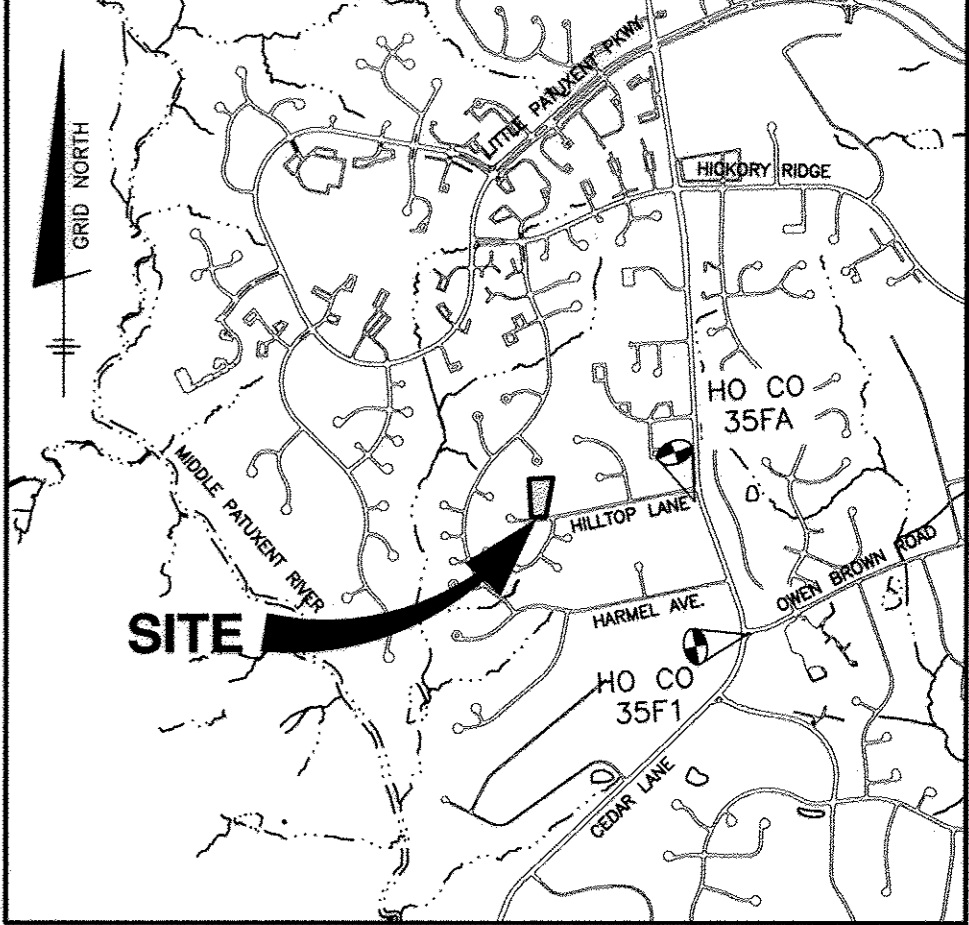


GENERAL NOTES

- 1.) THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS ALTERNATIVE COMPLIANCE(S) HAVE BEEN SUBMITTED AND 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. 35F1 AND 35FA WERE USED FOR THIS PROJECT.
...
31.) ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.

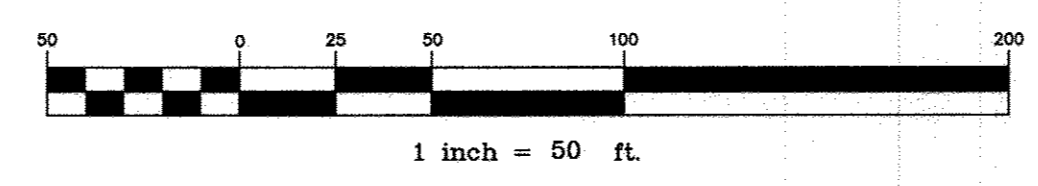
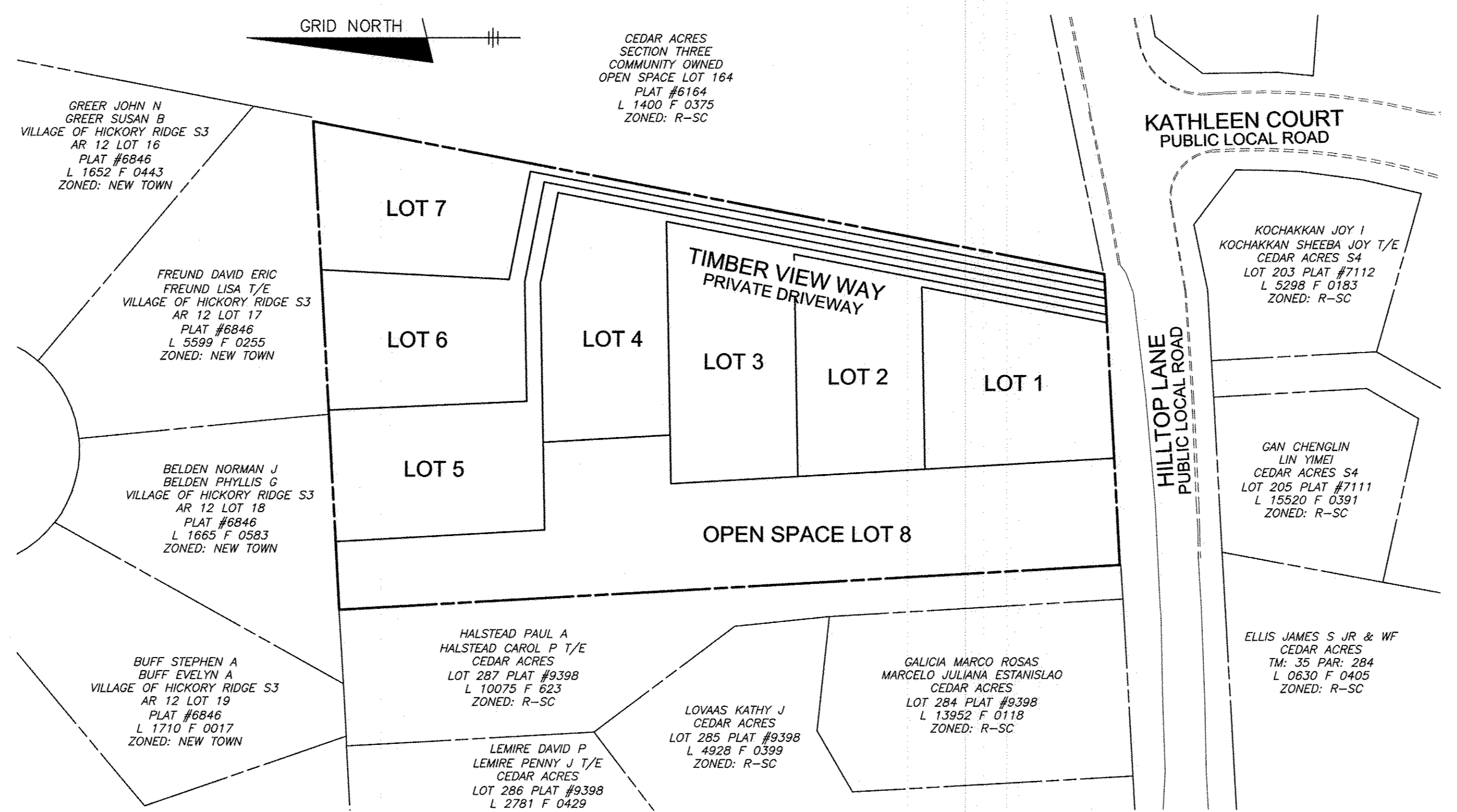
HILLTOP LANDING
RESIDENTIAL DEVELOPMENT
LOTS 1 thru 7 and OPEN SPACE LOT 8
PLAT #24376-24377
SITE DEVELOPMENT PLAN

BENCHMARKS NAD'83 HORIZONTAL
HO. CO. #35FA
STAMPED BRASS DISK SET ON TOP OF CONCRETE BASE.
N 559266.1334' E 1344682.6389'
ELEVATION: 410.329'

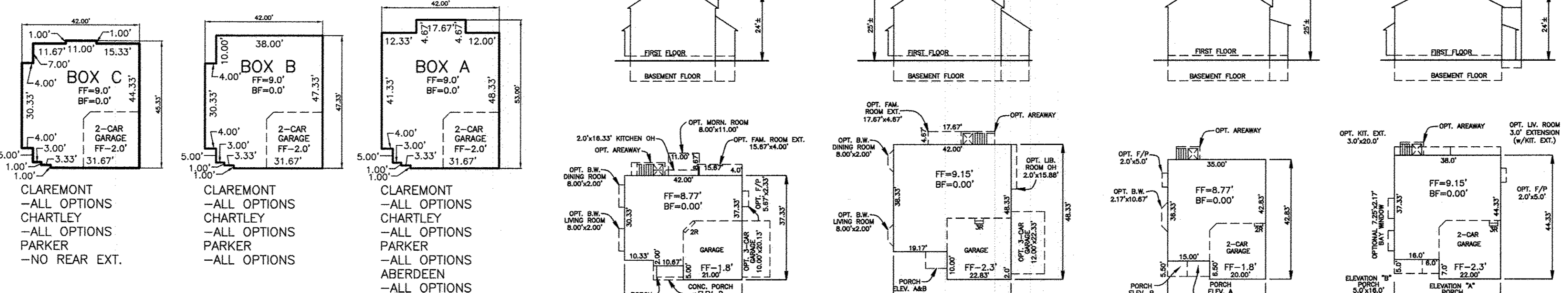


ADDRESS CHART table with columns: LOT, STREET ADDRESS. Lists lots 1 through 7 and their corresponding street addresses.

MINIMUM LOT SIZE CHART table with columns: LOT, GROSS AREA, PIPESTEM AREA, MINIMUM LOT SIZE. Lists lot sizes for lots 2 through 7.



SITE ANALYSIS DATA CHART table with columns: Item, Value. Lists project area, area of plan submission, limit of disturbed area, etc.



STORMWATER MANAGEMENT SUMMARY TABLE with columns: Lot, Street Address, Practice, DA, Imp Area, etc. Includes totals for individual drainage area and overall site.

SHEET INDEX table with columns: NO., TITLE. Lists sheets 1 through 10 and their titles, including site grading, sediment control, and stormwater management details.

PERMIT INFORMATION CHART table with columns: SUBDIVISION NAME, SECTION/AREA, PARCEL, PLAT, BLOCK No, ZONE, TAX MAP, ELECTION DISTRICT, CENSUS TRACT.

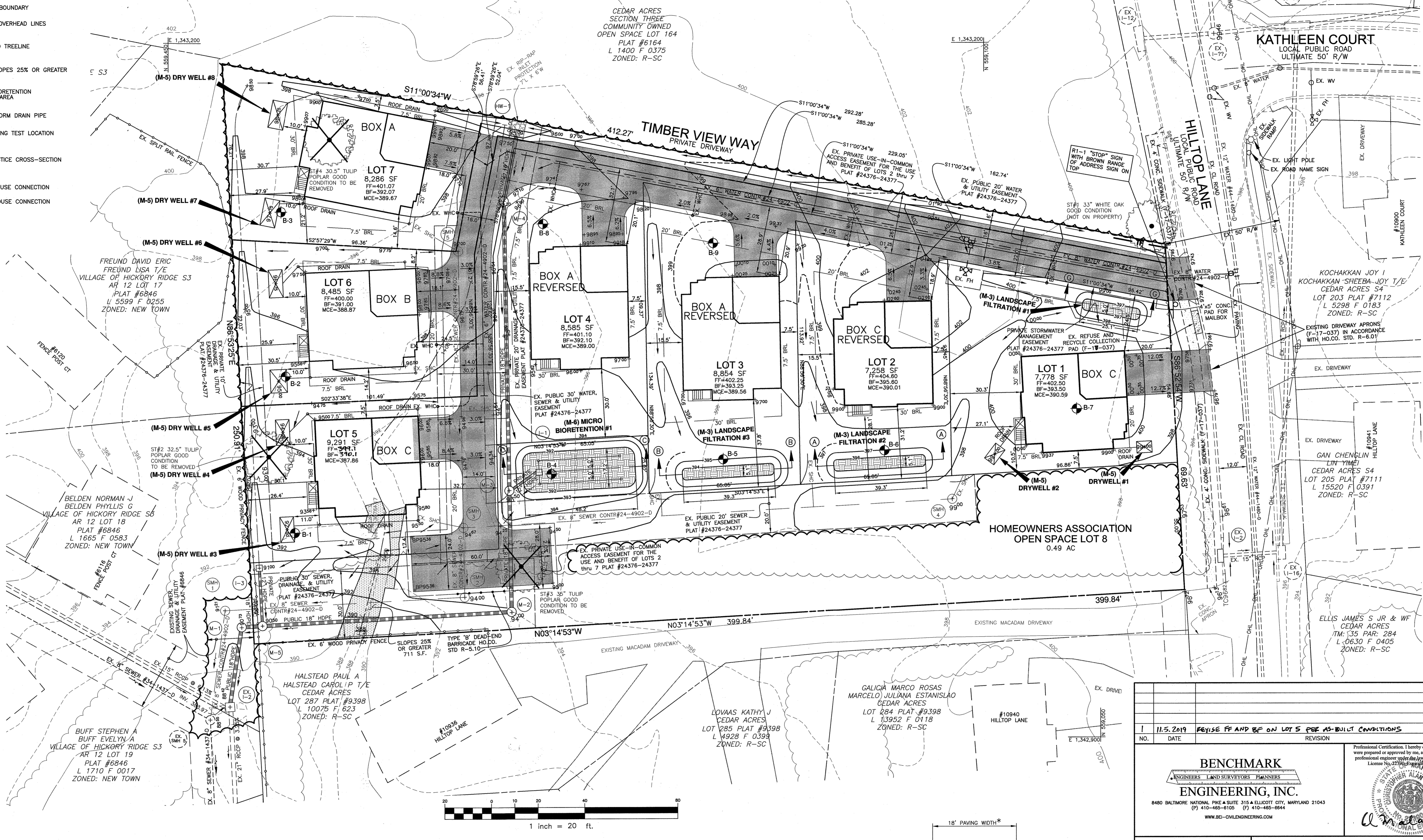
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signatures and dates for Chief of Development Engineering Division and Chief of Division of Land Development]

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS logo and contact information. Includes owner and developer details for Hilltop Landing.

