GENERAL NOTES RESIDENTIAL SITE DEVELOPMENT PLAN STAMPED DISC ON CONCRETE MONUMENT. 1.) THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE 2) THE SUBJECT PROPERTY IS ZONED R-SC PER THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN. STAMPED DISC ON CONCRETE MONUMENT. BÁSED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NO. 37AB AND CORNER MD. RT. 108 & MAYFIELD AVENUE WOODBROOK E 1,370,661.967 4.) TRACT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED ON OR ABOUT APRIL, 2015 5.) A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT. 6.) THE TRAFFIC STUDY WAS PREPARED BY MARS GROUP, INC. IN MARCH, 2014. 7.) THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT. THE WATER AND SEWER IS PUBLIC. THE SECTION 2, PHASES 1 AND 2, 8.) THIS SUBDIVISION IS SUBJECT TO SECTION 18.122B OF THE HOWARD COUNTY CODE. PUBLIC WATER AND/OR SEWER SERVICE HAS BEEN GRANTED UNDER THE TERMS AND PROVISIONS, THEREOF, EFFECTIVE MARCH 7, 2015, LOTS 63-70 AND OPEN SPACE LOTS 71 AND 72 18.122.B OF THE HOWARD COUNTY CODE. PUBLIC WATER AND SEWERAGE ALLOCATION WILL BE GRANTED AT TIME OF ISSUANCE OF BUILDING PERMIT IF CAPACITY IS AVAILABLE AT THAT TIME. 10.) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON-SITE. 11.) THERE ARE NO HISTORIC SITES/FEATURES LOCATED ON THIS SITE. 12.) THERE ARE WETLANDS, STREAMS AND THEIR REQUIRED BUFFERS, LOCATED ON THIS SITE. THERE IS NO 13.) THERE ARE NO STEEP SLOPES THAT 25% OR GREATER THAT IS MORE THAN A CONTIGUOUS 20,000 sf 14.) DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIR 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. ADDRESS CHART -FOOT DEPTH OVER DRIVEWAY. f) STRUCTURE CLEARANCES - MINIMUM 12 FEET. g) MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE. STREET ADDRESS 15.) THE WETLAND DELINEATION AND FOREST STAND DELINEATION WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. IN MARCH, 2014. 63 6202 WALTER WAY WOODBROOK 6206 WALTER WAY SECTION 2 PHASE BULK PARCEL "B" 17.) IN ACCORDANCE WITH SECTION 128.0.A.1 OF THE HOWARD COUNTY ZONING REGULATIONS, BAY WINDOWS, 6210 WALTER WAY 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 ZONED: R-SC 6209 WALTER WAY 6205 WALTER WAY 18.) NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING OR NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAM(S), THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS OR 100 YEAR FLOODPLAIN EXCEPT AS APPROVED THE HOWARD COUNTY, DEPARTMENT OF PLANNING AND ZONING. 6201 WALTER WAY 6251 WOODCREST DRIVE 6247 WOODCREST DRIVE SPACE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF \$3,750.00 (\$300 FOR EACH OF THE 10 SHADE TREES, \$150 FOR THE 5 EVERGREENS) FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE BUILDER'S GRADING PERMIT. LANDSCAPING FOR SECTION 2, PHASE 1 WAS PROVIDED AT THE TIME OF THE REFORESTATION OF 0.32 AC. WITHIN A FOREST CONSERVATION EASEMENT. FINANCIAL SURETY IN THE AMOUNT OF \$10,486 FOR THE PLANTING WAS POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT, F-15-096. RESIDENTS OF THIS SUBDIVISION AT THE TIME OF FINAL PLAT RECORDATION. THE ARTICLES OF INCORPORATION AND RESTRICTIONS FOR THE HOMEOWNERS ASSOCIATION ARE AS ON THE RECORD PLATS. THE "MARYLAND DEPARTMENT OF THE ENVIRONMENT STORMWATER MANAGEMENT ACT OF 2007" AND THE "HOWARD COUNTY DESIGN MANUAL VOLUME I, CHAPTER 5" TO THE MAXIMUM EXTENT PRACTICAL (MEP) VIA M-6 MICRO-BIORETENTION PRACTICES, M-3 LANDSCAPE INFILTRATION PRACTICE AND M-5 DRY WELLS. THE PRACTICES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED. THE STORMWATER MANAGEMENT WAS APPROVED 25.) ON JUNE 8, 2015, WP-15-140 WAS APPROVED BY THE DEPARTMENT OF PLANNING AND ZONING. THE FOLLOWING SECTIONS OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS WERE WAIVED; SECTION 16.121(a)(2), 16.121(e)(1), 16.144(b) & 16.145, 16.144(g) & 16.146 AND 16.1205(a)(7). APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS: 1. THE PETITIONER MUST RECEIVE APPROVAL OF F-15-096 WOODBROOK, SECTION 2 PHASE 1, TO CONSOLIDATE THE 3 PARCELS AND CREATE 3 BUILDABLE LOTS AND 2 NON-BUILDABLE BULK PARCELS. 2. ADD THE WAIVER PETITION, WP-15-140 ON F-15-096, SECTION 2, PHASE 1 AS GENERAL NOTE STATING THE REQUEST, THE APPROVAL DATE AND CONDITIONS IN WHICH IT WAS APPROVED. 3. A NOTE SHALL BE PROVIDED ON THE FINAL PLAN FOR F-15-096 AND THE SUPPLEMENTAL PLAN THAT THE 25% OPEN SPACE REQUIREMENT WILL BE TEMPORARILY DEFERRED UNDER SECTION 2, PHASE 1, F-15-096 AND WILL BE PROVIDED IN ITS ENTIRETY UNDER SECTION 2. PHASE 2 OF WOODBROOK. SPACE 4. A 12' ACCESS DRIVE WILL BE REQUIRED FOR THE OPEN SPACE ACCESS. A GENERAL NOTE SHOULD BE ADDED TO THE FINAL PLAN AND ALSO STATE THAT HOWARD COUNTY WILL NOT BE RESPONSIBLE FOR THE MAINTENANCE OF THE OPEN SPACE ACCESS DRIVE IF THE OPEN SPACE LOT IS DEDICATED TO HOWARD 5. SHOW THE 1 SPECIMEN TREE BEING REMOVED AND LABELED PER WP-15-140 ON THE SUPPLEMENTAL PLAN FOR F-15-096. THE SPECIMEN TREE REMOVAL SHALL BE MITIGATED BY THE PLANTING OF 2 PERIMETER SHADE TREES OF 3" CALIPER. PETITIONER SHALL ADDRESS ALL COMMENTS FROM ALL SRC AGENCIES FOR F-15-096. COMPLY WITH ALL COMMENTS FOR THE APPROVED ECP-14-081. 26.) THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK. 27.) THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY NOTE: THE MODERATE INCOME HOUSING UNIT REQUIREMENT COUNCIL BILL 35-2013) SHALL BE FULFILLED BY PAYMENT OF A FEE-IN-LIEU IN AN AMOUNT THAT IS TO BE CALCULATED 28.) EXISTING TOPOGRAPHY SHOWN HEREON WAS FIELD RUN BY BENCHMARK ENGINEERING, INC IN FEBRUARY, 2014. THE DEPARTMENT OF INSPECTIONS LICENSES AND PERMITS CONTOUR INTERVAL IS 2 FEET. AT THE TIME OF BUILDING PERMIT. THE JEE-IN-LIEU SHALL 1 inch = 30 ftBE PAID FOR LOTS 64 AND 66-70 WITHIN THIS SUBDIVISION SITE ANALYSIS DATA CHART T TIME OF BUILDING PERMIT ISSUANCE. A.) TOTAL PROJECT AREA. PLAN VIEW GENERAL NOTES CONT _R-SC (SINGLE CLUSTER) 29.) EXISTING UTILITIES SHOWN HEREON ARE BASED ON FIELD LOCATIONS AND RECORD DRAWINGS. E.) PROPOSED USE OF SITE:__ _RESIDENTIAL SINGLE FAMILY DETACHED 30.) ANY DAMAGE TO THE COUNTY'S RIGHT OF WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE. NO. DATE REVISION F.) FLOOR SPACE ON EACH LEVEL OF BLDG PER USE ___ N/A 31.) SHC ELEVATIONS SHOWN ARE LOCATED AT THE PROPERTY LINE OR EASEMENT LINE. 32.) FOR DRIVEWAY ENTRANCES DETAILS REFER TO THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed profession AS SHOWN ON FINAL PLAT(S)__ **BENCHMARK** engineer under the laws of the State of Maryland, License No. 45577; Expiration Date: 06-08-2016 H.) TOTAL NUMBER OF UNITS PROPOSED_ I.) MAXIMUM NUMBER OF EMPLOYEES, TENANTS ON SITE PER USE _____ ENGINEERING, INC .) NUMBER OF PARKING SPACES REQUIRED BY HO. CO. ZONING REGS AND/OR FDP CRITERIA _____ 20 (8 UNITS x 2.5) .) NUMBER OF PARKING SPACES PROVIDED ONSITE (P) 410-465-6105 (F) 410-465-6644 (INCLUDES HANDICAPPED SPACES) ____ 24 (1 FOR EACH GARAGE AND 2 FOR EACH DRIVEWAY WWW.BEI-CMILENGINEERING.COM M.) AREA OF RECREATIONAL OPEN SPACE REQUIRED____ N/A AREA OF RECREATIONAL OPEN SPACE PROVIDED____ N/A N.) BUILDING COVERAGE OF SITE_ PERCENTAGE OF GROSS AREA_ WOODBROOK OWNER/DEVELOPER: O.) APPLICABLE DPZ FILE REFERENCES: _ SECTION 2, PHASES 1 AND 2, LOTS 63-70 SHEET INDEX SECURITY DEVELOPMENT, LLC AND OPEN SPACE LOTS 71 AND 72 P.O. BOX 417 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING SHEET ELLICOTT CITY, MARYLAND 21041 TAX MAP 37, GRID 14 PARCELS 126, 488 AND 530 TITLE SHEET 410-465-4244 PERMIT INFORMATION CHART 1st ELECTION DISTRICT WOODCREST DRIVE SITE DEVELOPMENT PLAN HOWARD COUNTY, MARYLAND CHIEF, DEVELOPMENT ENGINEERING DIVISION SUBDIVISION NAME: LOT/PARCEL # SECTION/AREA: WILLIAMSBURG GROUP LLC SEDIMENT AND EROSION CONTROL & STORMWATER MANAGEMENT PLAN WOODBROOK 5485 HARPERS FARM ROAD LOTS 63 thru 70 STORMWATER MANAGEMENT NOTES AND DETAILS TITLE SHEET THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU PHASES 1 & SUITE 200 OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT STORMWATER MANAGEMENT NOTES AND DETAILS COLUMBIA, MARYLAND 21044 ELECTION CENSUS LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK. TAX MAP

