DESIGN NARRATIVE:

The site was analyzed as woods in good condition and a target RCN was determined. A target rainfall depth treatment (Pe) was determined based on the measured impervious areas and HSG soil types. The target Pe for this site is 1.6 inches. The target Pe was treated using Environmental Site Design practices as outlined in Chapter 5 of the 2000 Maryland Stormwater Design Manual, as amended by Maryland's Stormwater Management Act of 2007. The selected methods include Rooftop and Non-Rooftop disconnects, sheet flow to buffers and Micro-bioretention facilities, dry wells, and grass swales.

This site contains two streams. These areas have associated wetlands. Only the wetland areas contained within the effective site area are described on this plan. The site has some areas of steep slopes in excess of 15% and none in excess of 25%; To protect natural resource areas, it is important to delay release of stormwater runoff from new impervious areas to avoid increasing peak runoffs, and to adequately treat the stormwater to avoid damage to sensitive species. The design incorporates large lots with moderately sized houses and minimum width driveways in order to create the least possible stormwater runoff. In addition, steep slope areas are not included on the lots.

Conceptual treatment has been designated based on preliminary grading, the site topography and the house, well and septic locations. The roads treated by Non-Rooftop disconnect, grass swales and micro-bioretention. Driveway areas may be treated by disconnection, or on-lot micro-bioretention. Some driveway areas will be treated in preservation parcel facilities. Generally rooftop runoff will be addressed through disconnection, sheet flow to buffer or piped to on-site micro-bioretention facilities. Micro-bioretention facilities may be required to have impervious lining, depending on proximity to well locations. Multiple outfalls are provided to generally release runoff in natural drainage patterns for the site.

Sediment and erosion controls have been designed based on the 1994 Maryland Specifications for Soil Erosion and Sediment Control. Erosion control matting and super silt fence will be used to prevent runoff containing unacceptable levels of TSS from leaving the site and entering the adjacent wetlands during the construction. It will be the obligation of the contractor to install, inspect and maintain these practices.

The target Pe for this site is 1.6 inches. The treatment methods and capacity were severely limited as a result of the well and septic locations and associated setbacks. These limits resulted in the use of surface treatments (i.e. disconnections and sheet flow to buffer) where possible. The proposed practices capture or treat 130,865 s.f. of impervious. There is approximately 6,022 s.f. of impervious not being captured as a result of it grading and site limits. As a result of being limited to surface treatments that provide a maximum of 1" of treatment additional treatment limited to the 10yr storm within the M-6 practices was provided to bring the overall Pe treated to 1.6".

All environmentally sensitive areas (i.e. 100yr floodplain, wetlands, streams, their buffers) shall remain undisturbed with the exception of the installation of a crossing for the use-in-common drive and other development entrance improvements.

Natural flow patterns shall be preserved in that all proposed practices shall ultimately discharge into the same streams. The practices are generally dispersed along the outer edge of the LOD and shall discharge along this outer edge to mimic the layout of the natural ground as it enters the stream treated.

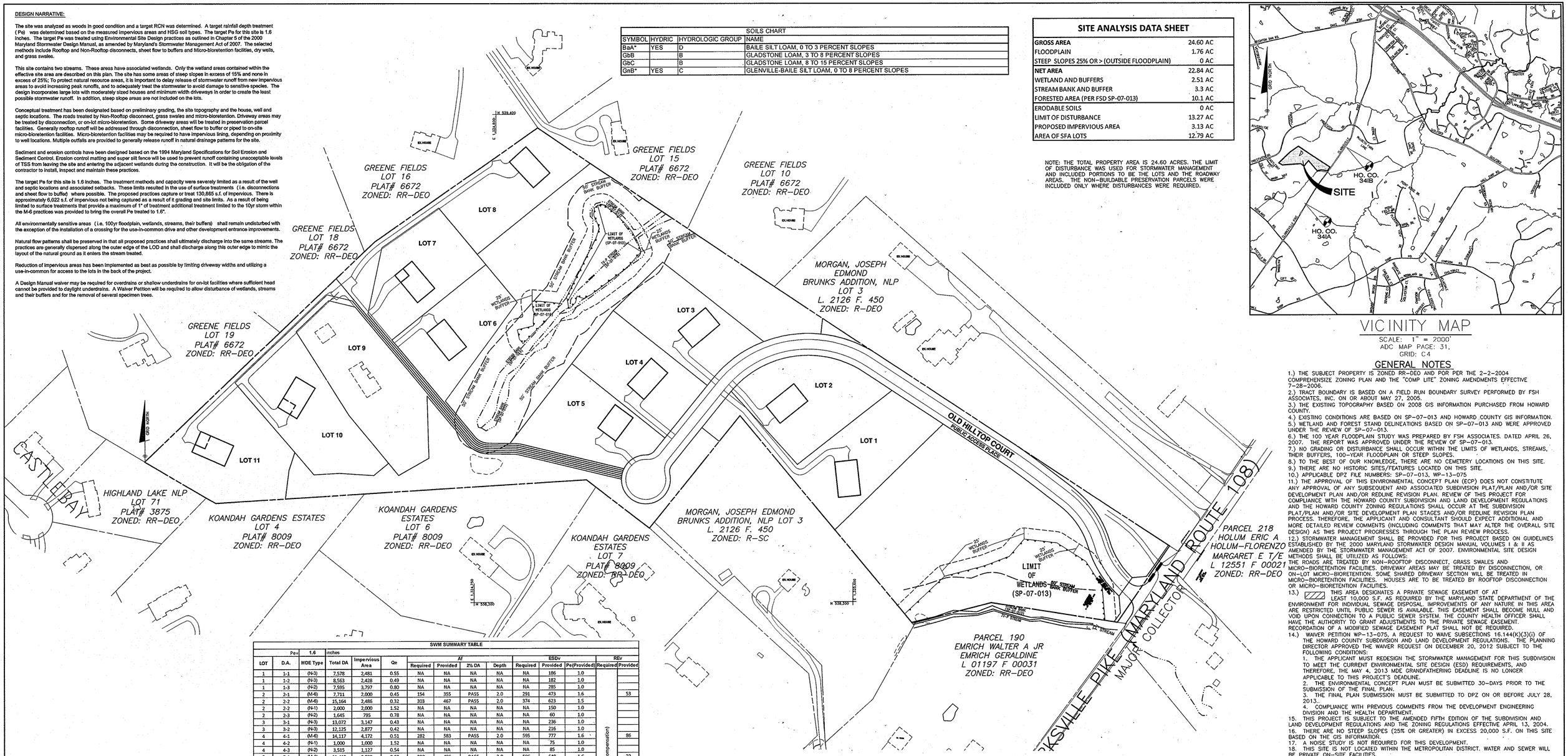
Reduction of impervious areas has been implemented as best as possible by limiting driveway widths and utilizing a use-in-common for access to the lots in the back of the project.