**LEGEND**

- EXISTING CONTOURS
- EXISTING TREELINE
- EXISTING FENCELINE
- PROJECT BOUNDARY
- EXISTING OVERHEAD LINES
- PROPOSED TREELINE
- STEEP SLOPES 25% OR GREATER
- MICRO-BIORETENTION SURFACE AREA
- PROP. STORM DRAIN PIPE
- SOIL BORING TEST LOCATION
- ESD PRACTICE CROSS-SECTION
- WATER HOUSE CONNECTION
- SEWER HOUSE CONNECTION

GRID NORTH



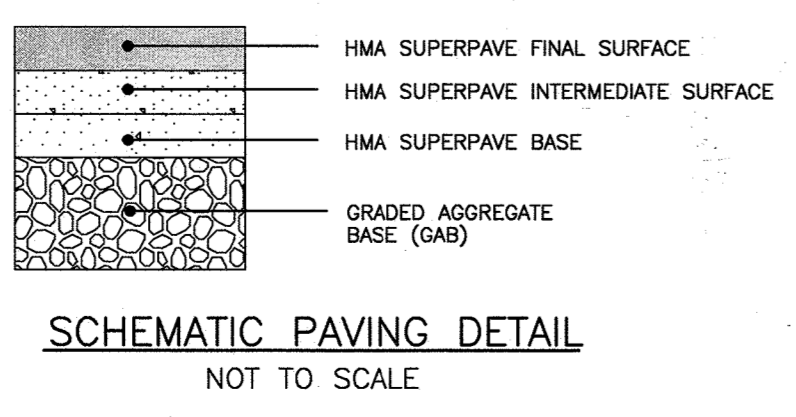
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Howard County Seal*

11-27-17 DATE

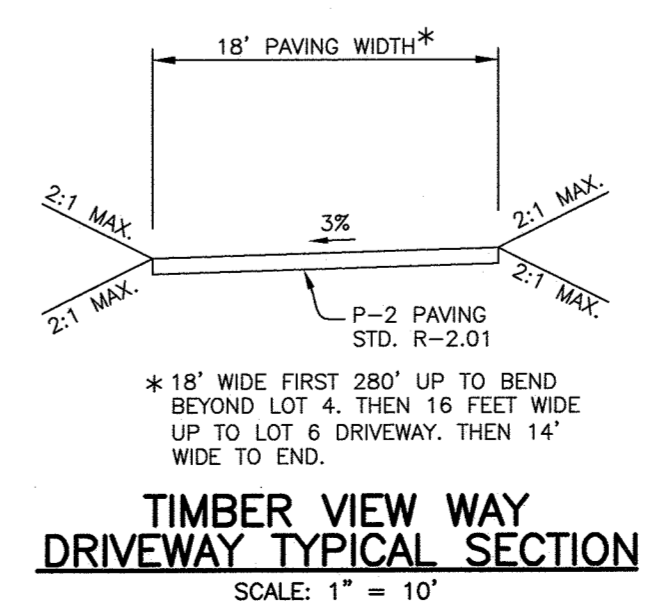
11-30-17 DATE

12-1-17 DATE

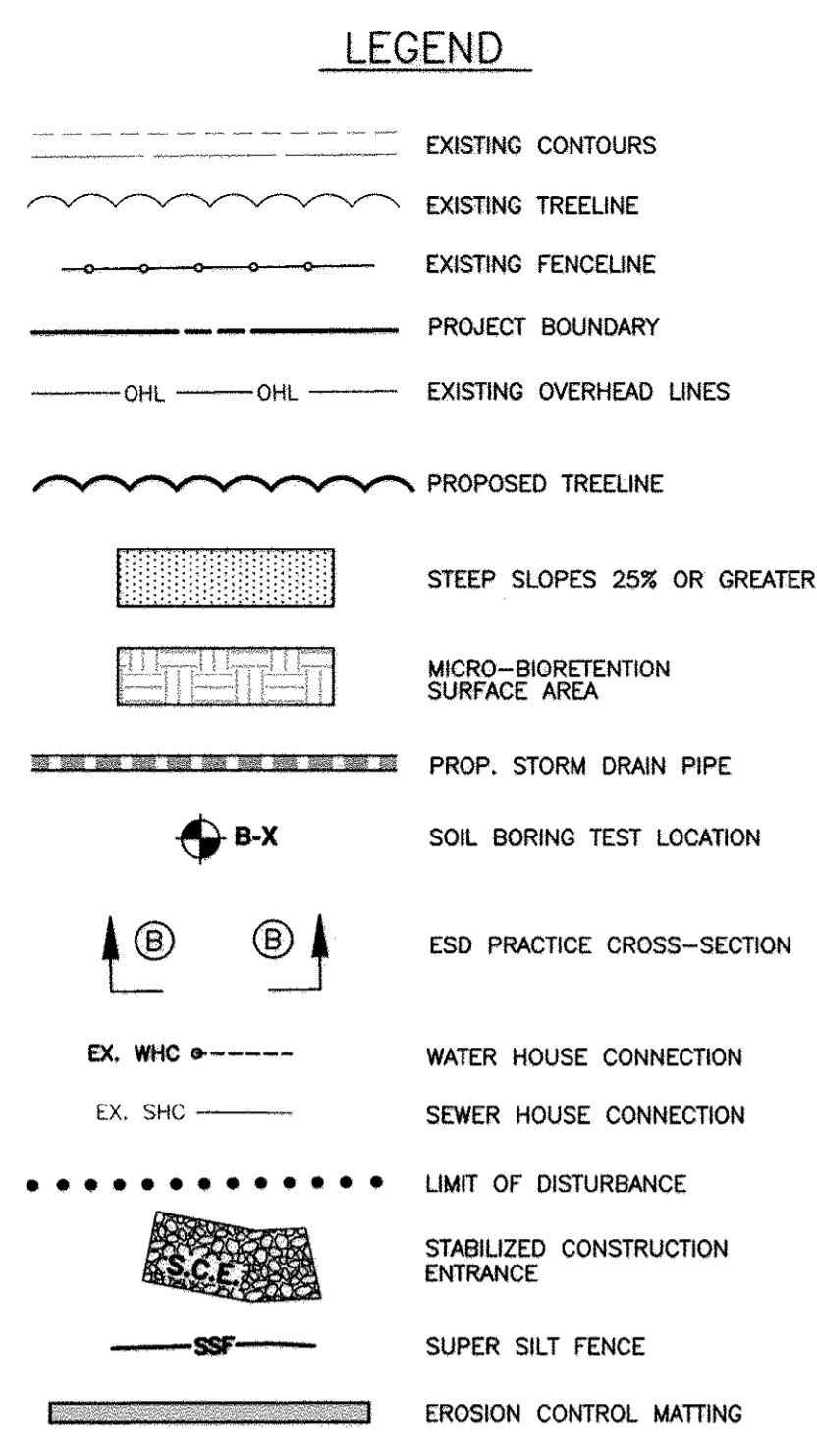


SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 to <5 to <7			3 to <5 to <7		
			MIN. HMA WITH GAB	HMA WITH CONSTANT GAB	MIN. HMA WITH GAB	HMA WITH CONSTANT GAB		
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SAC: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE	1.5	1.5	1.5	1.5	1.5	
		9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	
		HMA SUPERPAVE INTERMEDIATE SURFACE	1.0	1.0	1.0	1.0	1.0	
		HMA SUPERPAVE BASE	2.0	2.0	2.0	2.0	2.0	
		9.0 MM PG 64-22, LEVEL 1 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	

PAVING SPECIFICATIONS (HO.CO. STD R-2.01)



NO. DATE REVISION		11.5.2019 REVISE FF AND BF ON LOT 5 FOR AS-BUILT CONDITIONS	
<p><b>BENCHMARK ENGINEERING, INC.</b></p> <p>8480 BALTIMORE NATIONAL PIKE A SUITE 315 A ELICOTT CITY, MARYLAND 21043 (P) 410-465-8105 (F) 410-465-8844 WWW.BE-CIVILENGINEERING.COM</p>		<p>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. 22323 (Exp. Date: 6-30-2019)</p>	
OWNER:	DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	RESIDENTIAL - SINGLE FAMILY DETACHED	
DEVELOPER:	DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	<p><b>HILLTOP LANDING</b> LOTS 1-7 AND OPEN SPACE LOT 8</p> <p>TAX MAP: 35 - GRID: 11 - PARCEL: 41 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>	
DESIGN: DBT	DRAFT: MCR	DATE: NOVEMBER 2, 2017	BEI PROJECT NO. 2615
		SCALE: AS SHOWN	SHEET 2 OF 10



- ### 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 including diversion fencing and cleanwater diversion pipe.
  4. Upon approval from the Howard County Sediment Control Inspector, proceed to clear as necessary to install the storm drain system. (day 3)
  5. Install the storm drain system from existing I-2 up to HW-1. Once storm drain is in place the temporary diversion pipe can be removed. Keep diversion fencing in place. (day 4-8)
  6. Install water and sewer mains and house connections up to the easement line. (day 9-21)
  7. Install base paving of the use-in-common driveway. (day 22-23)
  8. Install Micro Bio-Retentions #1. Do not install plantings at this time. Cover surface area of MB with filter fabric and utilize AGIP at inlet.
- #### PHASE 2 - PER LOT HOUSE CONSTRUCTION
1. Obtain building permit. (day 1)
  2. Hold on-site preconstruction meeting. (day 2)
  3. Install individual lot perimeter controls, if any (i.e. wrap lot in silt fence). (day 3)
  4. Excavate for foundation, rough grade and stabilize in accordance with the temporary seeded 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 ESD SWM practices with underdrains and plantings. Construct roof leader underdrains to the practice, if necessary. Final grade lot and stabilize in accordance with the PERMANENT seeded 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 seeded notes. Install MB #1 plantings. (day 96-100)

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

*John P. Robertson* 11/14/17  
HOWARD SCD DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*John P. Robertson* 11-27-17  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Keith S. DeLoach* 11-30-17  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*William J. Flynn* 12-1-17  
DIRECTOR DATE

### ENGINEER'S CERTIFICATE

I HEREBY 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.