SEDIMENTS AND EROSION CONTROL NOTES & DETAILS

ANDSCAPE PLAN, NOTES AND DETAILS

TRACT:

410-964-4440

Draft: JC Check:

SCALE: AS SHOWN

PROJECT NO. 2370

DRAWING 1 OF 7

SDP-16-058

DISTRICT

1st

23804-23805

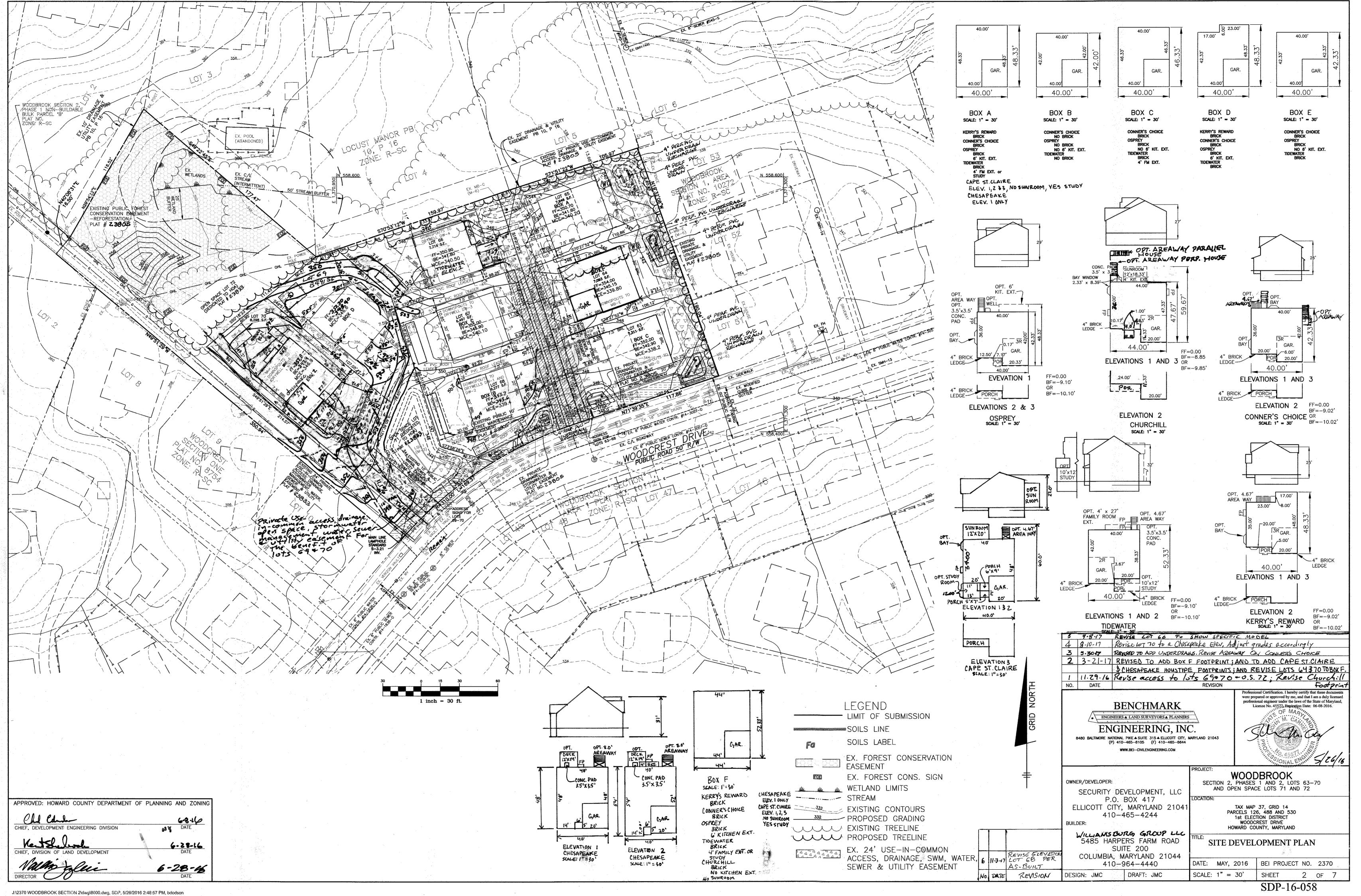
23632-23033

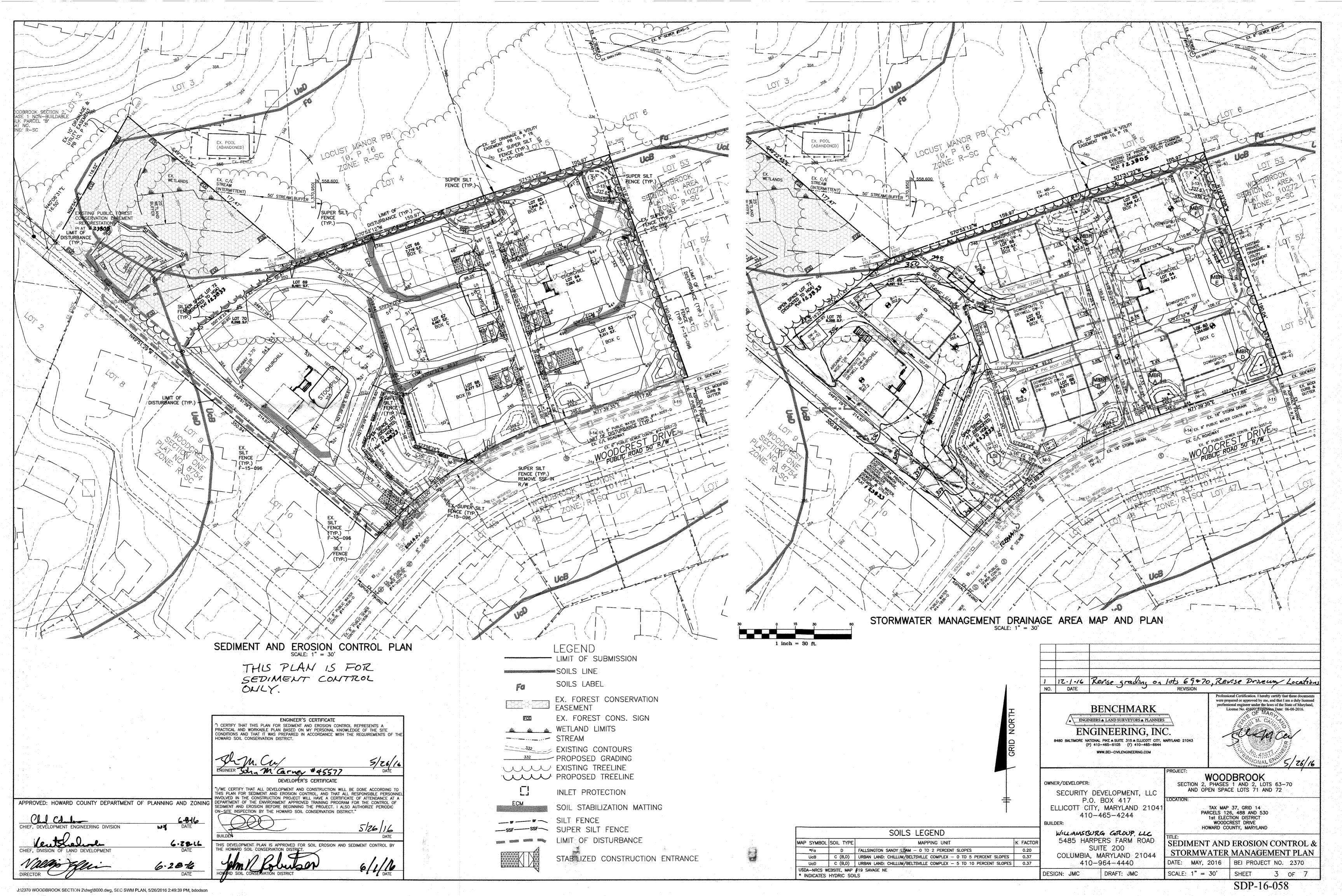
R-SC

14

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST

48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.





CONSTRUCTION SPECIFICATIONS These specifications are appropriate to all ponds within the scope of the Standard for 3. Laying pipe — Bell and spigot pipe shall be places with the bell end upstream. Joints Site Preparation shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped to topsoil. All trees, vegetation, roots and other objectionable material under the pipe are filled. Care shall be exercised to prevent any deviation form the original shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. line and grade of the pipe. The first joint must be located within 4 feet from the riser. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment 4. Backfilling shall conform to "Structure Backfill". Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and 6. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings. stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be Plastic Pipe - The following criteria shall apply for plastic pipe: 1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or All cleared and grubbed material shall be disposed of outside and below the limits of the ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4' - 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S. dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas. 2. Joints and connections to anti-seep collars shall be completely watertight. 3. Bedding — The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support. <u>Material</u> — The fill material shall be taken from approved designated borrow areas. If shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable material. Fill material for the center of the embankment, and cut off trench 4. Backfilling shall conform to "Structure Backfill". passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have 5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings. onstruction supervised by a geotechnical engineer. <u>Drainage Diaphragms</u> - When a drainage diaphragm is used, a registered professional Materials used in the outer shell of the embankment must have the capability to support engineer will supervise the design and construction inspection. vegetation of the quality required to prevent erosion of the embankment. <u>Placement</u> — Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are Concrete shall meet the requirements of Maryland Department of Transportation, State to be continuous over the entire length of the fill. The most permeable borrow material shall Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3. be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment. <u>Compaction</u> — the movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one Rock riprap shall meet the requirements of Maryland Department of Transportation, State tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with teh Highway Administration Standard Specifications for Construction and Materials, Section 311. Geotextile shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C. equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out. When required by the reviewing agency the minimum required density shall not be less than Care of Water during Construction % of maximum dry density with a moisture content within ± 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T—99 (Standard Proctor). All work on permanent structures shall be carried out in areas free from water. The contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the <u>Cut Off Trench</u> — The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of permanent works. The contractor shall also furnish, install, operate, and maintain all ecessary pumping and other equipment required for removal of water from various parts o the work and for maintaining the evacuations, foundation, and other parts of the work free the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be a least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the compacted with construction equipment, rollers, or hand tampers to assure maximum density of water to the spillway or outlet works and so as not to interfere in any way with the and minimum permeability. operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the exten <u>Embankment Core</u> — The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the cores shall be a minimum of four feet. The that will maintain stability of the excavated slopes and bottom required excavations and will

draining the water sumps from which the water shall be pumped.

