KNOX LANDING II

LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7

SITE DEVELOPMENT PLAN

GENERAL NOTES

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

2.) THE SUBJECT PROPERTY IS ZONED R-SC PER THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.

3.) THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NO. 47GD AND 47GE WERE USED FOR THIS PROJECT.

4.) TRACT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED ON OR ABOUT FEBRUARY, 2014 BY BENCHMARK ENGINEERING, INC.

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

6.) THE TRAFFIC STUDY WAS PREPARED BY MARS GROUP, INC. IN DECEMBER, 2014 AND WAS APPROVED BY DPZ ON 7-6-2015 UNDER F-15-049.

7.) THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT. THE WATER AND SEWER IS PUBLIC. THE CONTRACT NUMBER IS 24-4896-D.

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 , ON WHICH DATE DEVELOPERS AGREEMENT NUMBER F-15-049/24-4896 WAS FILED AND ACCEPTED.

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

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

11.) THERE ARE NO WETLANDS, STREAMS, THEIR REQUIRED BUFFERS, OR 100YR FLOODPLAIN LOCATED ON THIS SITE.

12.) THERE ARE NO STEEP SLOPES THAT 25% OR GREATER THAT IS MORE THAN A CONTIGUOUS 20,000 sf LOCATED ON THIS SITE.

13.) DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:

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

14.) THE WETLAND DELINEATION AND FOREST STAND DELINEATION WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. IN MARCH, 2014.

15.) THE GEOTECHNICAL REPORT WAS PREPARED BY GEOTECHNICAL LABORATORIES, INC. IN NOVEMBER, 2014.

16.) STORMWATER MANAGEMENT ENVIRONMENTAL SITE DESIGN (ESD) HAS BEEN PROVIDED IN ACCORDANCE WITH 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 FIVE (5) M-6 MICRO-BIORETENTION PRACTICES. THE PRACTICES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

17.) LANDSCAPING WAS PROVIDED WITH A CERTIFIED LANDSCAPE PLAN UNDER F-15-049 IN ACCORDANCE ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF $7,200.00 FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE GRADING PERMIT UNDER THE SITE DEVELOPMENT PLAN.

18.) THE FOREST CONSERVATION OBLIGATION WAS MET UNDER F-15-049.

19.) FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT-OF-WAY LINE AND NOT ONTO THE PIPESTEM LOT DRIVEWAY.

20.) WP-14-123, A REQUEST TO WAIVE SECTIONS 16.121(e)(2)(i), SECTION 16.134(a)(1), SECTION 16.144(b) AND SECTION 16.144(g) WAS APPROVED ON JULY 28, 2014 SUBJECT TO THE FOLLOWING CONDITIONS:

- A) SUBMISSION OF A FINAL SUBDIVISION PLAN AND APPLICATION UPON APPROVAL OF ECP-14-054
- B) COMPLY WITH ALL ATTACHED AGENCY COMMENTS ON THE SUBMITTED ECP PLANS.
- C) COMPLIANCE WITH THE DEVELOPMENT ENGINEERING DIVISION COMMENTS DATED JULY 17, 2014 REGARDING THE PAYMENT OF A FEE-IN-LIEU FOR THE SIDEWALK ALONG ALL SAINTS ROAD.
- D) COMPLIANCE WITH THE DEPARTMENT OF FIRE AND RESCUE SERVICES COMMENTS DATED MAY 15, 2014, AND DPW REAL ESTATE SERVICES COMMENTS DATED MAY 6, 2014 ON THE FINAL PLAN SUBMISSION.

21.) THE PRIVATE MAINTENANCE ACCESS AGREEMENT FOR LOTS 1-5 WAS RECORDED SIMULTANEOUSLY WITH THE RECORDATION OF THE PLAT F-15-049.

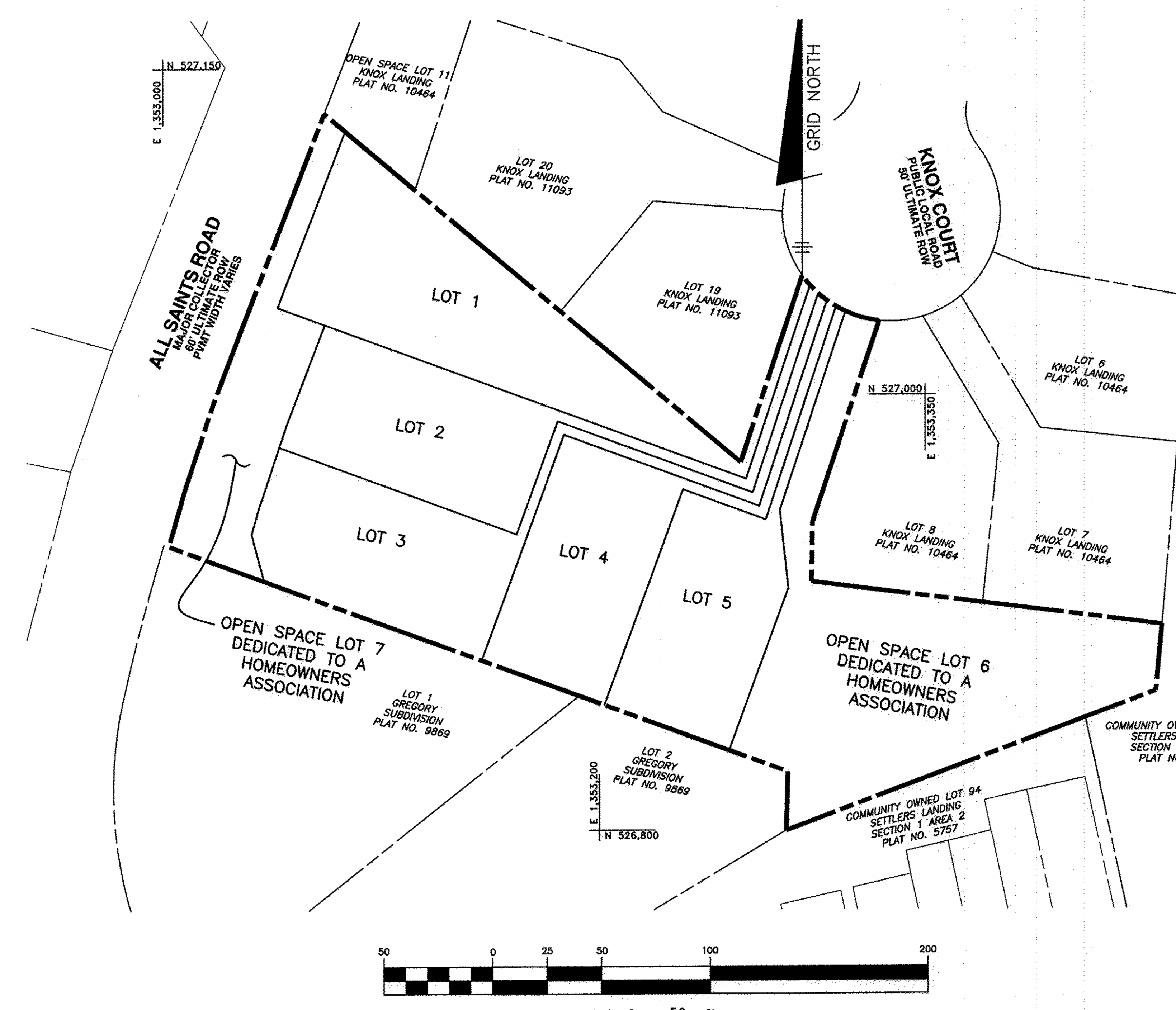
22.) WATER AND SEWER SERVICE TO THESE LOTS WILL BE GRANTED UNDER THE PROVISIONS OF SECTION 18.122.B OF THE HOWARD COUNTY CODE. PUBLIC WATER AND SEWERAGE ALLOCATION WILL BE GRANTED AT TIME OF ISSUANCE OF BUILDING PERMIT IF CAPACITY IS AVAILABLE AT THAT TIME.

23.) THE EXISTING STRUCTURE (GARAGE) PREVIOUSLY ON-SITE WAS REMOVED ON NOVEMBER 21, 2015.

24.) IN ACCORDANCE WITH SECTION 128 OF THE HOWARD COUNTY ZONING REGULATIONS, BAY WINDOWS, CHIMNEYS OR EXTERIOR STAIRWAYS NOT MORE THAN 16 FEET IN WIDTH MAY PROJECT NOT MORE THAN 4 FEET INTO ANY SETBACKS, PORCHES OR DECKS, OPEN OR ENCLOSED MAY PROJECT NOT MORE THAN 10 FEET INTO THE FRONT OR REAR YARD SETBACK (APPLIES FOR RESIDENTIAL SDP'S).

25.) THE REQUIRED COMMUNITY MEETING FOR THIS PROJECT WAS HELD ON JANUARY 6, 2014.

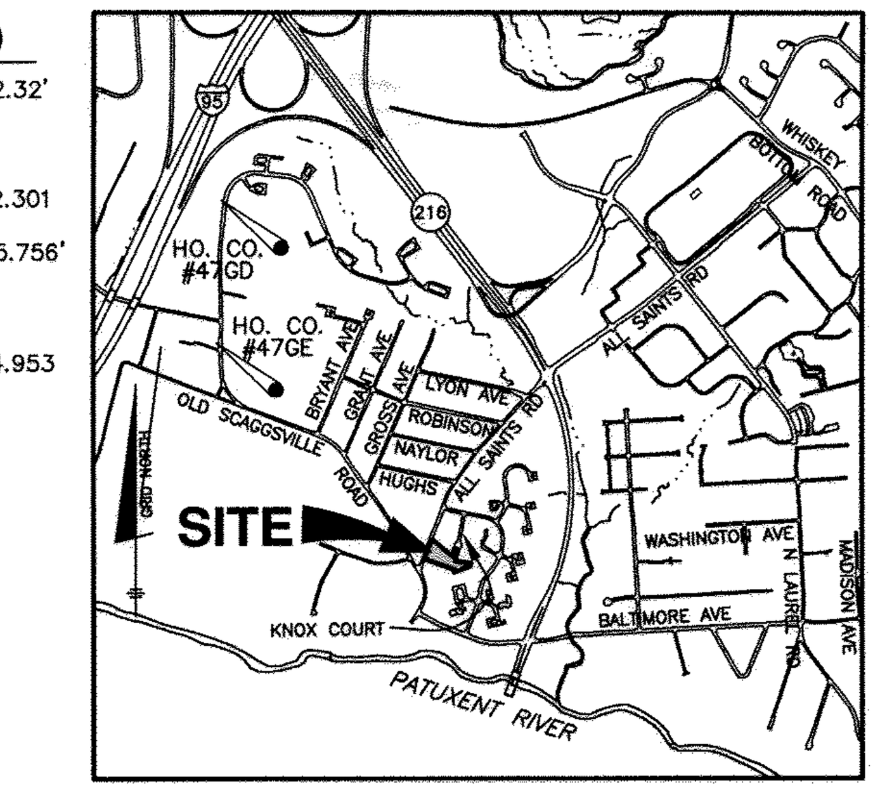
26.) A FEE-IN-LIEU IN THE AMOUNT OF $12,300.00 FOR THE REQUIRED SIDEWALK IMPROVEMENTS ALONG ALL SAINTS ROAD WAS PAID AS PART OF DEVELOPERS AGREEMENT. THIS PAYMENT WILL BE CREDITED TO CAPITAL PROJECT NUMBER K-5061.



