 584250
E 1359000
N 584250
E 1359000
N 583900

PETER R. PETERMAN
KELLI LYN PETERMAN
TM: 24 PARCEL: 660
L. 1622 / F. 322
GRAY ROCK
LOT: 26
AREA: 22,999 SF
USE: RESIDENTIAL
ZONED: R-20

DEBORAH C. MCKAY
TM: 24 PARCEL: 660
L. 15540 / F. 386
GRAY ROCK
LOT: 25
AREA: 21,605 SF
USE: RESIDENTIAL
ZONED: R-20

JOHN H. BENNETT
ANDREA D. BENNETT
TM: 24 PARCEL: 660
L. 6769 / F. 536
GRAY ROCK
LOT: 20
AREA: 24,088 SF
USE: RESIDENTIAL
ZONED: R-20

WILLIAM B. BRISTOR
JEAN BRISTOR
TM: 24 PARCEL: 660
L. 928 / F. 403
GRAY ROCK
LOT: 21
AREA: 22,564 SF
USE: RESIDENTIAL
ZONED: R-20

THE MILLER LAND CO.
TM: 24 PARCEL: 1030
L. 704 / F. 383
AREA: 9.51 AC.
USE: AGRICULTURAL

TODD CALDIS
SHEILA CALDIS
TM: 24 PARCEL: 660
L. 9507 / F. 108
GRAY ROCK
LOT: 24
AREA: 37,853 SF
USE: RESIDENTIAL
ZONED: R-20

JOHN P. O'MARA & WF
TM: 24 PARCEL: 1052
L.747 / F. 374
DUNLOGGIN 2
LOT: 27
AREA: 22,607 SF
USE: RESIDENTIAL
ZONED: R-20

JANET E. YEISLEY
TM: 24 PARCEL: 1052
L. 4427 / F. 482
DUNLOGGIN 2
PLAT: 22,30
LOT: 26
AREA: 26,571 SF
USE: RESIDENTIAL
ZONED: R-20

MARIO J. REDA SR.
MARION A. REDA
TM: 24 PARCEL: 1052
L. 11512 / F. 498
DUNLOGGIN 2
LOT: 20
AREA: 35,937 SF
USE: RESIDENTIAL
ZONED: R-20

JOHANNA P. MALEH
TM: 24 PARCEL: 660
L. 12141 / F. 264
GRAY ROCK
LOT: 22
AREA: 30,404 SF
USE: RESIDENTIAL
ZONED: R-20

KATHERINE L. WINDLEY
WILLIAM H. WINDLEY
TM: 24 PARCEL: 570
L.8738 / F. 434
GRAY ROCK
LOT: 14
AREA: 20,255 SF
USE: RESIDENTIAL
ZONED: R-20

DONNA C. TROLL
PETER TROLL
TM: 24 PARCEL: 1052
L. 6255 / F. 208
DUNLOGGIN
LOT: 19
AREA: 21,562 SF
USE: RESIDENTIAL
ZONED: R-20

BLUE HILL COURT
50' RIGHT-OF-WAY
PUBLIC STREET

SPRING MEADOW DR.

LOT 23
25,157 SF

R=50.00'
L=57.61'

N54°29'00"E 208.10'
N11°36'00"W 175.51'
N74°29'00"W 265.00'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11-3-15

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-9-15

LAYOUT PLAN
SCALE: 1"=30'

SCALE 1"=30'
15' 0' 30'

SHEET INDEX

DESCRIPTION	SHEET NO.
LAYOUT PLAN	1 OF 3
SOILS MAP, GRADING, EROSION AND SEDIMENT CONTROL PLAN	2 OF 3
STORMWATER MANAGEMENT DRAINAGE AREA MAP AND DETAILS	3 OF 3

ENVIRONMENTAL CONCEPT PLAN
LAYOUT PLAN
GRAY ROCK - SECTION TWO - LOT 23
PARCEL 660 (L. 16330 / F. 42)
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TAX MAP: 24 GRID: 10
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ZONED: R-20
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

STATE OF MARYLAND
ROBERT HARRIS VOGEL
No. 16193
REGISTERED
PROFESSIONAL ENGINEER
10-9-15

ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: JMR
CHECKED BY: RHV
DATE: OCTOBER 2015
SCALE: AS SHOWN
W.O. NO.: 15-16

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: 09-27-2016

SHEET 1 OF 3

ECP-16-005

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GRADING PLAN
SCALE: 1"=30'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11-3-15

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10-19-15

SCALE 1"=30'
15' 0' 30'

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION. RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS
THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF 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 CONTEN – MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
* CLAY CONTENT – MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
* PH RANGE – SHOULD BE BETWEEN 5.5 – 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

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 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 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 BIORETENION 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-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. 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 1/8TH 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 STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.
TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.
GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

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 OF HDPE).
* PERFORATIONS – IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4x4) GALVANIZED HARDWARE CLOTH.
* GRAVEL – THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
* THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
* A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,0000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
* A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES 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).