(MD-342) or as shown on the accompanying drawings.

be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural

vill be followed. Construction plans shall detail erosion and sediment control measures.

B-9

purces Conservation Service Standards and Specifications for Critical Area Planting

height shall extend up to at least the 10 year water elevation or as shown on the plans

The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction

equipment, rollers, or hand tampers to assure maximum density and minimum permeability In addition, the core shall be placed concurrently with the outer shell of the embankment.

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that

exceed four inches in thickness and compacted by hand tampers or other manually directed

compaction equipment. The material needs to fill completely all spaces under and adjacent

to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no

specified for the adjoining fill material. The fill shall be placed in horizontal layers not to

circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of

ransportation, State Highway Administration Standard Specifications for Construction and

unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and

minimum resistively of 2,000 ohm—cm. Material shall be placed such that a minimum of 6"

(measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding),

over and, on the sided of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate

measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in

horizontal layers not to exceed four inches in thickness and compacted by hand tampers or

equipment be allowed to operate closer than four feet, measured horizontally, to any part of

a structure. Under no circumstances shall equipment be driven over any part of a structure

or pipe unless there is a compacted fill of 24' or greater over the structure or pipe. Backfill material outside the structural backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment

other manually directed compaction equipment. The material shall completely fill all voids

adjacent to the flowable fill zone. At no time during the backfilling operation shall driven

Corrugated Metal Pipe — all of the following criteria shall apply for corrugated metal pipe:

Maerials — (Aluminum Coated Steel Pipe) — This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M—274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound.

Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of

Materials — (Aluminum Pipe) — This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M—196 or M—211 with watertight coupling bands or

be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip

use of rubber or plastic insulating materials at least 24 mils in thickness.

galvanized bolts may be used for connections. The pH of the surrounding soils shall be

flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO

Specification M-190 Type A. Aluminum surfaces that are to be contact with concrete shall

2. Coupling bands, anti—seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with

3. Connections - All connections with pipes must be completely watertight. The drain pipe or

barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely

All connection shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re—rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in

diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, prepunched to the flange bolt circle, sandwiched between adjacent flanges; a 12—inch wide standard lap type band with 12—inch wide by 3/8—inch thick closed cell circular

minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24—inch wide by 3/8—inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the

Helically corrugated pipe shall have either continuously welded seams or have lock seams

removed and replaced with suitable earth compacted to provide adequate support.

6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

4. Bedding — The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be

Reinforced Concrete Pipe-All of the following criteria shall apply for reinforced concrete pipe:

1. Materials — Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding — Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under

the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum

thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used a described in the "Structure Backfill" section of this standard. Gravel

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

6.58-16

6-28-16

neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a

1. Materials — (Polymer Coated steel pipe) — Steel pipes with polymeric coatings shall bave a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 &

All pipes shall be circular in cross section

M-246 with watertight coupling bands or flanges.

zinc chromate primer or two coats of asphalt.

with internal caulking or a neoprene bead.

bedding is not permitted.

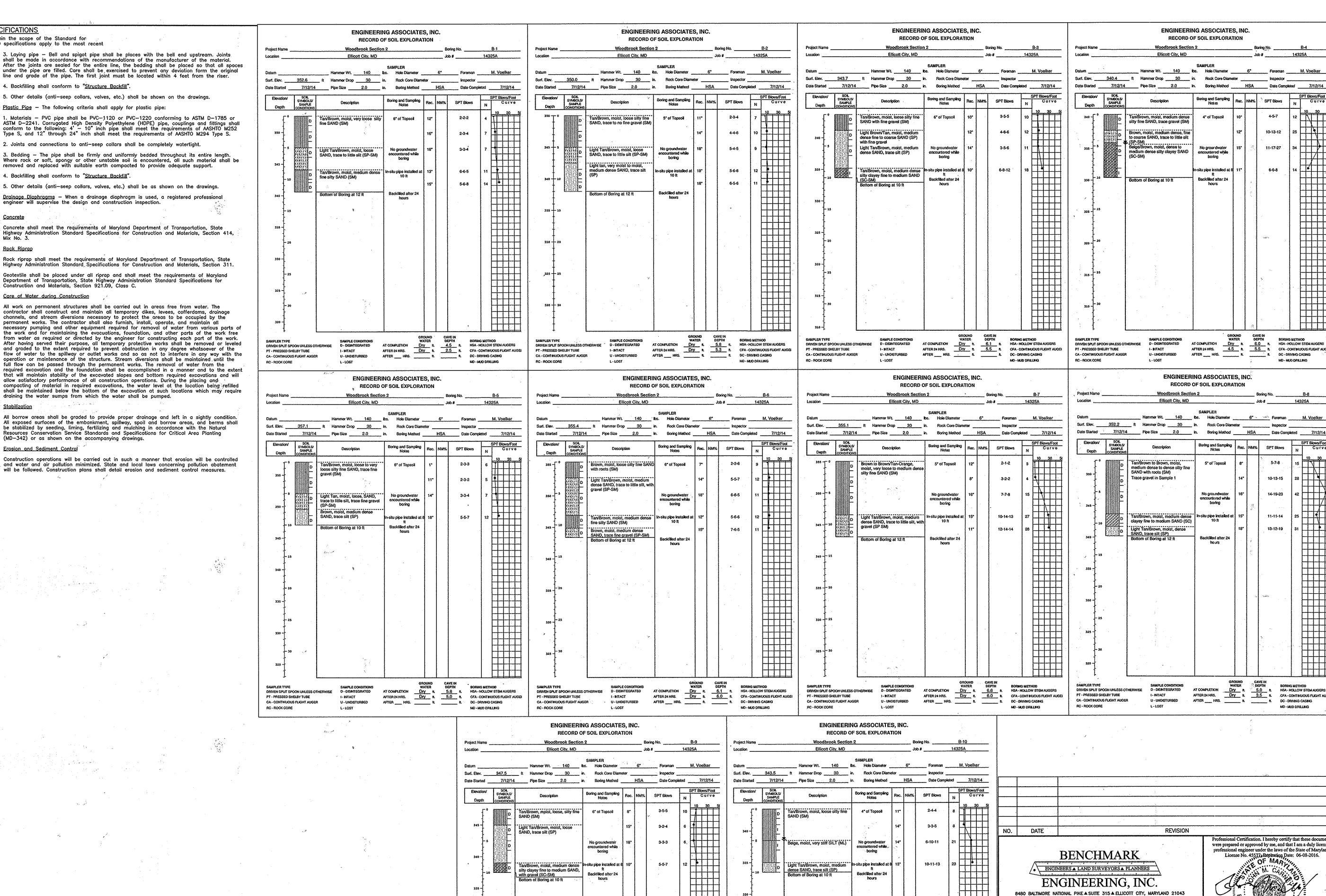
Backfilling shall conform to "Structure Backfill".

CHIEF, DEVELOPMENT ENGINEERING DIVISION

16, I Shelwole

HIEF, DIVISION OF LAND DEVELOPMEN

Materials. Section 313 as modified. The mixture shall have a 100-200 psi: 28 day



OWNER/DEVELOPER: Approximate Measured In-situ Depth of Test Infiltration Rate BUILDER: 22.5 GROUND WATER AT COMPLETION Dry ft.
AFTER 24 HRS. Dry ft. AT COMPLETION HSA - HOLLOW STEM AUGERS HSA - HOLLOW STEM AUGERS DRIVEN SPLIT SPOON UNLESS OTHERWISE CFA - CONTINUOUS FLIGHT AUG 1-INTACT AFTER 24 HRS. I-INTACT CFA - CONTINUOUS FLIGHT AUGE PT - PRESSED SKELBY TUBE AFTER ____ HRS. _____ ft. CA - CONTINUOUS FLIGHT AUGER U - UNDISTURBED CA - CONTINUOUS FLIGHT AUGER U - UNDISTURBED DC - DRIVING CASING DESIGN: JMC L LOST

RC - ROCK CORE

MD - IAJD DRALING

L - LOST

WOODBROOK SECTION 2, PHASES 1 AND 2, LOTS 63-70 AND OPEN SPACE LOTS 71 AND 72 TAX MAP 37, GRID 14 PARCELS 126, 488 AND 530 1st ELECTION DISTRICT WOODCREST DRIVE HOWARD COUNTY, MARYLAND STORMWATER MANAGEMENT NOTES AND DETAILS

Professional Certification. I hereby certify that these docum

were prepared or approved by me, and that I am a duly licenses

professional engineer under the laws of the State of Maryland

ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

4" of Toosoil

u pipe installed a

GROUND WATER

Hammer Wt. 140 tbs. Hole Diameter 6" Foreman M. Voelker

acklited after 24

Pipe Size 2.0 in. Boring Method HSA Date Completed 7/12/14

AT COMPLETION

AFTER 24 HRS.

ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Backfilled after 2

Hammer Wt. 140 bs. Hole Diameter 6" Foreman M. Voelker

14325A

HSA - HOLLOW STEM AUGERS

CFA - CONTINUOUS FLIGHT AUG

DC - DRIVING CASING

MO - MUD ORRLING

5-7-8

10-13-15

14-19-23

11-11-14

13-12-19

.CFA - CONTINUOUS FLIGHT AUG

Date: 06-08-2016.