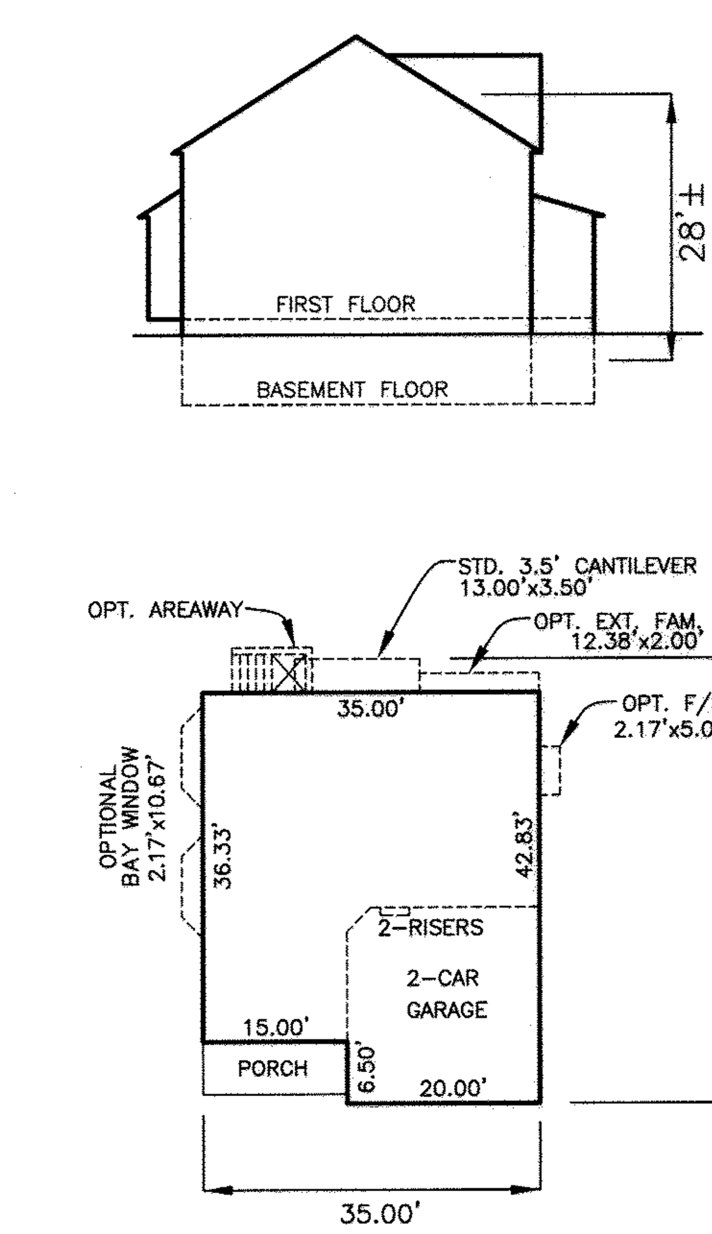
BENCH MARKS (NAD83)

HO. CO. No. 47GD ELEV. 312.32'
NEAR 9028 OLD SCAGGSVILLE ROAD
6 FEET FROM FIRE HYDRANT
33.9 FEET FROM BGE 315258
N 530494.447 E 1350872.301

HO. CO. No. 47GE ELEV. 335.756'
BY 9160 OLD SCAGGSVILLE ROAD
19.8 FEET FROM WATER METER
76.5 FEET FROM BGE 31000
N 529044.964 E 1350854.953



VICINITY MAP
SCALE: 1" = 2000'
ADC MAP: 40
ADC GRID: B8



CLAREMONT II
SCALE: 1" = 20'

ADDRESS CHART

LOT	STREET ADDRESS
1	9124 KNOX COURT
2	9128 KNOX COURT
3	9132 KNOX COURT
4	9136 KNOX COURT
5	9140 KNOX COURT

SITE ANALYSIS DATA CHART

A.) TOTAL PROJECT AREA — 1.42 acres
B.) AREA OF PLAN SUBMISSION — 1.42 acres
C.) LIMIT OF DISTURBED AREA — 1.11 acres
D.) PRESENT ZONING: — R-SC
E.) PROPOSED USE OF SITE: — RESIDENTIAL SINGLE FAMILY DETACHED
F.) FLOOR SPACE ON EACH LEVEL OF BLDG PER USE — N/A
G.) TOTAL NUMBER OF UNITS ALLOWED AS SHOWN ON FINAL PLAT(S) — 5
H.) TOTAL NUMBER OF UNITS PROPOSED — 5
I.) MAXIMUM NUMBER OF EMPLOYEES, TENANTS ON SITE PER USE — N/A
J.) NUMBER OF PARKING SPACES REQUIRED BY HO. CO. ZONING REGS AND/OR FDP CRITERIA — 12.5 (5 UNITS x 2.5)
K.) NUMBER OF PARKING SPACES PROVIDED ONSITE (INCLUDES HANDICAPPED SPACES) — 20 (2 PER GARAGE AND 2 PER DRIVEWAY)
L.) OPEN SPACE ON-SITE — 0.48 AC. (RECORDED UNDER PLAT ____)
M.) AREA OF RECREATIONAL OPEN SPACE REQUIRED — N/A
AREA OF RECREATIONAL OPEN SPACE PROVIDED — N/A
N.) BUILDING COVERAGE OF SITE — N/A
PERCENTAGE OF GROSS AREA — N/A
O.) APPLICABLE DPZ FILE REFERENCES: — ECP-14-054, WP-14-123, F-15-049

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.

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

"NO AS-BUILT INFORMATION IS REQUIRED ON THIS SHEET"

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 BY THE DEPARTMENT OF INSPECTIONS LICENSES AND PERMITS AT THE TIME OF BUILDING PERMIT. THE FEE-IN-LIEU SHALL BE PAID FOR ALL LOTS/RESIDENTIAL UNITS WITHIN THIS SUBDIVISION AT TIME OF BUILDING PERMIT ISSUANCE.

DESIGN NARRATIVE:

FOR THE PROPOSED IMPERVIOUS AREAS OF THIS SUBDIVISION, FIVE (M-6) MICRO BIO-RETENTION PRACTICES HAVE BEEN PROPOSED FOR TREATMENT.

NATURAL RESOURCE PROTECTION IS BEING ACHIEVED SINCE THERE ARE NO ENVIRONMENTALLY SENSITIVE AREAS LOCATED ON THE PROJECT. THE STEEP SLOPES ALONG ALL SAINTS ROAD SHALL NOT BE DISTURBED.

NATURAL FLOW PATTERNS HAVE BEEN PRESERVED BY PLACING THE ESD PRACTICES AROUND THE OUTER PERIMETER OF THE SITE AND HAVING THEM DISCHARGE ALONG THIS PERIMETER IN VARIOUS LOCATIONS AS OPPOSED TO ONE CONCENTRATED AREA. THIS SHALL MIMIC THE EXISTING CONDITION OF FLOW.

REDUCTION OF IMPERVIOUS AREAS HAS BEEN ACHIEVED BY UTILIZING THE NARROWEST POSSIBLE DRIVEWAY WIDTHS AS ALLOWED BY HOWARD COUNTY FOR A USE-IN-COMMON DRIVE.

SEDIMENT AND EROSION CONTROL SHALL MAINLY CONSIST OF DOUBLE ROW OF SUPER SILT FENCE AROUND THE PERIMETER. DIVERSION FENCING SHALL BE UTILIZED ALONG THE NORTH SIDE OF THE PROJECT TO DIVERT RUNOFF AROUND THE SITE. SEDIMENT TRAPS WILL NOT BE NEEDED.

AS A RESULT OF UTILIZING ENVIRONMENTAL SITE DESIGN (ESD) TO THE MAXIMUM EXTENT PRACTICAL (MPE), STORMWATER MANAGEMENT HAS BEEN ADEQUATELY ADDRESSED WITHOUT THE NEED FOR STRUCTURAL PRACTICES.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-18
6-19-17

ESD STORMWATER MANAGEMENT SUMMARY TABLE

Pe= 1.2 inches; Qe= 0.33 inches; ESDv= 1705 cf; Rv= 0.28

Practice		DA to practice	Imp Area to practice	Af (s.f.) Required	Af (s.f.) Provided	Af (s.f.) 2% DA?	ESDv Required	ESDv Provided	ESDv Pe Provided	REv Required	REv Provided	Ownership
(M-6) MicroBioretention	#1	3,351	1,583	67	87	PASS	159	261	1.2		REv is met via 0.5' stone chamber below MB #5	Private
(M-6) MicroBioretention	#2	2,113	1,062	42	83	PASS	106	202	1.2			Private
(M-6) MicroBioretention	#3	6,513	3,485	130	193	PASS	346	405	1.2			Private
(M-6) MicroBioretention	#4	4,551	2,416	91	136	PASS	240	309	1.2			Private
(M-6) MicroBioretention	#5	13,154	6,425	263	529	PASS	644	923	1.2			Private
Total Treated ⟶		29,682	14,971	594	1,028		1,705	2,100	1.5	85	106	
Site Total ⟶		61,986	15,448									

The 517 sf of impervious area that is left untreated is the area at the beginning portion of the use-in-common drive that drains back to the cul-de-sac.
Total ESDv provided exceeds that which is required.
* ESD volume required based on 75% of ESDv.

SHEET INDEX

NO.	TITLE
1	TITLE SHEET
2	SITE DEVELOPMENT AND GRADING PLAN
3	STORMWATER MANAGEMENT NOTES, CHARTS & DETAILS
4	STORM DRAIN DRAINAGE MAP, PROFILES & DETAILS
5	SEDIMENT AND EROSION CONTROL PLAN
6	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
7	SOIL BORING LOGS

PERMIT INFORMATION CHART

SUBDIVISION NAME:			SECTION/AREA:		LOT/PARCEL #
KNOX LANDING II			N/A		LOTS 1 thru 5
PLAT No.	GRID No.	ZONE	TAX MAP NO	ELECTION DISTRICT	CENSUS TRACT
23635 - 23636	2	R-SC	50	6th	6069.03

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS
COUNTY HEALTH OFFICER — DATE
HOWARD COUNTY HEALTH DEPARTMENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2-3-16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2-12-16
DIRECTOR — DATE 2-16-16

NO.	DATE	REVISION
1	8-31-2016	REVISE HOUSE TYPE TO A "CLAREMONT II"

