GENERAL NOTES

1.) THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.

2.) THE SUBJECT PROPERTY IS ZONED R-20 PER THE 2-2-2004 COMPREHENSIVE ZONING PLAN AND THE "COMP LITE" ZONING AMENDMENTS EFFECTIVE 7-28-2006.

3.) COORDINATES BASED ON NAD '83, MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS 35FA AND 35F1.

4.) TRACT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED ON OR ABOUT SEPTEMBER, 2012 BY BENCHMARK ENGINEERING, INC.

5.) A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.

6.) A CERTIFICATION LETTER DATED AUGUST 23, 2012, PREPARED BY ECO-SCIENCE PROFESSIONALS, INC., INDICATING THAT THERE ARE NO WETLANDS IDENTIFIED ON SITE, WAS SUBMITTED TO HOWARD COUNTY DPZ.

7.) THE TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY MARS GROUP, DATED JANUARY 2013 AND WAS APPROVED IN APRIL, 2013.

8.) THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.

9.) WATER IS PUBLIC. THE CONTRACT NUMBER IS 34-3376-D.

10.) SEWER IS PUBLIC. THE CONTRACT NUMBER IS 34-3376-D

11.) THIS SUBDIVISION IS SUBJECT TO SECTION 18.122B OF THE HOWARD COUNTY CODE. PUBLIC WATER AND/OR SEWER ALLOCATIONS WILL BE GRANTED AT THE TIME OF ISSUANCE OF THE BUILDING PERMIT IF CAPACITY IS AVAILABLE AT THAT TIME.

12.) THERE ARE NO WETLANDS, STREAMS, THEIR BUFFERS, 100-YEAR FLOODPLAIN OR STEEP SLOPES LOCATED ON THESE LOTS.

13.) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON-SITE.

14.) THERE ARE NO HISTORIC SITES/FEATURES LOCATED ON THIS SITE.

15.) 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' (16' SERVING MORE THAN ONE RESIDENCE).
b) SURFACE - 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MIN.)
c) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM 45' TURNING RADIUS.
d) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
e) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOODPLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY.
f) STRUCTURE CLEARANCES - MINIMUM 12 FEET.
g) MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.

16.) THIS DEVELOPMENT IS DESIGNED TO BE IN ACCORDANCE WITH SECTION 16.127 - RESIDENTIAL INFILL DEVELOPMENT - OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE DEVELOPER OF THIS PROJECT SHALL CREATE COMPATIBILITY WITH THE EXISTING NEIGHBORHOOD THROUGH USE OF ENHANCED PERIMETER LANDSCAPING, BERMS, FENCES, SIMILAR HOUSING UNIT TYPES AND THE DIRECTION ORIENTATION OF THE HOUSES.

17.) STORMWATER MANAGEMENT FOR THESE LOTS IS PROVIDED IN ACCORDANCE WITH THE STORMWATER MANAGEMENT ACT OF 2007. ENVIRONMENTAL SITE DESIGN (ESD) HAS BEEN IMPLEMENTED TO THE MAXIMUM EXTENT PRACTICAL (MEP) BY THE USE OF (M-6) MICRO-BIORETENTION PRACTICES LOCATED ON THE INDIVIDUAL LOT IN WHICH IT SERVES. ALL ESD PRACTICES SHALL BE PRIVATELY OWNED AND MAINTAINED. ALL ROOF DRAINS SHALL BE CONVEYED TO EACH ON LOT ESD PRACTICE VIA OVERLAND SWALES OR PIPE MANIFOLD.

18.) THIS PROJECT COMPLIES WITH THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION BY A FEE-IN-LIEU PAYMENT IN THE AMOUNT OF $9,801.00 UNDER F-13-035.

19.) THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED 4 TREES IN THE AMOUNT OF $1,200.00 IS PART OF THE BUILDERS GRADING PERMIT APPLICATION.

20.) A FEE-IN-LIEU OF OPEN SPACE IN THE AMOUNT OF $4,500.00 WAS PAID UNDER F-13-035.

21.) THE EXISTING TOPOGRAPHY SHOWN WAS FIELD RUN BY DEMARIO DESIGN CONSULTANTS, INC. IN JULY, 2009.

22.) THE EXISTING UTILITIES SHOWN HEREON ARE BASED ON FIELD SURVEYS BY DEMARIO DESIGN CONSULTANTS, INC AND BY RECORD DRAWINGS. IT IS THE CONTRACTORS RESPONSIBILITY FOR VERIFYING THESE UTILITIES IN THE FIELD AT TIME OF CONSTRUCTION.

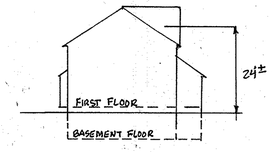
23.) THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF ANY WORK.

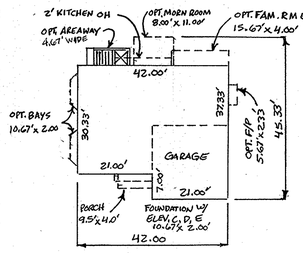
24.) THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.

25.) ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.

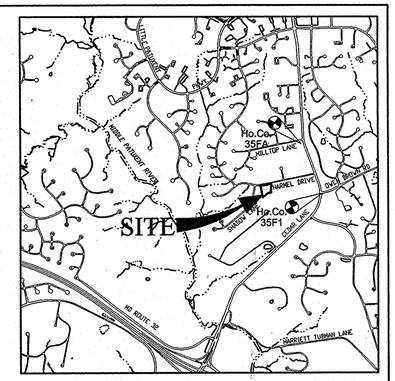
26.) ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.

27.) 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 OR REAR YARD SETBACK.





CHARTLEY II
HOUSE FOOT PRINT
SCALE: 1" = 20'



VICINITY MAP
SCALE: 1" = 2000'
ADC MAP: 32 GRID: D3

HOWARD COUNTY BENCHMARKS

35F1: N 557787.3788
E 1345217.2645
ELEV. 400.439

35FA: N 559266.1334
E 1344682.6389
ELEV. 410.329

ADDRESS CHART		
	STREET ADDRESS	
1	10887	HARMEL DRIVE
2	10883	HARMEL DRIVE
3	10879	HARMEL DRIVE

LEGEND

PROJECT BOUNDARY

PROJECT SITE

SITE ANALYSIS DATA CHART

A.) TOTAL PROJECT AREA ____ 1.66 AC.
B.) AREA OF PLAN SUBMISSION ____ 1.66 AC.
C.) LIMIT OF DISTURBED AREA ____ 0.91 AC.
D.) PRESENT ZONING: ____ R-20
E.) PROPOSED USE OF SITE: ____ RESIDENTIAL SFD
F.) FLOOR SPACE ON EACH LEVEL OF BLDG PER USE ____ N/A
G.) TOTAL NUMBER OF UNITS ALLOWED AS SHOWN ON FINAL PLAT(S) ____ 3
H.) TOTAL NUMBER OF UNITS PROPOSED ____ 3
I.) MAXIMUM NUMBER OF EMPLOYEES, TENANTS ON SITE PER USE ____ N/A
J.) NUMBER OF PARKING SPACES REQUIRED BY HO. CO. ZONING REGS AND DMW III ____ 7.5 (3 LOTS x 2.5 SPACES)
K.) NUMBER OF PARKING SPACES PROVIDED (INCLUDES 2 PER GARAGE AND 2 PER DRIVEWAY) ____ 12
L.) OPEN SPACE ON-SITE ____ 0 AC. (FEE-IN-LIEU)
M.) AREA OF RECREATIONAL OPEN SPACE REQUIRED ____ N/A (LESS THAN 10 UNITS)
AREA OF RECREATIONAL OPEN SPACE PROVIDED ____ N/A
N.) BUILDING COVERAGE OF SITE ____ N/A
PERCENTAGE OF GROSS AREA ____ N/A
O.) APPLICABLE DPZ FILE REFERENCES: ____ ECP-13-013, F-13-035

SHEET INDEX	
NO.	DESCRIPTION
1	TITLE SHEET
2	SITE DEVELOPMENT, GRADING AND LANDSCAPE PLAN
3	SEDIMENT AND EROSION PLAN
4	SEDIMENT AND EROSION NOTES AND DETAILS
5	STORMWATER MANAGEMENT NOTES AND DETAILS

Design Narrative

For the rooftops, (M-6) Micro-Bioretention practices have been proposed for treatment. Since the lots slope from the rear to the front the location of any SWM practice would best be placed in the front of the lot. The geotechnical results of the soil borings indicated rock at 4.5 feet in borings #1 and #2. The drainage area to each practice is relatively small (3,800 sf +/-), and the soils in this area are class 'B'. Based on this information it was determined that the best practice would be (M-6) Micro-Bioretentions.