DC - DRIVING CASING

10-13-12

11-17-27

6-6-8

Efficott City, MD

Tan/Brown, moist, medium dens

ilty fine SAND, trace gravel (SN

to coarse SAND, trace to little sil

nedium dense silty clayey SAND

Bottom of Boring at 10 f

E- INTACT

an/Brown to Brown, mols

SAND with roots (SM)

Frace gravel in Sample 1

clayey fine to medium SAND (So

ight Tan/Brown, moist, dense

I - INTACT

REVISION

DATE: MAY, 2016

SCALE: AS SHOWN

(P) 410-465-6105 (F) 410-465-6644

WWW.BEI-CIVILENGINEERING.COM

SECURITY DEVELOPMENT, LLC P.O. BOX 417

ELLICOTT CITY, MARYLAND 21041

410-465-4244

WILLIAMSBURG GROUP LLC 5485 HARPERS FARM ROAD

SUITE 200

COLUMBIA, MARYLAND 21044

410-964-4440

DRAFT: JMC

ND, trace silt (SP)

U - UNDISTURBED

Ellicott City, MD

SDP-16-058

SHEET

BEI PROJECT NO. 2370

4 of 7

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 microbioretention 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

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

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

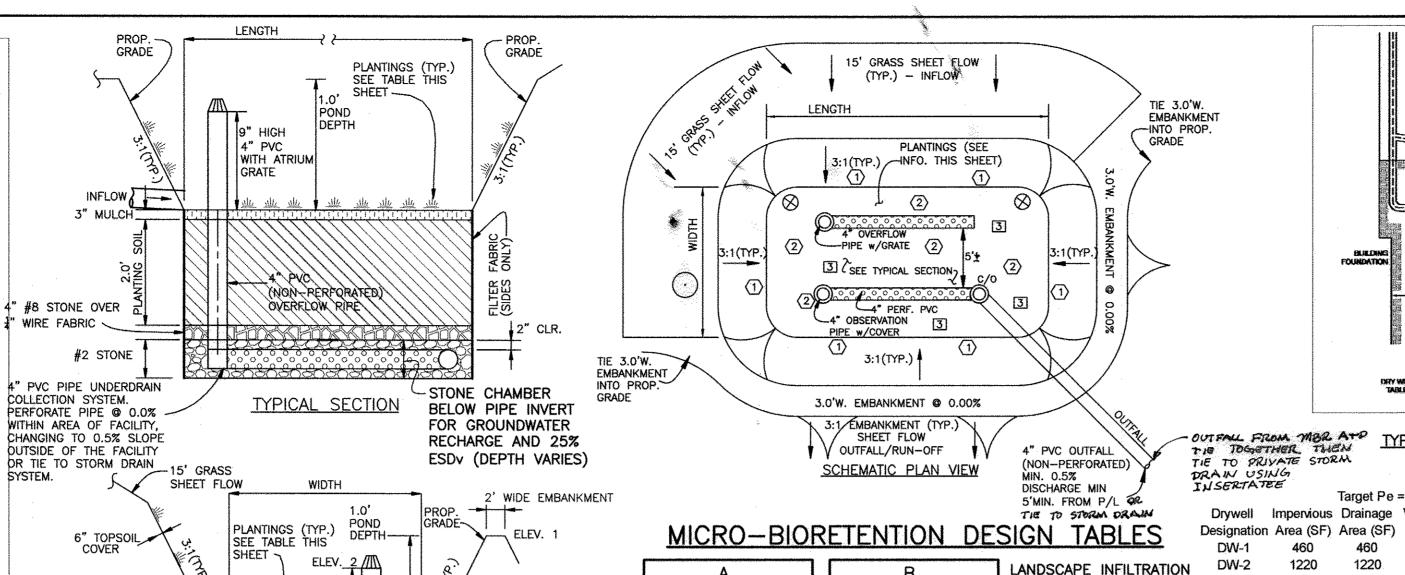
Underdrains should meet the following criteria:

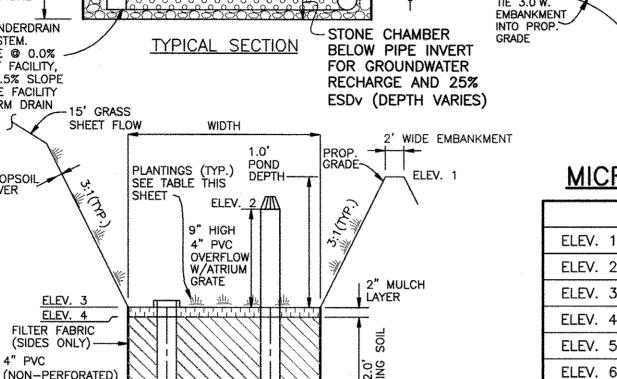
- Pipe-Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g.,
- Perforations If perforated pipe is used, perforations should be 3/8" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/2" (No. 4 or 4x4) galvanized
- Gravel The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the
- The main collector pipe shall be at a minimum 0.5% slope.
- A rigid, non-perforated observation well must be provided (one per every 1,0000 square feet) to
- provide a clean-out port and monitor performance of the filter. A 4" layer of pea gravel (1/4" to 1/4" stone) shall be located between the filter media and underdrain
- to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

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

These practices may not be constructed until all contributing drainage area has been stabilized MICRO-BIORETENTION (M-6) MICRO-BIORETENTION (M-6) LANDSCAPE DATA PLANTING DATA

HYDROLOGIC ZONE 3 — REGULARLY INUNDATED SHORELINE FRINGE (HIGH MARSH) HYDROLOGIC CONDITION — 0" TO 1'-0" DEEP HARDINESS — TEMPERATE ZONE 6b (-5' TO 0') SEE SHEET _ FOR SEQUENCE OF CONSTRUCTION NOTE: REFER TO MDE 2000 MD STORMWATER DESIGN MANUAL VOLUMES 1 & 2 FOR LANDSCAPE CONTRACTOR RESPONSIBILITIES, PRACTICES AND MAINTENANCE DUTIES	PLANTINGS WITHIN THE PONDING AREA OF THE LS ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE SUGGESTED SPECIES: CREEPING BUGLEWEED (AJUGA REPTANS) COMMON PERIWINKLE (VANCA MINOR) LILY—TURF (LIRIOPE, SP.) PLANTINGS ALONG THE PERIMETER (BERM) AREA O INFILTRATION ARE TO BE OF A LOW TO MEDIUM WATEI SUGGESTED SPECIES:(PERENNIALS/ANNUALS) IRIS (IRIS VERSICOLOR) DAYLLY (HEMEROCALLIS SP.) WHITE GLORY (ASTIBLE SP.)
APPROVED: HOWARD COUNTY DEPARTMENT	OF PLANNING AND ZONING
Chil Chuls	6816
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE.
CHIEF, DIVISION OF LAND DEVELOPMENT	6-28-16 DATE





ELEV. 6 #2 STONE -STONE CHAMBER 4" PVC PIPE UNDERDRAIN_ COLLECTION SYSTEM. BELOW PIPE INVERT PERFORATE PIPE @ 0.0% FOR GROUNDWATER WITHIN AREA OF FACILITY RECHARGE AND 25% CHANGING TO 0.5% SLOPE ESDv (DEPTH VARIES) OUTSIDE OF THE FACILITY

TYPICAL MICRO-BIORETENTION DETAILS

UNDERDRAIN, OVERFLOW AND OUTFALL NOTES

OBSERVATION -

PIPE W/CAP

- 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
- 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.

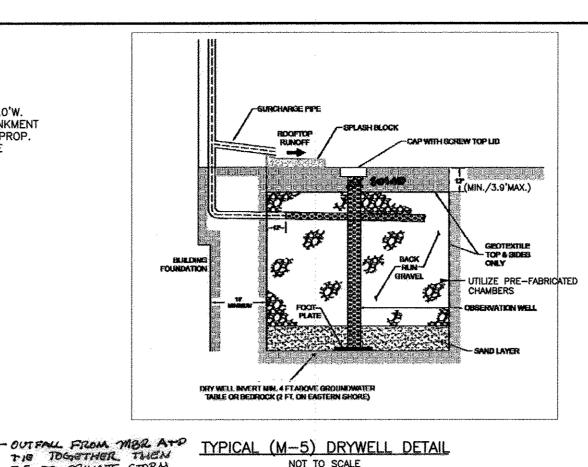
MICRO-BIORETENTION (M-6) CONSTRUCTION SPECIFICATIONS

I. THE SUBGRADE FOR ALL BIORETENTION COMPONENTS SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL EMBANKMENTS SHALL PREPARED BY STRIPPING TOPSOIL AND ANY OTHER LINSUITABLE MATERIALS FROM THE AREAS, AND BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY REFERENCED TO AASHTO T-99 (STANDARD PROCTOR). 2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER. GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING CUTTING OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT. 4. STONE FOR THE RIP-RAP OR LEVEL SPREADERS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR LEVEL SPREADERS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. STONE SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT

5. THE STONE LINER SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND, IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

LANDSCAPE INFILTRATION FACILITY A B D E								
	^	В	D	_				
AREA (SF)	111	85	124	110				
PLANTINGS								
AJUGA REPTANS								
(CREEPING BUGLEWEED)	4	3	4	4				
IRIS VERSICOLOR (IRIS)	4	3	4	4				
CLETHRA (COMMON								
PERIWINKLE)	2	1	2	2				
ELYMUS VIRGINICUS								
(VIRGINIA WILD RYE)	2	1	2	2				
VACCINIUM ATROCOCCUM								
(HIGHBUSH BLUEBERRY)	2	1	2	2				
BETULA NIGRA (RIVER								
BIRCH)	1	1	1	1				

PLANTINGS WITHIN THE PONDING AREA OF THE LS INFILTRATION ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE SUGGESTED SPECIES:					
CREEPING BUGLEWEED (AJUGA REPTANS) COMMON PERIWINKLE (VINCA MINOR)	MICRO-BIORETENTION PLANTING LEGEND				
LILY-TURF (LIRIOPE, SP.) 2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE LS	SYMBOL	NAME			
INFILTRATION ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE SUGGESTED SPECIES:(PERENNIALS/ANNUALS) IRIS (IRIS VERSICOLOR) DAYLILY (HEMEROCALLIS SP.)	1)	AJUGA REPTANS (CREEPING BUGLEWEED)			
T OF PLANNING AND ZONING	2	IRIS VERSICOLOR (IRIS)			
6846		CLETHRA (COMMON PERIWINKLE)			
DATE 6-22L6	Δ	ELYMUS VIRGINICUS (VIRGINIA WILD RYE)			
DATE	, O	VACCINIUM ATROCOCCUM (HIGHBUSH BLUEBERRY)			
6-28-66 DATE	\bigcirc	BETULA NIGRA (RIVER BIRCH)			



Target Pe =

Runoff

0.95

0.95

0.95

0.95

0.95

5.00

5.00

5.00

-4 OZ. [113g] NON-WOVER FILTER FABRIC AT

4" DRAIN POP-UP EMITTER-

STONE/SOIL INTERFACE

Impervious Drainage Volumetric

460

1220

1853

1693

1831

1870

Width

7.00

FOR SIDE BY SIDE

CHAMBERS ONLY PVC

RECOMMENDED INSTALLATION OF STORMCHAMBER

FOR STORMWATER MANAGEMENT

(PROVIDED AS AN ILLUSTRATED EXAMPLE ONLY)

UPFLOW END

DOWNFLOW END

TABLE B.4.1 MATERIALS AND SPECIFICATIONS FOR (M-6) MICRO-BIORETENTION

PLANTINGS ARE SITE SPECIFIC

USDA SOIL TYPES: LOAMY SAND, SANDY LOAM; CLAY CONTENT <5

DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND

SIZE

FOR UNPAVED AREAS

4 .