BENCHMARK ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017
12-17-15

OWNER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

DEVELOPER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

KNOX LANDING II
LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7
RESIDENTIAL - SINGLE FAMILY DETACHED

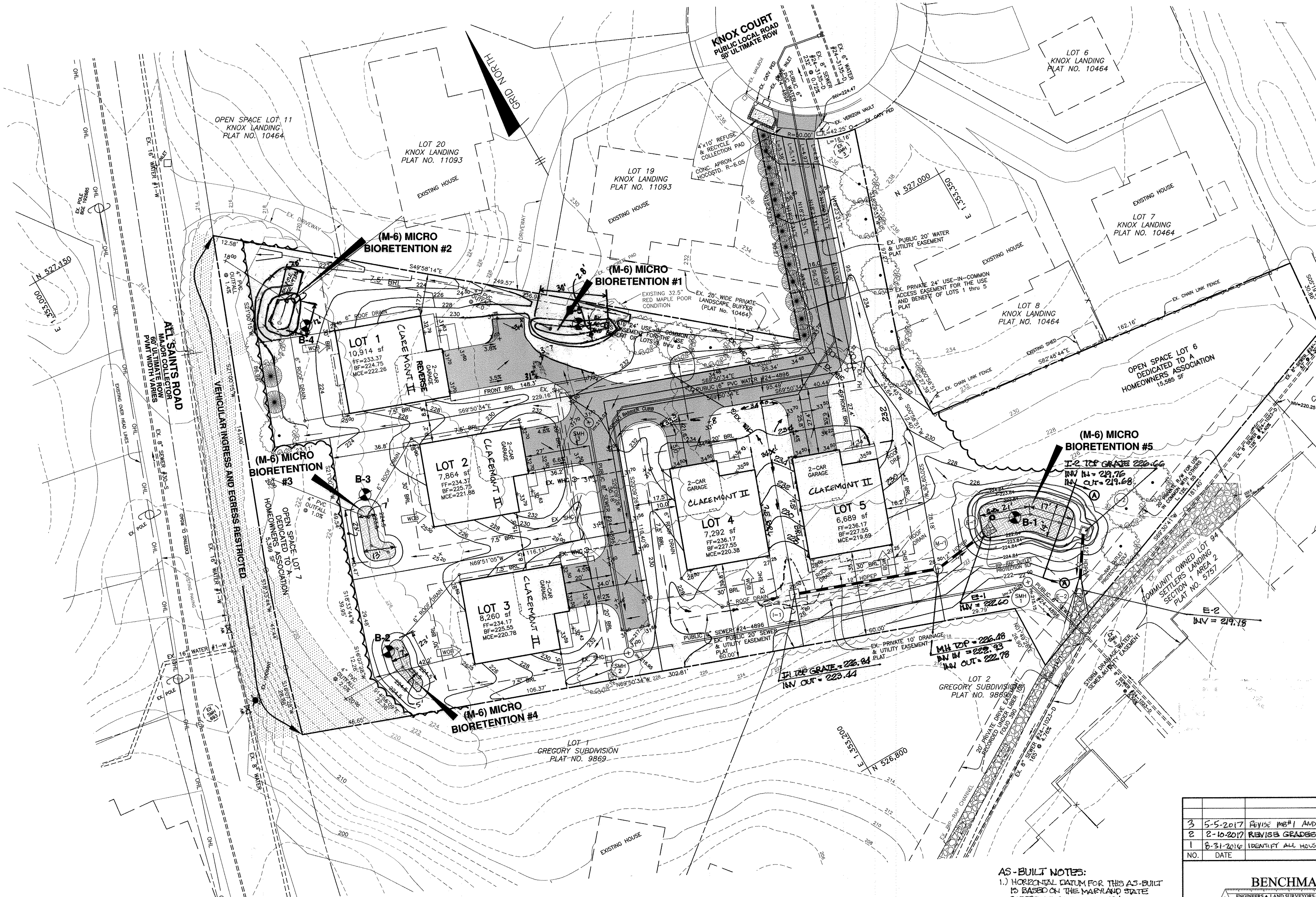
TAX MAP: 50 GRID: 2 PARCEL: 75 & 528 ZONED: R-SC
9417 ALL SAINTS ROAD
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
TITLE SHEET

DATE: DECEMBER, 2015 — BEI PROJECT NO: 2586
DESIGN: DBT — DRAWN: DBT — SCALE: AS SHOWN — SHEET 1 OF 7

AS-BUILT

SDP-16-010



LEGEND

- EXISTING CONTOURS
- STEEP SLOPES
- EXISTING TREELINE
- PROPOSED TREELINE
- PROJECT BOUNDARY LINE
- DRIVEWAY
- MICRO-BIORETENTION SURFACE AREA
- PERIMETER TREES INSTALLED UNDER F-15-049
- B-1 TEST BORING LOCATION
- WOB INDICATES A WALK-OUT BASEMENT
- EX. WHC EX. 1.5" WATER HOUSE CONN. WITH 1" METER
- EX. SHC EX. 4" SEWER HOUSE CONN.
- 30' BRL INDICATES BUILDING RESTRICTION LINE

NO.	DATE	REVISION
3	5-5-2017	REVISE MB#1 AND #2 CONFIGURATIONS ON LOT 1 PER AS-BUILT CONDITIONS
2	2-10-2017	REVISE GRADES ON LOT 5 PER AS-BUILT CONDITIONS
1	8-31-2016	IDENTIFY ALL HOUSES AS "CLAREMONT II"

1 inch = 20 ft.

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 6-19-17

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-18

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

AS-BUILT NOTES:
1.) HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83/ ADJ 07 AS PROJECTED FROM HO CO. GEODETIC CONTROL STATIONS 47GO AND 47GE. VERTICAL DATUM FOR THIS AS-BUILT IS NORTH AMERICAN VERTICAL DATUM NGVD 88 AS PROJECTED FROM THE ABOVE MENTIONED HOWARD COUNTY GEODETIC CONTROL STATIONS
2.) THE INSTRUMENTS USED IN PERFORMING THE AS-BUILT WERE A 5" TOTAL STATION AND PRISM AND RTK GPS.
3.) THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 2-3-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 2-12-16
DIRECTOR	DATE 2-16-16

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017
STATE OF MARYLAND CHRISTOPHER ALAN MALAGARI PROFESSIONAL ENGINEER 12-17-15

OWNER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

DEVELOPER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

KNOX LANDING II
LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7

TAX MAP: 50 GRID: 2 PARCEL: 75 & 528 ZONED: R-SC
9417 ALL SAINTS ROAD
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT AND GRADING PLAN

DESIGN: DBT	DRAWN: DBT	DATE: DECEMBER, 2015	BEI PROJECT NO: 2586
		SCALE: AS SHOWN	SHEET 2 OF 7

AS-BUILT

SDP-16-010

2586 Knox Property\dwg\8000.dwg, 12/16/2015 2:20:19 PM

CONSTRUCTION SPECIFICATIONS

B.4.C Specifications for Micro-Bioretention, Rain Gardens, Landscape Infiltration & Infiltration Berms

1. Material Specifications:

The allowable materials to be used in these practices are detailed in Table B.4.1.

2. Filtering Media or Planting Soil:

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the micro-bioretention practice that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05. The planting soil shall be tested and shall meet the following criteria:

Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)
Organic Content - Minimum 10% by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy and(60%-65%) and compost (35% to 40%) or sandy loam (30%), coarse sand (30%), and compost (40%).
Clay Content - Media shall have a clay content of less than 5%.
pH Range - Should be between 5.5 - 7.0. Amendments (e.g., lime, iron sulfate plus sulfur) may be mixed into the soil to increase or decrease pH.

There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.

3. Compaction:

It is very important to minimize compaction of both the base of bioretention practices and the required backfill. When possible, use excavation hoes to remove original soil. If practices are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

4. Plant Material:

Recommended plant material for micro-bioretention practices can be found in Appendix A, Section A.2.3.

5. Plant Installation:

Compost is a better organic material source, is less likely to float, and should be placed in the invert and other low areas. Mulch should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

6. Underdrains:

Underdrains should meet the following criteria:

- Pipe- Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
- Perforations - If perforated pipe is used, perforations should be ⅜" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a ¼" (No. 4 or 4x4) galvanized hardware cloth.
- Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain
- The main collector pipe shall be at a minimum 0.5% slope.
- A rigid, non-perforated observation well must be provided (one per every 1,0000 square feet) to provide a clean-out port and monitor performance of the filter.
- A 4" layer of pea gravel (⅛" to ⅜" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

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

7. Miscellaneous:

These practices may not be constructed until all contributing drainage area has been stabilized

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

a. The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.

b. The Owner shall perform a plant inspection in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.

c. The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed the new layer is applied.

d. The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature]	2-3-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
[signature]	2-12-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
[signature]	2-16-16
DIRECTOR	DATE

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

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

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 – 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with ¼-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'_c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

M-6 Micro-Bioretention #1

Elev.	Description	Elevation
1	top of ponding/storage	229.00
2	top of mulch	228.00
3	top of soil	227.83
4	bottom of soil	225.83
5	bottom of stone	225.50
6	4" pvc pipe invert	224.92
7	bottom of facility	224.67
	Surface Area (sf)	87

M-6 Micro-Bioretention #2

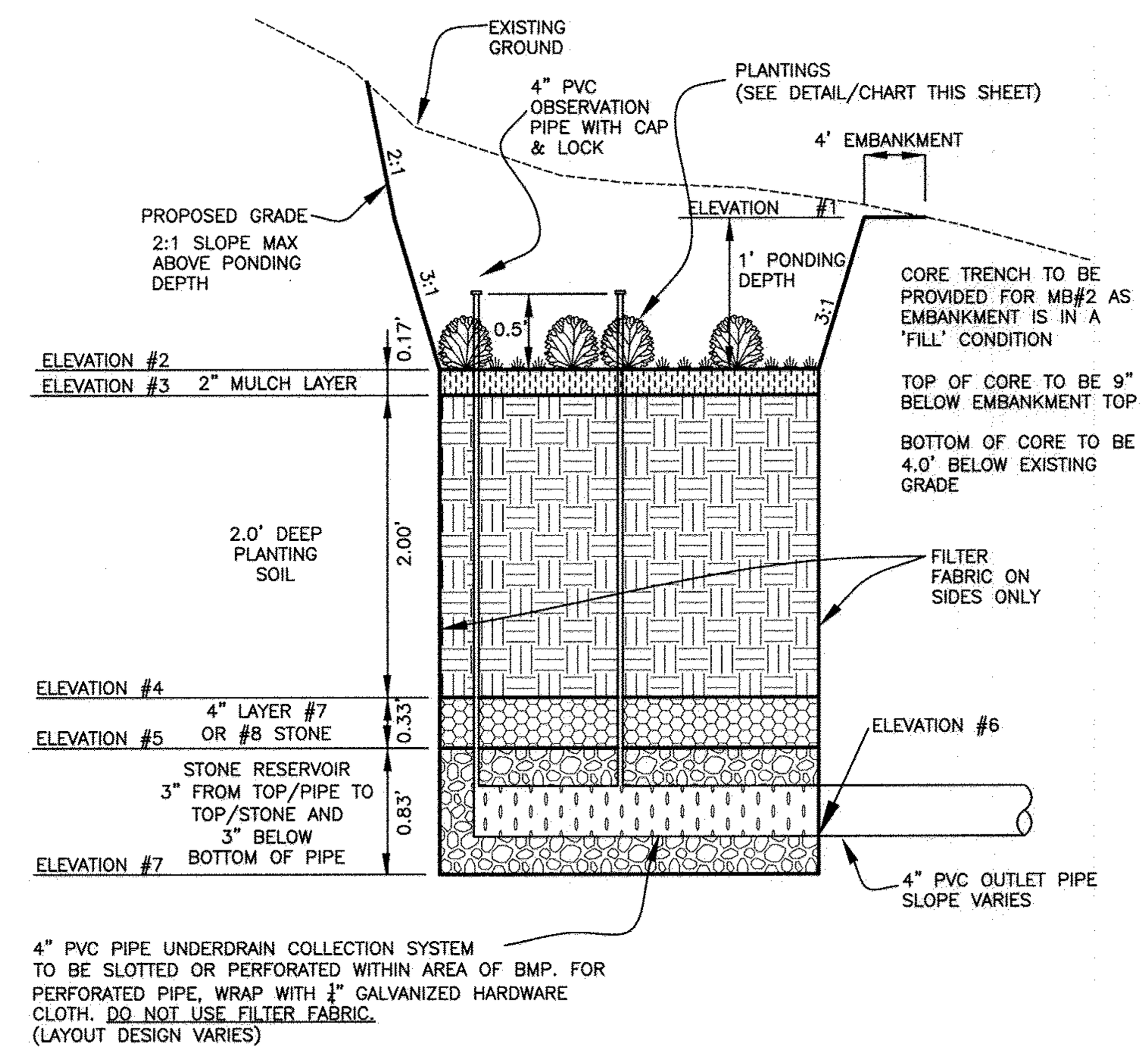
Elev.	Description	Elevation
1	top of ponding	222.50
2	top of mulch	221.50
3	top of soil	221.33
4	bottom of soil	219.33
5	bottom of stone	219.00
6	4" pvc pipe invert	218.42
7	bottom of facility	218.17
	Surface Area (sf)	83

M-6 Micro-Bioretention #3

Elev.	Description	Elevation
1	top of ponding	224.50
2	top of mulch	223.50
3	top of soil	223.33
4	bottom of soil	221.33
5	bottom of stone	221.00
6	4" pvc pipe invert	220.42
7	bottom of facility	220.17
	Surface Area (sf)	193