A Design Manual waiver may be required for overdrains or shallow underdrains for on-lot facilities where sufficient head cannot be provided to daylight underdrains. A Waiver Petition will be required to allow disturbance of wetlands, streams and their buffers and for the removal of several specimen trees.

SOILS CHART			
SYMBOL	HYDRIC	HYDROLOGIC GROUP	NAME
BaA*	YES	D	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES
GbB		B	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES
GbC		B	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES
GnB*	YES	C	GLENVILLE-BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES

SITE ANALYSIS DATA SHEET	
GROSS AREA	24.60 AC
FLOODPLAIN	1.76 AC
STEEP SLOPES 25% OR > (OUTSIDE FLOODPLAIN)	0 AC
NET AREA	22.84 AC
WETLAND AND BUFFERS	2.51 AC
STREAM BANK AND BUFFER	3.3 AC
FORESTED AREA (PER FSD SP-07-013)	10.1 AC
ERODABLE SOILS	0 AC
LIMIT OF DISTURBANCE	13.27 AC
PROPOSED IMPERVIOUS AREA	3.13 AC
AREA OF SFA LOTS	12.79 AC

NOTE: THE TOTAL PROPERTY AREA IS 24.60 ACRES. THE LIMIT OF DISTURBANCE WAS USED FOR STORMWATER MANAGEMENT AND INCLUDED PORTIONS TO BE THE LOTS AND THE ROADWAY AREAS. THE NON-BUILDABLE PRESERVATION PARCELS WERE INCLUDED ONLY WHERE DISTURBANCES WERE REQUIRED.