CONNECTING

PREFERRED IN FLOW LOCATION

(UP TO 30" [750mm] O.D. PIPE)

MATERIAL

PLANTINGS (IF REQUIRED)

460

1220

1853

1693

1831

DRY WELL (M-5) DESIGN TABLES

348.0 347.0

5.00 354.0 355.0 / 352.0 / 347.0 YES

58.27

234.71

214.45

236.8

Length

10

Width

(ft)

Stormchamber design

Stormchamber design

Stormchamber design

Stormchamber design

Stormchamber design

Top of | Bottom | Storm-

Stone of Stone Chamber

347.0 346.0 341.0 NO

351.0 350.0 345.0 YES

348.0 347.0 342.0 YES

351.0 350.0 345.0 YES

*** * ** *******

444 + 44 + 44

(ft)

95% COMPACTED, CLEAN FILL

INFLOW BY PIPES ONLY

- INFLOW PIPE

*** * **

- LIGHT WEIGHT STABILIZATION

NETTING (SUPPLIED) UNDER

IN FLOW AND ADJACENT ROW(S)

OR CONTINUE CRUSHED WASHED

STONE TO SURFACE OR GRASS IF

6" [150mm] MIN

	Α			В			
	ELEV. 1	345.00		ELEV. 1	345.50		
	ELEV. 2	344.75		ELEV. 2	345.25		
	ELEV. 3	344.00		ELEV. 3	344.50		
	ELEV. 4	343.83		ELEV. 4	344.33		
	ELEV. 5	341.83		ELEV. 5	342.33		
	ELEV. 6	341.50		ELEV. 6	342.00		
ONE OVER	ELEV. 7	340.92		ELEV. 7	341.42		
	ELEV. 8	339.87		ELEV. 8	340.27		
	DIMENS	IONS		DIMENSIONS			
	' A'	varies varies		'A'	varies		
	'B'			'B'	varies		
	TOTAL SF			TOTAL SF	85		
3)							

,			
D		E	
ELEV. 1	343.00	ELEV. 1	340.3
ELEV. 2	342.80	ELEV. 2	340.0
ELEV. 3	342.05	ELEV. 3	339.3
ELEV. 4	341.88	ELEV. 4	339.1
ELEV. 5	339.88	ELEV. 5	337.1
ELEV. 6	339.55	ELEV. 6	336.8
ELEV. 7	338.97	ELEV. 7	336.2
ELEV. 8	337.74	ELEV. 8	334.8
DIMENS	SIONS	DIMENS	IONS
'A'	varies	'A'	varie
,B,	varies	'B'	varie
TOTAL SF	124	TOTAL SF	110

INSTALLATION OF STORMCHAMBER SYSTEMS (can be downloaded and printed from

TRENCH PREPARATION 1. Do not excavate trench until dry weather is forecast long enough to allow at least coverage of The stone base that the chambers are placed on will not be compacted in orde the StormChamber system with filter fabric prior to raining. 2. Excavate to a width and length sufficient to accommodate the number of StormChambers plus a to avoid compaction of the stone-soil interface, which restricts soil infiltration. minimum one foot border around the entire bed. The bottom of the bed must be level, unless of the filter fabric from sediment and debris deposition 3. Do not use heavy equipment on the excavated trench bed in order to avoid soil compaction.

4. If use of heavy equipment on the excavated trench bed can not be avoided, scarify the trench bottom and break up soil clumps and till smooth before adding the stone base. 5. Line trench walls with a 4-ounce [113q] non-woven filter fabric such as Mirafi 140N or 140NC, Synthetic Industries 401, or AMOCCO 4545 or 4535. Overlap adjacent filter fabric by at least 2' [600mm]. Do not place filter fabric under the StormChambers. . Unless otherwise specified, place 6" [150mm] of crushed, washed, 3/4" - 2" [20mm - 50mm]

www.stormchambers.com

otherwise specified.

7. If it becomes impractical to level the stone base by hand, use a low pressure, tracked dozer, not exceeding 1,100 lbs/sf [500kg/sf], maintaining at least 6" [150mm] of stone under the tracks at all Backfill soil must be free from large stones and large organic material (e.g. tree limbs and large organic material)

1. Backfill soil must be free from large stones and large organic material (e.g. tree limbs and large organic material).

hard, non-calcarious stone on the bottom of the trench. The base must be level and at a zero

root stumps), and is capable of being compacted to at least 90% of the Standard Proctor Test (AASHTO Method T-99). If not, crusher run or other suitable backfill material must be used. The stone surrounding the StormChambers can also be extended up to the pavement subgrade, if Compaction of the soil backfill must be achieved in 6" [150mm] - 8" [200mm] lifts. Grading [773.18mm]. of lifts should start in one comer of the system with a low pressure, tracked dozer, with a pressure

times. Compact lifts to 90% Standard Proctor with tracked vehicles not exceeding 1,100 lbs/sf [500kg/sf], or with a hand operated compactor or vibratory roller not exceeding a dynamic force of

IMPORTANT: After compaction of backfill and setting of final grade, avoid parking on or traversing over the StormChamber installation with heavily loaded trucks and heavy equipment until paved.

is completely stabilized (grass growing and all pavement placed).

MATERIAL

PLANTINGS (IF REQUIRED)

PLANTING SOIL

GEOTEXTILE (CLASS "C")

(2.5' TO 4.0' DEEP)

UNDERDRAIN GRAVEI

JNDERDRAIN PIPING

CHECK DAM (TREATED WOOD

IMPORTANT: These instructions assume accepted construction procedures and trucks that do not exceed specified DOT load limits. Uncustomary loads or improper load distributions Each chamber system will be designed without utilizing a header pipe In vehicles may require additional cover. Contact StormChamber for installation under abnormal conditions. Installations not in compliance with these instructions will void TABLE B.3.2 MATERIALS AND SPECIFICATIONS FOR SWM FACILITIES

SPECIFICATION

E APPENDIX A;

SHREDDED HARDWOOD

(ASTM D-4751) GRAB TENSILE STRENGTH:

PUNCTURE RESISTANCE:

F758, TYPE PS28 OR

TO MEET ASTM 615-60

AWPA STANDARD C6

APPARENT OPENING SIZE: N/A

TARIF A.4

SAND: 35-60% SILT: 30-35%

(ASTM D-4632)

(ASTM D-4833)

AASHTO M-278

AASHTO M-43

POURED-IN-PLACE CONC. MSHA MIX NO.3; f'c=3500psi @ 28 DAYS, NORMAL WEIGHT, AIR

1870 CONSTRUCTED UNDER THE APPROVED ROAD CONSTRUCTION PLANS F-15-096. 33.00 33.00 18.00 13.00 18.00 13.00 DW-6 18.00 13.00

FACILITY LSI 1 AND

MICRO-BIORETENTION

FACILITIES C & F ARE

	1						
	E						
43.00	ELEV. 1	340.30					
42.80	ELEV. 2	340.05					
42.05	ELEV. 3	339.30					
41.88	ELEV. 4	339.13					
39.88	ELEV. 5	337.13					
39.55	ELEV. 6	336.80					
38.97	ELEV. 7	336.22					
37.74	ELEV. 8	334.81					
NS	DIMENS	DIMENSIONS					
varies	'A'	varies					
varies	'B'	varies					
124	TOTAL SF	110					

PRODUCT ENGINEERING SPECIFICATIONS FOR STORMCHAMBER Each chamber will be formed from high molecular weight/high density polyethylene. Each chamber will be composed of at least 40% recycled material

The chamber system will be designed without filter fabric under the chambers in order to avoid restriction of soil infiltration, which occurs from the normal cloquing Use of filter fabric between the soil and stone backfill layer and lining the side walls of the excavated area will be required to prevent intrusion of soil or silt into the chambers and surrounding stone.

Each chamber will be capable of supporting a minimum of 24,000 pounds [10,886kg] per square foot (i.e., three times the AASHTO H-20 Wheel Load Rating). Each chamber will be capable of being installed with a minimum of 25 feet [7620mm] of cover above the crown of the chamber. Each chamber system will be capable of being installed in at least two layers, providing a

minimum of 0.8 cubic feet of storage per square foot of surface area. Each chamber system will be capable of being installed with a minimum of six inches [150mm] of stone base. Lay-up length will be 8.1' [2464mm] (start and end unit) and 7.6' [2311mm] (middle unit). Each chamber will have 14 ribs of approximately 3.6" [91.4mm] in height, 3.8" [96.5mm] wide at the top and tapering to 4.4" [112mm] at the bottom. Spacing of the ribs at the bottom of the chamber will be approximately 4.9" [124mm] and approximately 3.2" [81.3mm] at the top. One smaller rib sized dimensionally to effectively nest under and interlock to connect units will be 2.9" [73.7mm] high, 3.3" [83.8] wide at the top of the rib, and

4.1" [104mm] wide at the base. Overall height to the inside rib will be 30.44" [864.62mm]. Overall height to the outside rib will be 34.04" Each chamber will have a defined top portal which is structurally enhanced to compensate for loss of structural not exceeding 1,100 lbs/sf [500kg/sf], keeping at least 1' [300mm] of fill in front of the blade at all integrity when apertures are cut open to receive pipe. Each such portal will be capable to receive up to a 12"

[300mm] PVC pipe. Each chamber will have defined side portals on opposing sides which are structurally enhanced to compensate for loss of structural integrity when apertures are cut open to receive pipe. 3. Keep the StormChamber system closed or protected from receiving sediment until the site Invert height for a 10" [250mm] PVC pipe through a defined side portal will be 17.49" [444.25mm]. Invert height for an 8" [200mm] PVC pipe through a defined side portal will be 18.49" [469.65mm]

Each chamber will be capable to accept an 8" [200mm] or 10" [250mm] PVC feed pipe through a defined side portal. Each chamber will be capable to accept up to a 30" [750mm] OD pipe through its end wall. Each chamber will be capable of storing at least 9 cubic feet per lineal foot with 6" [150mm] or stone above and below the chamber

manifold system

SIZE

" TO 6" RIGID

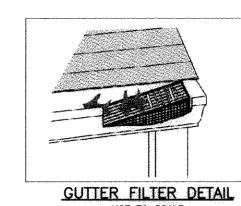
Stone diameter will be 3/4" - 2" [20mm - 50mm].