M-6 Micro-Bioretention #4

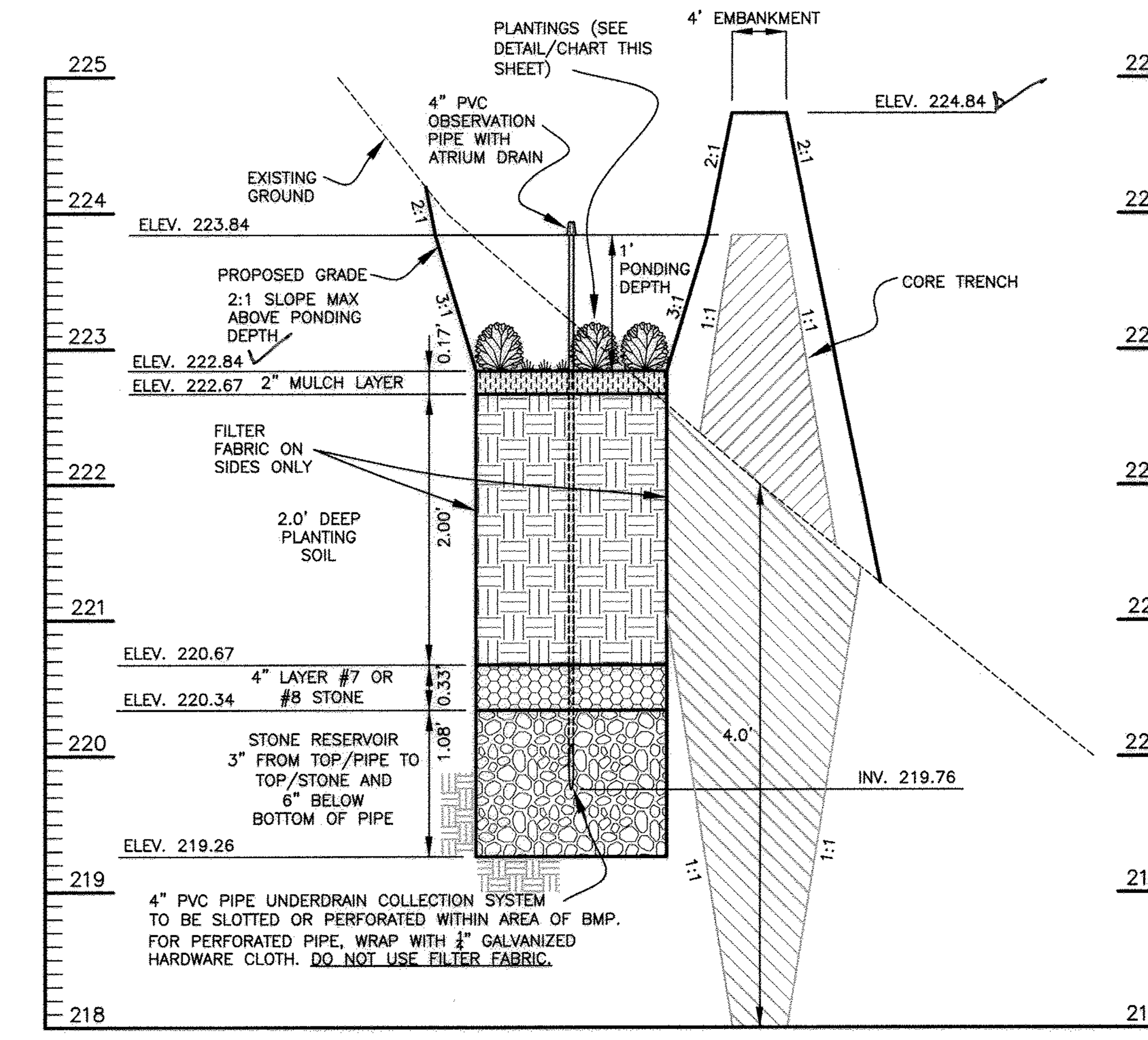
Elev.	Description	Elevation
1	top of ponding	224.50
2	top of mulch	223.50
3	top of soil	223.33
4	bottom of soil	221.33
5	bottom of stone	221.00
6	4" pvc pipe invert	220.42
7	bottom of facility	220.17
	Surface Area (sf)	136



TYPICAL CROSS-SECTION THROUGH PRIVATE MICRO-BIORETENTIONS #1, #2, #3 AND #4

SCALE: 1"=10' HORZ., 1"=1' VERT.

NOTE: MICRO BIORETENTION FACILITIES 1, 2, 3 & 4 WERE AS-BUILT AS PART OF THE ON LOT GRADE CERTIFICATIONS



CROSS-SECTION A-A THROUGH PRIVATE MICRO-BIORETENTION #5

SCALE: 1"=10' HORZ., 1"=1' VERT.

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 6-19-17

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-18

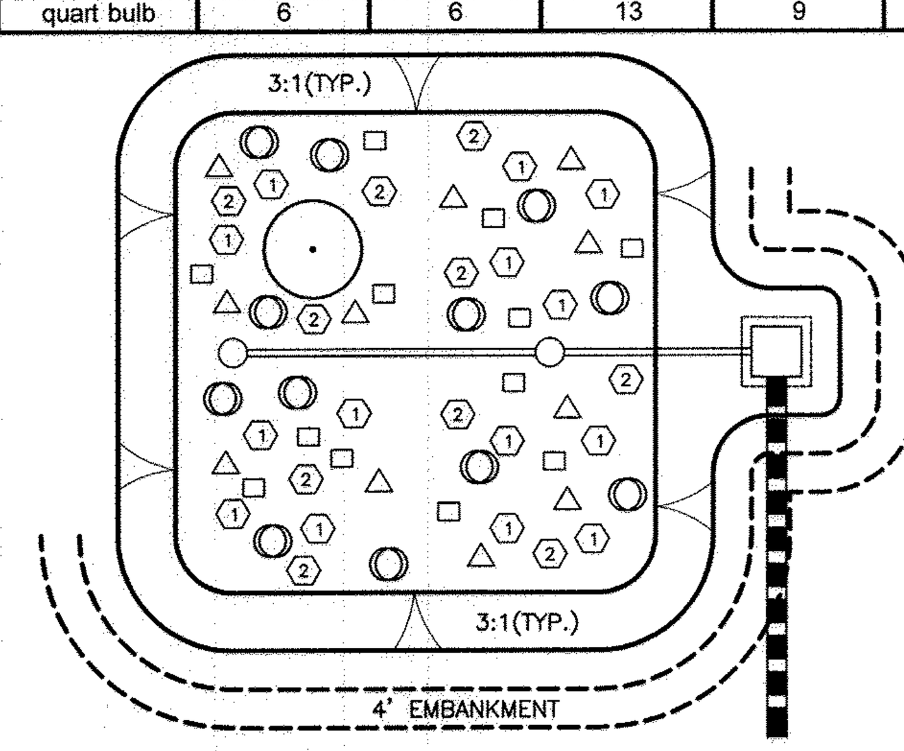
STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

M-6 MICRO-BIORETENTION PRACTICE INTERNAL LANSCAPING CHART

				MB #1	MB #2	MB #3	MB #4	MB #5	TOTAL
Facility square footage	→			87	83	193	136	529	1028
PLANT NAME	COMMON NAME	TYPE	SIZE	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
Ilex verticillata	Common Winterberry	shrub	2.5'-3' ht	1	1	2	1	5	10
Lobelia cardinalis	Cardinal flower	perennial herbaceous plant	quart bulb	6	6	13	9	35	69
Lobelia siphilitica	Great Blue Lobelia	perennial herbaceous plant	quart bulb	6	6	13	9	35	69
Carex stricta	Uptight Sedge	grass	quart bulb	6	6	13	9	35	69
Iris versicolor	Blue Water Iris	perennial herbaceous plant	quart bulb	6	6	13	9	35	69
Liatris spicata	Prairie Gay Feather	perennial herbaceous plant	quart bulb	6	6	13	9	35	69

PLANTING LEGEND

SYMBOL	NAME
(1)	LOBELIA CARDINALIS
(2)	LOBELIA SIPHILITICA
□	CAREX STRICTA
△	IRIS VERSICOLOR
◎	LIATRIS SPICATA
⊙	ILEX VERTICILLATA



SCHEMATIC PLANTING DETAIL FOR (M-6) MICRO-BIORETENTION

NOT TO SCALE

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017
STATE OF MARYLAND CHRISTOPHER ALAN MALAGARI PROFESSIONAL ENGINEER 12-17-15

OWNER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

DEVELOPER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

KNOX LANDING II
LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7

TAX MAP: 50 GRID: 2 PARCEL: 75 & 528 ZONED: R-SC
9417 ALL SAINTS ROAD
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT NOTES, CHART AND DETAILS

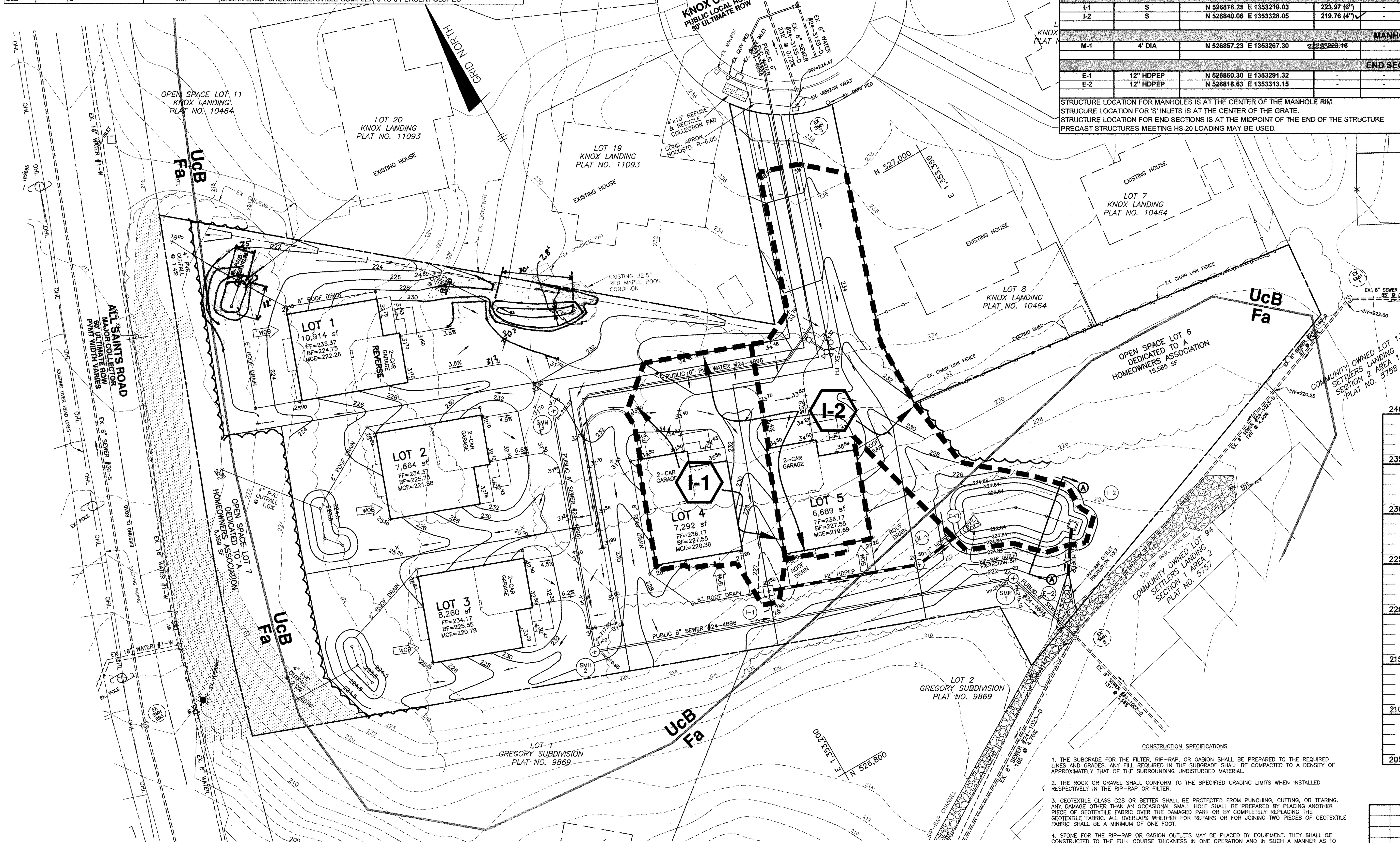
DATE: DECEMBER, 2015		BEI PROJECT NO: 2586	
DESIGN: DBT	DRAWN: DBT	SCALE: AS SHOWN	SHEET 3 OF 7