*Christopher A. Malagari* 11/2/17  
ENGINEER - CHRISTOPHER A. MALAGARI DATE

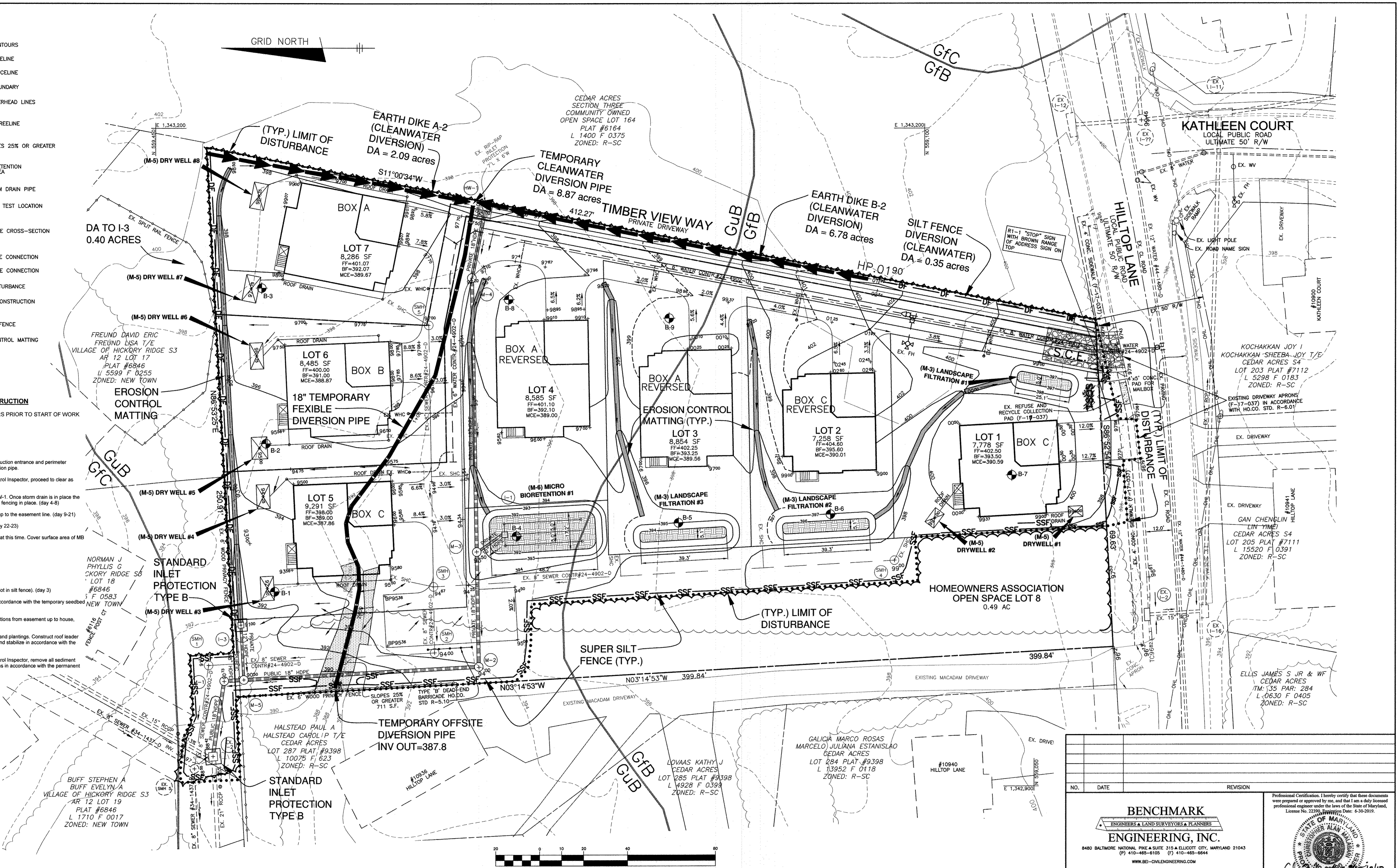
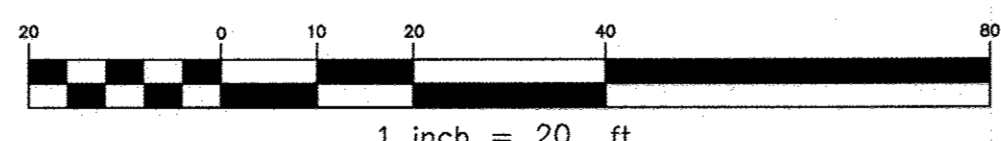
### OWNER'S CERTIFICATE

I HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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.

*Justin M. Boy* 11/3/17  
OWNER - JUSTIN M. BOY DATE

### NRCS SOILS CHART - HoCo Soils Map No. 17

SYMBOL	HYDRIC	GROUP	Kw	MAP UNIT NAME
GfB	no	B	0.28	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES
GuB	no	C	0.43	GLENVILLE-URBAN LAND-UDORTHERTS COMPLEX, 0 TO 8 PERCENT SLOPES



NO. DATE REVISION	
<p align="center"><b>BENCHMARK</b> ENGINEERS &amp; LAND SURVEYORS &amp; PLANNERS <b>ENGINEERING, INC.</b> 8480 BALTIMORE NATIONAL PIKE &amp; SUITE 315 &amp; ELLICOTT CITY, MARYLAND 21043 (P) 410-485-6105 (F) 410-485-6544 WWW.BE-CIVILENGINEERING.COM</p>	
<p>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. 22399, Expiration Date: 6-30-2019.</p>	
OWNER:	RESIDENTIAL - SINGLE FAMILY DETACHED
DEVELOPMENT PARTNERS LLC 9693 GERWING LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	<b>HILLTOP LANDING</b> LOTS 1-7 AND OPEN SPACE LOT 8
DEVELOPER:	TAX MAP: 35 - GRID: 11 - PARCEL: 41 ZONED: R-SC ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND
DEVELOPMENT PARTNERS LLC 9693 GERWING LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	<b>SEDIMENT &amp; EROSION CONTROL PLAN</b> <b>AND SOILS MAP</b>
DESIGN: DBT DRAFT: MCR	DATE: NOVEMBER 2, 2017 BEI PROJECT NO. 2615
SCALE: AS SHOWN	SHEET 3 OF 10

B-4.3 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Using vegetation as cover to protect exposed soil from erosion. Purpose: To promote the establishment of vegetation on eroded soil. Conditions: When Practice Applies...

B-4.4 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

Application of seed and mulch to establish vegetative cover. Purpose: To protect disturbed soils from erosion during the period of construction. Conditions: When Practice Applies...

B-4.5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

To stabilize disturbed soils with permanent vegetation. Purpose: To establish permanent ground cover on disturbed soils. Conditions: When Practice Applies...

B-4.6 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

Establishment of vegetative cover on cut and fill slopes. Purpose: To provide timely vegetative cover on cut and fill slopes. Conditions: When Practice Applies...

B-4.7 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

Establishment of vegetative cover on cut and fill slopes. Purpose: To provide timely vegetative cover on cut and fill slopes. Conditions: When Practice Applies...

B-4.8 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

Establishment of vegetative cover on cut and fill slopes. Purpose: To provide timely vegetative cover on cut and fill slopes. Conditions: When Practice Applies...

B-4.9 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

Establishment of vegetative cover on cut and fill slopes. Purpose: To provide timely vegetative cover on cut and fill slopes. Conditions: When Practice Applies...

B-4.10 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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B-4.11 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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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 L&O 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 activity,
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.

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.

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 3:1 horizontal to 1:1 vertical (S:1), and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.

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.

Site Analysis:
Total Area of Site: 1.84 Acres
Area Disturbed: 1.64 Acres
Area to be roofed or paved: 0.54 Acres
Area to be vegetatively stabilized: 1.10 Acres
Total cut: 2,151 Cu Yds
Total fill: 2,151 Cu Yds

Off-site waste/borrow area location: SITE WITH AN ACTIVE GRADING PERMIT
7. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.

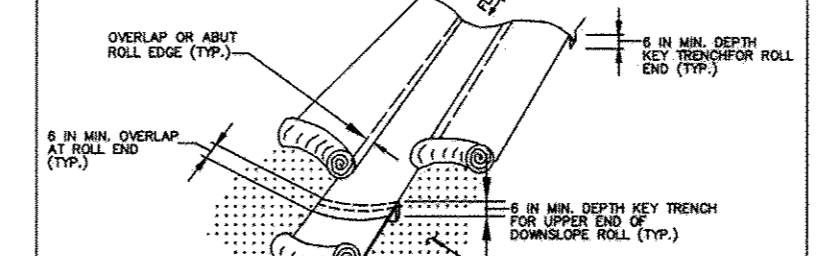
8. Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly and the next day after every inspection and the contractor, made available upon request, is part of every inspection and should include:
a. Inspection date
b. Name and title of inspector
c. Weather information
d. Current conditions as well as time and amount of last recorded precipitation
e. Brief description of project's status (e.g. percent complete) and/or current activities
f. Identification of sediment discharges
g. Identification of sediment deficiencies
h. Identification of sediment controls that require maintenance
i. Identification of missing or improperly installed sediment controls
j. Compliance status regarding the sequence of construction and stabilization requirements
k. Photographs
l. Monitoring/sampling
m. Maintenance and/or corrective action performed
n. Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (GPDES, MDE).

9. Tranches 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 a grading unit (maximum acreage of 20 ac. per grading unit) when the 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 noted and approved by the HSCD, 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 water 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 implicated at 25' minimum intervals, with lower ends curled up by 2' in elevation.
15. Stream channels must not be disturbed during the following restricted time periods (inclusive):
a. Use I and IP March 1 - June 15
b. Use II and IIP October 1 - April 30
c. Use IV March 1 - May 31

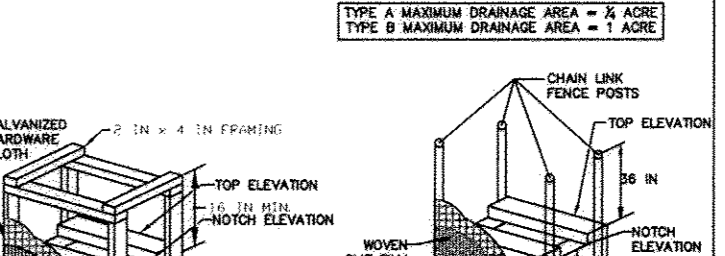
16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION



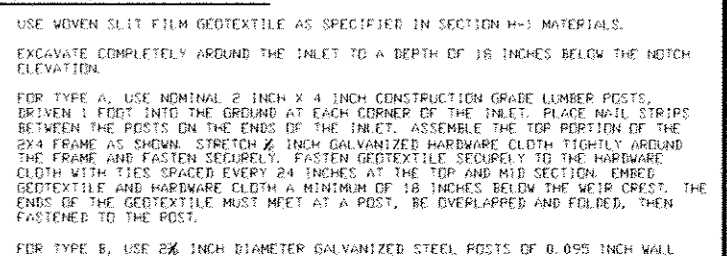
CONSTRUCTION SPECIFICATIONS:
1. USE MATTING THAT HAS A DESIGN VALUE FOR BREAK STRENGTH EQUAL TO OR HIGHER THAN THE REQUIREMENTS OF THE APPROVED PLAN.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF ORGANIC (BASTS) MINIMUM MINIMUM WEIGHT PER SQUARE YARD (WTS) SHALL BE 1.5 LBS. WITH A MINIMUM GRAIN SIZE OF 20# AND A MINIMUM OF 2% HUMUS. THE MAT SHALL BE 18 INCHES WIDE AND 18 INCHES LONG. THE MAT SHALL BE 18 INCHES WIDE AND 18 INCHES LONG. THE MAT SHALL BE 18 INCHES WIDE AND 18 INCHES LONG.

DETAIL E-9-1 STANDARD INLET PROTECTION

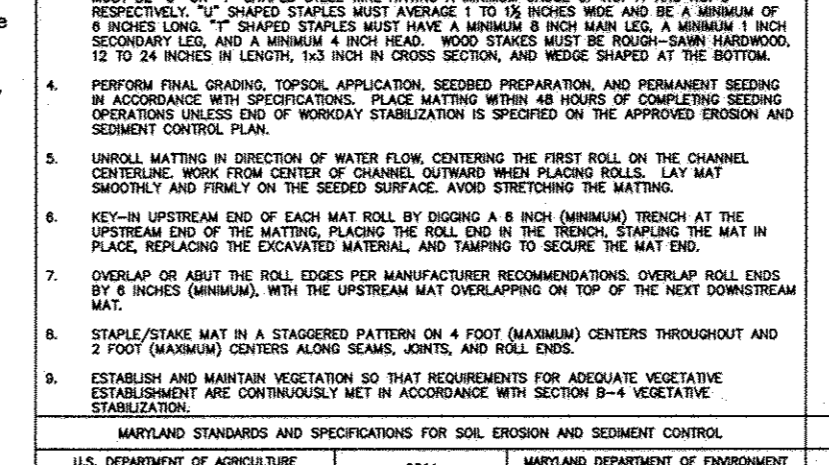


CONSTRUCTION SPECIFICATIONS:
1. USE NUMBER 12 REINFORCING AS SPECIFIED IN SECTION 1.0 MATERIALS.
2. EXCAVATE COMPLETELY UNDER THE SHEET TO A DEPTH OF 18 INCHES BELOW THE BOTTOM OF THE SHEET.