SWM SUMMARY TABLE															
			Pe=	1.6	inches										
							Af				ESDv			REv	
LOT	D.A.	MDE Type	Total DA	Impervious Area	Qe	Required	Provided	2% DA	Depth	Required	Provided	Pe(Provided)	Required	Provided
1	1-1	(N-3)	7,578	2,481	0.55	NA	NA	NA	NA	NA	186	1.0		
1	1-2	(N-3)	8,563	2,428	0.49	NA	NA	NA	NA	NA	182	1.0		
1	1-3	(N-2)	7,595	3,797	0.80	NA	NA	NA	NA	NA	285	1.0		
2	2-1	(M-6)	7,711	2,000	0.45	154	355	PASS	2.0	291	473	1.6		53
2	2-2	(M-6)	15,164	2,486	0.32	303	467	PASS	2.0	374	623	1.5		
2	2-2	(N-1)	2,000	2,000	1.52	NA	NA	NA	NA	NA	150	1.0		
2	2-3	(N-2)	1,645	795	0.78	NA	NA	NA	NA	NA	60	1.0		
3	3-1	(N-3)	13,072	3,147	0.43	NA	NA	NA	NA	NA	236	1.0		
3	3-2	(N-3)	12,125	2,877	0.42	NA	NA	NA	NA	NA	216	1.0		
4	4-1	(M-6)	14,117	4,172	0.51	282	583	PASS	2.0	595	777	1.6		86
4	4-2	(N-1)	1,000	1,000	1.52	NA	NA	NA	NA	NA	75	1.0		
4	4-3	(N-2)	3,515	1,127	0.54	NA	NA	NA	NA	NA	85	1.0		
5	5-1	(M-6)	11,413	3,580	0.53	228	486	PASS	2.0	506	648	1.6		72
5	5-2	(N-1)	1,000	1,000	1.52	NA	NA	NA	NA	NA	75	1.0		
5	5-3	(N-2)	1,701	818	0.77	NA	NA	NA	NA	NA	61	1.0		
6	6-1	(M-6)	10,139	3,201	0.53	203	503	PASS	2.0	452	671	1.6		74
6	6-2	(M-6)	2,575	1,782	1.08	52	232	PASS	4.0	190	309	1.6		34
6	6-3	(N-2)	2,098	893	NA	NA	NA	NA	NA	NA	67	1.0		
7	7-1	(M-6)	9,320	2,400	0.45	186	363	PASS	2.0	350	484	1.6		54
7	7-2	(M-6)	5,813	2,710	0.75	116	444	PASS	4.0	364	592	1.6		66
7	7-3	(N-2)	1,213	535	0.72	NA	NA	NA	NA	NA	40	1.0		
UIC	7-4	(N-2)	1,288	640	0.80	NA	NA	NA	NA	NA	48	1.0		
8	8-1	(M-6)	11,381	3,000	0.46	228	531	PASS	2.0	436	708	1.6		79
8	8-2	(N-1)	1,000	1,000	1.52	NA	NA	NA	NA	NA	75	1.0		
8	8-3	(N-2)	14,080	6,500	0.74	NA	NA	NA	NA	NA	488	1.0		
UIC	8-4	(N-2)	2,241	1,474	1.03	NA	NA	NA	NA	NA	111	1.0		
UIC	8-5	(N-2)	906	448	0.79	NA	NA	NA	NA	NA	34	1.0		
9	9-1	(M-6)	10,567	6,139	0.92	211	931	PASS	2.0	807	1241	1.6		138
9	9-2	(N-1)	1,624	1,624	1.52	NA	NA	NA	NA	NA	122	1.0		
9	9-3	(M-5)	934	934	1.52	NA	NA	NA	5.0	118	122	1.6		
UIC	9-4	(N-2)	1,722	1,022	0.93	NA	NA	NA	NA	NA	77	1.0		
10	10-1	(M-6)	10,539	3,167	0.51	211	548	PASS	2.0	450	731	1.6		81
10	10-2	(N-1)	2,000	2,000	1.52	NA	NA	NA	NA	NA	150	1.0		
10	10-3	(N-2)	1,058	1,058	1.52	NA	NA	NA	NA	NA	79	1.0		
UIC	10-4	(N-2)	6,780	3,429	0.81	NA	NA	NA	NA	NA	257	1.0		
11	11-1	(M-6)	12,288	2,757	0.40	246	503	PASS	2.0	413	671	1.6		74
11	11-2	(N-1)	2,000	2,000	1.52	NA	NA	NA	NA	NA	150	1.0		
11	11-3	(N-2)	3,058	1,528	0.80	NA	NA	NA	NA	NA	115	1.0		
ROW	A-1	(M-6)	3,690	1,992	0.86	74	296	PASS	2.0	264	395	1.6		44
ROW	A-2	(M-6)	19,128	9,575	0.80	383	1393	PASS	2.0	1277	1857	1.6		206
ROW	A-3	(M-8)	7,102	3,262	0.74	NA	NA	NA	NA	NA	391	1.6		
ROW	A-4	(M-8)	6,834	2,918	0.69	NA	NA	NA	NA	NA	350	1.6		
ROW	C-1	(M-6)	29,855	14,693	0.79	597	1659	PASS	2.0	1962	2212	1.6		246
ROW	C-2	(M-6)	7,643	1,085	0.28	153	150	PASS	2.0	181	200	1.6		22
ROW	B-1	(M-6)	17,421	7,864	0.73	348	1292	PASS	2.0	1060	1723	1.6		191
ROW	B-2	(M-6)	18,357	7,991	0.71	367	1318	PASS	2.0	1081	1757	1.6		195
	TOTAL TREATED		330,853	139,843		4,342	12,054			21,149	20,357	1.6	1,260	1,715
	SITE TOAL		576,800	136,503										

REv requirement calculation based on entire site, REv provided within specific facilities (overcompensation)