AS-BUILT

SDP-16-010

NRCS SOILS CHART - Map No. 28

SYMBOL	HYDRIC	HYDROLOGIC GROUP	Kw erodibility Factor	NAME
Fa*	YES	D	0.20	FALLSINGTON SANDY LOAM, 0 TO 2 PERCENT
UcB		D	0.37	URBAN LAND- CHILLUM-BELTSVILLE COMPLEX, 0 TO 5 PERCENT SLOPES



STRUCTURE TABLE

STRUCTURE	TYPE	LOCATION	INVERT IN		INVERT OUT	TOP ELEV.	THROAT ELEV.	STD. DETAIL	MAINTENANCE
INLETS									
I-1	S	N 526878.25 E 1353210.03	223.97 (6")	-	223.44 ~~223.47~~	~~226.50~~ 226.34	NA	HO.CO.STD. D-4.22	PRIVATE
I-2	S	N 526840.06 E 1353328.05	219.76 (4") ✓	-	219.68 ~~219.76~~	~~223.84~~ 223.66	NA	HO.CO.STD. D-4.22	PRIVATE
MANHOLES									
M-1	4' DIA	N 526857.23 E 1353267.30	222.93 ~~223.16~~	-	222.78 ~~222.96~~	~~226.50~~ 226.48		HO.CO.STD. G-5.12	PRIVATE
END SECTIONS									
E-1	12" HDPEP	N 526860.30 E 1353291.32	-	-	222.60 ~~222.84~~	NA		NA	PRIVATE
E-2	12" HDPEP	N 526818.63 E 1353313.15	-	-	219.18 ~~219.50~~	NA		NA	PRIVATE

STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE RIM.
STRUCURE LOCATION FOR 'S' INLETS IS AT THE CENTER OF THE GRATE.
STRUCTURE LOCATION FOR END SECTIONS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

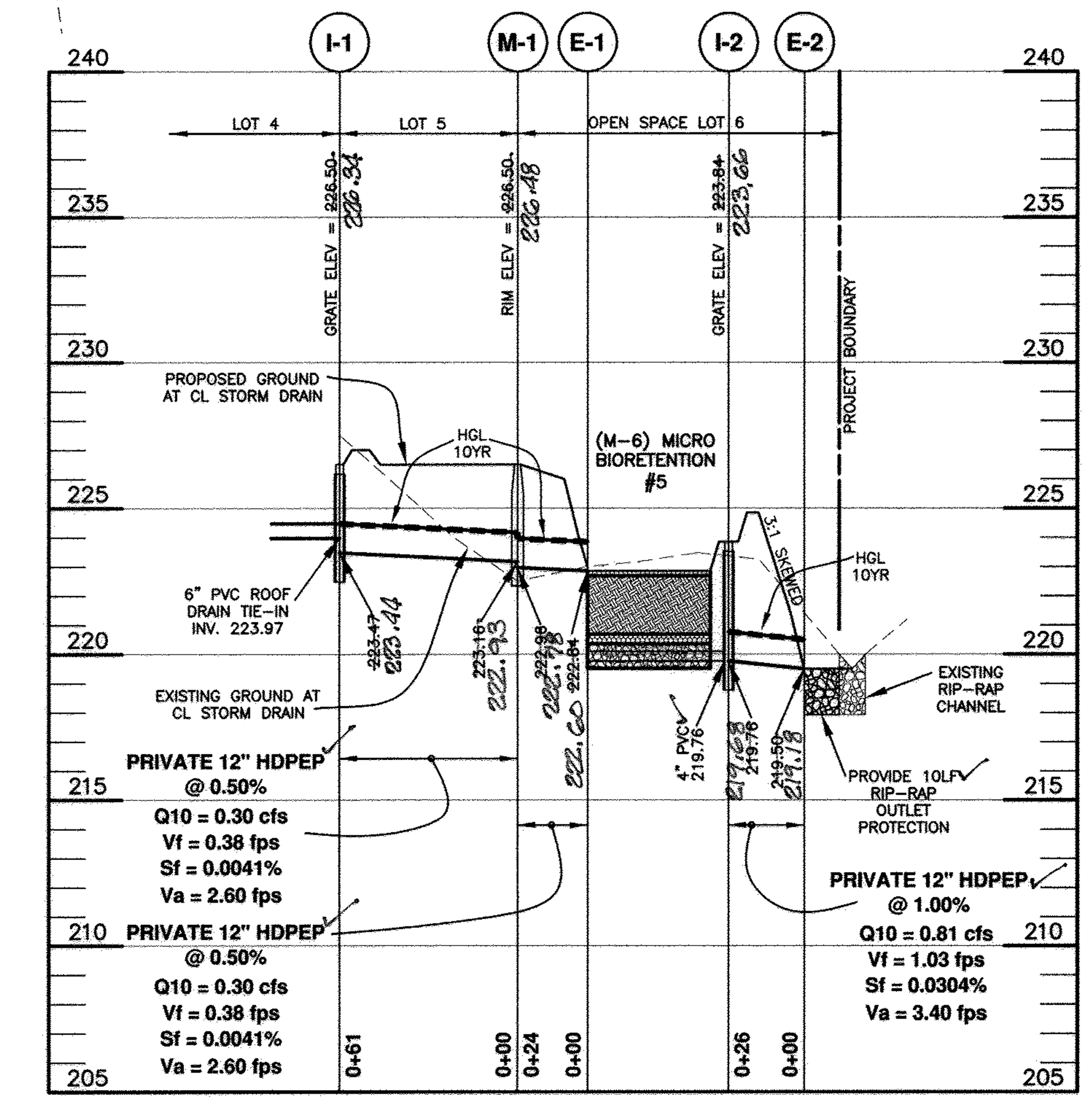
PIPE SCHEDULE

SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
4"	PVC (MB outfall pipes)	128	PRIVATE
6"	PVC (roof manifold)	447	PRIVATE
12"	HDPEP	111	PRIVATE

All pipes shall have smooth interior. No interior corrugations.

STORM DRAIN DRAINAGE AREA CHART

INLET #	ZONING (Z)	AREA (Ac) (A)	"C" FACTOR (C)<25	% IMPERVIOUS (P)<25
I-1	R-SC	0.10	0.36	65.0
I-2	R-SC	0.30	0.36	65.0



STORM DRAIN PROFILE

SCALE: 1" = 50' HORZ., 1" = 5' VERT.

1 inch = 20 ft.

CONSTRUCTION SPECIFICATIONS

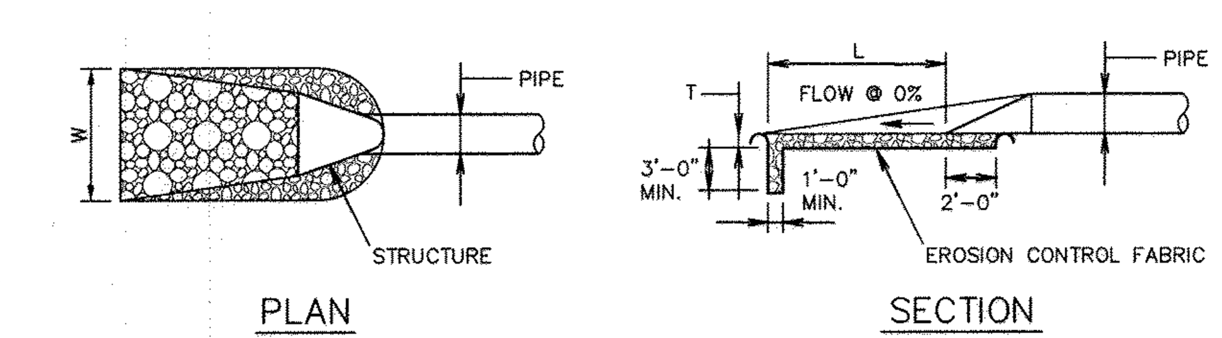
1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.

3. 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 GABION OUTLETS 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 HE RIP-RAP OR GABION OUTLETS 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. RIP-RAP 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 WORKS.

5. THE STONE 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.



PLAN

SECTION

STRUCTURE	V10 fps	d10 (ft)	d50	LENGTH(L)	WIDTH(W)	THICK.(T)	SHA CLASS
E-1	3.32	0.17	9.5"	5'	5'	19"	I
E-2	5.26	0.25	9.5"	10'	10'	19"	I

OUTLET PROTECTION DETAIL

NOT TO SCALE

LEGEND

- EXISTING CONTOURS
- STEEP SLOPES
- EXISTING TREELINE
- PROPOSED TREELINE
- PROJECT BOUNDARY LINE
- DRAINAGE DIVIDE
- **BaA** SOILS CLASSIFICATION
- SOILS DELINEATION

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 6-19-17

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 , Expiration Date: 12-21-18

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] CHIEF, DEVELOPMENT ENGINEERING DIVISION JR	2-3-16 DATE
[signature] CHIEF, DIVISION OF LAND DEVELOPMENT	2-12-16 DATE
[signature] DIRECTOR	2-16-16 DATE

NO.	DATE	REVISION
1	5-5-2017	REVISE MB#1 AND #2 CONFIGURATIONS ON LOT 1 PER AS-BUILT CONDITIONS

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017

STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — PROFESSIONAL ENGINEER — 12-17-15

OWNER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

DEVELOPER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

KNOX LANDING II
LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7

TAX MAP: 50 GRID: 2 PARCEL: 75 & 528 ZONED: R-SC
9417 ALL SAINTS ROAD
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