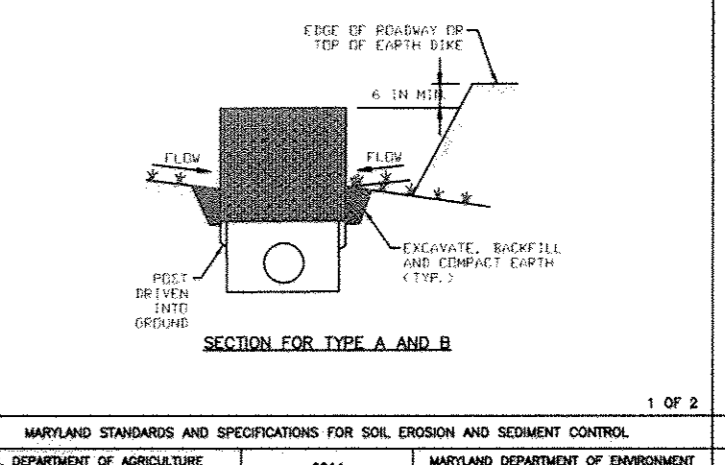
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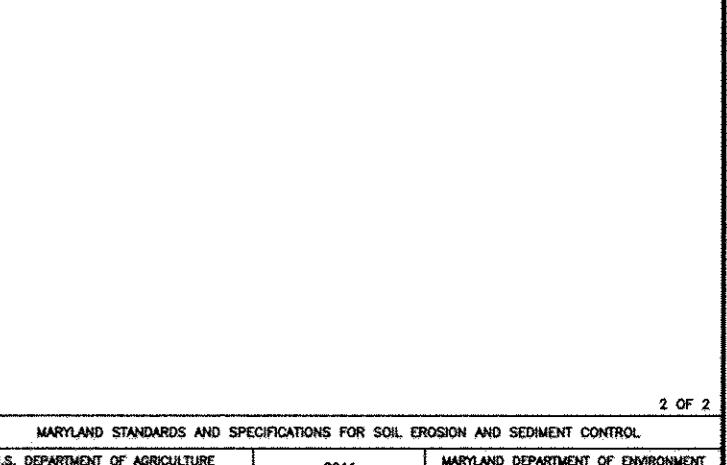
CONSTRUCTION SPECIFICATIONS:
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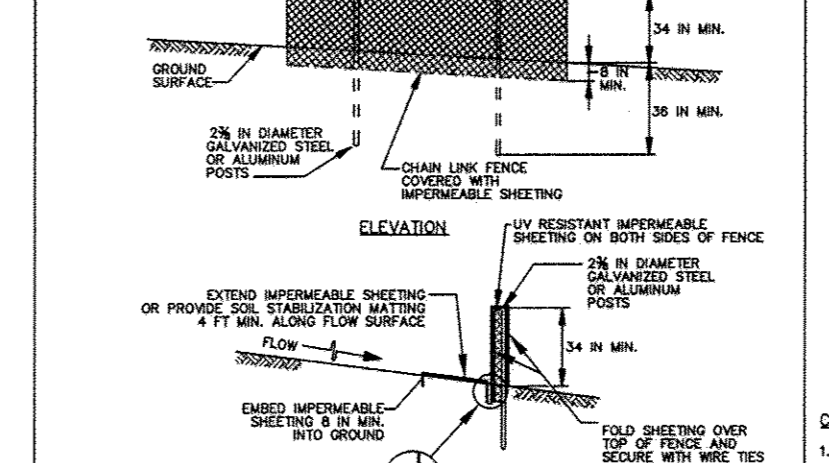
CONSTRUCTION SPECIFICATIONS:
1. USE 4x4 HICKORY OR SHAVE OR HICKORY CHAIN LINK FENCE (NO HIGH MOUNTAIN FABRIC).
2. USE 2x4 POSTS SPACED AT 6 FEET ON CENTER. THE POSTS SHALL BE SET IN 18 INCHES DEEP HOLES.



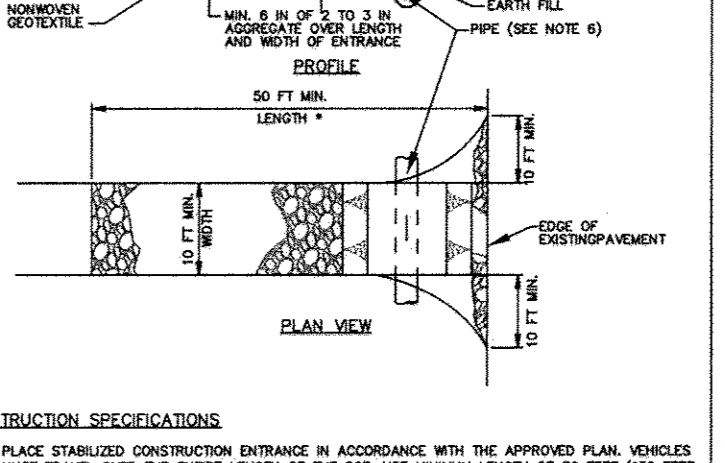
CONSTRUCTION SPECIFICATIONS:
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE ENTRANCE. THE MINIMUM LENGTH OF 30 FEET (NO FEET LESS) SHALL BE MAINTAINED AT ALL TIMES.



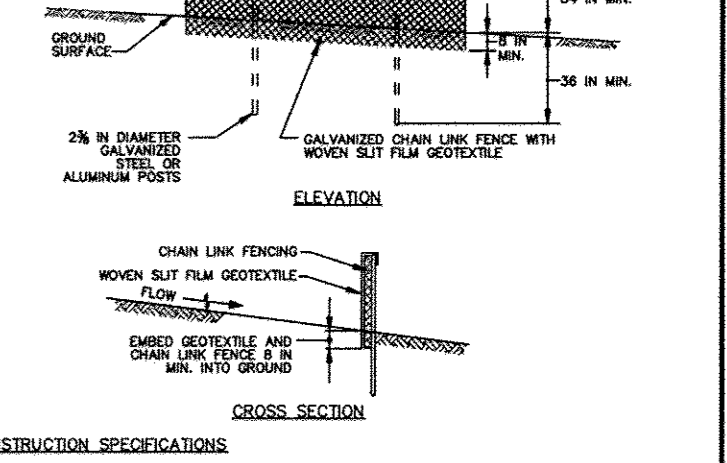
CONSTRUCTION SPECIFICATIONS:
1. INSTALL 36 INCH GALVANIZED STEEL POSTS OF 3/8 INCH WALL THICKNESS AND SIX (6) FEET SPACED SPACED FURTHER THAN 10 FEET APART. THE POSTS SHALL BE SET IN 18 INCHES DEEP HOLES.



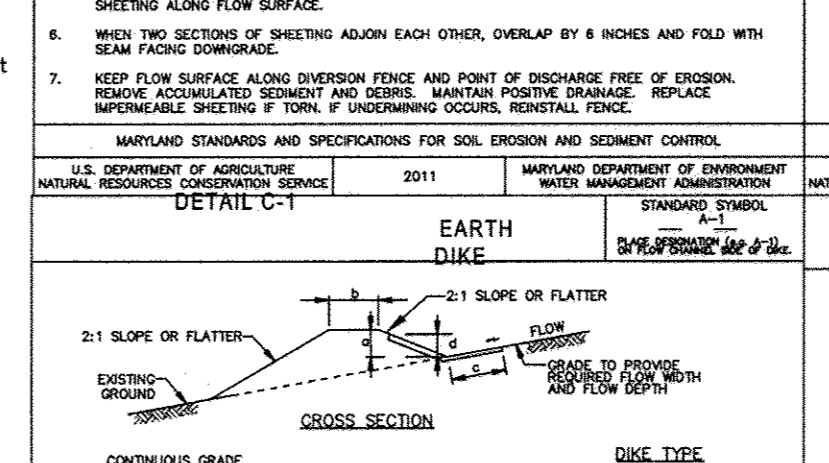
CONSTRUCTION SPECIFICATIONS:
1. USE 4x4 HICKORY OR SHAVE OR HICKORY CHAIN LINK FENCE (NO HIGH MOUNTAIN FABRIC).
2. USE 2x4 POSTS SPACED AT 6 FEET ON CENTER. THE POSTS SHALL BE SET IN 18 INCHES DEEP HOLES.



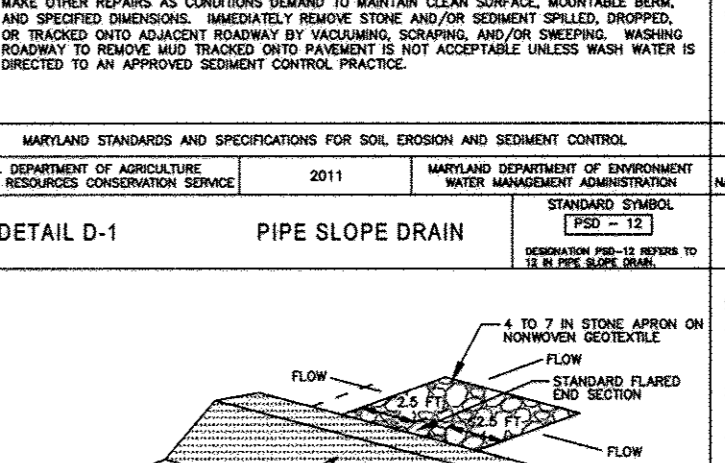
CONSTRUCTION SPECIFICATIONS:
1. MAINTAIN LINE GRADE AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS.
2. MAINTAIN LINE GRADE AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS.



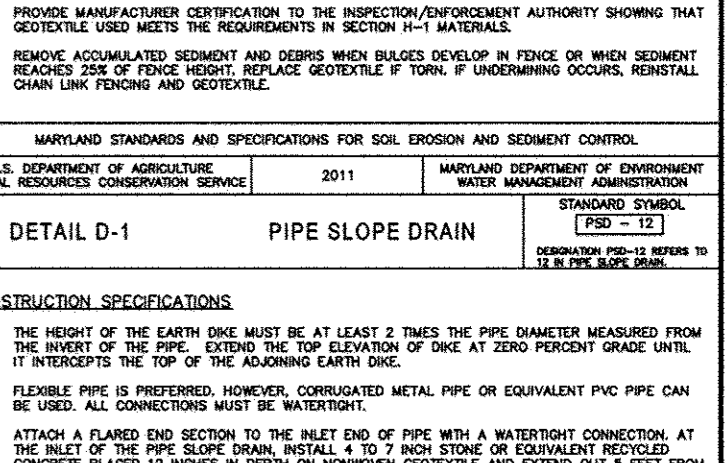
CONSTRUCTION SPECIFICATIONS:
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HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING. ENGINEER'S CERTIFICATE. CHIEF, DEVELOPMENT ENGINEERING DIVISION. CHIEF, DIVISION OF LAND DEVELOPMENT. DIRECTOR.

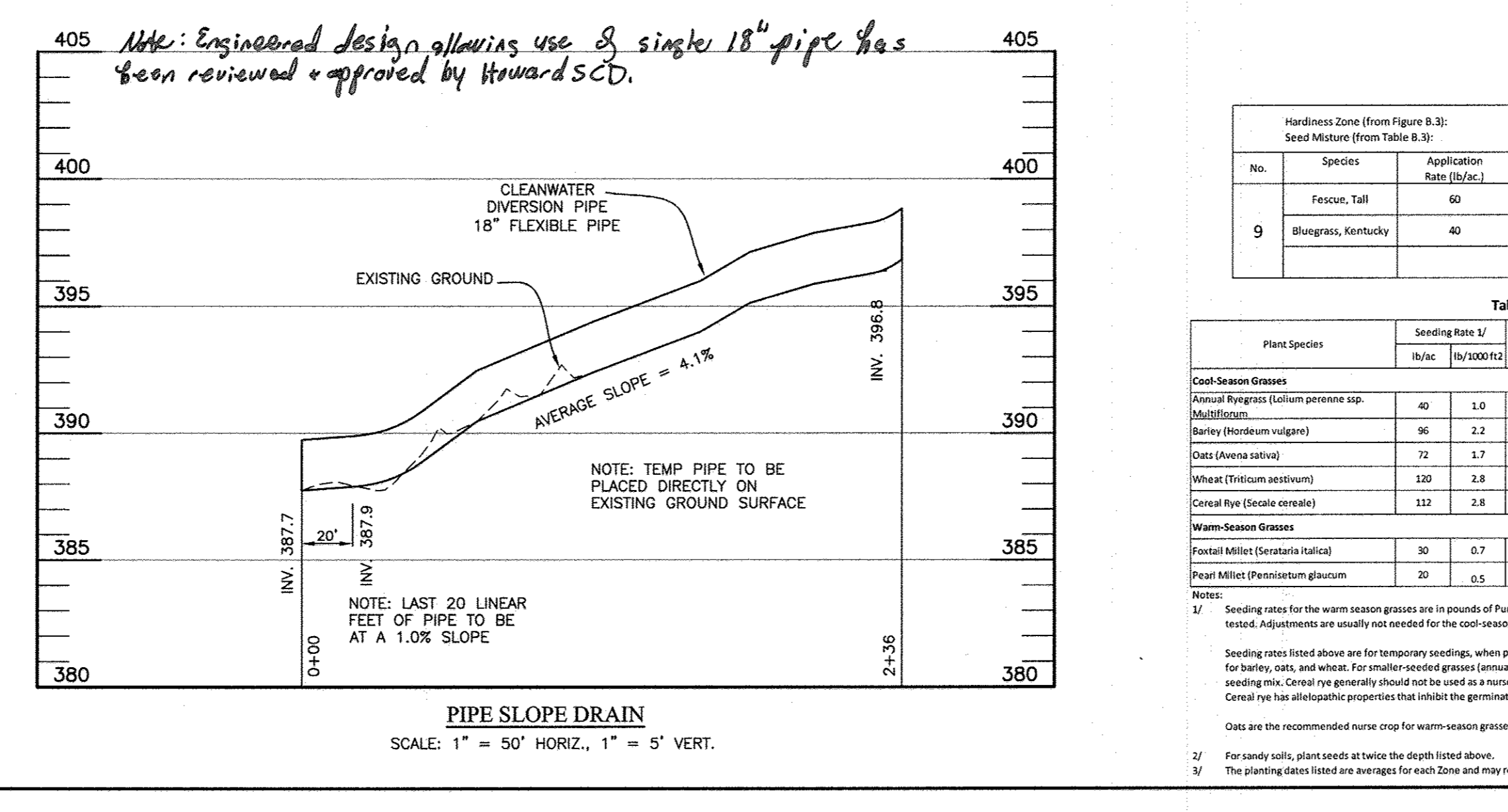




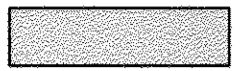
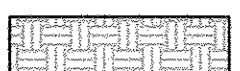





Table 1: Permanent Seeding Summary. Columns: Hardiness Zone, Species, Application Rate, Seeding Date, Seeding Depth, Seeding Rate, Fertilizer Rate, Lime Rate.