For the driveways, it is being proposed that the upper portions, mainly the 20'x20' pad shall be treated via the (M-6) Micro-Bioretentions that are being used for the rooftops. The runoff shall be directed to the practice via a trench drain system across the driveway.

Natural resource protection and/or enhancement shall be achieved as there is no disturbance to any natural resource areas. Natural flow patterns have been preserved by having the proposed grades mimic the existing condition of flow from the rear of the lots to the front of the lots. The (M-6) Micro-Bioretentions practices are located along the lower outer edge of the LOD and shall mimic the layout of the natural ground as runoff re-enters the ground as treated.

Sediment and erosion control shall mainly consist of erosion control matting within the proposed swales around the house to reduce erosion of the swale. A cleanwater diversion dike shall divert water around the site during construction of the homes and SWM practices.

There are no disturbances to environmental features proposed as there are no environmental features located on this property.

As a result of utilizing environmental site design (ESD) to the maximum extent practical (MEP), SWM has been adequately addressed without the need for structural practices.

SOILS CHART

SYMBOL	HYDRIC	HYDROLOGIC GROUP	ALTERNATE GROUP	NAME
GtB	NO	B	D	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES
GtC	NO	B	D	GLADSTONE-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES
GuB	NO	C	D/C	GLENVILLE-URBAN LAND-UDORTHENTS COMPLEX, 0 TO 8 PERCENT SLOPES

ESD PRACTICE SUMMARY TABLE

Pe= 1 inches Qe= 0.19 inches ESDv= 1113 cf

Lot	Address	Practice		DA to practice	Imp Area to practice	Af (s.f.) Required	Af (s.f.) Provided	2% DA?	ESDv Required	ESDv Provided	75% ESDv?	REv Required	REv Provided
Lot 1	10887 Harmel Drive	(M-6) MicroBioretenion	#1	3,822	2,507	76	172	PASS	204	172	PASS	231 cf	REv is met via 1.2' stone chambers below each practice
Lot 2	10883 Harmel Drive	(M-6) MicroBioretenion	#2	3,822	2,507	76	172	PASS	204	172	PASS		
Lot 3	10879 Harmel Drive	(M-6) MicroBioretenion	#3	3,822	2,507	76	172	PASS	204	172	PASS		
								TOTAL =	612	516	PASS	231	249

The 612 cf required ESDv is based on DA to each practice provided. ESDv of 1,113 cf is based on total site area.
SWM has been provided for at least 75% of the 612 cf. The remaining impervious area (lower end of driveways) is left untreated.
SWM Environmental Site Design to the Maximum Extent Practical has been provided.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/5/13

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/04/13

DIRECTOR — DATE 9/5/13

PERMIT INFORMATION CHART

SUBDIVISION NAME:			SECTION/AREA:		LOT/PARCEL #
CEDAR OVERLOOK			NA		LOTS 1-3
PLAT No.	GRID No.	ZONE	TAX MAP NO	ELECTION DISTRICT	CENSUS TRACT
22491	17	R-20	35	5	6056.01

NO.	DATE	REVISION
1	3-27-2014	ADD CHARTLEY II HOUSE FOOTPRINT

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. 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. 28559, Expiration Date: 07-22-2015.

7/25/2013

OWNER/BUILDER:
CORNERSTONE HOLDINGS, LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

CEDAR OVERLOOK
LOTS 1 thru 3
A RESUBDIVISION OF P/O LOTS 6, 7 AND 8 OF CEDAR ACRES, BLOCK 'C'

TAX MAP: 35 GRID: 17 PARCEL: 101
ZONED: R-20
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
TITLE SHEET

DATE: JULY, 2013 BEI PROJECT NO: 2519
DESIGN: DBT DRAWN: DBT
SCALE: AS SHOWN SHEET 1 OF 5

SDP-13-064

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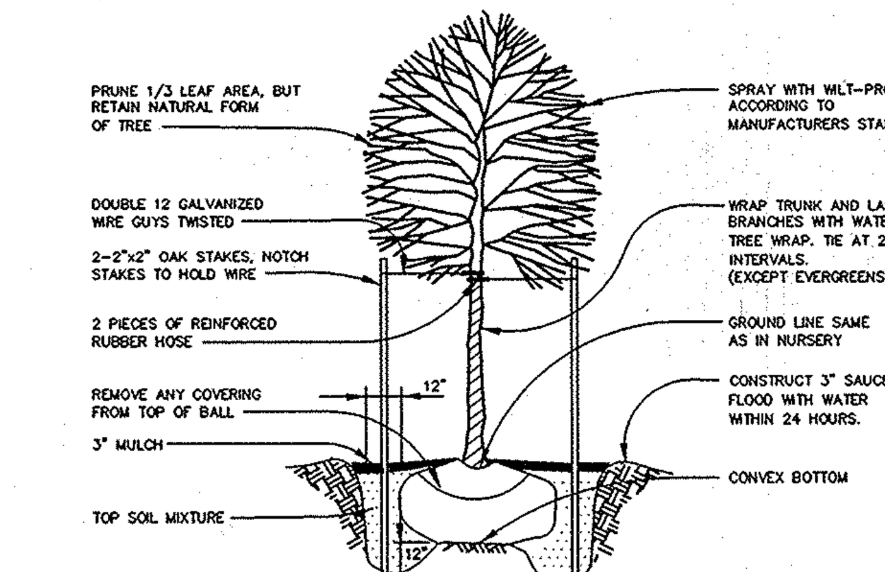
PERIMETER LANDSCAPE PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	4	ACER RUBRUM 'RED SUNSET' (Red Sunset Red Maple)	2.5" – 3"cal.	SHADE TREES ALONG PERIMETER TO BE PROVIDED BY THE BUILDER

SCHEDULE A PERIMETER LANDSCAPE EDGE	
CATEGORY	ADJACENT TO PERIM. PROPERTY ①
LANDSCAPE TYPE	A 1:60 shade
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	821 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	YES* 610 LF
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS	211 LF 4 0 0 0
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS (10:1 SUBSTITUTE)	 4 0 0 0

*610 LF OF CREDIT BASED ON EXISTING LANDSCAPING 20' OR GREATER IN WIDTH ALONG PROPERTY BOUNDARY TO REMAIN.



TREE PLANTING DETAIL
NOT TO SCALE

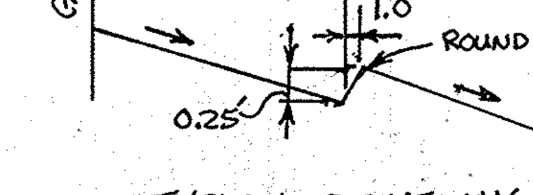
LANDSCAPE NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.

2. 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 RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.

3. THE OWNER, TENANTS 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.

4. FINANCIAL SURETY IN THE AMOUNT OF $1,200.00 FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE GRADING PERMIT.



TYPICAL DRIVEWAY SWALE DETAIL
NOT TO SCALE

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 SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION OF A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE-YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