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

LEGEND:
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING EDGE OF PAVING
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING WATER LINE
- EXISTING TREELINE
- EXISTING TREES
- EXISTING WOOD FENCE
- PROPOSED TREELINE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING MODERATE SLOPES (15%-24.99%)
- PROPOSED SUPER SILT FENCE
- PROPOSED SILT FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED EROSION CONTROL MATTING
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED TREE PROTECTION FENCE
- PROPOSED MICRO-BIORETENTION FACILITY (M-6)
- 15' DRAINAGE & UTILITY EASEMENT (PLAT BOOK 7/9)

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
LoC	LEGORE-MONTALTO-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES	B	N/A	NO

-SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE
-HOWARD COUNTY SOILS MAP NUMBER 17 – CLARKSVILLE NE

NOTE:
HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

OWNER/DEVELOPER
VIKING CUSTOM HOMES
C/O CARY CUMBERLAND
12800 FREDERICK ROAD
WEST FRIENDSHIP, MD 21794
(410) 489-6728

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
SOILS MAP, GRADING, EROSION, AND SEDIMENT CONTROL PLAN
GRAY ROCK - SECTION TWO - LOT 23
PARCEL 660 (L. 16330 / F. 42)
3630 BLUE HILL COURT
ELLICOTT CITY, MD 21042

TAX MAP: 24 GRID: 10
2ND ELECTION DISTRICT

PARCEL: 660
ZONED: R-20
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
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8407 MAIN STREET
ELLICOTT CITY, MD 21043
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FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO. 16193 — REGISTERED PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: JMR
CHECKED BY: RHV
DATE: OCTOBER 2015
SCALE: AS SHOWN
W.O. NO.: 15-16

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: 09-27-2016

SHEET 2 OF 3

ECP-16-005

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

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULTCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.

2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

3. 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.

4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

SWM DRAINAGE AREA MAP
SCALE: 1"=30'

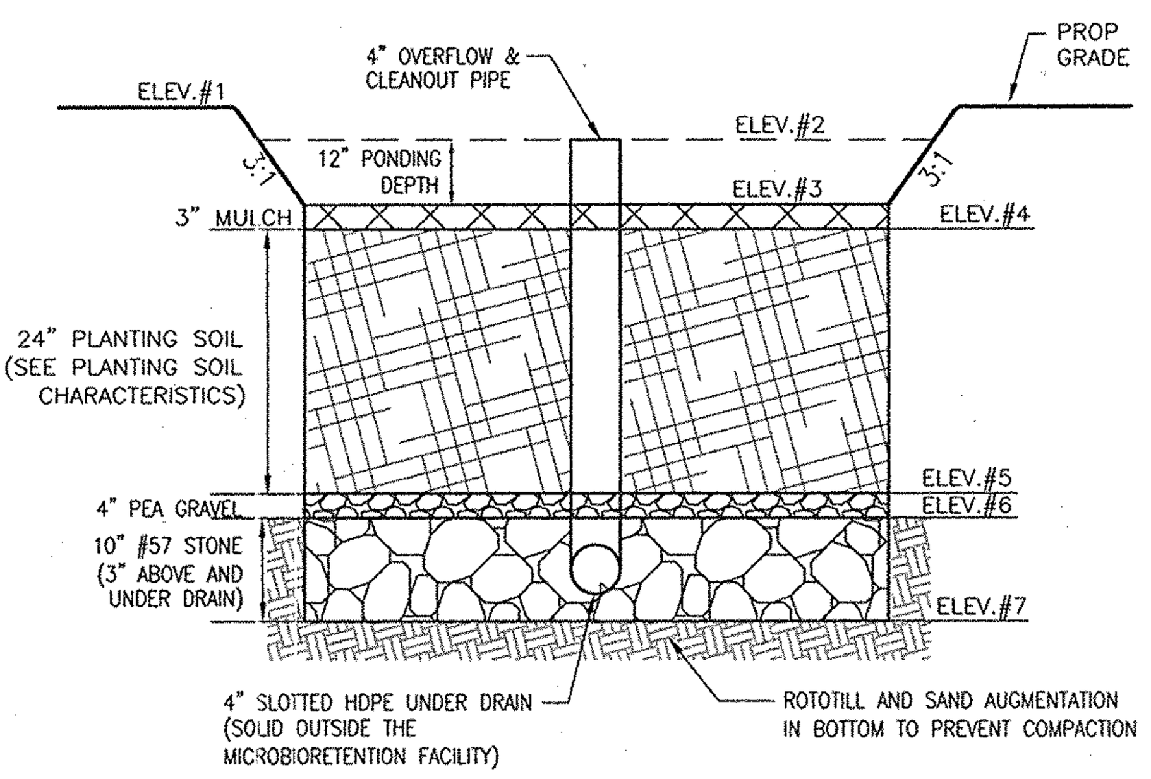
Appendix B.4. Construction Specifications for Environmental Site Design Practices

Table B.4.1 Materials Specifications for Micro-Bioretention, 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 ¼-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 pressures); 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.