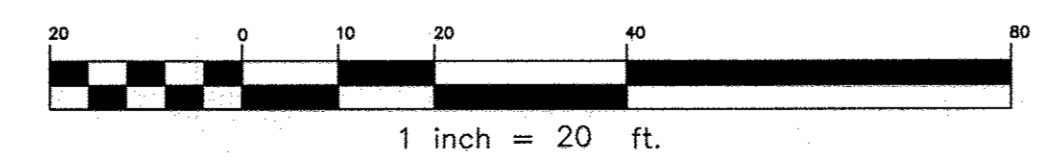
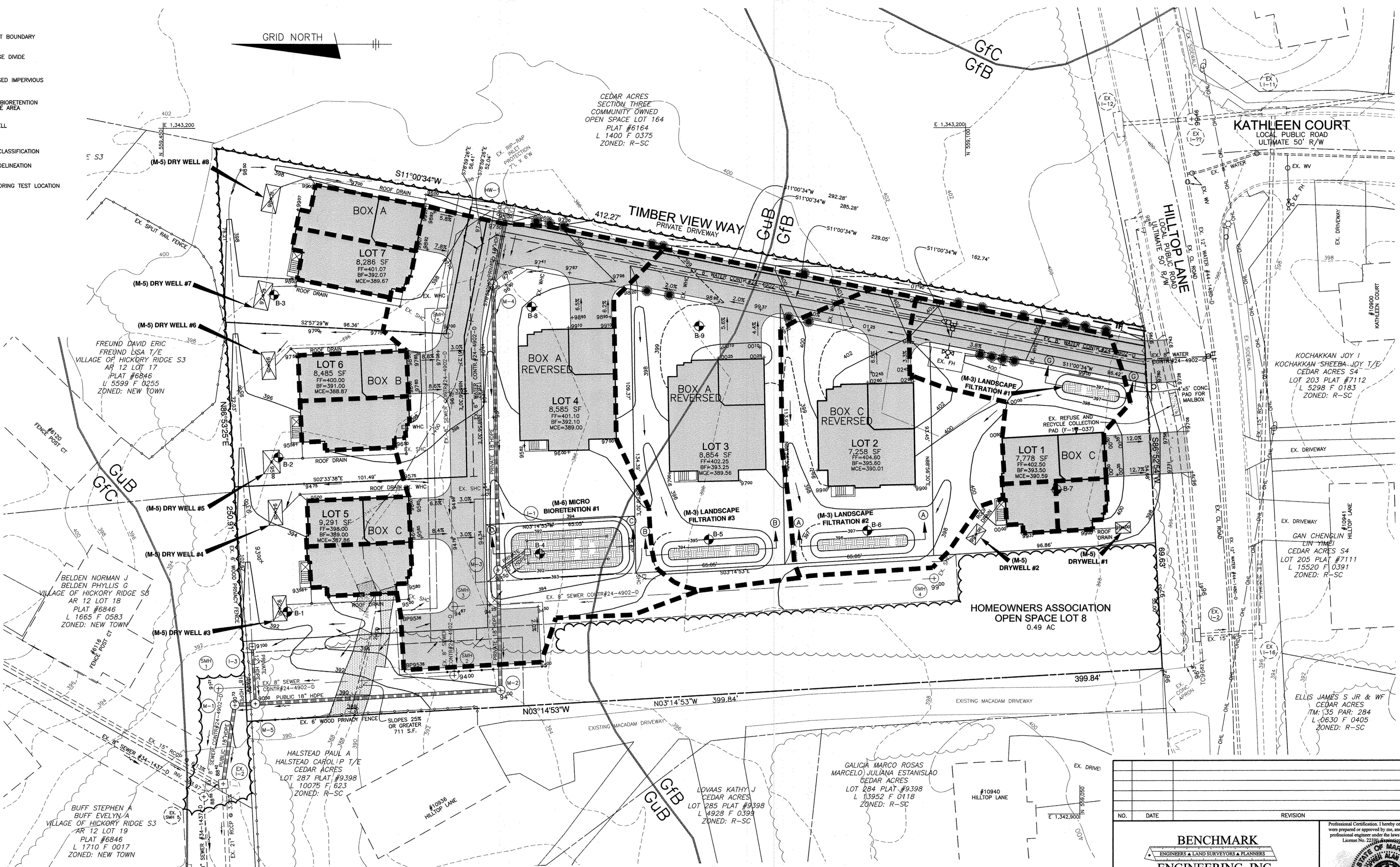
Table 2: Temporary Seeding for Site Stabilization. Columns: Plant Species, Seeding Rate, Seeding Depth, Seeding Date, Seeding Rate, Fertilizer Rate, Lime Rate.

Table 3: Seeding Rates for Warm Season Grasses. Columns: Plant Species, Seeding Rate, Seeding Depth, Seeding Date, Seeding Rate, Fertilizer Rate, Lime Rate.

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. RESIDENTIAL - SINGLE FAMILY DETACHED HILLTOP LANDING LOTS 1-7 AND OPEN SPACE LOT 8. DEVELOPMENT PARTNERS LLC. 9693 GERWING LANE, SUITE L COLUMBIA, MD 21046. DATE: NOVEMBER 2, 2017. SHEET 4 OF 10.

**LEGEND**

-  PROJECT BOUNDARY
-  DRAINAGE DIVIDE
-  PROPOSED IMPERVIOUS
-  MICRO-BIORETENTION SURFACE AREA
-  DRY WELL
-  UcB
-  SOILS CLASSIFICATION
-  SOILS DELINEATION
-  SOIL BORING TEST LOCATION



SEE SHEET 1 FOR STORMWATER MANAGEMENT SUMMARY TABLE

**NRCS SOILS CHART - HoCo Soils Map No. 17**

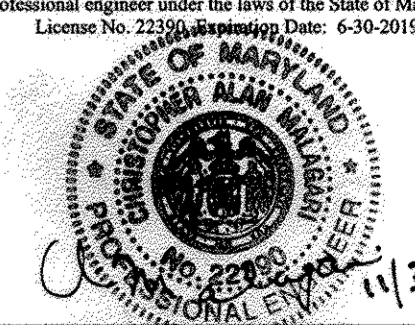
SYMBOL	HYDRIC	GROUP	Kw	MAP UNIT NAME
GfB	no	B	0.28	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES
GuB	no	C	0.43	GLENVILLE-URBAN LAND-UDORTHTENTS COMPLEX, 0 TO 8 PERCENT SLOPES

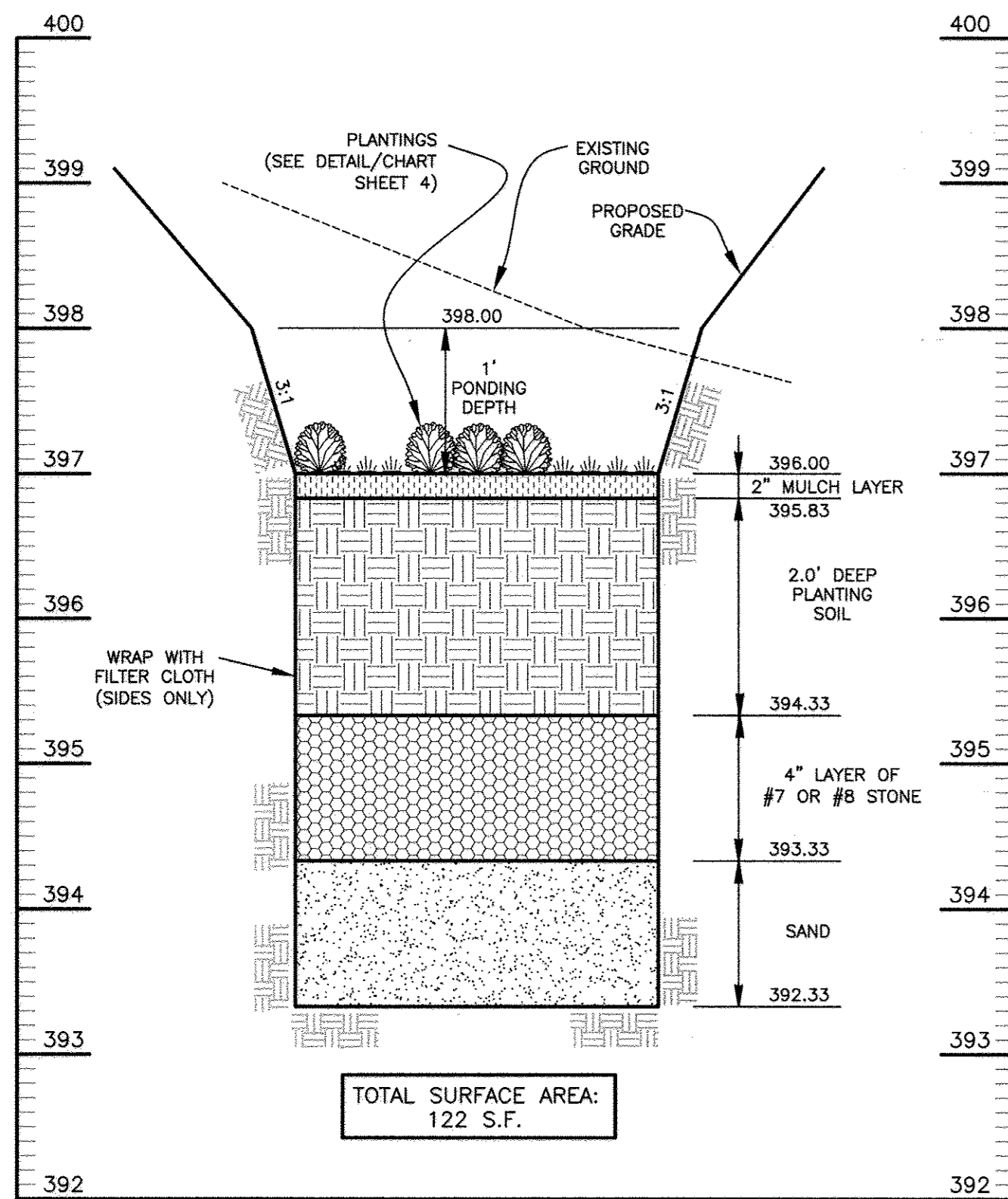
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 11-27-17  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