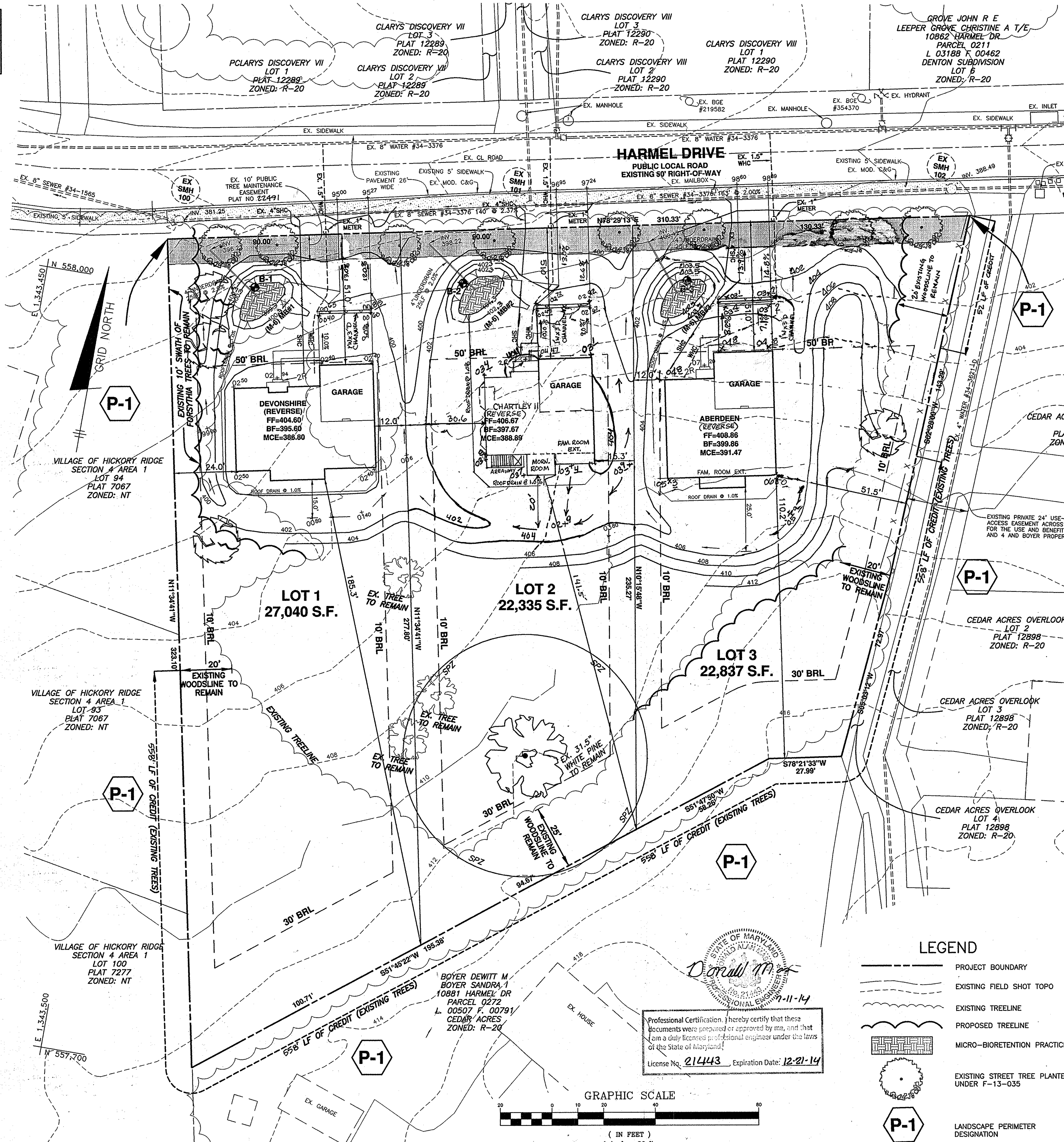
[illegible] 7/25/13
DEVELOPER DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[illegible] 9/3/13
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

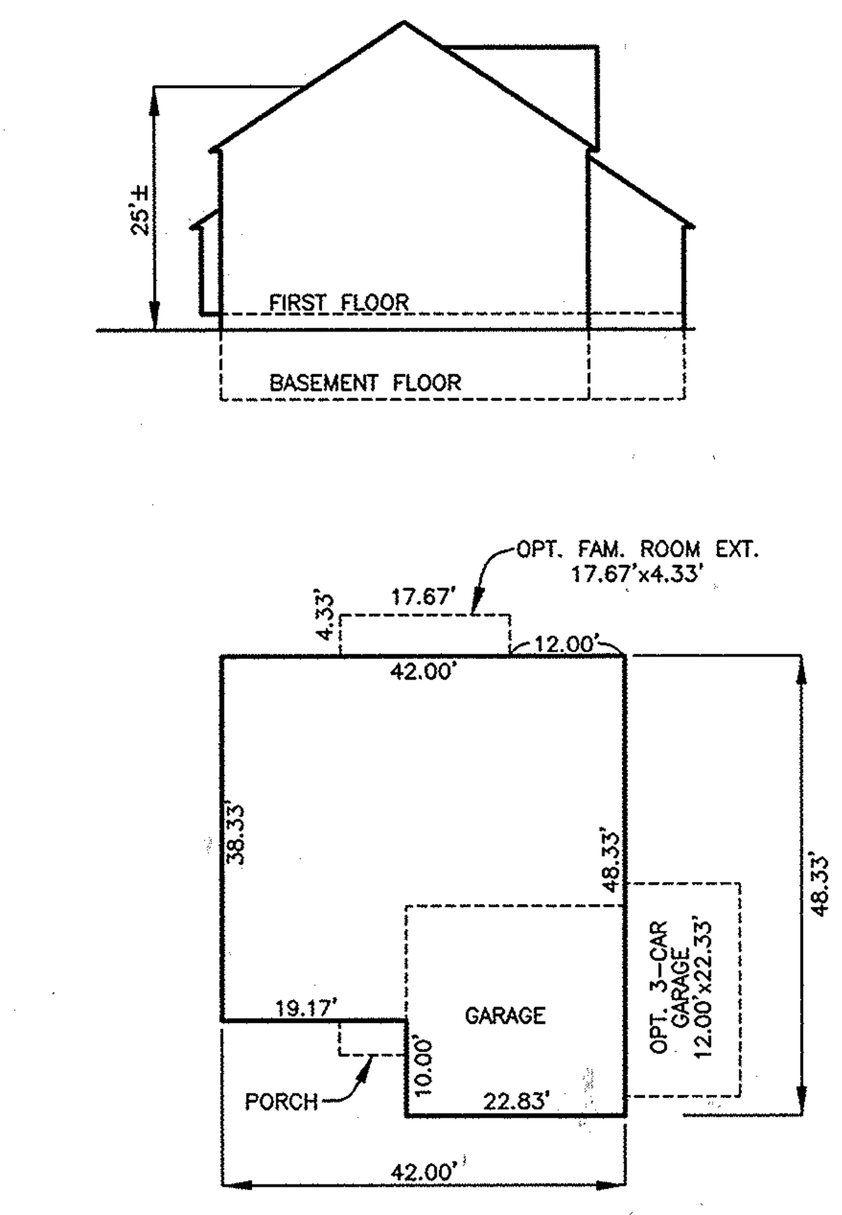
[illegible] 9/04/13
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[illegible] 9/4/13
DIRECTOR DATE