DO NOT COAT WITH CREOSOTE; EMBED AT LEAST 3' INTO SIDE SLOPES

LOAMY SAND (60-65%) & COMPOST (35-40%) (2.0' TO 4.0' DEEP) LOAMY SAND (30%) COARSE SAND (30%) & COMPOST (35-40%) MIN. 10% BY DRY WEIGHT N/A DRGANIC CONTENT NOTES: (ASTM D2974) PLANTINGS ARE SITE SPECIFIC AGED 6 MONTHS, MINIMUM SHREDDED HARDWOOD PEA GRAVEL DIAPHRAGM #8 OR #9 (1/8" TO 3/8"). USDA SOIL TYPES: LOAMY SAND, SANDY LOAM OR LOAM PE TYPE 1 - NONWOVEN GEOTEXTILE 2" TO 3" DEPTH, AGED 6 MONTHS, MINIMUM FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY #8 STONE (UNDERDRAINS & BERMS) AGGREGATE (3/8" TO 3/4") 4" TO 6" RIGID SLOTTED OR PERFORATED: 3/8" PERFS. @ 6" O/C, 4 HOLES PEI SCH.40 PVC OR ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY F758, TYPE PS28 OR AASHTO M-278 UNDERNEATH PIPES. PERFORATED PIPE SHALL BE WRAPPED WITH 3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 3" ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED; 28 GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES OURED-IN-PLACE CONC. MSHA MIX NO.3; f'c=3500psi @ 28 DAYS, DAY STRENGTH TEST AND SLUMP TEST: ALL CONC. DESIGN (CAST -IN-PLACE or PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM 615-60 ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED; 28
DAY STRENGTH TEST AND SLUMP TEST: ALL CONC. DESIGN (CAST AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND. — DESIGN TO INCLUDE -IN-PLACE or PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED MEETING ACI CODE 350.R/89: VERTICAL LOADING (H-10 or H-20 AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND. — DESIGN TO INCLUDE ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING MEETING ACI CODE 350.R/89: VERTICAL LOADING (H-10 or H-20 SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE (AASHTO AASHTO M-6 OR ASTM C-33 0.02" TO 0.04 ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); SAND (1.0' DEEP) AND ANALYSIS OF POTENTIAL CRACKING #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OF

SPECIFICATION

SEE APPENDIX A; TABLE A.4



OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED & MAINTAINED DRY WELLS (M-5) a. The Owner shall inspect the monitoring wells and structures on a quarterly basis and after every heavy storm

b. The Owner shall record the water levels and sediment build b. The Owner shall record the water levels and seatment but up in the monitoring wells over a period of several days to insure trench drainage.

c. The Owner shall maintain a log book to determine the rate at which the facility drains.

d. When the facility becomes clogged so that it does not drain down within a seventy—two (72) hour time period, correctly action shall be taken. corrective action shall be taken.

e. The maintenance log book shall be available to Howard
County for inspection to insure compliance with operation and maintenance criteria.

f. Once the performance characteristics of the infiltration

facility have been verified, the monitoring schedule can be reduced to an annual basis unless the performance data indicates that a more frequent schedule is required.

Full ESDv

ALTERNATE SIDE PORTAL IN FLOW

OPTION (10" [250mm] PVC)

— 4 OZ. [113g] NON-WOVEN FILTER FABRIC

(SUPPLIED) UNDER IN FLOW

AND ADJACENT START UNIT(S)

-6.7' x 10' [2000mm x 3050mm]

TRENCH WALL

STABILIZATION NETTING

HEAVYWEIGHT

Volume

140

650

650

650

650

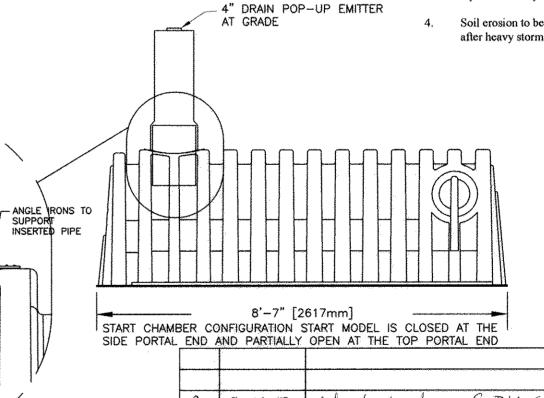
650

Provided (CF) Provided?

SWM SUMMARY TABLE													
Pe=	1.6	Inches											
D.A. MDE Type		Total DA	na Impervious	Qe	Al			Volume			REV		
E.FP4.	MINTEL LYPE	10th DA	Area	Sel XV	Required	Provided	2% DA	Depth	Required	Treated	ESDv at least	Required	Provided
Å	(M-6)	2,955	1,387	0.76	59	111	ok	1,00	186	258	PASS	78 £ 6	0.0678
8	(M-6)	2,750	1,149	0.68	55	85	ok	1.00	156	223	PASS	asec withir	0,0631
С	(M-6)	5.206	2,552	0.79	104	191	ok	1.00	341	411	PASS	9 0 0	0.1195
D	(M-6)	3,336	1,835	0.87	67	124	ok	0.95	242	252	PASS	888	0.0000
-	(M-6)	4730	1870	0.65	95	110	ok	1.00	256	275	PASS	# 3 8	0.0000
F	(M-6)	5,089	1,899	0,62	1.02	176	ok	0.80	262	269	PASS	8 2 2	0.0000
DVV-1	(M-5)	460	460	1.52	NA	NA	NA	NA	58	140	100%	RE.	0,0000
DW-2	(M-5)	1,220	1,220	1.52	NA	NA	NA	NA	155	650	100%	(4)	0.0000
DW-3	(M-5)	1,853	1,853	1.52	NA	NA	NA	NA.	235	650	100%	Sife	0.0000
DVV-4	(M-S)	1,693	1,693	1.52	NA .	NA	NA	NA	214	550	100%	3 2 3	0.0000
DW-5	(M-5)	1,831	1,831	1.52	ΝA	NA	NA	NA	232	650	100%	ent re	0.0000
DW-6	(M-5)	1870	1870	1.52	NA	NA	NA	NA	237	650	100%	Pec or	0.0000
LSI1	(M-3)	15,416	2,885	0.35	308	1012	PASS	2.0	449	2733	100%	1 10	
To	lais	48.409	22,504		790	1,809			3023	7,811		0.1384	0.2505
								ODER A TROX	T ANTENNA TA	PPENIANICH.	COLIETATI E E	ΔÞ	

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)

- Annual maintenance of plant material, mulch layer and soil layer is required. Maintenance 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,
- Schedule of plant inspection will be twice a year in spring and fall. This inspection will include removal of dead and diseased vegetation considered beyond treatment, treatment of all diseased trees and shrubs and replacement of all deficient stakes and wires.
- Mulch shall be inspected each spring. Remove previous mulch layer before applying new layer once every 2 to 3 years.
- Soil erosion to be addressed on an as needed basis, with a minimum of once per month and after heavy storm events.



8-10-17 Adjust elevations of DW-6 AND OUTFALL NOTES TO MBR DETAIL. 5-30-17 Revise Fectities E + DWG For New footprint 1 12.1.16 NO. DATE REVISION **BENCHMARK**

rofessional Certification. I hereby certify that these documen were prepared or approved by me, and that I am a duly license rofessional engineer under the laws of the State of Maryland, License No. 45577, Expiration Date: 06-08-2016.

8480 BALTIMORE NATIONAL PIKE A SUITE 315 A ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM OWNER/DEVELOPER: SECURITY DEVELOPMENT, LLC

410-964-4440

DRAFT: JMC

BUILDER:

DESIGN: JMC

● ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS

ENGINEERING, INC.

P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244 WILLIAMS BURG. GROUP LLC 5485 HARPERS FARM ROAD SUITE 200 COLUMBIA. MARYLAND 21044

WOODBROOK SECTION 2, PHASES 1 AND 2, LOTS 63-70 AND OPEN SPACE LOTS 71 AND 72 TAX MAP 37, GRID 14 PARCELS 126, 488 AND 530 1st ELECTION DISTRICT