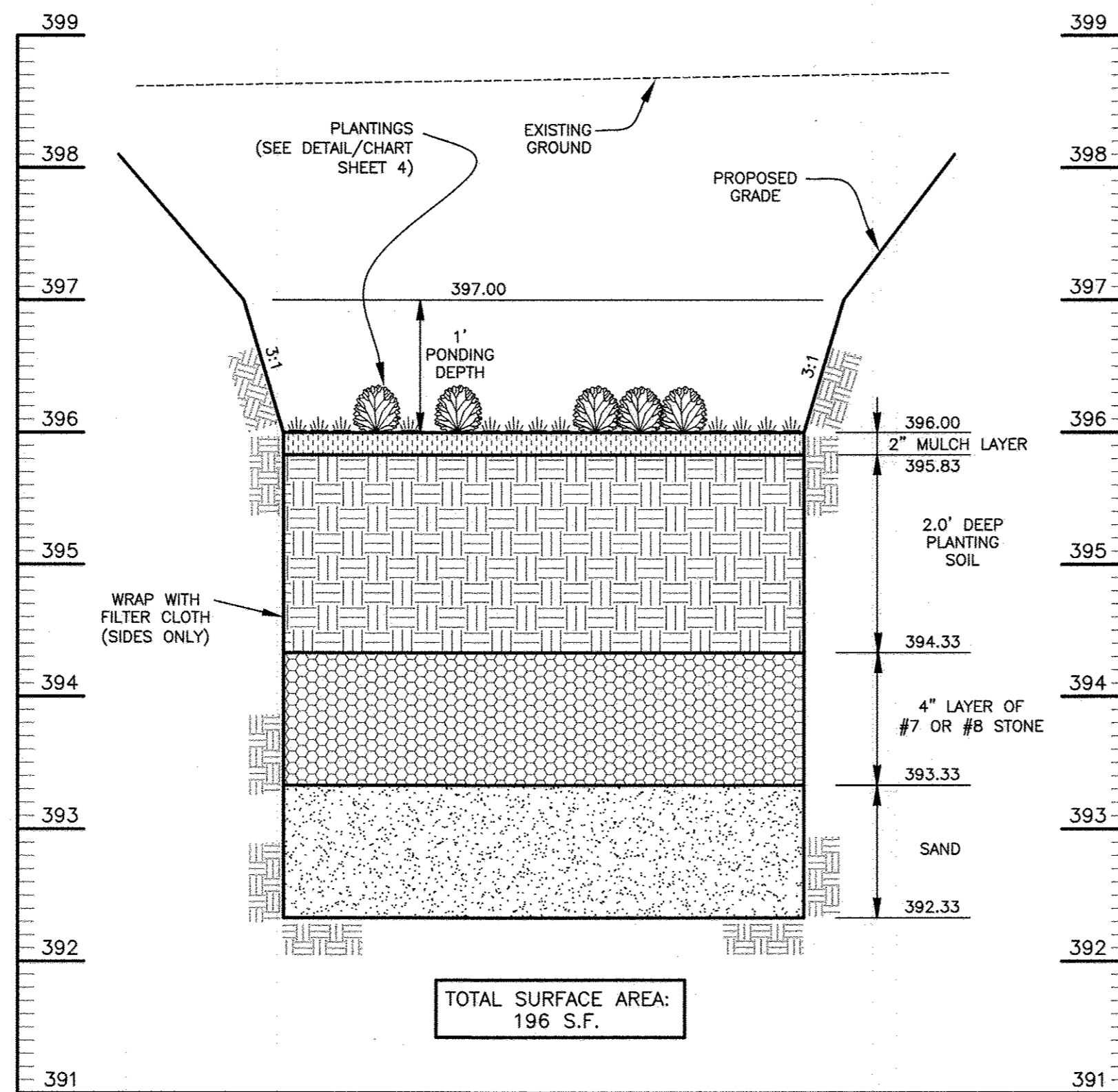
*[Signature]* 11-30-17  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 12-1-17  
 DIRECTOR DATE

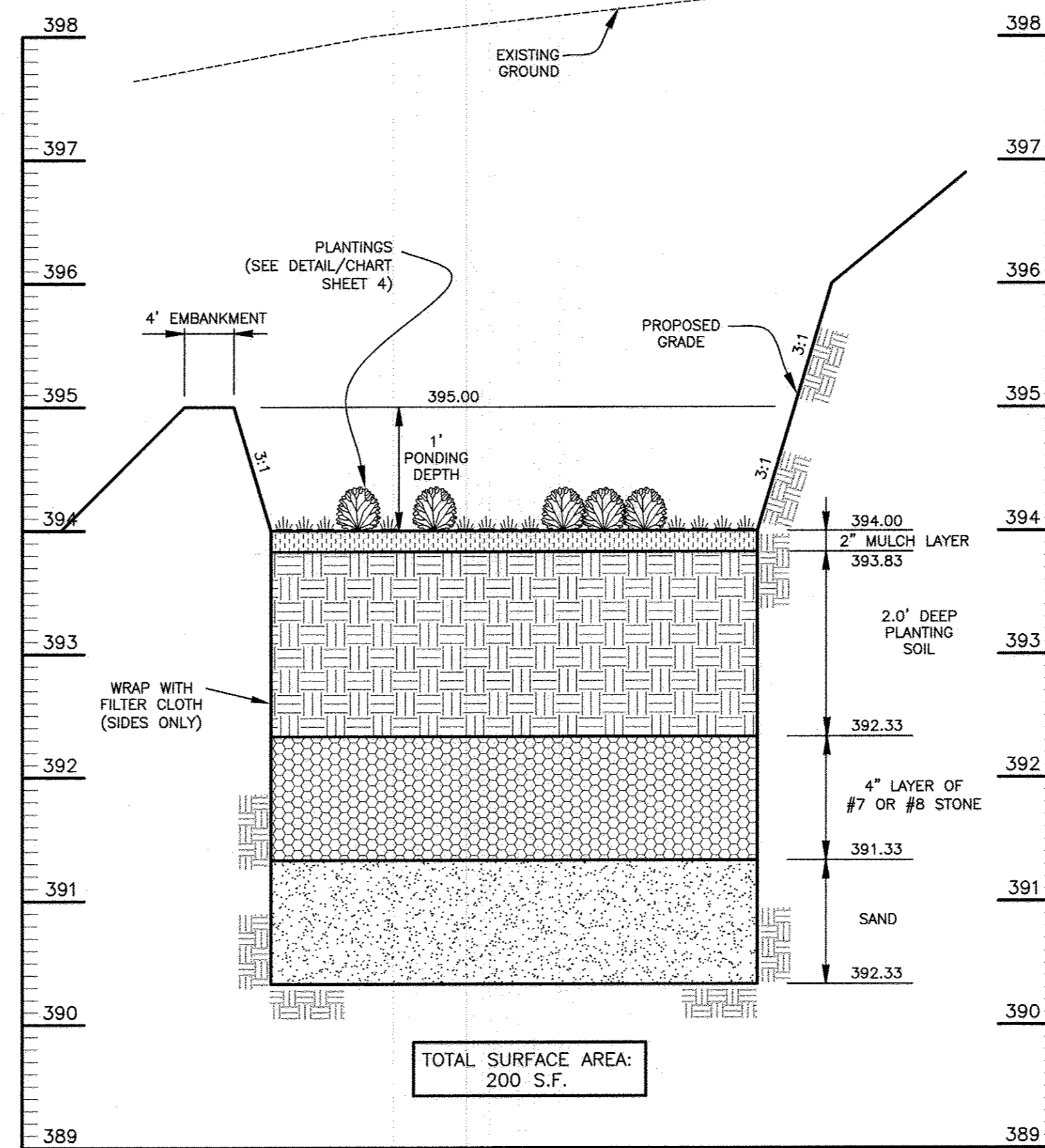
NO.	DATE	REVISION		
<p><b>BENCHMARK</b>                  ENGINEERS &amp; LAND SURVEYORS &amp; PLANNERS  <b>ENGINEERING, INC.</b>                  8480 BALTIMORE NATIONAL PIKE &amp; SUITE 315 &amp; ELLAGOTT CITY, MARYLAND 21043                  (P) 410-465-6105 (F) 410-465-6644                  WWW.BEI-CIVILENGINEERING.COM</p>				
<p>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. 22139. Expiration Date: 6-30-2019.</p> 				
OWNER:		RESIDENTIAL - SINGLE FAMILY DETACHED		
DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565		<b>HILLTOP LANDING</b> LOTS 1-7 AND OPEN SPACE LOT 8		
DEVELOPER:		TAX MAP: 35 - GRID: 11 - PARCEL: 41 ZONED: R-SC ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND		
DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565		<b>ESD to the MEP STORMWATER MANAGEMENT DRAINAGE AREA MAP</b>		
DESIGN: DBT	DRAFT: MCR	DATE: NOVEMBER 2, 2017	BEI PROJECT NO. 2615	
		SCALE: AS SHOWN	SHEET 5 OF 10	



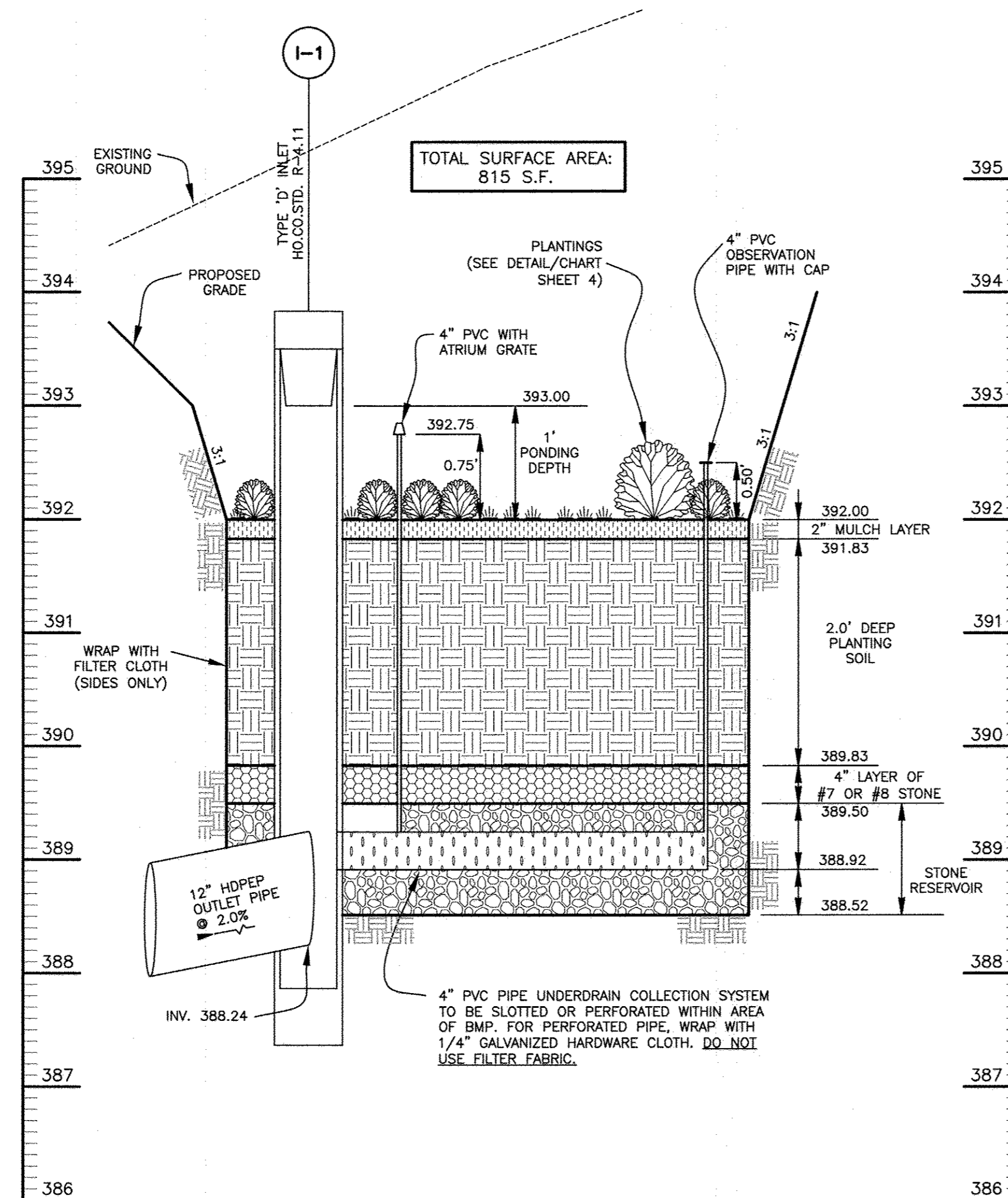
**CROSS-SECTION G-G  
(M-3) LANDSCAPE INFILTRATION #1  
H.O.A. MAINTAINED**  
SCALE: 1"=10' HORZ., 1"=1' VERT.