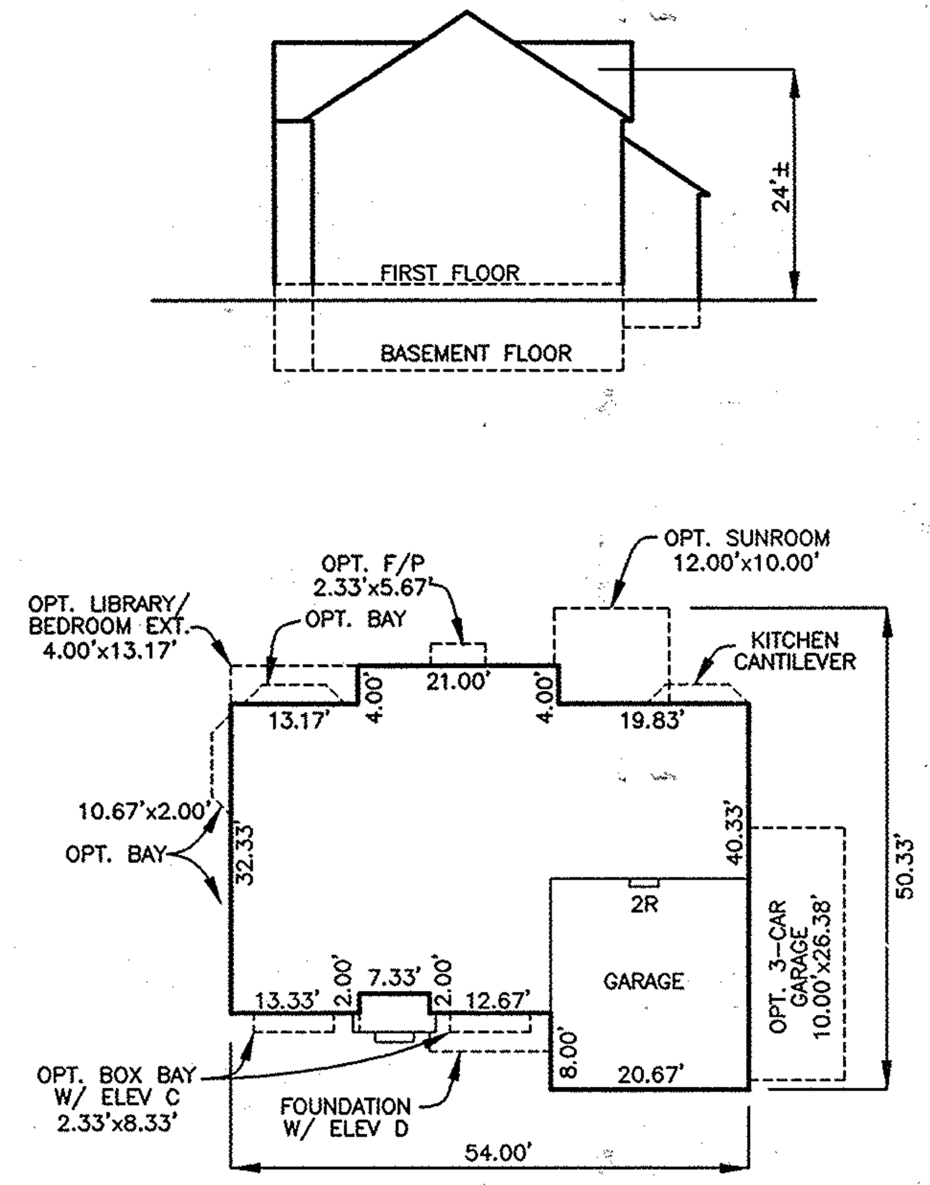


STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER
[illegible] 7-11-14

Professional Certification. 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. 21443 Expiration Date: 12-21-14



ABERDEEN
RECEIVED: 1/04/12



DEVONSHIRE
ISSUE: 12/22/95
REVISION: 1/30/02

LEGEND

— — —	PROJECT BOUNDARY
- - -	EXISTING FIELD SHOT TOPO
﹏	EXISTING TREELINE
︵	PROPOSED TREELINE
▨	MICRO-BIORETENTION PRACTICE
●	EXISTING STREET TREE PLANTED UNDER F-13-035
P-1	LANDSCAPE PERIMETER DESIGNATION
⊕ B-2	SOIL BORING TEST LOCATION

NO.	DATE	REVISION
3	7-11-2014	REVISE GRADES ON LOT 2 PER AS-BUILT CONDITIONS
2	4-8-2014	REVISE GRADES ON LOT 3 PER AS-BUILT CONDITIONS.
1	3-27-2014	ADD CHARTLEY II HOUSE TYPE TO LOT 2. ELIMINATE TRENCH DRAINS AND REVISE DRIVEWAY GRADING TO DIVERT TO MB VIA SMALL SWALE. REVISE MB GRADES AND DRIVEWAY DETAIL.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. 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. 28559, Expiration Date: 07-22-2015.

STATE OF MARYLAND
BRIAN F. CLEARY
No. 28559
REGISTERED
PROFESSIONAL ENGINEER
[illegible] 7/25/2013

OWNER/BUILDER:

CORNERSTONE HOLDINGS, LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

CEDAR OVERLOOK
LOTS 1 thru 3
A RESUBDIVISION OF P/O LOTS 6, 7 AND 8 OF CEDAR ACRES, BLOCK 'C'

TAX MAP: 35 GRID: 17 PARCEL: 101
ZONED: R-20
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT, GRADING AND LANDSCAPE PLAN

DESIGN: DBT	DRAWN: DBT	DATE: JULY, 2013	BEI PROJECT NO: 2519
		SCALE: AS SHOWN	SHEET 2 OF 5

SDP-13-064

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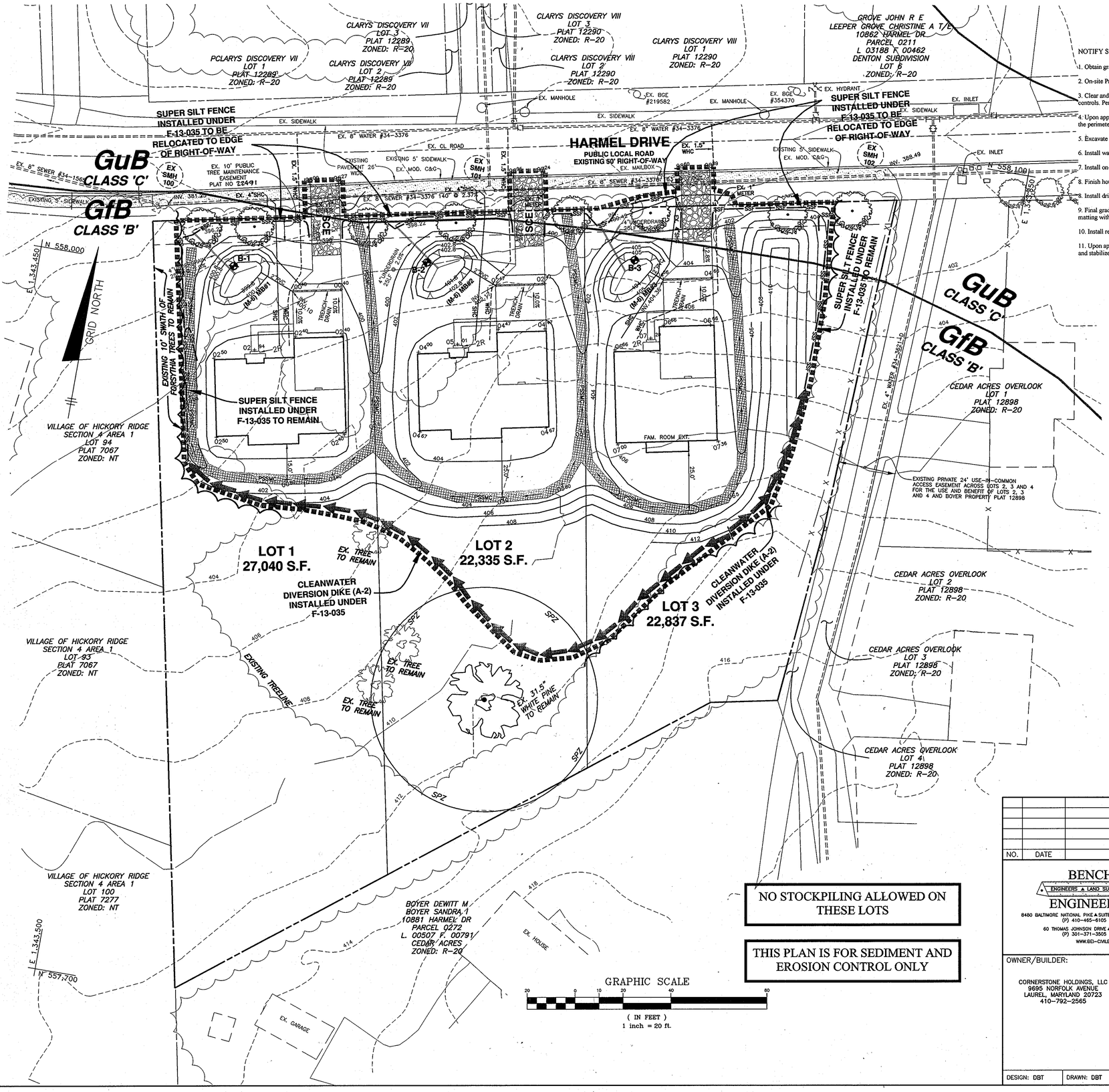

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF WORK

1. Obtain grading permit.
2. On-site Pre-Construction meeting.
3. Clear and Grub as necessary to install stabilized construction entrances and additional perimeter controls. Perimeter controls installed under F-13-035 shall remain for house construction.
4. Upon approval from the Howard County sediment control inspector, proceed to clear and grub within the perimeter.
5. Excavate for foundation, pour and backfill.
6. Install water & sewer house connections.
7. Install on-lot micro-bioretention practice.
8. Finish house construction. Install the roof drains to the micro-bioretention practice.
8. Install driveway and trench drain.
9. Final grade the lot stabilize in accordance with the permanent seedbed notes including erosion control matting within all swales as shown on the plan.
10. Install required perimeter trees.
11. Upon approval from the Howard County sediment control inspector, remove sediment control devices and stabilize any remaining disturbed areas.