HOWARD COUNTY, MARYLAND **STORMWATER MANAGEMENT**

WOODCREST DRIVE

NOTES AND DETAILS DATE: MAY, 2016 | BEI PROJECT NO. 2370

SHEET

SCALE: AS SHOWN

SDP-16-058

5 of 7

DETAIL B-4-6-C PERMANENT SOIL STABILIZATION FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS MATTING CHANNEL APPLICATION | PSSMC - * 16/f1 The process of preparing the soils to sustain adequate ve-**VEGETATIVE STABILIZATION** urpose: To provide a suitable soil medium for vegetative growth. Conditions Where Practice Applies: Where vegetative stabilization is to be established. The application of seed and mulch to establish vegetative cover. sing vegetation as cover to protect exposed soil from erosion CONSTRUCTION SPECIFICATIONS To protect disturbed soils from erosion during and at the end of construction. Table B.1: Temporary Seeding for Site Stabilization USE VOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS. Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading. Conditions Where Practice Applies Temporary Stabilization Seedbed preparation consists of toosening soil to a depth of 3 to 5 inches by means of On all disturbed areas not stabilized by other methods. This specification is divided into sections on EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION. Recommended Seeding Dates by Plant Hardiness Zone 3 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 stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN I FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRANE AS SHOWN. STRETCH & INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRANE ANI FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE VEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST. rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to lb/ac | lb/1000 ft a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be be tracked with ridges running parallel to the contour of the slope. and permanent stabilization. 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 Effects on Water Quality and Quantity Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other lized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, TOP ELEVATION Annual Ryegrass (*Lolium pere* eb 15 to Apr 30; A -16 IN MIN. -NOTCH ELEVATION a. A soil test is required for any earth disturbance of 5 acres or more. The minimum so b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is conditions required for permanent vegetative establishment are: 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 Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and Mar I to May 15: A eb 15 to Apr 30; A Basley (Hordeum vulgare) Mar 15 to May 31; Aug 1 to Sep runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation Soluble salts less than 500 parts per million (opm --NAILING STRIP far I to May 15; Au cb 15 to Apr 30; Au 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. not be used later than the date indicated on the container. Add fresh inoculants as ase organic matter content and improve the water holding capacity of the soil and subsequent plant ISOMETRIC VIEW An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt Note: It is very important to keep inoculant as cool as possible until used. Temperatur Mar I to May 15: 5 15 to Apr 30: A LINK FENCE (TYP.) Wheat (Triticum aestivun olus clav) would be acceptable. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS. Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to iv. Soil contains 1.5 percent minimum organic matter by weight. receiving waters. Plants will also help protect groundwater supplies by assimilating those substances Feb 15 to Apr 30; A v. Soil contains sufficient pore space to permit adequate root penetration d. Sod or seed must not be placed on soil which has been treated with soil sterilants or real Ryc (Secale cereale) b. Application of amendments or topsoil is required if on-site soils do not meet the above chemicals used for weed control until sufficient time has elapsed (14 days min.) to STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN VITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE. ediment control practices must remain in place during grading, seedbed preparation, seeding, mulching Graded areas must be maintained in a true and even grade as specified on the 18 IN INTO GROUND approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.

Apply soil amendments as specified on the approved plan or as indicated by the results a. Dry Seeding: This includes use of conventional drop or broadcast spreader oxtail Millet (Setaria italica) May 16 to Jul 31 May 1 to Aug 14 TYPE B TYPE A 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. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WAYNG A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST Pearl Millet (Pennisetum glaucum May 16 to Jul 31 ISOMETRIC VIEW May 1 to Aug 14 e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable 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 2. If an area has less than 40 percent groundcover, restabilize following the original recommendations branches, and ready the area for seed application. Loosen surface soil by dragging wi seed to soil contact. Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be ad 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 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 permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipmen leaving the soil in an irregular condition with ridges running parallel to the contour of the provide at least 1/4 inch of soil covering. Seedbed must be firm after Maintenance fertilizer rates for permanent seeding are shown in Table B.6. slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may b planting.
ii. Apply seed in two directions, perpendicular to each other. Apply half the for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, (oxtail millet), do not exceed more than 5% (by weight) of the overall permanent unnecessary on newly disturbed areas. seeding mix. Cereal tye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal tye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above. seeding rate in each direction. **8-4-1 STANDARDS AND SPECIFICATIONS** UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER I WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS, LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING. c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low INCREMENTAL STABILIZATION I. If fertilizer is being applied at the time of seeding, the application rates should moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable so not exceed the following: nitrogen, 100 pounds per acre total of soluble Topsoil salvaged from an existing site may be used provided it meets the standards as set The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone. forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type 200 pounds per acre. can be found in the representative soil profile section in the Soil Survey published by il. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be Conditions Where Practice Applies applied by hydroseeding). Normally, not more than 2 tons are applied by any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles Topsoiling is limited to areas having 2:1 or flatter slopes where: droseeding at any one time. Do not use burnt or hydrated lime when 1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed SECTION FOR TYPE A AND B The soil material is so shallow that the rooting zone is not deep enough to support and apply seed and mulch on all cut slopes as the work progresses. iv. When hydroseeding do not incorporate seed into the soil. plants or furnish continuing supplies of moisture and plant nutrients. Construction sequence example (Refer to Figure B.1): a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff Mulch Materials (in order of preference) The soil is so acidic that treatment with limestone is not feasible b. Perform Phase 1 excavation, prepare seedbed, and stabilize. bright in color. Straw is to be free of noxious weed seeds as specified in the MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL Topsoil Specifications: Soil to be used as topsoil must meet the following criteri laryland Seed Law and not musty, moldy, caked, decayed, or excessively dust MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as Note: Use only sterile straw mulch in areas where one species of grass is desired sand. Other soils may be used if recommended by an agronomist or soil scientist and b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previous processed into a uniform fibrous physical state seeded areas as necessary. contrasting textured subsoils and must contain less than 5 percent by volume of cinder Table B.3: Recommended Planting Dates for Permanent Cover in Maryland WCFM is to be dyed green or contain a green dye in the package that wi SUPER SILT SILT FENCE DETAIL E-1 stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than provide an appropriate color to facilitate visual inspection of the |----SSF-----| ____SF___ completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any FENCE Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack ii. WCFM, including dye, must contain no germination or growth inhibiting Type of Plant Material grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified. 7a and 7b 5b and 6a iii. WCFM materials are to be manufactured and processed in such a Feb 15 to Apr 30 Aug 15 to Oct 31 scientist and approved by the appropriate approval authority, may be used in lieu of USE WOOD POSTS $1\frac{1}{4}$ X $1\frac{1}{4}$ ± $\frac{1}{16}$ inch (minimum) square cut of sound quality hardwood. As an alternative to wooden post use standard "t" or "u" section steel posts weight not less than 1 pound per linear foot. Seeds - Cool-Season Grasses manner that the wood cellulose fiber mulch will remain in uniform 1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedber Aug I to Sep 30 Aug I to Oct I: (includes mixes with forbs and/or legumes and apply seed and mulch on all slopes as the work progresses. Nov 1 to Nov 30+ Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans. fertilizer and other additives to form a homogeneous slurry. Th USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART. nuich material must form a biotter-like ground cover, on application Seeds - Warm-Season/Cool-Season Grass Mixes Feb 15 to Apr 30 + + -34 IN MIN. Uniformly distribute topsoil in a 5 to 8 Inch layer and lightly compact to a minimum May 16 to Jun 154 May I to May 314 having moisture absorption and percolation properties and must (includes mixes with forbs and/or legumes) 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. surface runoff and convey it down the slope in a non-erosive manner. Mar I to May I Feb 15 to Apr 30 seeding can proceed with a minimum of additional soil preparation and tillage. Any 4. Construction sequence example (Refer to Figure B.2): the growth of the grass seedlings Sod - Cool-Season a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around corrected in order to prevent the formation of depressions or water pockets. the fill. Construct silt fence on low side of fill unless other methods shown on the plans concentration levels that will be phyto-toxic. Unrooted Woody Materials; Bare-Root Plants; Bulbs, Rhizomes, Corms, and Tubers 2 Feb 15 to Apr 30 when the subsoil is excessively wet or in a condition that may otherwise be detriment of approximately 10 millimeters, diameter approximately 1 millimeter Jun 1 to Jun 30* May 16 to Jun 30* May 1 to Jun 30* ELEVATION intercept surface runoff and convey it down the slope in a non-erosive manner. Feb 15 to Apr 30 mendments (Fertilizer and Lime Specifications) Mar 15 to May Mar I to May 15 EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC. water holding capacity of 90 percent minimum. ontainerized Stock; Balled-and-Burlapped d. Place Phase 2 fill, prepare seedbed, and stabilize. and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be a. Apoly mulch to all seeded areas immediately after seeding e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas a WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a igineering purposes may also be used for chemical analyses. ote: Once the placement of fill has begun the operation should be continuous from grubbing through the uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and der Fertilizers must be uniform in composition, free flowing and suitable for accurate application by 1. The planting dates listed are averages for each zone. These dates may require adjustment to reflect local conditions, especially near the boundaries of the zones. When seeding toward the end of the listed planting dates, or when conditions are expected to be less than optimal, select an appropriate nurse crop from Table 1 and plant with the permanent seeding mix. (See Table B.2, Note 1, for more information.) EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE AUGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE. completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any so that the soil surface is not exposed. When using a mulch anchoring tool, increase the appropriate equipment. Manure may be substituted for fertilizer with prior approval from the nnlication rate to 2.5 tons per acre ons in the operation or completing the operation out of the seeding season will necessitate the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled 130 M WOVEN SLIT FILM GEOTEXTILE c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per application of temporary stabilization. FLOW according to the applicable laws and must bear the name, trade name or trademark and 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. warranty of the producer. 2. When planted during the growing season, most of these materials must be purchased and kept in a dormant condition until planting. Bare-root grasses are the of wood cellulose fiber per 100 gallons of water. Lime materials must be ground limestone (hydrated or burnt lime may be substituted excepwhen hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus **B-4-5 STANDARDS AND SPECIFICATIONS** Additional planting dates for the lower Coastal Plain, dependent on annual rainfall and temperature trends. Recommend adding a nurse crop, as noted above, if or water. This may be done by one of the following methods (listed by preference), depending pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve PERMANENT STABILIZATION upon the size of the area and erosion hazard: + Warm-season grasses need a soil temperature of at least 50 degrees F in order to germinate. If soil temperatures are colder than 50 degrees, or moisture is not adequate, the seeds will remain dormant until conditions are favorable. In general, planting during the latter portion of this period allows more time for weed emergence and weed control prior to planting. When selecting a planting date, consider the need for weed control vs. the likelihood of having sufficient moistures. CROSS SECTION soil by disking or other suitable means. mulch into the soil surface a minimum of 2 inches. This practice is most effective To stabilize disturbed soils with permanent vegetation 5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestor at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of CONSTRUCTION SPECIFICATIONS To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils. If used on sloping land, this practice should follow the contour. INSTALL 2% 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. Conditions Where Practice Applies 8-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABLIZATION dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a + Frequent freezing and thawing of wet soils may result in frost-heaving of materials planted in late fall, if plants have not sufficiently rooted in place.