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

VICINITY MAP

SCALE: 1" = 2000'
ADC MAP PAGE: 31.
GRID: C 4

GENERAL NOTES

1.) THE SUBJECT PROPERTY IS ZONED RR-DEO AND POR PER THE 2-2-2004 COMPREHENSIZE ZONING PLAN AND THE "COMP LITE" ZONING AMENDMENTS EFFECTIVE 7-28-2006.
2.) TRACT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED BY FSH ASSOCIATES, INC. ON OR ABOUT MAY 27, 2005.
3.) THE EXISTING TOPOGRAPHY BASED ON 2008 GIS INFORMATION PURCHASED FROM HOWARD COUNTY.
4.) EXISTING CONDITIONS ARE BASED ON SP-07-013 AND HOWARD COUNTY GIS INFORMATION.
5.) WETLAND AND FOREST STAND DELINEATIONS BASED ON SP-07-013 AND WERE APPROVED UNDER THE REVIEW OF SP-07-013.
6.) THE 100 YEAR FLOODPLAIN STUDY WAS PREPARED BY FSH ASSOCIATES. DATED APRIL 26, 2007. THE REPORT WAS APPROVED UNDER THE REVIEW OF SP-07-013.
7.) NO GRADING OR DISTURBANCE SHALL OCCUR WITHIN THE LIMITS OF WETLANDS, STREAMS, THEIR BUFFERS, 100-YEAR FLOODPLAIN OR STEEP SLOPES.
8.) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON THIS SITE.
9.) THERE ARE NO HISTORIC SITES/FEATURES LOCATED ON THIS SITE.
10.) APPLICABLE DPZ FILE NUMBERS: SP-07-013, WP-13-075
11.) THE APPROVAL OF THIS ENVIRONMENTAL CONCEPT PLAN (ECP) DOES NOT CONSTITUTE ANY APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAT/PLAN AND/OR SITE DEVELOPMENT PLAN AND/OR REDLINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAT/PLAN AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR REDLINE REVISION PLAN PROCESS. THEREFORE, 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.) STORMWATER MANAGEMENT SHALL BE PROVIDED FOR THIS PROJECT BASED ON GUIDELINES ESTABLISHED BY THE 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUMES I & II AS AMENDED BY THE STORMWATER MANAGEMENT ACT OF 2007. ENVIRONMENTAL SITE DESIGN METHODS SHALL BE UTILIZED AS FOLLOWS:
THE ROADS ARE TREATED BY NON-ROOFTOP DISCONNECT, GRASS SWALES AND MICRO-BIORETENTION FACILITIES. DRIVEWAY AREAS MAY BE TREATED BY DISCONNECTION, OR ON-LOT MICRO-BIORETENTION. SOME SHARED DRIVEWAY SECTION WILL BE TREATED IN MICRO-BIORETENTION FACILITIES. HOUSES ARE TO BE TREATED BY ROOFTOP DISCONNECTION OR MICRO-BIORETENTION FACILITIES.
13.) ▨ THIS AREA DESIGNATES A PRIVATE SEWAGE EASEMENT OF AT LEAST 10,000 S.F. AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWER IS AVAILABLE. THIS EASEMENT SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWER SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWAGE EASEMENT. RECORDATION OF A MODIFIED SEWAGE EASEMENT PLAT SHALL NOT BE REQUIRED.
14.) WAIVER PETITION WP-13-075, A REQUEST TO WAIVE SUBSECTIONS 16.144(K)(3)(i) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE PLANNING DIRECTOR APPROVED THE WAIVER REQUEST ON DECEMBER 20, 2012 SUBJECT TO THE FOLLOWING CONDITIONS:
1. THE APPLICANT MUST REDESIGN THE STORMWATER MANAGEMENT FOR THIS SUBDIVISION TO MEET THE CURRENT ENVIRONMENTAL SITE DESIGN (ESD) REQUIREMENTS, AND THEREFORE, THE MAY 4, 2013 MDE GRANDFATHERING DEADLINE IS NO LONGER APPLICABLE TO THIS PROJECT'S DEADLINE.
2. THE ENVIRONMENTAL CONCEPT PLAN MUST BE SUBMITTED 30-DAYS PRIOR TO THE SUBMISSION OF THE FINAL PLAN.
3. THE FINAL PLAN SUBMISSION MUST BE SUBMITTED TO DPZ ON OR BEFORE JULY 28, 2013.
4. COMPLIANCE WITH PREVIOUS COMMENTS FROM THE DEVELOPMENT ENGINEERING DIVISION AND THE HEALTH DEPARTMENT.
15. THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE APRIL 13, 2004.
16. THERE ARE NO STEEP SLOPES (25% OR GREATER) IN EXCESS 20,000 S.F. ON THIS SITE BASED ON THE GIS INFORMATION.
17. A NOISE STUDY IS NOT REQUIRED FOR THIS DEVELOPMENT.
18. THIS SITE IS NOT LOCATED WITHIN THE METROPOLITAN DISTRICT. WATER AND SEWER WILL BE PRIVATE ON-SITE FACILITIES.
19. THE FOREST CONSERVATION ACT OBLIGATION FOR THIS PROJECT WILL BE MET BY THE ON-SITE RETENTION OF FOREST, ON-SITE REFORESTATION AND OFF-SITE REFORESTATION.

SHEET INDEX	
NO.	DESCRIPTION
1	ENVIRONMENTAL CONCEPT PLAN
2	ENVIRONMENTAL CONCEPT PLAN
3	ENVIRONMENTAL CONCEPT PLAN AND SEDIMENT CONTROL DETAILS
4	ENVIRONMENTAL CONCEPT PLAN AND SEDIMENT CONTROL NOTES

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11.15.13

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11-13-13

NO.	DATE	REVISION

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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. 22530, Expiration Date: 7-22-2015.

STATE OF MARYLAND — BRIAN F. CLEARY — PROFESSIONAL ENGINEER — 11/6/2013

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NANCY L. BROWN
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301.596.9882

DEVELOPER:
ELM STREET DEVELOPMENT
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SUITE 205
ELLICOTT CITY, MD 21042
410-720-3021

CLARKSVILLE CROSSING

LOTS 1 THRU 11 AND PRESERVATION PARCELS 'A', 'B', 'C' AND NON-BUILDABLE PARCEL 'D'