STORM DRAIN DRAINAGE MAP, PROFILES & DETAILS

DATE: DECEMBER, 2015 | BEI PROJECT NO: 2586
DESIGN: DBT | DRAWN: DBT | SCALE: AS SHOWN | SHEET 4 OF 7

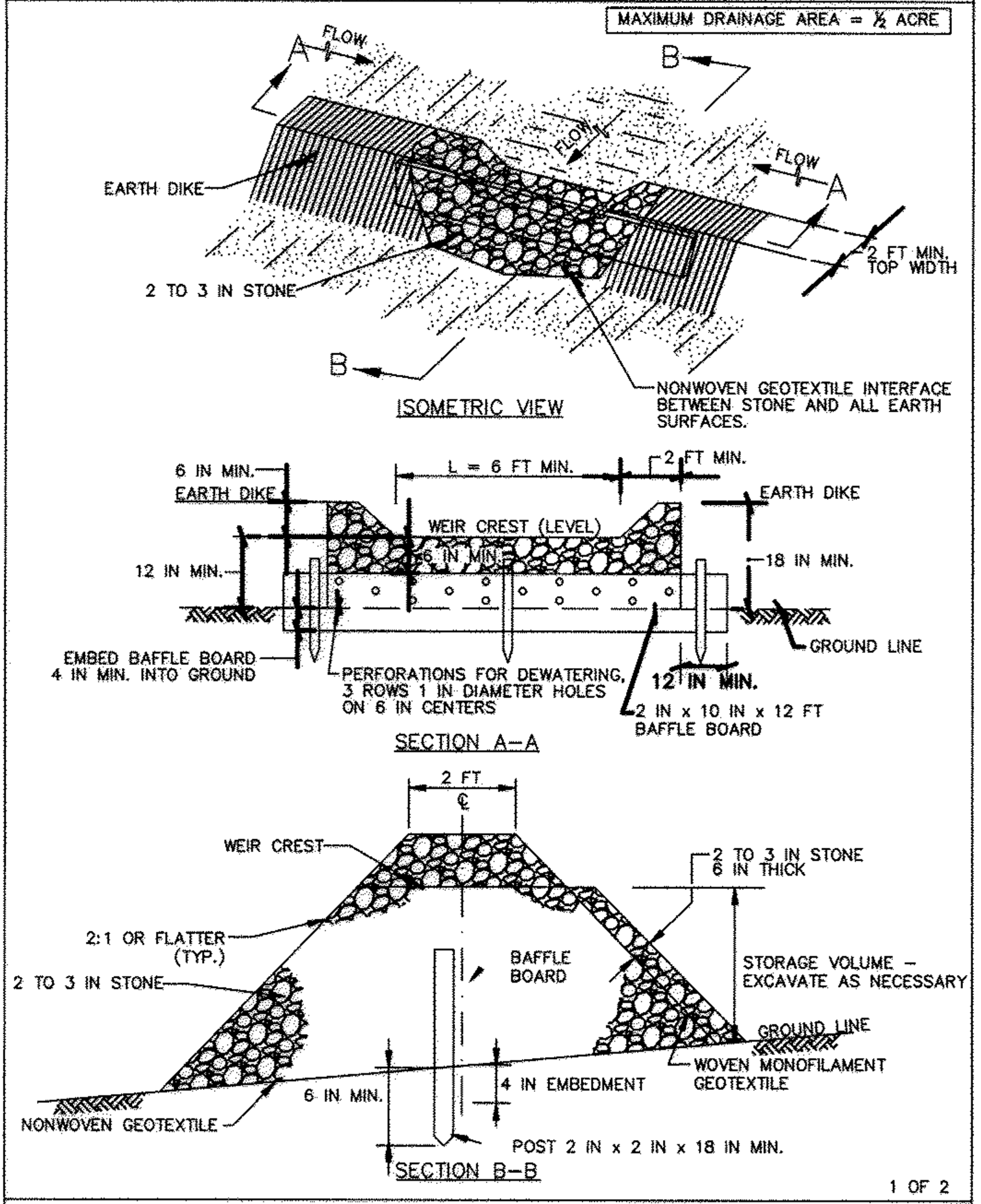
AS-BUILT

SDP-16-010

DETAIL E-7 TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

MAXIMUM DRAINAGE AREA = ½ ACRE



1 OF 2

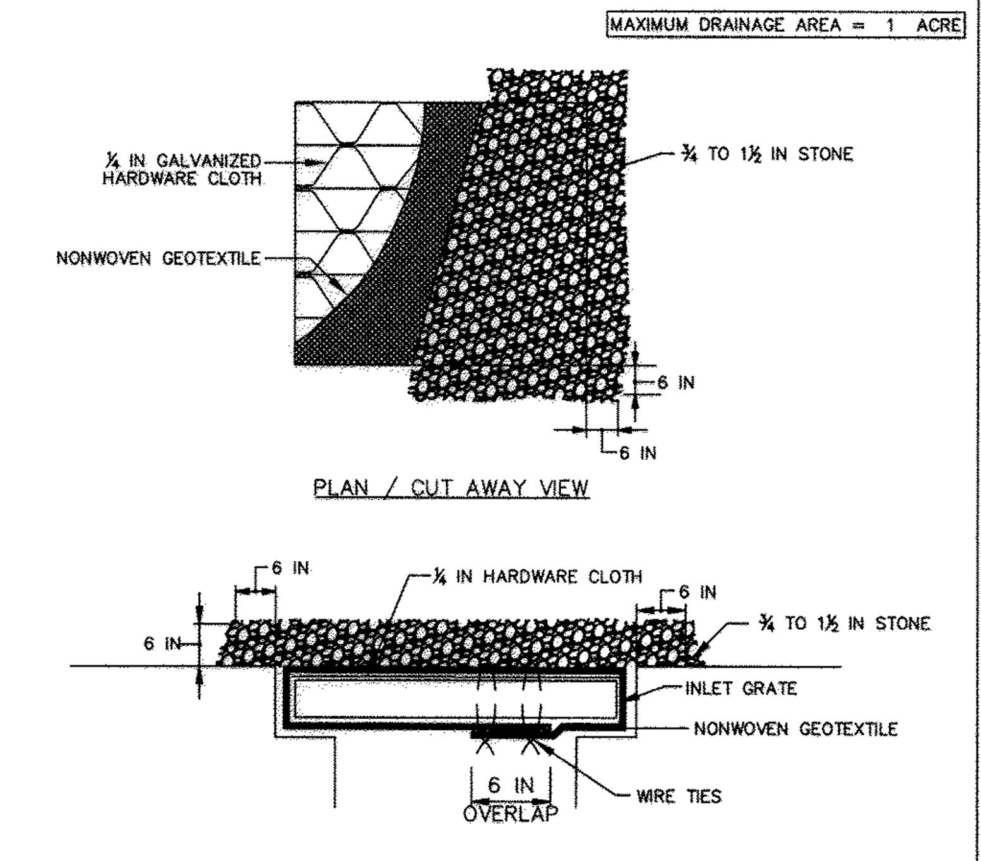
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL: AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



CONSTRUCTION SPECIFICATIONS

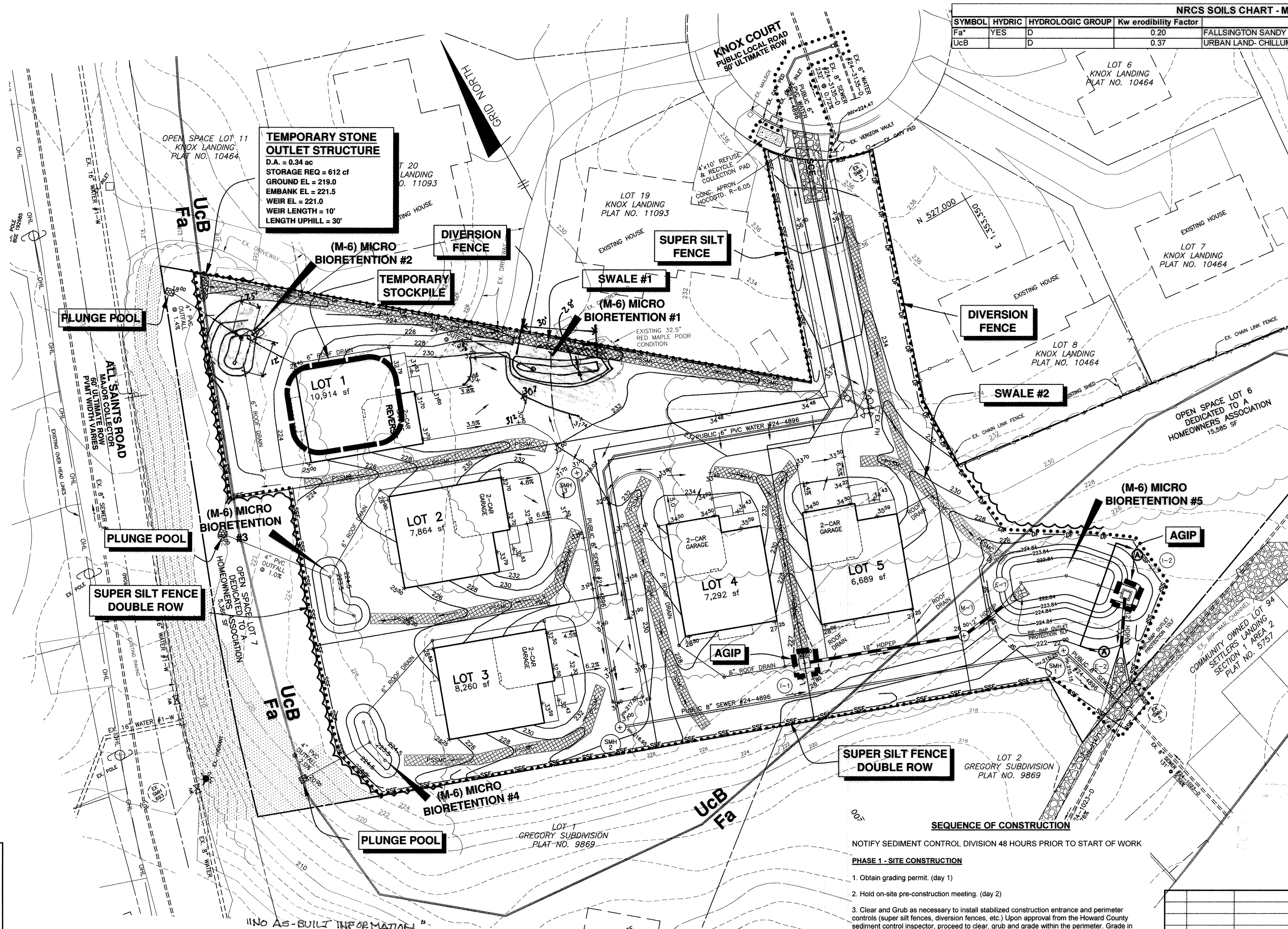
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM 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 WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

NRCS SOILS CHART - Map No. 28

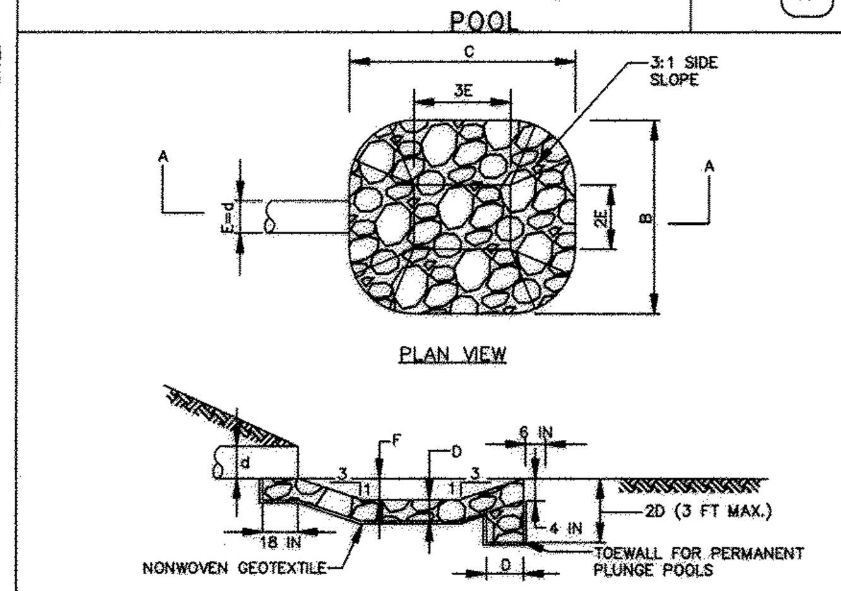
SYMBOL	HYDRIC	HYDROLOGIC GROUP	Kw erodibility Factor	NAME
Fa*	YES	D	0.20	FALLSINGTON SANDY LOAM, 0 TO 2 PERCENT
UcB		D	0.37	URBAN LAND- CHILLUM-BELTSVILLE COMPLEX, 0 TO 5 PERCENT SLOPES



"NO AS-BUILT INFORMATION" IS REQUIRED ON THIS SHEET

DETAIL D-4-2 PLUNGE POOL

STANDARD SYMBOL: PP



CONSTRUCTION SPECIFICATIONS

1. USE SPECIFIED CLASS OF RIPRAP.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.
3. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.
5. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Cl Malagari — 12-17-15
ENGINEER — DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON–SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

B D By — 12/16/15
DEVELOPER — DATE

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

[signature] — 1/6/16
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] — 2-3-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

[signature] — 2-12-16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] — 2-16-16
DIRECTOR — DATE

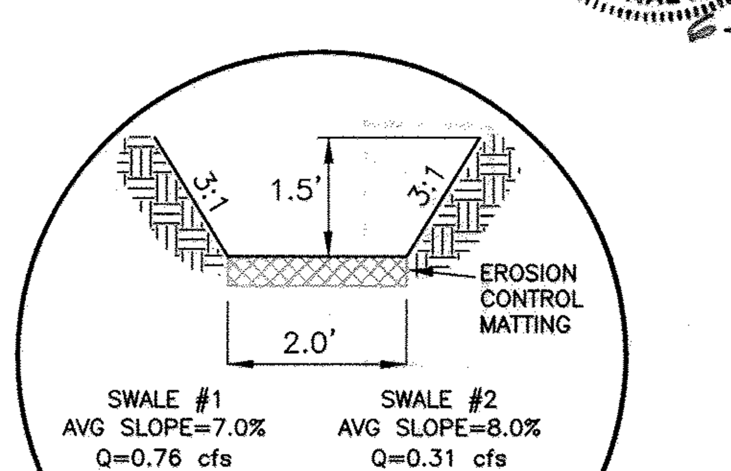
LEGEND

- EXISTING CONTOURS
- STEEP SLOPES
- EXISTING TREELINE
- PROPOSED TREELINE
- PROJECT BOUNDARY LINE
- USE–IN–COMMON DRIVEWAY
- LIMIT OF DISTURBANCE
- SSF — SUPER SILT FENCE
- DF — DIVERSION FENCE
- PSSMC — EROSION CONTROL MATTING
- SCE — STABILIZED CONSTRUCTION ENTRANCE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-18

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
6-19-17

20 0 10 20 40 80
1 inch = 20 ft.