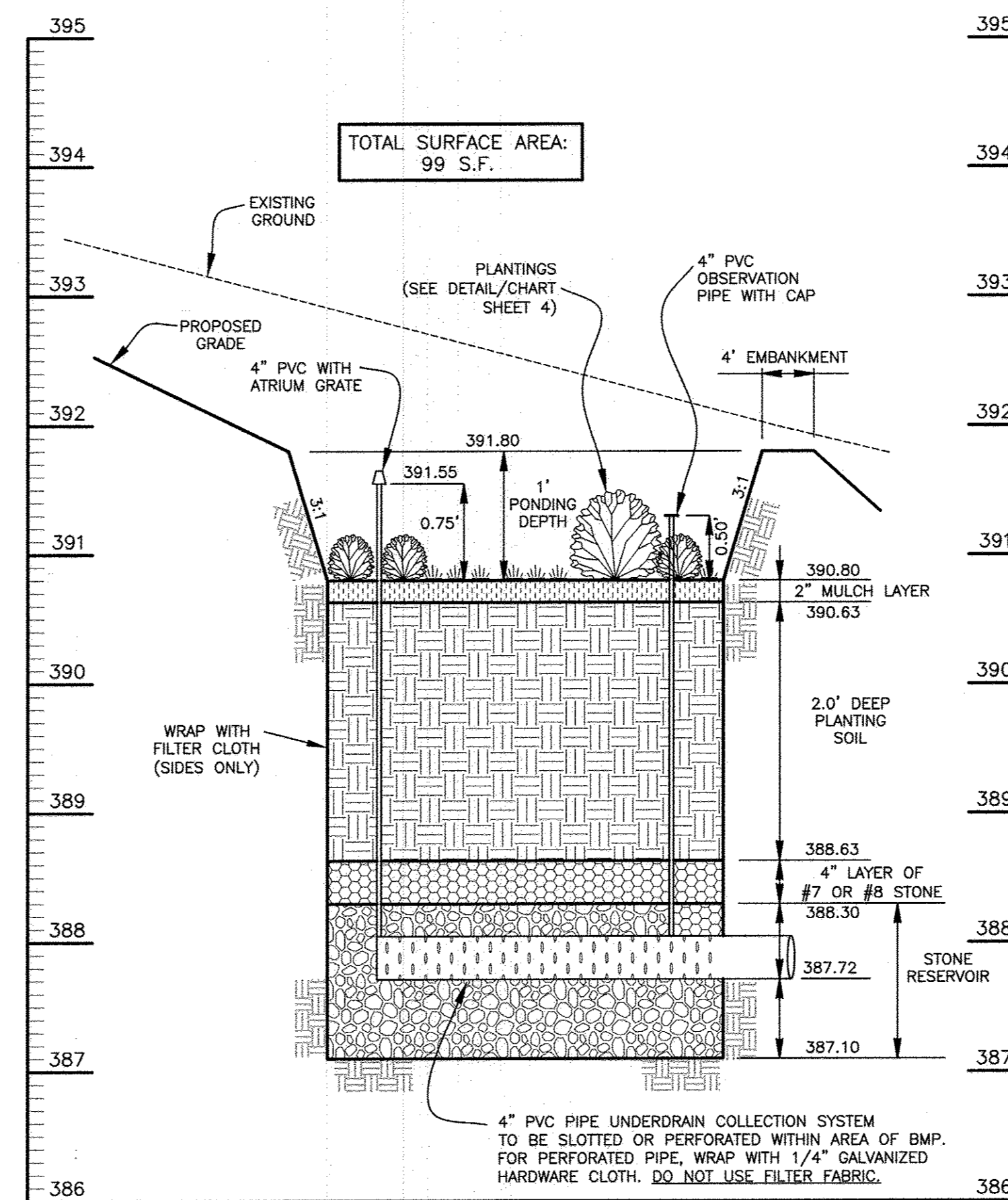
**CROSS-SECTION A-A  
(M-3) LANDSCAPE INFILTRATION #2  
LOT 2 OWNER MAINTAINED**  
SCALE: 1"=10' HORZ., 1"=1' VERT.



**CROSS-SECTION B-B  
(M-3) LANDSCAPE INFILTRATION #3  
LOT 3 OWNER MAINTAINED**  
SCALE: 1"=10' HORZ., 1"=1' VERT.



**CROSS-SECTION C-C  
(M-6) MICRO BIO-RETENTION #1  
H.O.A. MAINTAINED**  
SCALE: 1"=10' HORZ., 1"=1' VERT.



**CROSS-SECTION D-D  
(M-6) MICRO BIO-RETENTION #2  
LOT 5 OWNER MAINTAINED**  
SCALE: 1"=10' HORZ., 1"=1' VERT.

NOTE: SEE SHEET 2 FOR SURFACE AREA DIMENSIONS

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 [Signature] 11-27-17  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 11-30-17  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature] 12-1-17  
 DIRECTOR

NO.	DATE	REVISION
<b>BENCHMARK</b> <b>ENGINEERS &amp; LAND SURVEYORS &amp; PLANNERS</b> 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BEI-CIVILENGINEERING.COM		
RESIDENTIAL - SINGLE FAMILY DETACHED <b>HILL TOP LANDING</b> LOTS 1-7 AND OPEN SPACE LOT 8 TAX MAP: 35 - GRID: 11 - PARCEL: 41 ZONED: R-SC ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND		
<b>STORMWATER MANAGEMENT DETAILS</b>		
OWNER:	DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	
DEVELOPER:	DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	
DESIGN:	DBT	DRAFT: DBT
DATE:	NOVEMBER 2, 2017	BEI PROJECT NO. 2615
SCALE:	AS SHOWN	SHEET 6 OF 10

**CONSTRUCTION SPECIFICATIONS**

**B.4.C Specifications for Micro-Bioretenion, 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-bioretenion practices 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 hoses 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 subsolar. These tilling operations are to restructure 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-bioretenion 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 (ASTM F 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 3/4" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/4" (No. 4 or 4x4) galvanized hardware cloth.
- Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain.
- The main collector pipe shall be at a minimum 0.5% slope.
- A rigid, non-perforated observation well must be provided (one per every 1,000 square feet) to provide a clean-out port and monitor performance of the filter.
- A 4" layer of pea gravel (1/4" to 3/4" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

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

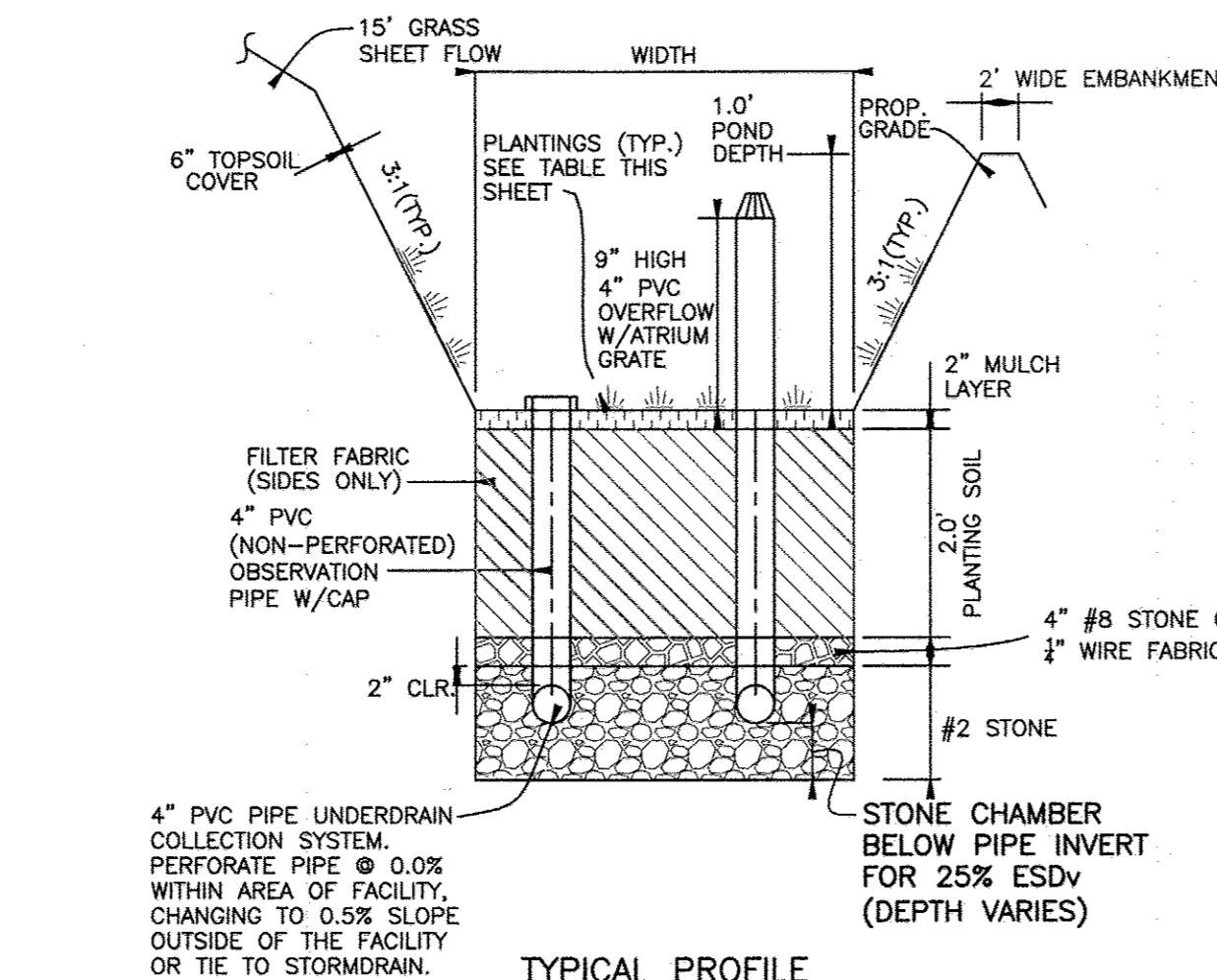
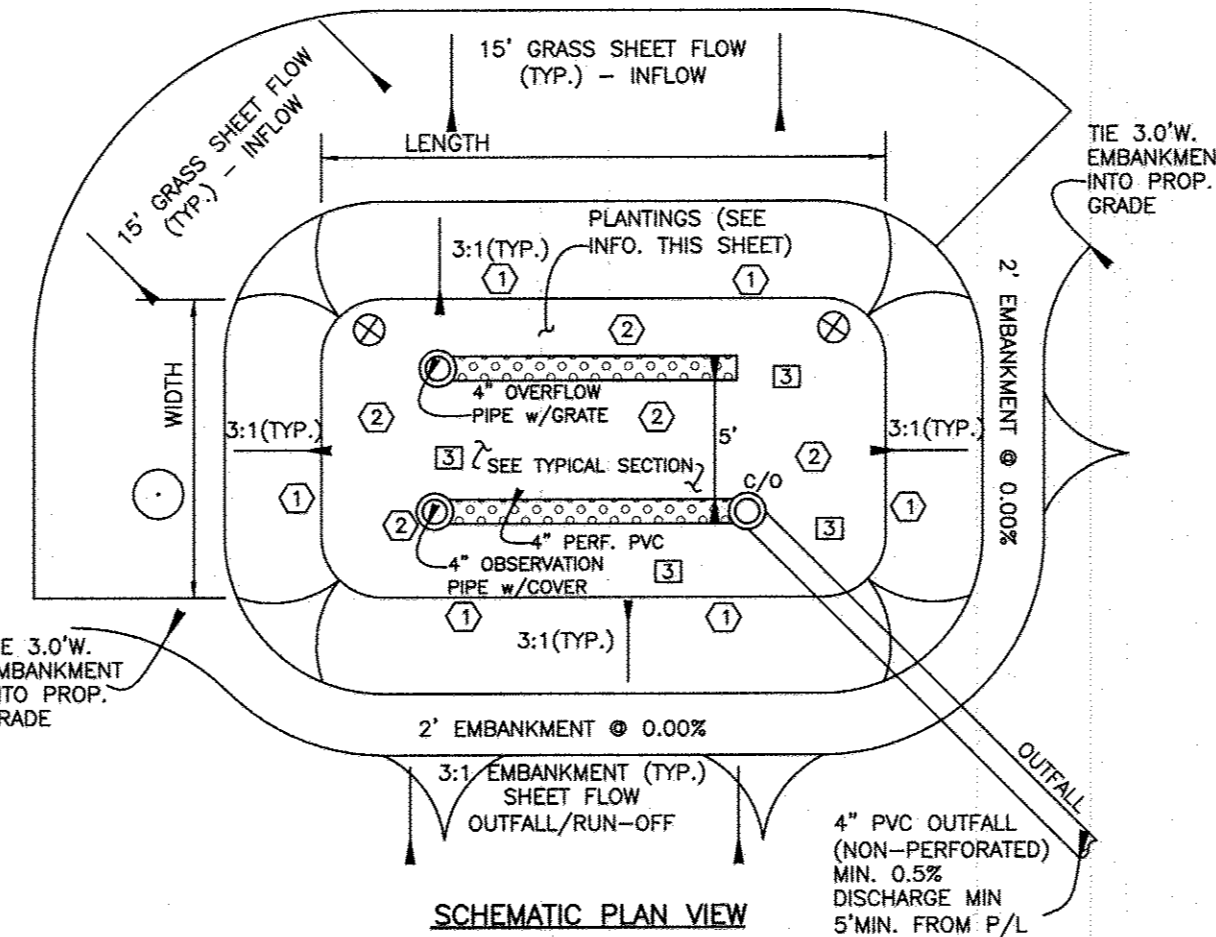
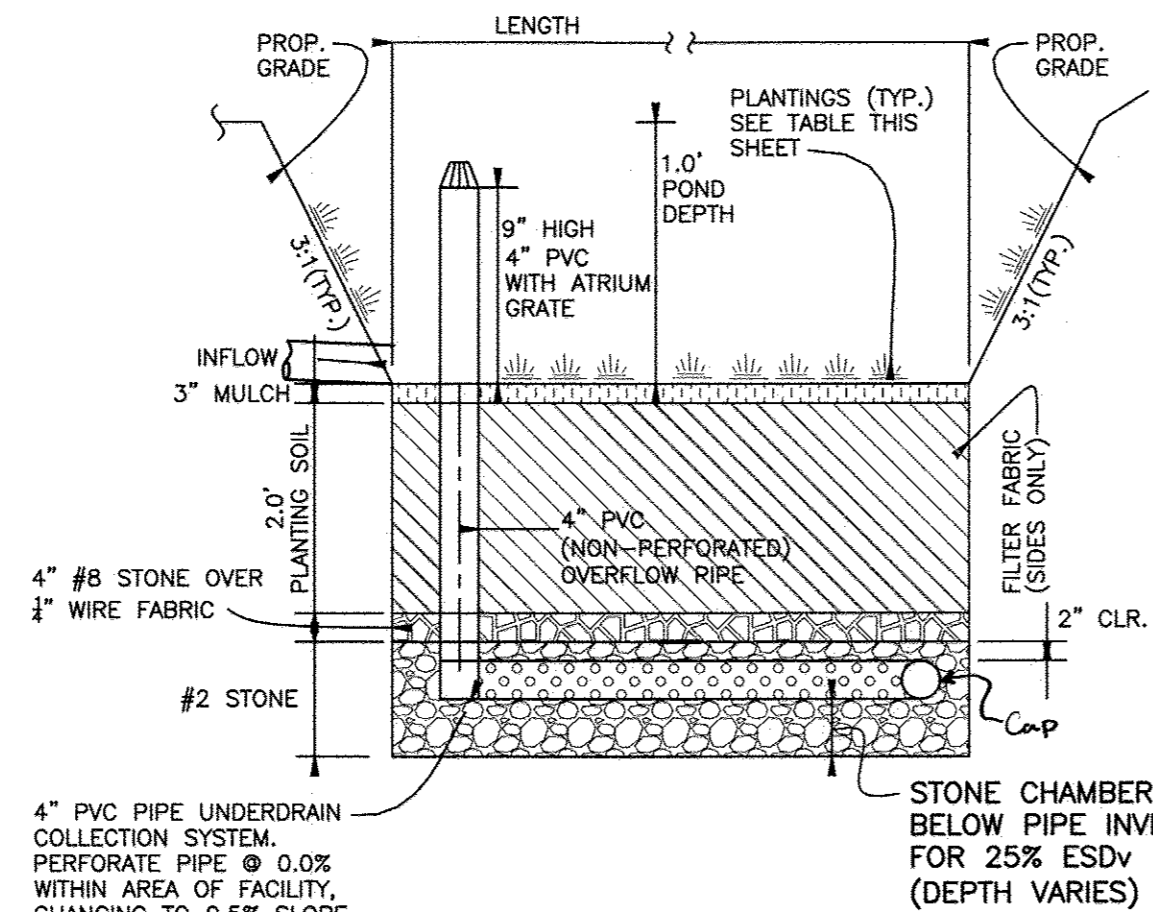
**7. Miscellaneous:**