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

ENVIRONMENTAL CONCEPT PLAN

DATE: JUNE, 2013
DATE: NOVEMBER, 2013
BEI PROJECT NO: 2525-E

DESIGN: BFC DRAWN: BFC SCALE: AS SHOWN SHEET 1 OF 4

ECP-13-077

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LEGEND

SOILS CLASSIFICATION — AbC1
SOILS DELINEATION
EXISTING CONTOURS — 999
PROPOSED CONTOURS — 999
EXISTING WOODS LINE
PROPOSED WOODS LINE
EXISTING STRUCTURE
PROPOSED STRUCTURE
LIMIT OF DISTURBANCE
STABILIZED CONSTRUCTION ENTRANCE
SUPER SILT FENCE — SSF
EARTH DIKE
INLET PROTECTION
DRAINAGE AREA
FOREST CONSERVATION EASEMENT AREA
EXISTING SEPTIC FIELD
GUARDRAIL
IMPERVIOUS
NON-ROOFTOP DISCONNECT
ROOFTOP DISCONNECT — 75 @ 5%
BIORETENTION — MBR #
DRY WELL — DW
SPECIMEN TREE — ST26
STEEP SLOPES 15-24.99%
STEEP SLOPES 25%+
100YR FLOODPLAIN

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11.15.13

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11-13-13

2008 HOWARD COUNTY WEB SOIL SUVEY MAP #16

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

NO.	DATE	REVISION

BENCHMARK
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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. 21659, Expiration Date: 7-22-2015.

STATE OF MARYLAND — BRIAN F. CLEARY — No. 21659 — REGISTERED PROFESSIONAL ENGINEER — 11/6/2013

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CLARKSVILLE CROSSING

LOTS 1 THRU 11 AND PRESERVATION PARCELS 'A', 'B', 'C' AND NON-BUILDABLE PARCEL 'D'

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

ENVIRONMENTAL CONCEPT PLAN

DATE: JUNE, 2013
DATE: NOVEMBER, 2013
BEI PROJECT NO: 2189
DESIGN: BFC DRAWN: BFC
SCALE: AS SHOWN
SHEET 2 OF 4

ECP-13-077

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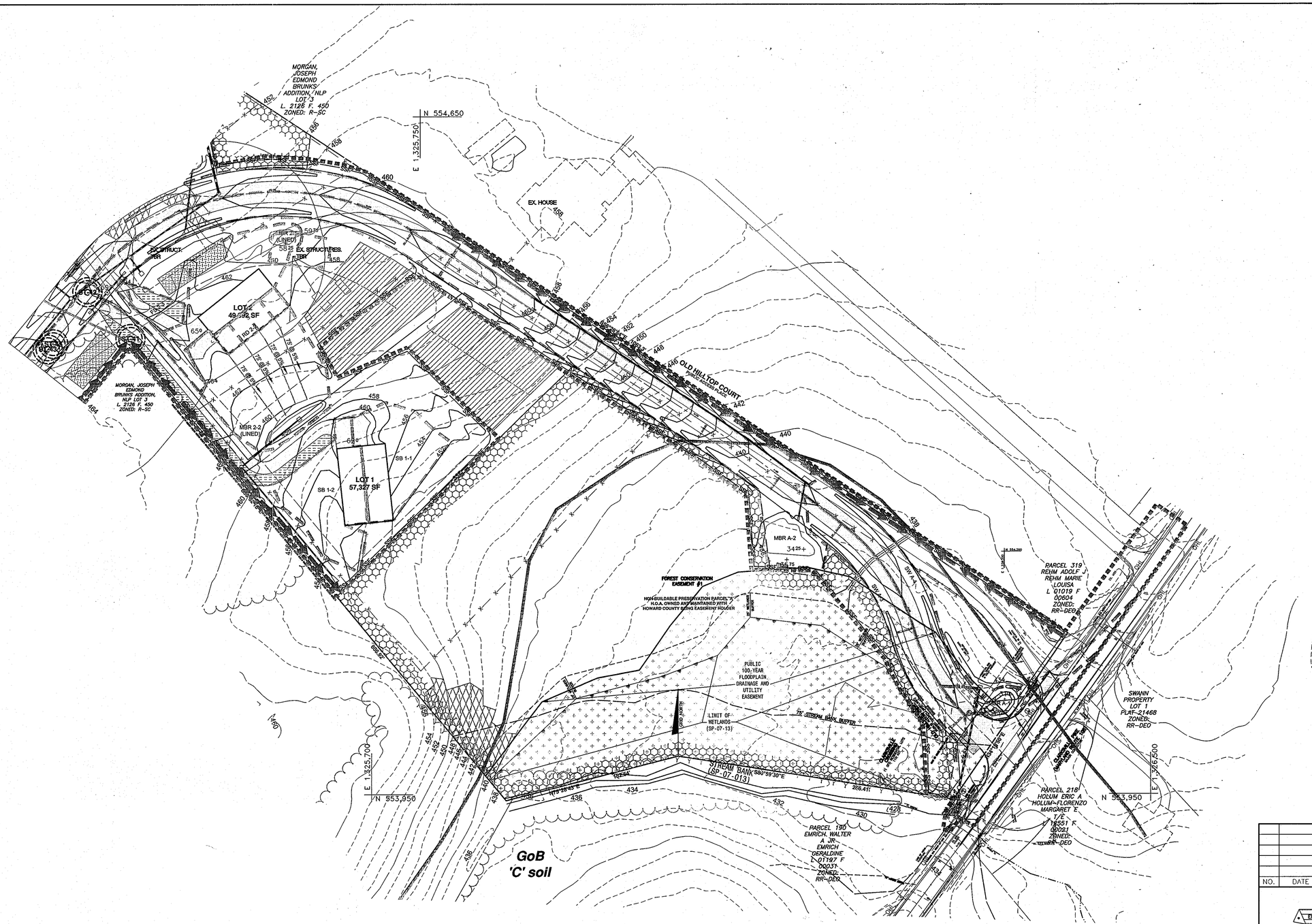