LEGEND

- PROJECT BOUNDARY
- EXISTING FIELD SHOT TOPO
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING STREET TREE PLANTED UNDER F-13-035
- LIMIT OF DISTURBANCE
- EARTH DIKE
- SSF — SUPER SILT FENCE
- FSSMC — EROSION CONTROL MATTING
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- GuB CLASS 'C' — SOILS TYPE
- SOILS DELINEATION LINE

ENGINEER'S CERTIFICATE

"I 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.

ENGINEER — DATE 7/25/2013

DEVELOPER'S CERTIFICATE

"I/WE 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."

DEVELOPER — DATE 7/25/13

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/6/13

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/3/13

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/04/13

DIRECTOR — DATE 9/4/13

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
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WWW.BEI-CIVILENGINEERING.COM

Professional Certification. 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. 28550, Expiration Date: 07-22-2015.

BRIAN F. CLEARY — No. 28550 — REGISTERED PROFESSIONAL ENGINEER — 7/25/2013

OWNER/BUILDER:
CORNERSTONE HOLDINGS, LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20723
410-792-2565

CEDAR OVERLOOK
LOTS 1 thru 3
A RESUBDIVISION OF P/O LOTS 6, 7 AND 8 OF CEDAR ACRES, BLOCK 'C'

TAX MAP: 35 GRID: 17 PARCEL: 101
ZONED: R-20
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SEDIMENT AND EROSION CONTROL PLAN

DESIGN: DBT	DRAWN: DBT	DATE: JULY, 2013	BEI PROJECT NO: 2519
		SCALE: AS SHOWN	SHEET 3 OF 5

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SDP-13-064

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity

Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment

Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

Definition

Establishment of vegetative cover on cut and fill slopes.

Purpose

To provide timely vegetative cover on cut and fill slopes as work progresses.

Conditions Where Practice Applies

Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria

A. Incremental Stabilization - Cut Slopes
   1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
   2. Construction sequence example (Refer to Figure B.1):
      a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
      b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
      c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
      d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

B. Incremental Stabilization - Fill Slopes
   1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
   2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
   3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
   4. Construction sequence example (Refer to Figure B.2):
      a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
      b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
      c. Place Phase 1 fill, prepare seedbed, and stabilize.
      d. Place Phase 2 fill, prepare seedbed, and stabilize.
      e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

Figure B.

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

A. Soil Preparation
   1. Temporary Stabilization
      a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
      b. Apply fertilizer and lime as prescribed on the plans.
      c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
   2. Permanent Stabilization
      a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
         i. Soil pH between 6.0 and 7.0.
         ii. Soluble salts less than 500 parts per million (ppm).
         iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
         iv. Soil contains 1.5 percent minimum organic matter by weight.
         v. Soil contains sufficient pore space to permit adequate root penetration.
      b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
      c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
      d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
      e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling
   1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
   2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
   3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
      a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
      b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
      c. The original soil to be vegetated contains material toxic to plant growth.
      d. The soil is so acidic that treatment with limestone is not feasible.
   4. Areas having slopes steeper than 2:1 require special consideration and design.
   5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
      a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
      b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
      c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
   6. Topsoil Application
      a. Erosion and sediment control practices must be maintained when applying topsoil.
      b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
      c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)
   1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
   2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
   3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
   4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
   5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria

A. Seeding
   1. Specifications
      a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
      b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
      c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
      d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
   2. Application
      a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
         i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
         ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
      b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
         i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
         ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
      c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
         i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P2O5 (phosphorous), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
         ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
         iii. Mix seed and fertilizer on site and seed immediately and without interruption.
         iv. When hydroseeding do not incorporate seed into the soil.

B. Mulching
   1. Mulch Materials (in order of preference)
      a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
      b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
         i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
         ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
         iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
         iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
         v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
   2. Application
      a. Apply mulch to all seeded areas immediately after seeding.
      b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
      c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
   3. Anchoring
      a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
         i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
         ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
         iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
         iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

1. General Use
   a Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
   b Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guild, Section 342 - Critical Area Planting.
   c For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil testing agency.
   d For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
2. Turfgrass Mixtures
   a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
   b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
   i. Kentucky Bluegrass: Full sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
   ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
   iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
   iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 ½ to 3 pounds per 1000 square feet.
   Notes: Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland" Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.
   c. Ideal Times of Seeding for Turf Grass Mixtures
   Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
   Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
   Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)
   d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 ½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
   e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is not especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

B. Sod: to provide quick cover on disturbed areas (2:1 grade or flatter).

1. General Specifications
   a. Class of turfgrass must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
   b. Sod must be machine cut at a uniform soil thickness of ¾ inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and tom or uneven ends will not be acceptable.
   c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
   d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
   e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
2. Sod Installation
   a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
   b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
   c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
   d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
3. Sod Maintenance
   a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
   b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
   c. Do not mow until the sod is firmly rooted. No more than 1/3 of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABLIZATION

Definition

To stabilize disturbed soils with vegetation for up to 6 months.

Purpose

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria

1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

Definition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

H-5 STANDARDS AND SPECIFICATIONS FOR DUST CONTROL

Definition

Controlling the suspension of dust particles from construction activities.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.

Conditions Where Practice Applies

Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications

1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).

2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

6. SITE ANALYSIS:

TOTAL AREA OF SITE:	1.66	ACRES
AREA DISTURBED:	0.91	ACRES
AREA TO BE ROOFED OR PAVED:	0.50	ACRES
AREA TO BE VEGETATIVELY STABILIZED:	0.41	ACRES
TOTAL CUT:	2,500	CY
TOTAL FILL:	2,500	CY
OFFISTE WASTE/BORROW LOCATION:	N/A	

7. ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.

8. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

9. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

10. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.

11. ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.

12. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 ACRES PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

ENGINEER'S CERTIFICATE

"I 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] 7/25/2013

ENGINEER DATE

DEVELOPER'S CERTIFICATE

"I/WE 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] 7/25/13

DEVELOPER DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

[signature] 8/6/13

HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 9/3/13

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[signature] 9/04/13

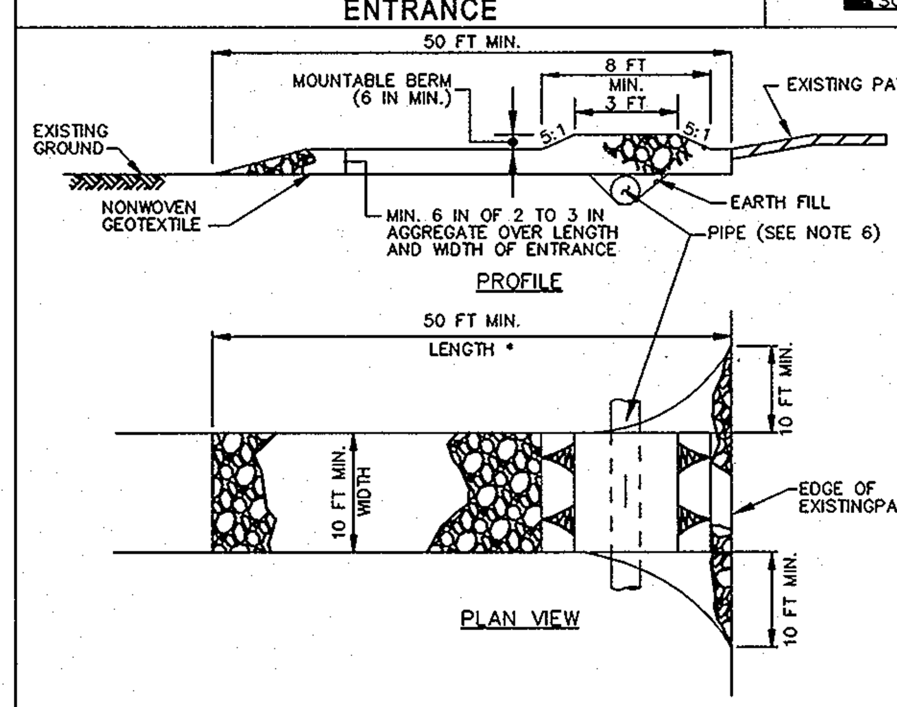
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[signature] 9/4/13