SWALE DETAIL
NOT TO SCALE

NOTES:

1. SUPER SILT FENCING TO BE CURLED UPHILL EVERY 6 FEET IN ELEVATION FORMING A 'J' SHAPE WHERE FENCING RUNS DOWNHILL.

THIS PLAN IS FOR SEDIMENT AND EROSION CONTROL ONLY

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF WORK

PHASE 1 - SITE CONSTRUCTION

1. Obtain grading permit. (day 1)
2. Hold on-site pre-construction meeting. (day 2)
3. Clear and Grub as necessary to install stabilized construction entrance and perimeter controls (super silt fences, diversion fences, etc.) Upon approval from the Howard County sediment control inspector, proceed to clear, grub and grade within the perimeter. Grade in swale along northern edge of the property and install TSOS. (day 3-10)
4. Install new water and sewer lines and house connections up to the easement line. (day 11-18)
5. Construct the storm drain system and the use-in-common portion of the driveway. Construct MB#5 but do not install plantings at this time[1]. Wrap outer perimeter of MB #5 with silt fence. Utilize inlet protection.

PHASE 2 - PER LOT HOUSE CONSTRUCTION

1. Obtain building permit. (day 1)
2. Hold on-site preconstruction meeting. (day 2)
3. Install perimeter lot controls (i.e. super silt fence). (day 3)
4. Excavate for foundation, rough grade and stabilize in accordance with the temporary seedbed notes. (day 4-10)
5. Construct house, install water and sewer house connections from easement up to house, backfill and construct driveway. (day 11-90)
6. Construct on-lot SWM practice (i.e. micro bio-retentions) complete with underdrains and plantings. Construct roof leader underdrains to the facilities. Final grade lot and stabilize in accordance with the PERMANENT seedbed notes. (day 91-5)
7. Upon approval from the Howard County Sediment Control Inspector, remove all sediment control devices and stabilize any remaining disturbed areas in accordance with the permanent seedbed notes. (day 96-100)

[1] *once the houses on Lots 4 and 5 have been constructed and the lots permanently stabilized, MB#5 can be planted and the silt fence and inlet protection can be removed.*

NO.	DATE	REVISION
1	5-5-2017	REVISE MB#1 AND #2 CONFIGURATIONS ON LOT 1 PER AS-BUILT CONDITIONS

BENCHMARK ENGINEERING, INC.
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017

STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — PROFESSIONAL ENGINEER
12-17-15

OWNER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410–792–2565

DEVELOPER:
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9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
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KNOX LANDING II

LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7

TAX MAP: 50 GRID: 2 PARCEL: 75 & 528 ZONED: R–SC
9417 ALL SAINTS ROAD
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

SEDIMENT & EROSION CONTROL PLAN

DATE: DECEMBER, 2015	BEI PROJECT NO: 2586
SCALE: AS SHOWN	SHEET 5 OF 7

DESIGN: DBT — DRAWN: DBT

AS-BUILT

SDP-16-010

B-4 STANDARDS AND SPECIFICATIONS
FOR
VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

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

Effects on Water Quality and Quantity

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

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

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

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

Adequate Vegetative Establishment

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

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

B-4-1 STANDARDS AND SPECIFICATIONS
FOR
INCREMENTAL STABILIZATION

Definition

Establishment of vegetative cover on cut and fill slopes.

Purpose

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

Conditions Where Practice Applies

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

Criteria

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

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

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

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

Figure B.

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

Definition

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

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

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

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

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

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

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

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

Conditions Where Practice Applies

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

Criteria

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

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

B-4-5 STANDARDS AND SPECIFICATIONS
FOR
PERMANENT STABILIZATION

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

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

Conditions Where Practice Applies

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

Criteria

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

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

B-4-4 STANDARDS AND SPECIFICATIONS
FOR
TEMPORARY STABLIZATION

Definition

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

Purpose

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

Conditions Where Practice Applies

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

Criteria

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

B-4-8 STANDARDS AND SPECIFICATIONS
FOR
STOCKPILE AREA

Definition

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

Purpose

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

Conditions Where Practice Applies

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

Criteria

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

Maintenance

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

H-5 STANDARDS AND SPECIFICATIONS
FOR
DUST CONTROL

Definition

Controlling the suspension of dust particles from construction activities.

Purpose

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

Conditions Where Practice Applies

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

Specifications

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

HOWARD SOIL CONSERVATION DISTRICT (HSCD)
STANDARD SEDIMENT CONTROL NOTES

1. A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-3133-1855 after the 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:

   a. Prior to the start of earth disturbance,
   b. Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading,
   c. Prior to the start of another phase of construction or opening of another grading unit,
   d. Prior to the removal or modification of sediment control practices.

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 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.

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 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 disturbed areas on the project site except for those areas under active grading.

4. All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (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 concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).

5. All sediment control structures are to remain in place, and are to be maintained in operative condition until permission for their removal has been obtained from the CID.

6. Site Analysis:

Total Area of Site:	1.42	Acres
Area Disturbed:	1.11	Acres
Area to be roofed or paved:	0.34	Acres
Area to be vegetatively stabilized:	0.77	Acres
Total cut:	1,400*	Cu Yds
Total fill:	1,100*	Cu Yds
Off-site waste/borrow area location:	SITE WITH AN ACTIVE GRADING PERMIT	

*CUT/FILL NUMBERS ARE FOR SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR TO VERIFY.

7. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.

8. Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly; and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:

- Inspection date
- Inspection type (routine, pre-storm event, during rain event)
- Name and title of inspector
- Weather information (current conditions as well as time and an=mount of last recorded precipitation
- Brief description of project's status (e.g. percent complete) and/or current activities
- Evidence of sediment discharges
- Identification of plan deficiencies
- Identification of sediment controls that require maintenance
- Identification of missing or improperly installed sediment controls
- Compliance status regarding the sequence of construction and stabilization requirements
- Photographs
- Monitoring/sampling
- Maintenance and/or corrective action performed
- Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).

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, whichever is shorter.

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. Minor revisions may be allowed by the CID per the list of HSCD-approved field changes.

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 grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has been stabilized and approved by the CID. Unless otherwise specified and approved by the CID, no more than 30 acres cumulatively may be disturbed at a given time.

12. Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.

13. Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.

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.

15. Stream channels must not be disturbed during the following restricted time periods (inclusive):

- Use I and IP March 1 – June 15
- Use III and IIIP October 1 – April 30
- Use IV March 1 – May 31

16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[signature] 12-17-15
ENGINEER — DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

[signature] 12/16/15
DEVELOPER — DATE

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

[signature] 1/6/16
HOWARD SOIL CONSERVATION DISTRICT — DATE

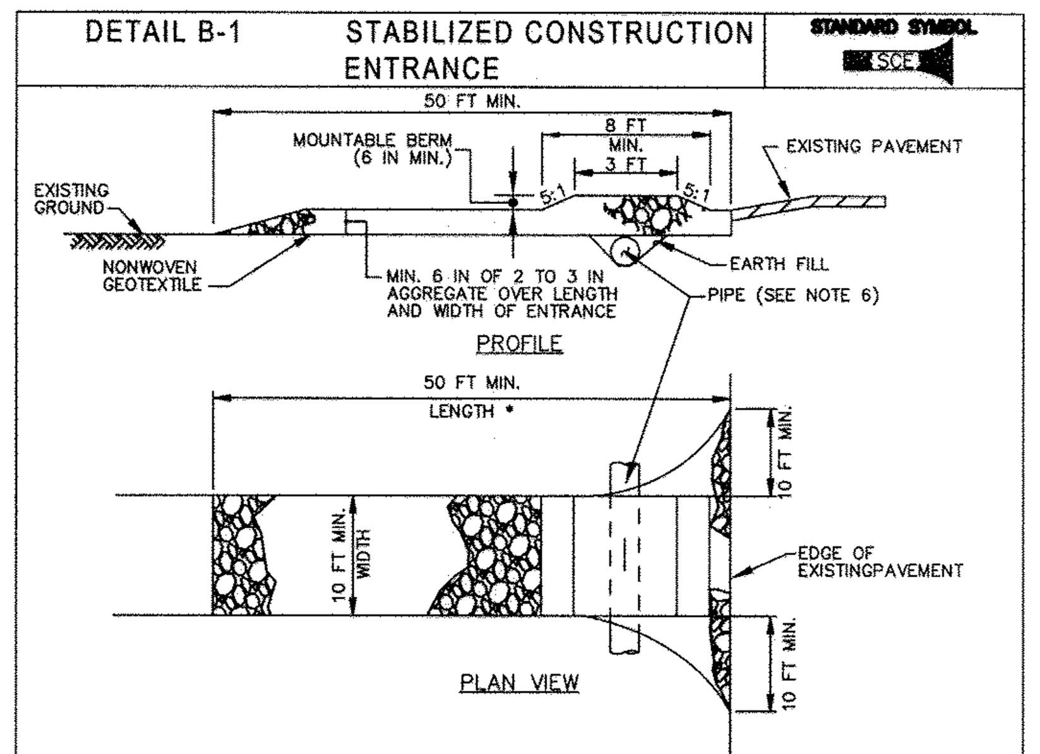
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 2-3-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

[signature] 2-12-16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 2-16-16
DIRECTOR — DATE

DETAIL B-1 — STABILIZED CONSTRUCTION ENTRANCE — STANDARD SYMBOL: SCE

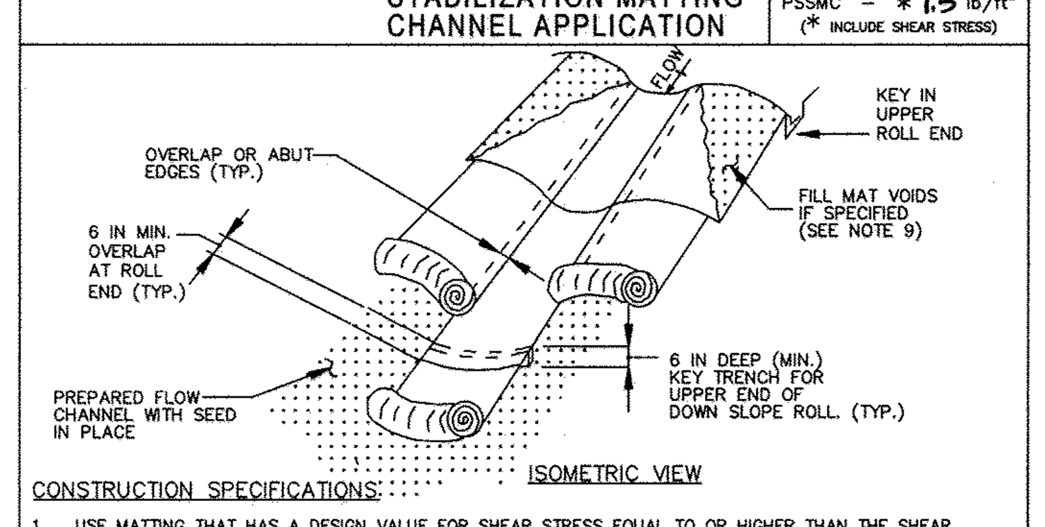


CONSTRUCTION SPECIFICATIONS

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-C — PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION — STANDARD SYMBOL: PSSMC – * 1.5 lb/ft² (* INCLUDE SHEAR STRESS)