LEGEND

SOILS CLASSIFICATION	AbC1
SOILS DELINEATION	
EXISTING CONTOURS	999
PROPOSED CONTOURS	999
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
EXISTING STRUCTURE	
PROPOSED STRUCTURE	
LIMIT OF DISTURBANCE	
STABILIZED CONSTRUCTION ENTRANCE	
SUPER SILT FENCE	SSF
EARTH DIKE	
INLET PROTECTION	
DRAINAGE AREA	
FOREST CONSERVATION EASEMENT AREA	
EXISTING SEPTIC FIELD	
GUARDRAIL	
IMPERVIOUS	
NON-ROOFTOP DISCONNECT	
ROOFTOP DISCONNECT	75' @ 5%
BIORETENTION	MBR #
DRY WELL	DW
SPECIMEN TREE	ST@36
STEEP SLOPES 15-24.99%	
STEEP SLOPES 25%+	
100YR FLOODPLAIN	

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

2008 HOWARD COUNTY WEB SOIL SUVEY MAP #16

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11-15-13

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11-13-13

NO.	DATE	REVISION

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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. 29559, Expiration Date: 7-22-2015.

BRIAN F. CLEARY — STATE OF MARYLAND — 29559 — REGISTERED PROFESSIONAL ENGINEER — 11/6/2013

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CLARKSVILLE CROSSING

LOTS 1 THRU 11 AND PRESERVATION PARCELS 'A', 'B', 'C' AND NON-BUILDABLE PARCEL 'D'

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

ENVIRONMENTAL CONCEPT PLAN

DATE: JUNE, 2013
DATE: AUGUST, 2013
BEI PROJECT NO: 2189
DESIGN: BFC DRAWN: BFC
SCALE: AS SHOWN
SHEET 3 OF 4

ECP-13-077

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 grass 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.

A. 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 torn 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.

SEQUENCE OF CONSTRUCTION – INDIVIDUAL HOUSE

DAY 1	OBTAIN GRADING PERMIT.
DAY 2	THE CONTRACTOR(S) IS TO IDENTIFY AND MARK ANY HAZARDOUS CONDITIONS THAT MAY EXIST ONSITE, SUCH AS OVERHEAD POWERLINES, OLD WELLS, GAS LINES, ETC.
DAY 3–4	INSTALL STABILIZED CONSTRUCTION ENTRANCE, SILT FENCES AND DIVERSION DIKES.
DAY 4–10	INSTALL STORM DRAIN ESSENTIAL TO BYPASSING CLEAN WATER AND GRADE ROAD AREA AND STABILIZE IN ACCORDANCE WITH PERMANENT SEEDBED NOTES.
DAY 11	INSTALL EROSION CONTROL MATTING IN THE DITCHES AND SWALES.
DAY 12–60	CONSTRUCT ROADS, GRADE LOTS AND STABILIZE DISTRURBED AREAS.
DAY 61–63	STABILIZE ANY REMAINING DISTURBED AREAS IN ACCORDANCE WITH PERMANENT SEEDBED NOTES.
DAY 64–65	UPON APPROVAL OF HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL SEDIMENT CONTROL DEVICES. PERMANENTLY STABILIZE AS REQUESTED.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 11-15-13

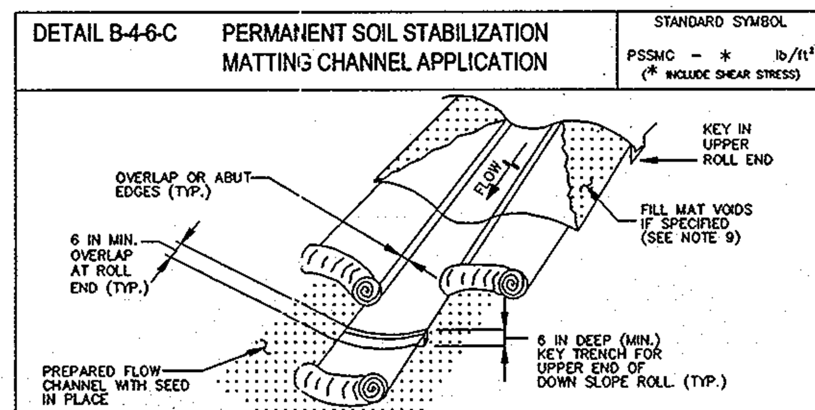
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

[signature] 11-13-13

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

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

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



CONSTRUCTION SPECIFICATIONS

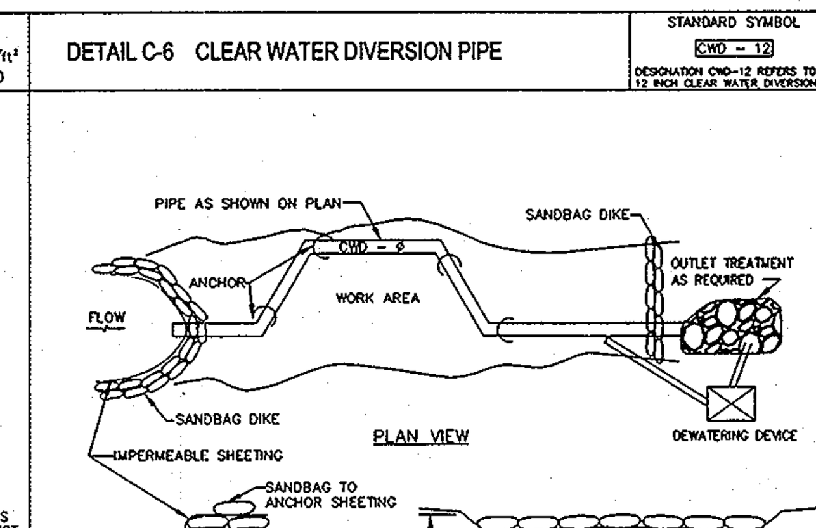
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN 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 C-6 CLEAR WATER DIVERSION PIPE