DIRECTOR DATE

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

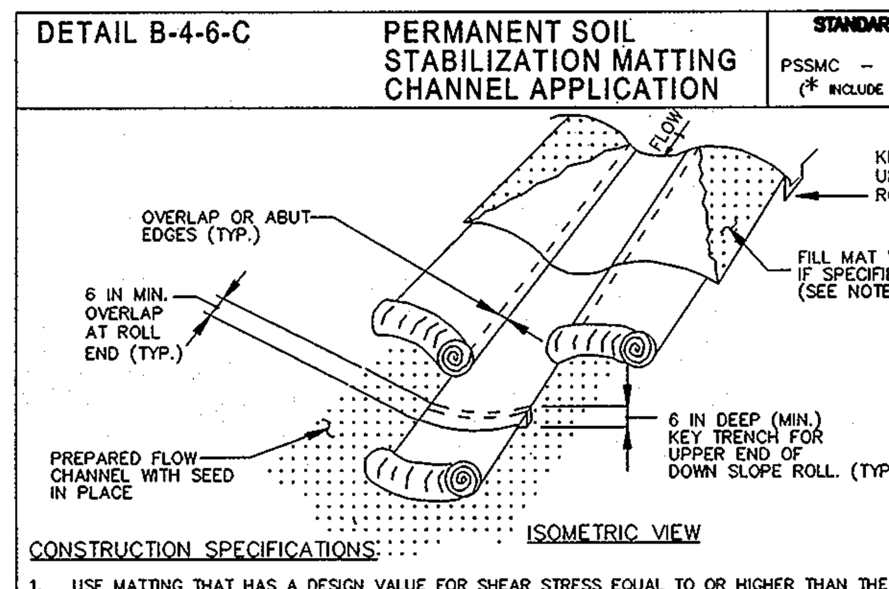
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-C PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: PSSMC – * lb/ft² (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

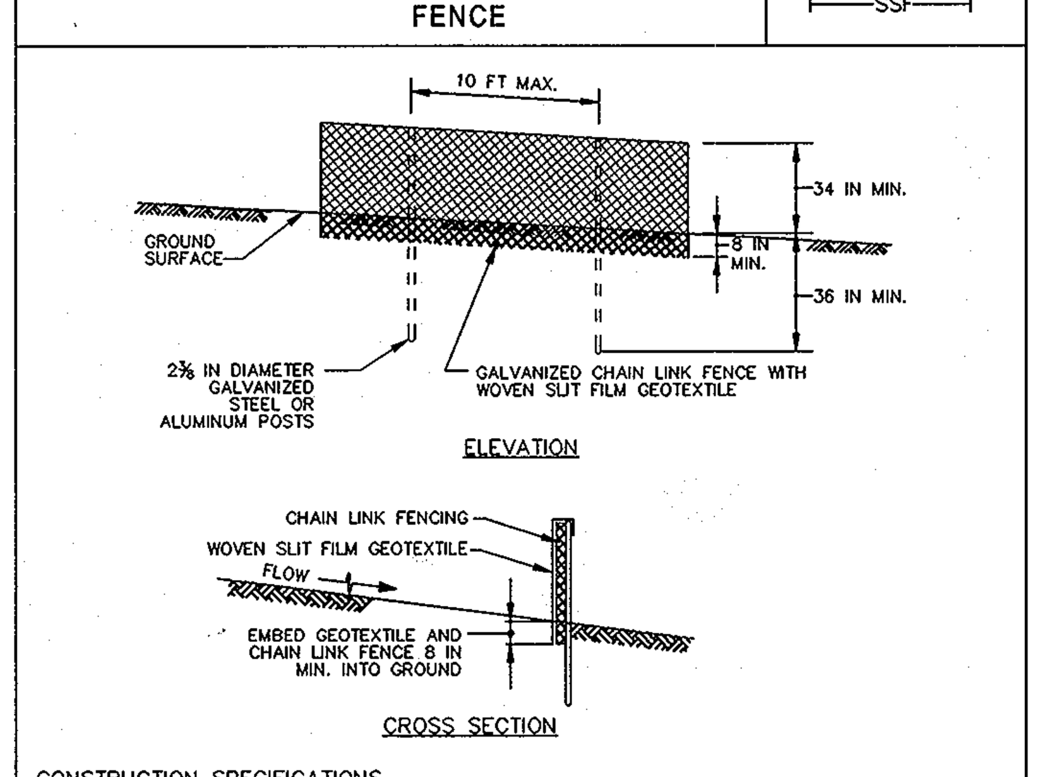
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 ½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER LINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

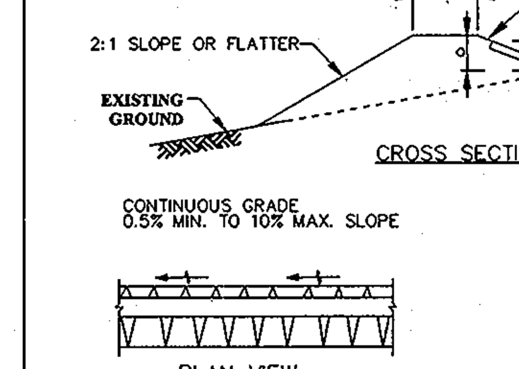
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A-1 (PLACE DESIGNATION (e.g. A-1) ON FLOW CHANNEL SIDE OF DIKE.)



DIKE TYPE

	A	B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

A-1	SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A-2/B-2	SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A-3/B-3	4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.

ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS

8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. 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. 28559, Expiration Date: 7-22-2015.

[Seal: STATE OF MARYLAND, BRIAN F. CLEARY, No. 28559, REGISTERED PROFESSIONAL ENGINEER] [signature] 7/25/2013

OWNER/BUILDER:

CORNERSTONE HOLDINGS, LLC
9695 NORFOLK AVENUE
LAUREL, MARLAND 20723
410-792-2565

CEDAR OVERLOOK

LOTS 1 thru 3

A RESUBDIVISION OF P/O LOTS 6, 7 AND 8 OF CEDAR ACRES, BLOCK 'C'

TAX MAP: 35 GRID: 17 PARCEL: 101
ZONED: R-20
ELECTION DISTRICT NO.
HOWARD COUNTY, MARYLAND

SEDIMENT AND EROSION CONTROL NOTES AND DETAILS

DESIGN: DBT	DRAWN: DBT	DATE: JULY, 2013	BEI PROJECT NO: 2519
		SCALE: AS SHOWN	SHEET 4 OF 5

SDP-13-064

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CONSTRUCTION SPECIFICATIONS

B.4.C Specifications for Micro-Bioretention. 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-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 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 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-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 or HDPE).
- Perforations - If perforated pipe is used, perforations should be ⅜" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a ¼" (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 (⅛" to ⅜" 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

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

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

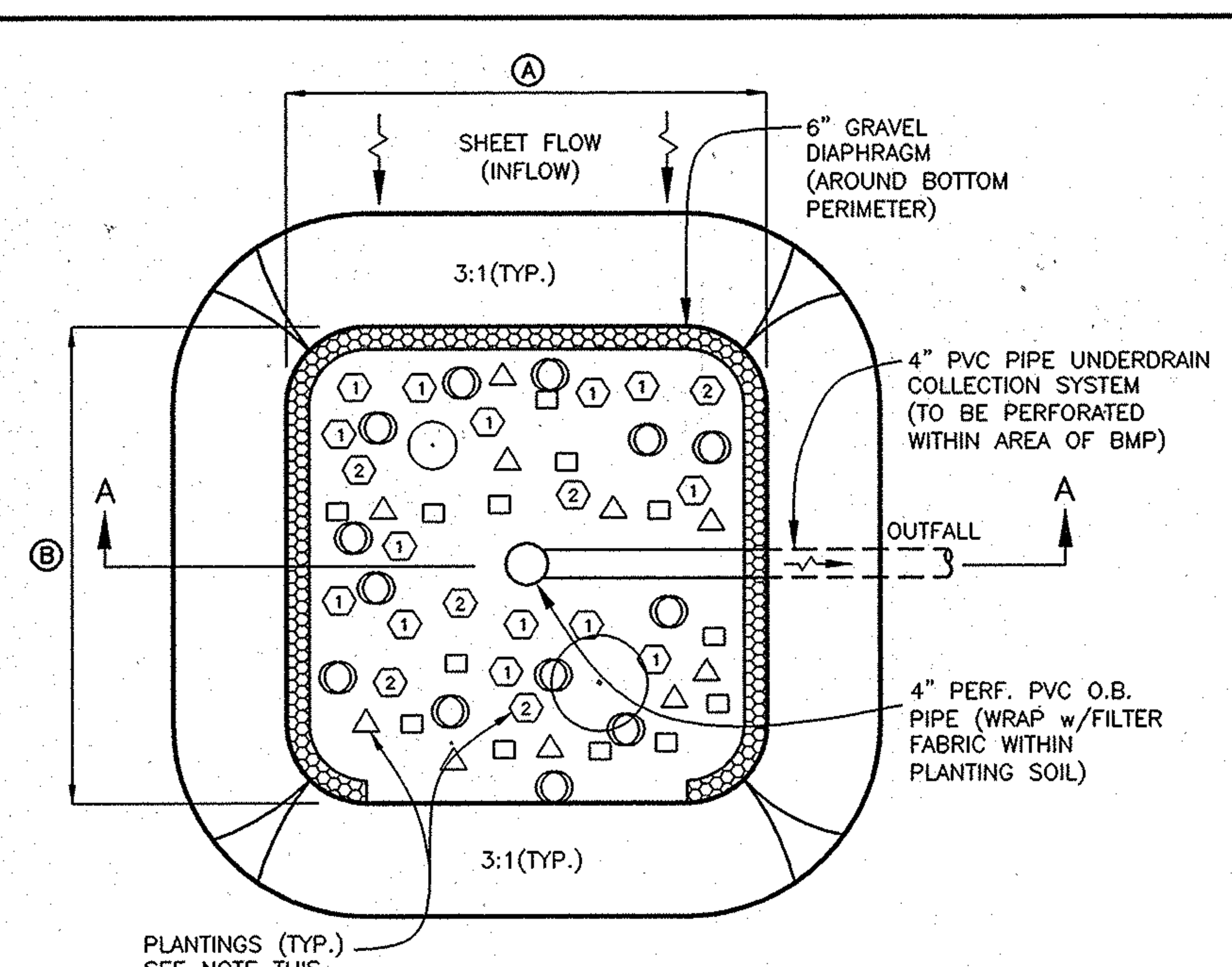
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 – 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic 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.