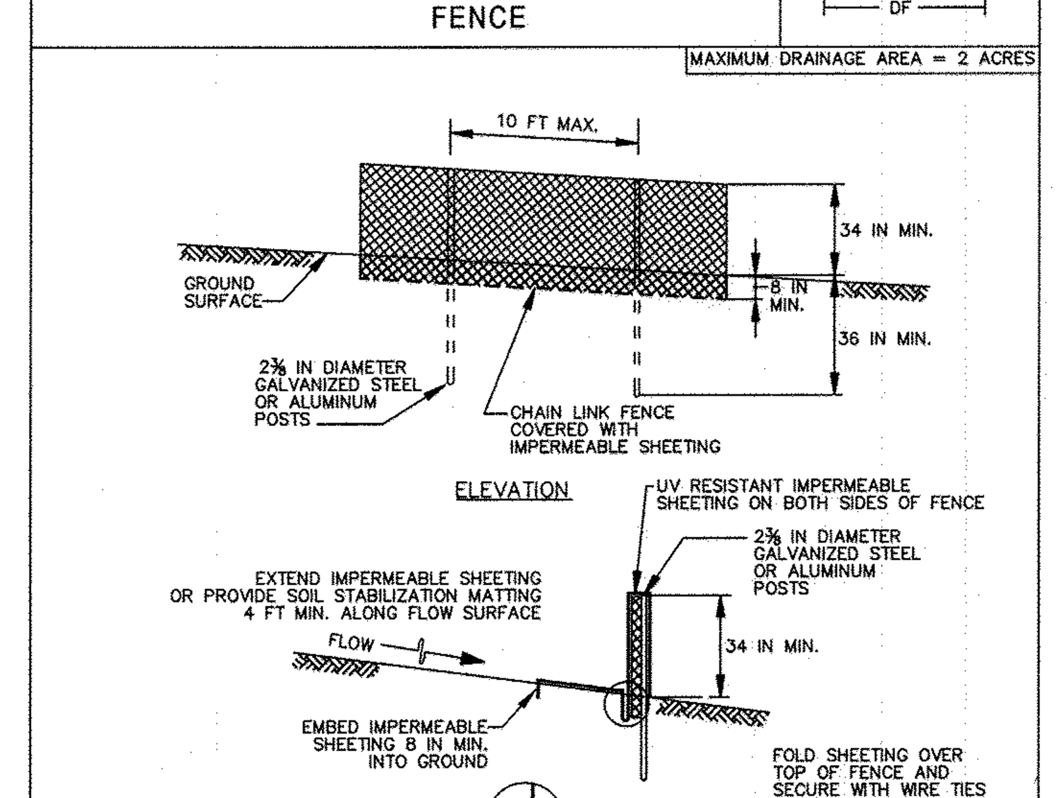
CONSTRUCTION SPECIFICATIONS

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-9 — DIVERSION FENCE — STANDARD SYMBOL: DF

MAXIMUM DRAINAGE AREA = 2 ACRES

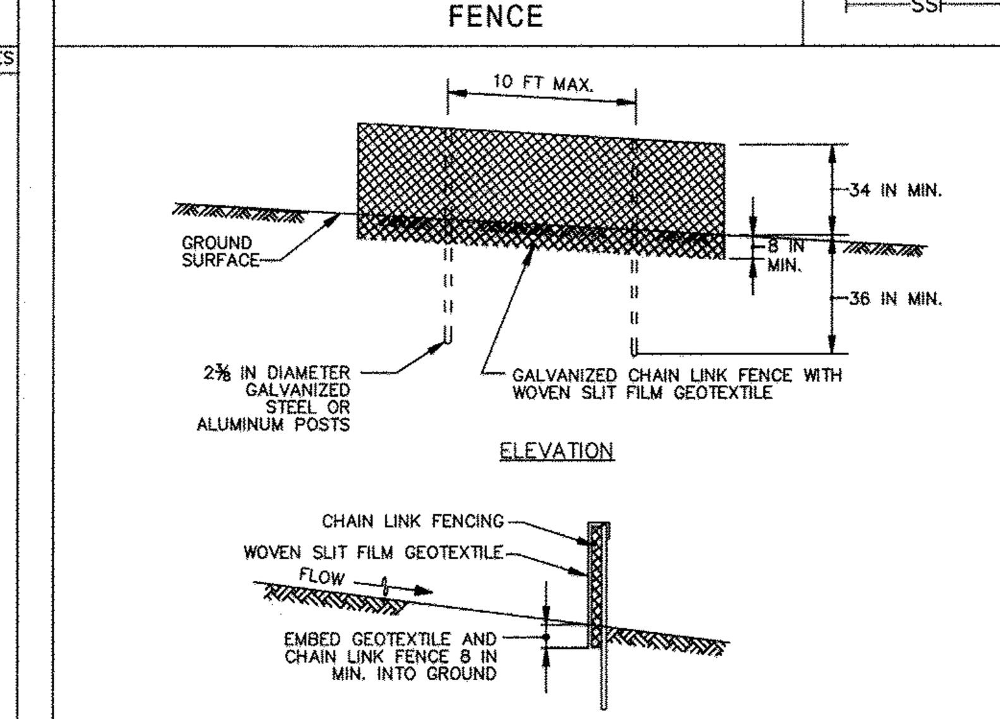


CONSTRUCTION SPECIFICATIONS

1. USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2⅜ INCH MAXIMUM OPENING).
2. USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
4. SECURE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
5. EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
7. KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 — SUPER SILT FENCE — STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

"NO AS-BUILT INFORMATION IS" REQUIRED ON THIS SHEET

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-18

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
6-19-17

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017
12-17-15

OWNER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

DEVELOPER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

KNOX LANDING II
LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7

TAX MAP: 50 GRID: 2 PARCEL: 75 & 528 ZONED: R-SC
9417 ALL SAINTS ROAD
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

SEDIMENT AND EROSION CONTROL NOTES & DETAILS

DATE: DECEMBER, 2015		BEI PROJECT NO: 2586	
DESIGN: DBT	DRAWN: DBT	SCALE: AS SHOWN	SHEET 6 OF 7

AS-BUILT

SDP-16-010

2586 Knox Property\dwg\8000.dwg, 12/16/2015 2:14:29 PM

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/26/2014
Client: Cornerstone Holdings, Inc.
Project: Knox Landing II — Project No. 114-131
Boring No.: B-1 (1 of 1) Total Depth: 10 Elev: 223.5 +/- Location: See Boring Location Plan
Type of Boring: Excavator / Hand-Auger Started: 11/19/2014 Completed: 11/19/2014 Driller: S. Park

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
223.5	0.0	Topsoil with root (organic) matter and organic soil				Boring was dry during drilling and at completion.
222.75	0.75	Light brown silty fine SAND with gravel, moist. (SM, USDA: Sandy Loam)				Infiltration pipe was set at 6.0 feet.
220	3.5	Light brown fine to medium SAND with little silt and clay, moist. (SM, USDA: Sandy Loam)		6.0 6.5	17.8	
213.5	10.0	End of Boring				

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

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/26/2014
Client: Cornerstone Holdings, Inc.
Project: Knox Landing II — Project No. 114-131
Boring No.: B-2 (1 of 1) Total Depth: 10 Elev: 225.0 +/- Location: See Boring Location Plan
Type of Boring: Solid-stem Auger Started: 11/13/2014 Completed: 11/13/2014 Driller: D. Rockwood & S. Park

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
225	0.0	Topsoil with root (organic) matter and organic soil				Boring was dry during drilling and at completion.
224.25	0.75	Light brown fine to medium SAND with some silt and little clay and fine gravel, dry. (SM, USDA: Sandy Clay Loam)				Infiltration pipe was set at 5.5 feet.
				5.5 6	5.2	
				8.0 8.5	8.6	
215	10.0	End of boring				

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

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/26/2014
Client: Cornerstone Holdings, Inc.
Project: Knox Landing II — Project No. 114-131
Boring No.: B-3 (1 of 1) Total Depth: 11 Elev: 226.0 +/- Location: See Boring Location Plan
Type of Boring: Solid-stem Auger Started: 11/13/2014 Completed: 11/13/2014 Driller: D. Rockwood & S. Park

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
226	0.0	Topsoil with root (organic) matter and organic soil				Boring was dry during drilling and at completion.
225.25	0.75	Light brown fine to medium SAND with gravel and little silt and clay, moist. (SM, USDA: Sandy Loam)				
223	3.0	Light brown fine to medium SAND with little silt and clay, moist. (SM, USDA: Sandy Loam)		5.0 5.5	11.0	
				8.5 9	10.7	
215	11.0	End of boring				

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

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/26/2014
Client: Cornerstone Holdings, Inc.
Project: Knox Landing II — Project No. 114-131
Boring No.: B-4 (1 of 1) Total Depth: 10 Elev: 222.0 +/- Location: See Boring Location Plan
Type of Boring: Solid-stem Auger Started: 11/13/2014 Completed: 11/13/2014 Driller: D. Rockwood & S. Park

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
222	0.0	Topsoil with root (organic) matter and organic soil				Boring was dry during drilling and at completion.
221.25	0.75	Light brown clayey SILT with some fine sand, moist to dry. (ML, USDA: Clay Loam)				Infiltration pipe was set at 6.0 feet.
				5.0 5.5	11.8	
212	10.0	End of boring				

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

BORING LOG — GEOLAB, INC.

Report No.: Date: 11/26/2014
Client: Cornerstone Holdings, Inc.
Project: Knox Landing II — Project No. 114-131
Boring No.: B-5 (1 of 1) Total Depth: 12 Elev: 230.5 +/- Location: See Boring Location Plan
Type of Boring: Solid-stem Auger Started: 11/13/2014 Completed: 11/13/2014 Driller: D. Rockwood & S. Park

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
230.5	0.0	Topsoil with root (organic) matter and organic soil				Boring was dry during drilling and at completion.
229.75	0.75	Tan to off-white micaceous fine to medium SAND with little silt and clay, moist. (SM, USDA: Sandy Loam)				
				8.0 8.5	16.3	
				11.0 11.5	14.4	
218.5	12.0	End of boring				

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

"NO AS-BUILT INFORMATION IS" REQUIRED ON THIS SHEET

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-16

STATE OF MARYLAND — DONALD ALAN WILSON — No. 21443 — PROFESSIONAL ENGINEER — 12-17-15

21947

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 21443, Expiration Date: 6-30-2017

STATE OF MARYLAND — CHRISTOPHER ALAN WILSON — No. 21443 — REGISTERED PROFESSIONAL ENGINEER — 12-17-15

OWNER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

DEVELOPER:
CORNERSTONE HOLDINGS LLC
9695 NORFOLK AVENUE
LAUREL, MARYLAND 20793
410-792-2565

KNOX LANDING II

LOTS 1 thru 5 AND OPEN SPACE LOTS 6 and 7
RESIDENTIAL - SINGLE FAMILY DETACHED

TAX MAP: 50 GRID: 2 PARCEL: 75 & 528 ZONED: R-SC
9417 ALL SAINTS ROAD
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

SOIL BORING LOGS

DATE: DECEMBER, 2015 BEI PROJECT NO: 2586
DESIGN: DBT DRAWN: DBT SCALE: AS SHOWN SHEET 7 OF 7

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2-3-16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2-12-16
DIRECTOR — DATE 2-16-16

AS-BUILT

SDP-16-010

586 Knox Property\dwg\8000.dwg, 12/16/2015 2:10:05 PM