STANDARD SYMBOL: CWD – 12 (DESIGNATION CWD-12 REFERS TO 12 INCH CLEAR WATER DIVERSION.)



CONSTRUCTION SPECIFICATIONS

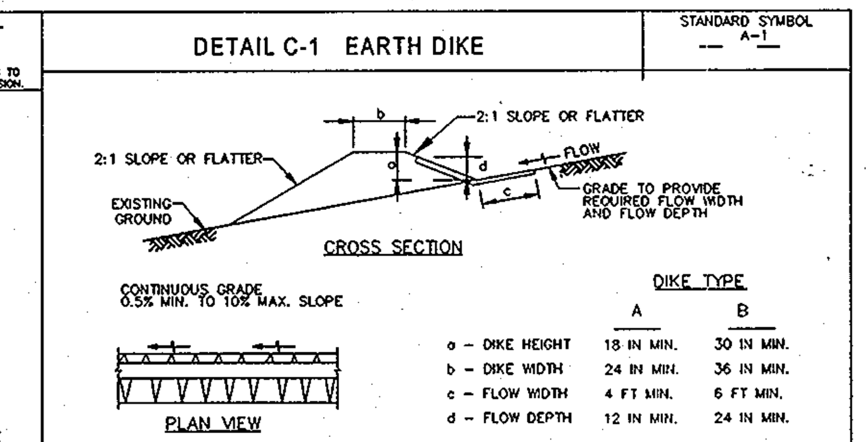
1. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATERTIGHT.
2. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
3. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNTURING AND TEARING.
4. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
5. SET HEIGHT OF SANDBAG DIKE AT TWICE THE PIPE DIAMETER. MAINTAIN HEIGHT ALONG LENGTH OF SANDBAG DIKE. PLACE DOUBLE ROW OF SANDBAGS.
6. AT A MINIMUM, SECURELY ANCHOR DIVERSION PIPE AT EACH DOWNGRADE JOINT.
7. SET OUTLET END OF DIVERSION PIPE LOWER THAN INLET END.
8. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
10. KEEP POINT OF DISCHARGE FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

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



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

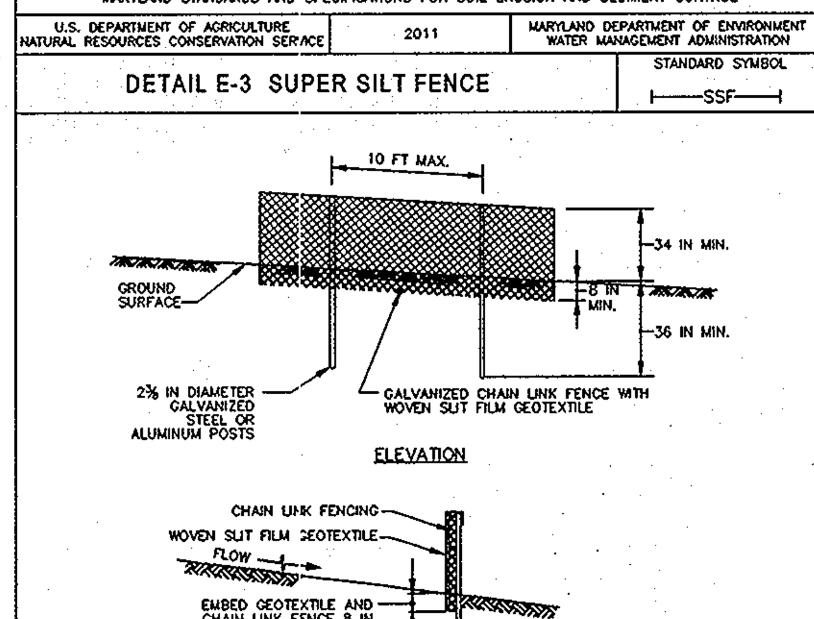
1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT 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