B47

Supp. 1

UNDERDRAIN, OVERFLOW AND OUTFALL NOTES

1. THE LAST CLEAN-OUT LOCATION WITHIN EACH MICRO-BIORETENTION FACILITY SHALL BE FITTED WITH A NON-CLOGGING SURFACE DRAIN (EXAMPLE: 4" ABS ROOF DRAIN W/CAST ALUMINUM DOME) AT THE POND SURFACE ELEVATION INDICATED IN THE CORRESPONDING TABLE ELEV. 2.
2. THE PVC WITHIN THE FACILITY SHALL BE PERFORATED.
3. THE UNDER-DRAIN AND PIPE TO OUTFALL SHALL BE INSTALLED TO A MINIMUM DEPTH OF 2' BELOW FINISHED GRADE AND SHALL MAINTAIN A MINIMUM 1% SLOPE AND MAINTAIN A MINIMUM OF 1' OF SEPARATION AT ALL CROSSINGS.



PLAN VIEW

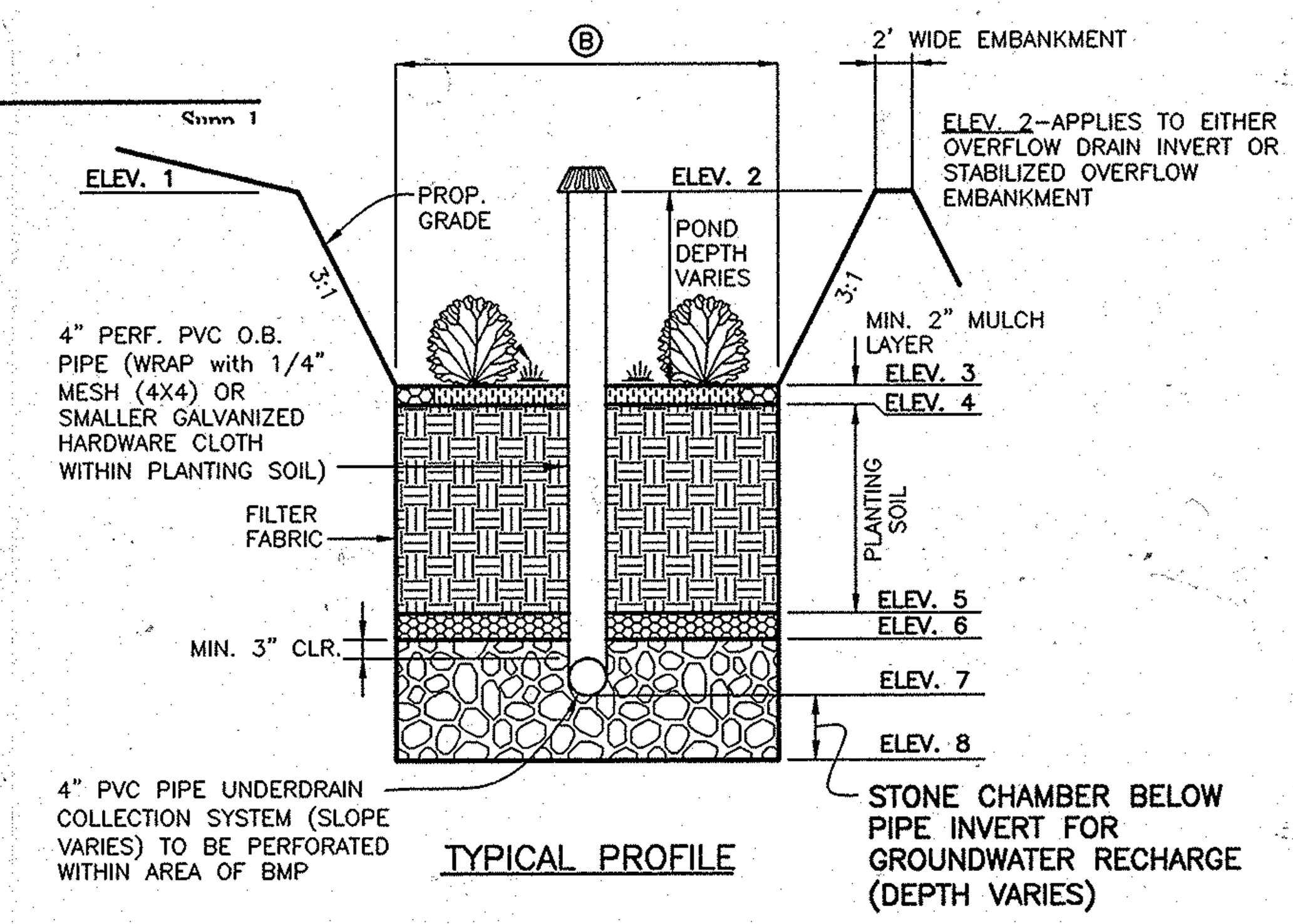
SYMBOL	NAME
PLANTING LEGEND	
⬡ 1	AJUGA REPTANS (CREEPING BUGLEWEED)
⬡ 2	IRIS VERSICOLOR (IRIS)
□	CLETHRA (COMMON PERIWINKLE)
△	ELYMUS VIRGINICUS (VIRGINIA WILD RYE)
◎	VACCINIUM ATROCOCCUM (HIGHBUSH BLUEBERRY)
⊙	BETULA NIGRA (RIVER BIRCH)