MICRO BIO-RETENTION (M-6) ELEVATIONS

LOT #	FACILITY #	1	2	3	4	5	6	7	4" INV.	4" INV. OUTFALL
LOT 23	MBR–A	407.40	407.00	406.00	405.75	403.75	403.42	402.59	402.84	402.47
	MBR–B	409.40	409.00	408.00	407.75	405.75	405.42	404.59	404.84	404.52



DETAIL – MICROBIORETENTION
NOT TO SCALE

MICROBIORETENTION NOTES:

1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETNTION WILL CAUSE THE MBR TO FAIL, AND THERFORE SHALL NOT BE INSTALLED.
2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.

MBR-A

ROOFTOP AREA = 1,118 SF
Pe = 1" Rv=0.95
ESDV = A(Pe)(Rv)/12 =
ESDV = 1,118 SF(1")(0.95)/12 = 89 CF

MBR-B

ROOFTOP AREA = 1,127 SF
Pe = 1" Rv=0.95
ESDV = A(Pe)(Rv)/12 =
ESDV = 1,127 SF(1")(0.95)/12 = 89 CF

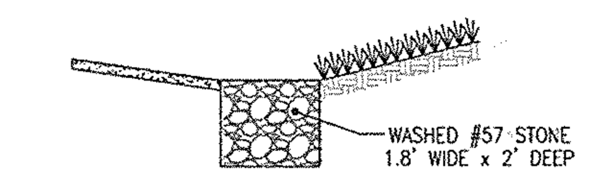
LEGEND:

- PROPERTY LINE
- RIGHT–OF–WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING EDGE OF PAVING
- EXISTING SANITARY MANHOLE (SMH 2)
- EXISTING SANITARY LINE (SS)
- EXISTING WATER LINE (W)
- EXISTING TREELINE
- EXISTING TREES
- EXISTING WOOD FENCE
- PROPOSED TREELINE
- EXISTING 10' CONTOUR (330)
- EXISTING 2' CONTOUR (328)
- SOILS (SsE / SfC2)
- PROPOSED 10' CONTOUR (330)
- PROPOSED 2' CONTOUR (328)
- PROPOSED SPOT ELEVATION (+328 28)
- EXISTING MODERATE SLOPES
- PROPOSED SUPER SILT FENCE (SSF)
- PROPOSED SILT FENCE (SF)
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- PROPOSED EROSION CONTROL MATTING
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE (SCE)
- PROPOSED TREE PROTECTION FENCE (ST 1)
- PROPOSED MICRO–BIORETENTION FACILITY (M–6)
- DRAINAGE AREA DIVIDE
- AREA OF ROOFTOP DRAINAGE TO MICRO–BIORETENTION (M–6)
- AREA OF DRIVEWAY RUNOFF TO SHEETFLOW TO GRAVEL TRENCH
- *EX. 15' DRAINAGE & UTILITY EASEMENT (PLAT BOOK 7/9)*

DRIVEWAY TRENCH

DRIVEWAY AREA = 1,352 SF
Pe = 1" Rv=0.95
ESDV = A(Pe)(Rv)/12 =
ESDV = 1,352 SF(1")(0.95)/12 = 107 CF

PUT IN STONE TRENCH
107 CF/0.4 VOIDS = 268 CF
268/(75 LF)(2' DEEP) = 1.8' WIDTH
PROVIDE TRENCH ADJACENT TO DRIVEWAY



DRIVEWAY TRENCH DETAIL
NOT TO SCALE

OWNER/DEVELOPER

VIKING CUSTOM HOMES
C/O CARY CUMBERLAND
12800 FREDERICK ROAD
WEST FRIENDSHIP, MD 21794
(410) 489–6728

NO.	REVISION	DATE

SWM PRACTICE CHART
ESD PRACTICES BY LOT

LOT #	ESD PRACTICE
#23	MICRO BIO–RETENTIONS (M–6) AND SHEETFLOW TO GRAVEL TRENCH

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
LoC	LEGORE–MONTALTO–URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES	B	N/A	NO

–SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE
–HOWARD COUNTY SOILS MAP NUMBER 17 – CLARKSVILLE NE

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] NY 11-3-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

[signature] EB 10-29-15
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT DRAINAGE AREA MAP AND DETAILS
GRAY ROCK - SECTION TWO - LOT 23

PARCEL 660 (L. 16330 / F. 42)
3630 BLUE HILL COURT
ELLICOTT CITY, MD 21042

TAX MAP: 24 GRID: 10
2ND ELECTION DISTRICT

PARCEL: 660
ZONED: R–20
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

STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO. 16193 — REGISTERED PROFESSIONAL ENGINEER — 10/16/15

[signature]
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: JMR
CHECKED BY: RHV
DATE: OCTOBER 2015
SCALE: AS SHOWN
W.O. NO.: 15–16

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: 09–27–2016

SHEET 3 OF 3

ECP-16-005

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