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

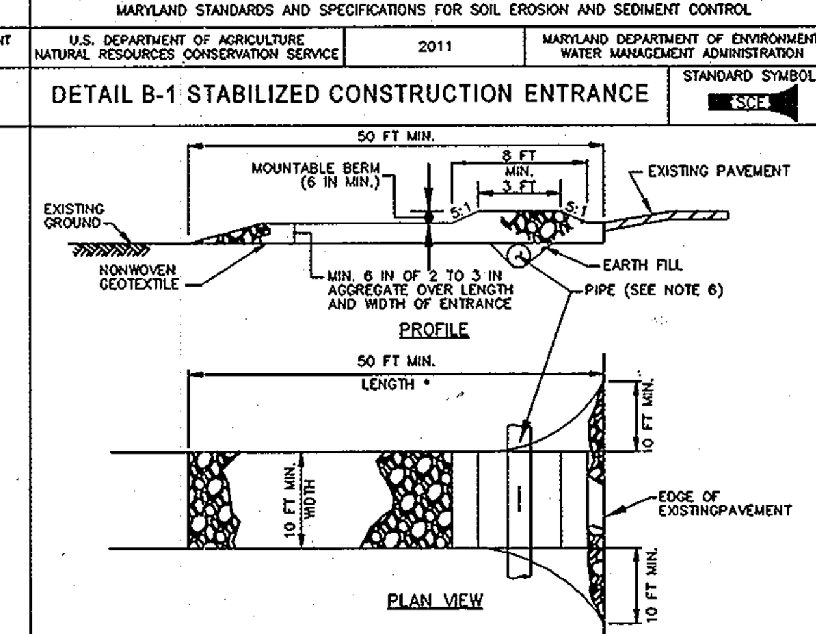
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY 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 B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

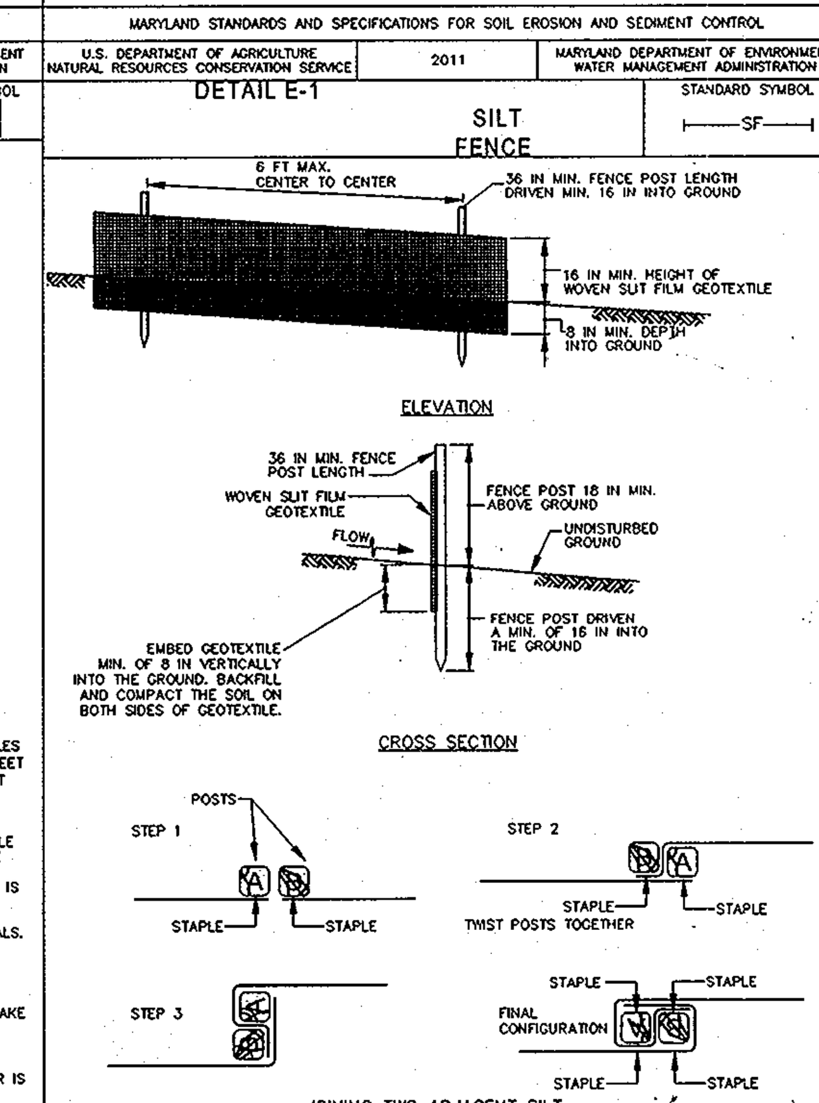
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING 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 E-1 SILT FENCE

STANDARD SYMBOL: SF



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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-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅛ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE 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 SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

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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

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-4-4 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.

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.

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.

Total Area of Site	24.60	Acres
Area Disturbed	13.27	Acres
Area to be roofed or paved	3.13	Acres
Area to be vegetatively stabilized	10.14	Acres
Total Cut	tbd	Cu. Yds.
Total Fill	tbd	Cu. Yds.

Offsite waste/borrow are location SITE WITH APPROVED GRADING PLAN

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 ac. 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 be 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. Rev. 4/2013

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.

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.

NO.	DATE	REVISION

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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] 11/6/2013

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CLARKSVILLE CROSSING

LOTS 1 THRU 11 AND PRESERVATION PARCELS 'A', 'B', 'C' AND NON-BUILDABLE PARCEL 'D'

TAX MAP: 34 GRID: 23 PARCEL: 301 ZONED: RR-DEO
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

ENVIRONMENTAL CONCEPT PLAN
SEDIMENT AND EROSION CONTROL
NOTES AND DETAILS

DATE: JUNE, 2013		BEI PROJECT NO:	2525-E
DATE: NOVEMBER, 2013			
DESIGN: BFC	DRAWN: BFC	SCALE: AS SHOWN	SHEET 4 OF 4

ECP-13-077