Sod usually needs 4 to 6 weeks to become sufficiently rooted. Large containerized and balled-and-buriapped stock may be planted into the winter months as long as 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 To stabilize disturbed soils with vegetation for up to 6 months FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2% INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS. a Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardines specified by the manufacturer. Application of liquid binders needs to be heavier a To use fast growing vegetation that provides cover on disturbed soils Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter he edges where wind catches mulch, such as in valleys and on crests of banks. Conditions Where Practice Applies Use of asphalt binders is strictly prohibited. iv. Lightweight plastic netting may be stapled over the mulch according to manufactur. Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time Summary is to be placed on the plan. dations. Netting is usually available in rolls 4 to 15 feet wide and 300 to Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes o permanent stabilization practices are required. DRAFT October 15, 2009 <u>Criteria</u>

Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical ----STAPLE 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 c. For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil H-5 STANDARDS AND SPECIFICATIONS SEQUENCE OF CONSTRUCTION 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. NOTE: NO CHANGES ARE ALLOWED DUST CONTROL Definition PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS. square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown 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 NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF WORK TO THE SEQUENCE OF Controlling the suspension of dust particles from construction activities JOINING TWO ADJACENT SILT CONSTRUCTION WITHOUT PRIOR a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites To prevent blowing and movement of dust from exposed soil surfaces to reduce on and 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. H-5 STANDARDS AND SPECIFICATIONS _{2 OF, 2}1. Obtain grading and building permits. (day 1) FENCE SECTIONS (TOP VIEW) HOWARD SCD APPROVAL FOR DUST CONTROL off-site damage including . Hold on-site preconstruction meeting. (day 2) MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL The summary is to be placed on the plan.

Kentucky Bluegrass: Full sun Mixture: For use in areas that receive intensive management Controlling the suspension of dust particles from construction activities Purpose

Conditions Where Practice Applies

To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including. Areas subject to dust blowing and movement where on and off-site damage is likely without NOTE: ALL SUPER SILT FENCES TO MARYLAND DEPARTMENT OF ENVIRONMENT

WATER MANAGEMENT ADMINISTRATION

U.S. DEPARTMENT OF ACRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE 2011 Imigation 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 3. Install perimeter lot controls (i.e. silt fence, super silt fence, etc.). (day 3) BE CHECKED DAILY TO ENSURE Conditions Where Practice Applies

Areas subject to dust blowing and movement where on and off-site damage is likely without treatment. minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 35 percent of the total **DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE** COMPLIANCE AND REPAIRED 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 SCE J HOWARD SOIL CONSERVATION DISTRICT (HSCD) 4. Excavate for foundation, rough grade and stabilize in accordance with the temporary seedbed mixture by weight. IMMEDIATELY AS REQUIRED . Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid notes. (day 4-10) Specifications

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 TANDARD SEDIMENT CONTROL NOTES 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 Stabilization. Mulch must be anchored to prevent blowing. 5. Construct house, install water and sewer house connections from easement up to house, 2. Vegetative Cover: See Section B-4-4 Temporary Stabilization. - EXISTING PAVEMENT . A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-3133-1855 after the NOTE: THE AREAS OF ESD Vegetative Cover: See Section B-4-4 Temporary Stabilization.

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. backfill and construct driveway. (day 11-90) 3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on 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 future LOD and protected areas are marked clearly in the field. A minimum of 48 hours notice to CID must be given at the following stages: IMPLEMENTATION SHALL HAVE LIMITED a. Prior to the start of earth disturbance 6. Construct on-lot SWM practice (i.e. micro bio-retentions, dry wells) complete with underdrains 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 side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed ACCESS FROM HEAVY CONSTRUCTION b. Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading, and plantings. Construct roof leader underdrains to the facilities. Final grade lot and stabilize in harrows, and similar plows are examples of equipment that may produce the -EARTH FILL 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. percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended EQUIPMENT TO AVOID UNNECESSARY c. Prior to the start of another phase of construction or opening of another grading unit, desired effect. accordance with the PERMANENT seedbed notes. (day 91-5) 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: -PIPE (SEE NOTE 6) 4.Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. Th d. Prior to the removal or modification of sediment control practices COMPACTION WHEN PRACTICAL. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar site must not be irrigated to the point that runoff occurs. Other building or grading inspection approvals may not be authorized until the initial approval by the inspection agency is made. Other related state and federal material can be used to control air currents and soil blowing.

Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority. PROFILE 7. Upon approval from the Howard County Sediment Control Inspector, remove all sediment 5.Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales 1 1/2 to 3 pounds per 1000 square feet. permits shall be referenced, to ensure coordination and to avoid conflicts with this plan. control devices and stabilize any remaining disturbed areas in accordance with the permanent 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 progra of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of and similar material can be used to control air currents and soil blowing 50 FT MIN. NOTE: TEMPORARY OR PERMANENT 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 2011 MARYLAND seedbed notes. (day 96-100) 6. Chemical Treatment: Use of chemical treatment requires approval by the LENGTH 1 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto. SEEDING AND STABILIZATION IS TO appropriate plan review authority. B-4-8 STANDARDS AND SPECIFICATIONS 3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all BE PERFORMED AT THE DIRECTION FOR STOCKPILE AREA perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other c. Ideal Times of Seeding for Turf Grass Mixtures OF THE SEDIMENT CONTROL disturbed areas on the project site except for those areas under active grading. A mound or pile of soil protected by appropriately designed erosion and sediment control measures 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) INSPECTOR OR AT THE TIME FRAME 4. All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS To provide a designated location for the temporary storage of soil that controls the potential for erosion, To provide a designated Accession and changes to drainage patterns.

Conditions Where Practice Applies FOR SOIL EROSION AND SEDIMENT CONTROL for topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-5). uthem MD, Eastern Shore: March 1 to May 15, August 15 to October 15 REQUESTED BY THE 2011 MARYLAND B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization STANDARDS & SPECIFICATIONS, SOIL (Sec. B-4-1) specifications shall be enforced in areas with >15' of cut and/or fill. Stockpiles (Sec. B-4-8) in excess of 20 feet must be benched with stable outlet. All Stockpile areas are utilized when it is necessary to salvage and store soil for later use. 4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION(CONTINUED) EROSION AND SEDIMENT CONTROL Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6). Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, lev PLAN VIEW and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches WHICH EVER IS MORE STRINGENT 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 erosion and sediment control plan.

2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material in diameter. The resulting seedbed must be in such condition that future mowing of grasses the CID. 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. and based on a side slope ratio no steeper than 2:1. Benching must be provided in 6. Site Analysis: ccordance with Section B-3 Land Grading. 3. Runoff from the stockpile area must drain to a suitable sediment control practice CONSTRUCTION SPECIFICATIONS Total Area of Site: 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 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. 1,55_ Acres Area Disturbed: A.Sod: to provide quick cover on disturbed areas (2:1 grade or flatter) an earth dike, temporary swale or diversion fence. Provisions must be made for discharging Area to be roofed or paved: a. Class of turigrass must be Maryland State Certified. Sod labels must be made available to the job concentrated flow in a non-erosive manner.

6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment Area to be vegetatively stabilized: 2,800 Cu Yds* foreman and inspector. 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 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 BERN 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 CONYEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT. Total cut:). Sod must be machine cut at a uniform soil thickness of ¼ inch, plus or minus ¼ inch, at the time of Total fill: cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or ndard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization. Off-site waste/borrow area location: 8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile s. Standard size sections of sod must be strong enough to support their own weight and retain their Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance. to facilitate cleanup. Stockpiles containing contaminated material must be covered with size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section DATE REVISION Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly; and the next d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include: PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS. rofessional Certification. I hereby certify that these documen 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 s. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted Inspection date were prepared or approved by me, and that I am a duly licenses 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. within this period must be approved by an agronomist or soil scientist prior to its installation. professional engineer under the laws of the State of Maryland • Inspection type (routine, pre-storm event, during rain event) 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 BENCHMARK ation Date: 06-08-2016. a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAK OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND Name and title of inspector e with Section B-3 Land Grading. 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 Weather information (current conditions as well as time and an=mount of last recorded precipitation 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. ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS Brief description of project's status (e.g. percent complete) and/or current activities ENGINEER'S CERTIFICATE 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 · Evidence of sediment discharges "I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A ENGINEERING, INC. 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. · Identification of plan deficiencies PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THI • Identification of sediment controls that require maintenance Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contac exists between sod roots and the underlying soil surface. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 HOWARD SOIL CONSERVATION DISTRICT. • Identification of missing or improperly installed sediment controls MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL 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 • Compliance status regarding the sequence of construction and stabilization requirements WWW.BEI-CMILENGINEERING.COM Photographs 2011 Monitoring/sampling a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as Maintenance and/or corrective action performed necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to • Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE). prevent witting.

b. After the first week, sod watering is required as necessary to maintain adequate moisture content. M. Carney #45577 9. Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back filled and stabilized by the end of each work day, **WOODBROOK** Do not mow until the sod is firmly rooted. No more than 1/3 of the grass leaf must be removed by 10. Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. OWNER/DEVELOPER: the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless SECTION 2, PHASES 1 AND 2, LOTS 63-70 Minor revisions may be allowed by the CID per the list of HSCD-approved field changes. AND OPEN SPACE LOTS 71 AND 72 "I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO SECURITY DEVELOPMENT, LLC 11. Disturbance shall not occur outside the L.O.D. A project is to be sequenced so that grading activities begin on one grading unit (maximum acreage of 20 ac. per THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNE 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 LOCATION: INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A P.O. BOX 417 stabilized and approved by the CID. Unless otherwise specified and approved by the CID, no more than 30 acres cumulatively may be disturbed at a given time. APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF ELLICOTT CITY, MARYLAND 21041 12. Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure. TAX MAP 37, GRID 14 SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC PARCELS 126, 488 AND 530 ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT." 13. Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade. 410-465-4244 1st ELECTION DISTRICT 14. All silt fence and super silt fence shall be placed on-the-contour, and be imbricated at 25' minimum intervals, with lower ends curled uphill by 2' in elevation. 6.8.16 WOODCREST DRIVE 15. Stream channels must not be disturbed during the following restricted time periods (inclusive): BUILDER: HOWARD COUNTY, MARYLAND • Use I and IP March 1 - June 15 WILLIAMSBURG GROUP LLC • Use III and IIIP October 1 - April 30 Use IV March 1 - May 31 5485 HARPERS FARM ROAD SEDIMENT AND EROSION 16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY SUITE 200 shall be on-site and available when the site is active. CONTROL NOTES & DETAILS COLUMBIA, MARYLAND 21044 DATE: MAY, 2016 | BEI PROJECT NO. 2370 410-964-4440 DRAFT: JMC SCALE: AS SHOWN SHEET 6 OF 7 DESIGN: JMC SDP-16-058

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