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

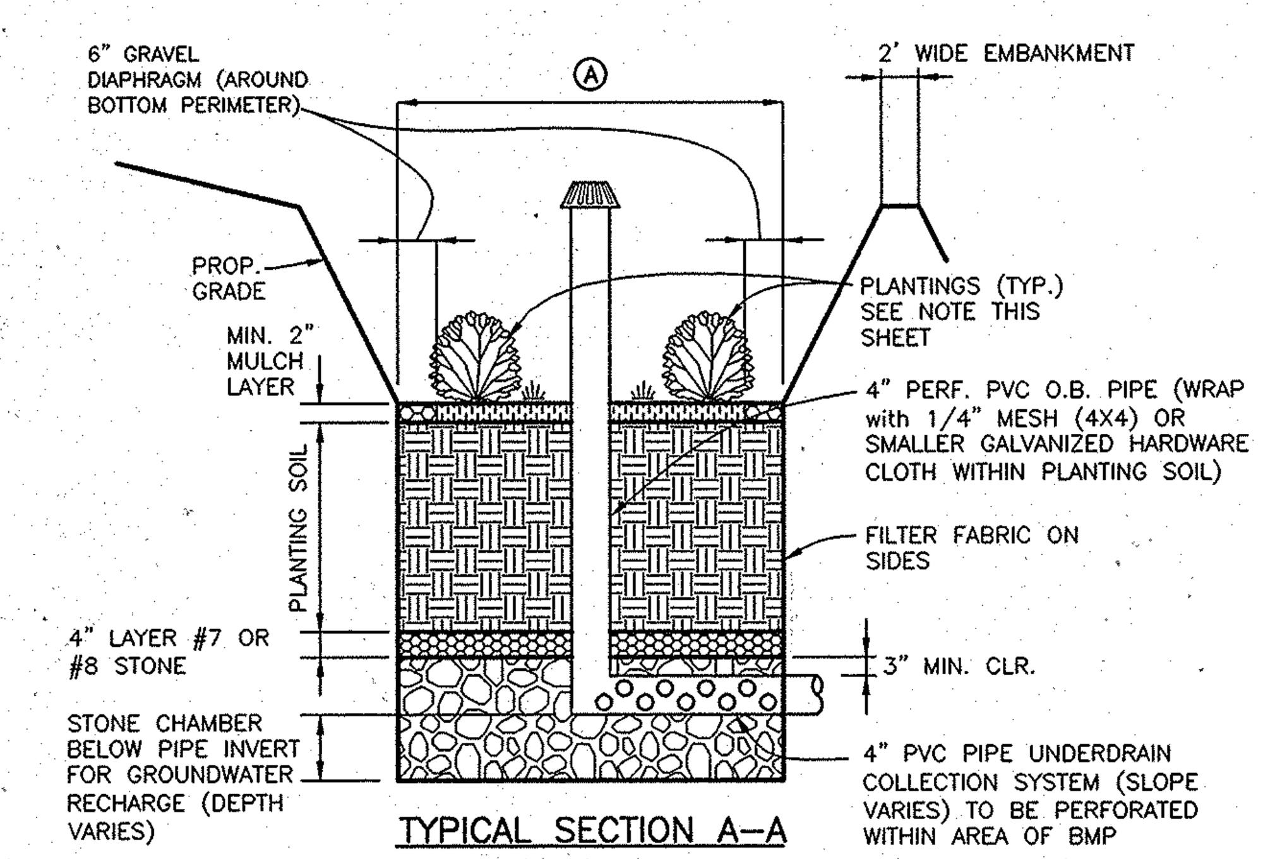
1. Annual maintenance of plant material, mulch layer and soil layer is required. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will 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.
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.
3. Mulch shall be inspected each spring. Remove previous mulch layer before applying new layer once every 2 to 3 years.
4. Soil erosion to be addressed on an as needed basis, with a minimum of once per month and after heavy storm events.

MICRO BIO-RETENTION INTERNAL LANSCAPING CHART

				MB #1	MB #2	MB #3
Facility square footage	→			172	172	172
PLANT NAME	**COMMON NAME**	**TYPE**	**SIZE**	**QUANTITY**	**QUANTITY**	**QUANTITY**
Betula nigra	RIVER BIRCH	tree	2.5"-3" caliper	1	1	1
Clethra	COMMON PERIWNKLE	herbaceous	quart bulb	22	22	22
Ajuga reptans	CREEPING BUGLEWEED	herbaceous	quart bulb	22	22	22
Iris versicolor	IRIS	herbaceous	quart bulb	22	22	22
Elymus virginicus	VIRGINIA WILD RYE	herbaceous	quart bulb	22	22	22
Vaccinium atrococcum	HIGHBUSH BLUEBERRY	shrub	2.5'-3' ht	2	2	2



TYPICAL PROFILE



TYPICAL SECTION A–A

TYPICAL MICRO–BIORETENTION DETAILS

NOT TO SCALE

(M–6) MICRO–BIORETENTION DESIGN TABLES

#1	
ELEV. 1	400,30
ELEV. 2	400.30
ELEV. 3	399.30
ELEV. 4	399.13
ELEV. 5	397.63
ELEV. 6	397.30
ELEV. 7	396.72
ELEV. 8	395.52
DIMENSIONS	
'A'	20'+/–
'B'	10'+/–
TOTAL SF	172
OUTFALL PIPE	
SIZE	4"
LENGTH	25'
SLOPE	2%
INV (daylight)	396.22

#2	
ELEV. 1	402.30
ELEV. 2	402.30
ELEV. 3	401.30
ELEV. 4	401.13
ELEV. 5	399.63
ELEV. 6	399.30
ELEV. 7	398.72
ELEV. 8	397.52
DIMENSIONS	
'A'	20'+/–
'B'	10'+/–
TOTAL SF	172
OUTFALL PIPE	
SIZE	4"
LENGTH	25'
SLOPE	2%
INV (daylight)	398.22

#3	
ELEV. 1	404.50
ELEV. 2	404.50
ELEV. 3	403.50
ELEV. 4	403.33
ELEV. 5	401.83
ELEV. 6	401.50
ELEV. 7	400.92
ELEV. 8	399.72
DIMENSIONS	
'A'	20'+/–
'B'	10'+/–
TOTAL SF	172
OUTFALL PIPE	
SIZE	4"
LENGTH	25'
SLOPE	2%
INV (daylight)	400.42

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/8/2012
Client: Cornerstone Homes
Project: Cedar Overlook Project No. 112-128
Boring No.: B-1 (1 of 1) Total Depth 4.5 Elev: 398.0 Location: See Boring Location Plan
Type of Boring: SSA Started: 10/26/2012 Completed: 11/3/2012 Driller: T. Beyer

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
398	0.0	Sod with root (organic) matter and organic soil				Boring dry during drilling and at completion. After 24 hours, the boring was still dry. Auger Refusal occurred at at depth of 4.5 feet.
397.5	0.5	Reddish-brown fine to medium sandy silty CLAY, moist (CL)				
393.5	4.5	End of Boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/8/2012
Client: Cornerstone Homes
Project: Cedar Overlook Project No. 112-128
Boring No.: B-2 (1 of 1) Total Depth 4.5 Elev: 400.0 Location: See Boring Location Plan
Type of Boring: SSA Started: 10/26/2012 Completed: 11/3/2012 Driller: T. Beyer

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
400	0.0	Sod with root (organic) matter and organic soil				Boring dry during drilling and at completion. After 24 hours, the boring was still dry. Auger Refusal occurred at at depth of 4.5 feet.
399.5	0.5	Reddish-brown fine to medium sandy silty CLAY, moist (CL)				
395.5	4.5	End of Boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/8/2012
Client: Cornerstone Homes
Project: Cedar Overlook Project No. 112-128
Boring No.: B-3 (1 of 1) Total Depth 7.5 Elev: 401.0 Location: See Boring Location Plan
Type of Boring: SSA Started: 10/28/2012 Completed: 11/3/2012 Driller: T. Beyer

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
401	0.0	Sod with root (organic) matter and organic soil				Boring dry during drilling and at completion. After 24 hours, the boring was still dry.
400.5	0.5	Reddish-brown fine to medium sandy silty CLAY, moist (CL)				
397	4.0	Tan fine to medium SAND with little clay, moist (SC)				
393.5	7.5	End of Boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[illegible] 9/3/13
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[illegible] 9/04/13
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[illegible] 9/4/13
DIRECTOR DATE

NO.	DATE	REVISION
1	3-27-2014	REVISE ELEV. 1, 2, 3, 4 OF MB #1, #2, #3

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
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60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702
(P) 301-371-3505 (F) 301-371-3506
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. 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. 28559, Expiration Date: 7-22-2015.

STATE OF MARYLAND
BRIAN F. CLEARY
No. 28559
REGISTERED
PROFESSIONAL ENGINEER
7/25/2013

OWNER/BUILDER:
CORNERSTONE HOMES, INC.
9695 NORFOLK AVENUE
LAUREL, MARLAND 20723
410-792-2565

CEDAR OVERLOOK
LOTS 1 thru 3
A RESUBDIVISION OF P/O LOTS 6, 7 AND 8 OF CEDAR ACRES, BLOCK 'C'

TAX MAP: 35 GRID: 17 PARCEL: 101
ZONED: R-20
ELECTION DISTRICT NO.
HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAIL SHEET

DATE:	JULY, 2013	BEI PROJECT NO:	2519
DESIGN: DBT	DRAWN: DBT	SCALE: AS SHOWN	SHEET 5 OF 5

SDP-13-064