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

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

**Table B.4.1 Materials Specifications for Micro-Bioretenion, 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	AASHTO M-43	n/a	PE Type I 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 underdrains pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; P <sub>c</sub> = 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 308.R/89; vertical loading [H-16 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.



**UNDERDRAIN, OVERFLOW AND OUTFALL NOTES**

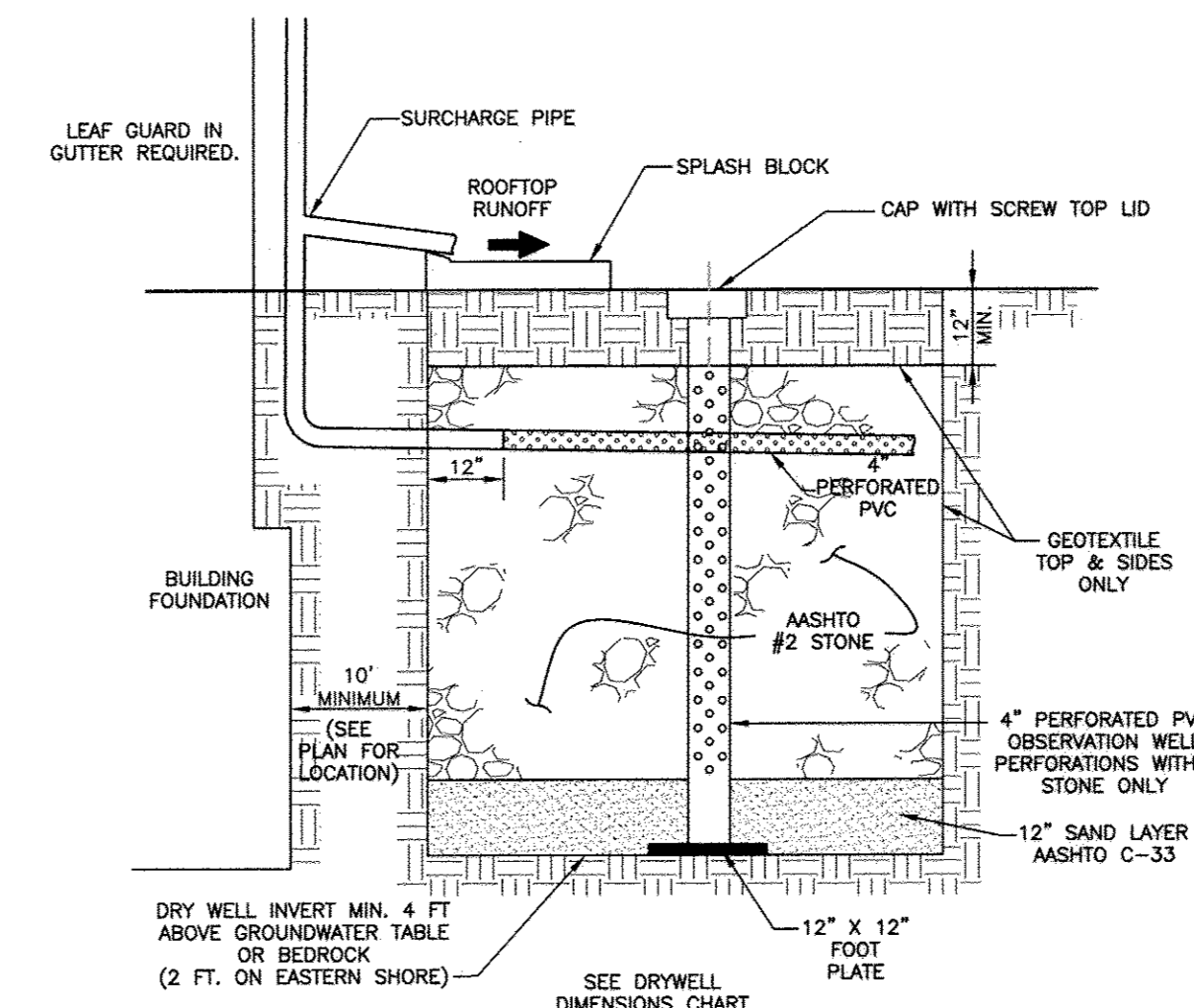
- THE LAST CLEAN-OUT LOCATION WITHIN EACH MICRO-BIORETENION FACILITY SHALL BE FITTED WITH A NON-CLOGGING SURFACE DRAIN (EXAMPLE: 4\"/>

**STANDARD MICRO-BIORETENION DETAILS**

NOT TO SCALE

**Dry Well Dimension Chart**

Dry Well	Lot	Length (ft)	Width (ft)	Depth of Stone (ft)	Bottom of Stone Elevation	Bottom of Sand Elevation
#1	Lot 1	6.5	5.0	4.0	395.00	394.00
#2	Lot 2	8.0	5.0	4.0	395.00	394.00
#3	Lot 5	11.0	6.0	5.0	387.50	386.50
#4	Lot 5	11.0	6.0	5.0	389.25	388.25
#5	Lot 6	12.0	6.0	5.0	390.00	389.00
#6	Lot 6	12.0	6.0	5.0	391.75	390.75
#7	Lot 7	12.0	6.5	5.0	392.75	391.75
#8	Lot 7	12.0	6.5	5.0	393.75	392.75



**DRY WELL DETAIL**

NOT TO SCALE

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED (M-5) DRY WELLS**

- The monitoring wells and structures shall be inspected on a quarterly basis and after every large storm event.
- Water levels and sediment build up in the monitoring wells shall be recorded over a period of several days to insure trench drainage.
- A log book shall be maintained to determine the rate at which the facility drains.
- When the facility becomes clogged so that it does not drain down within the 72 hour time period, corrective action shall be taken.
- The maintenance log book shall be available to Howard County for inspection to insure compliance with operation and maintenance criteria.
- Once the performance characteristics of the infiltration facility have been verified, the monitoring schedule can be reduced to an annual basis unless the performance data indicates that a more frequent schedule is required.

**MATERIALS & SPECIFICATIONS FOR DRY WELLS**

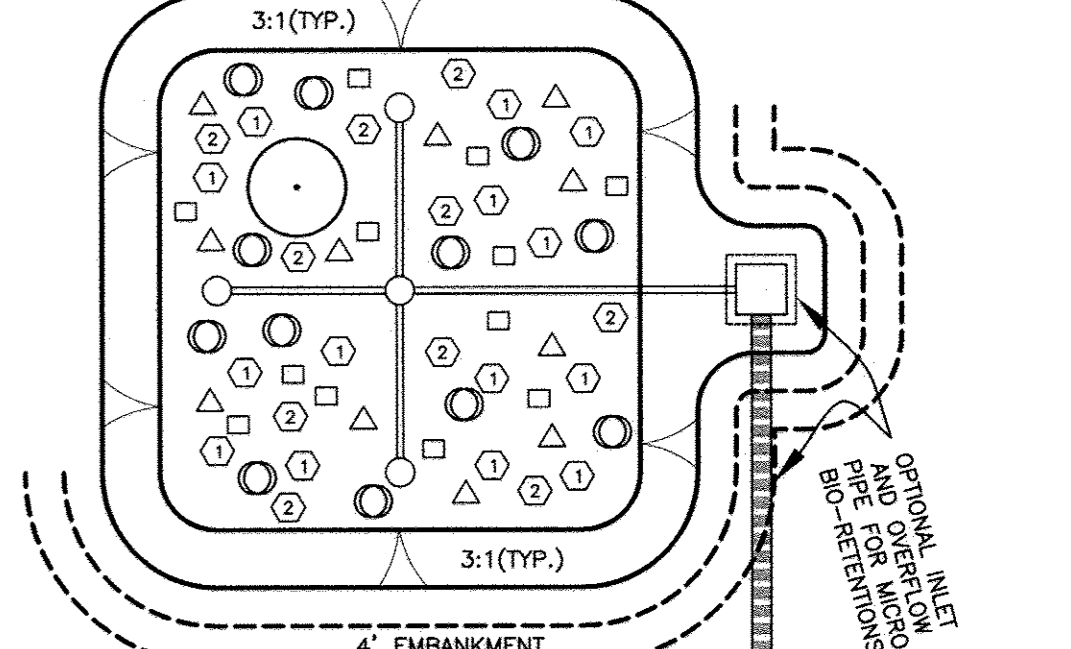
MATERIAL	SPECIFICATION	SIZE	NOTES
GEOTEXTILE (CLASS 'C')	AASHTO M 43	N/A	PE TYPE I, NONWOVEN
GRAVEL	AASHTO M 43	1 1/2" TO 2 1/2"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M-278	4" TO 6" RIGID SCHEDULE 40 PVC, SDR35 OR HDPE	3/8" PERF. @ 6" O.C./ 4 HOLES PER ROW; MINIMUM OF 2" OF GRAVEL OVER PIPES.
SAND	AASHTO M-6 OR ASTM-C-33	.02" TO .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-3) Landscape Infiltration and (M-6) Micro Bio-Retention Landscaping Chart**

PLANT NAME	COMMON NAME	TYPE	Surface Area	SIZE	QUANTITY				TOTAL
					MB#1 815	LI#1 122	LI#2 196	LI#3 200	
Ilex verticillata	Common Winterberry	shrub		2.5-3' ht	8	1	2	13	1333
Lobelia cardinalis	Cardinal flower	perennial herbaceous plant		quart bulb	54	8	13	13	89
Lobelia siphilitica	Great Blue Lobelia	perennial herbaceous plant		quart bulb	54	8	13	13	89
Carex stricta	Uplight Sedge	grass		quart bulb	54	8	13	13	89
Irish versicolor	Blue Water Iris	perennial herbaceous plant		quart bulb	54	8	13	13	89
Liatrix spicata	Prairie Gay Feather	perennial herbaceous plant		quart bulb	54	8	13	13	89

**PLANTING LEGEND**

SYMBOL	NAME
①	LOBELIA CARDINALIS
②	LOBELIA SIPHILITICA
□	CAREX STRICTA
△	IRIS VERSICOLOR
○	LIATRIS SPICATA
●	ILEX VERTICILLATA



**SCHEMATIC PLANTING DETAIL FOR (M-3) AND (M-6) PRACTICES**

NOT TO SCALE

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED (M-3) LANDSCAPE INFILTRATION (M-6) MICRO-BIORETENION**

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

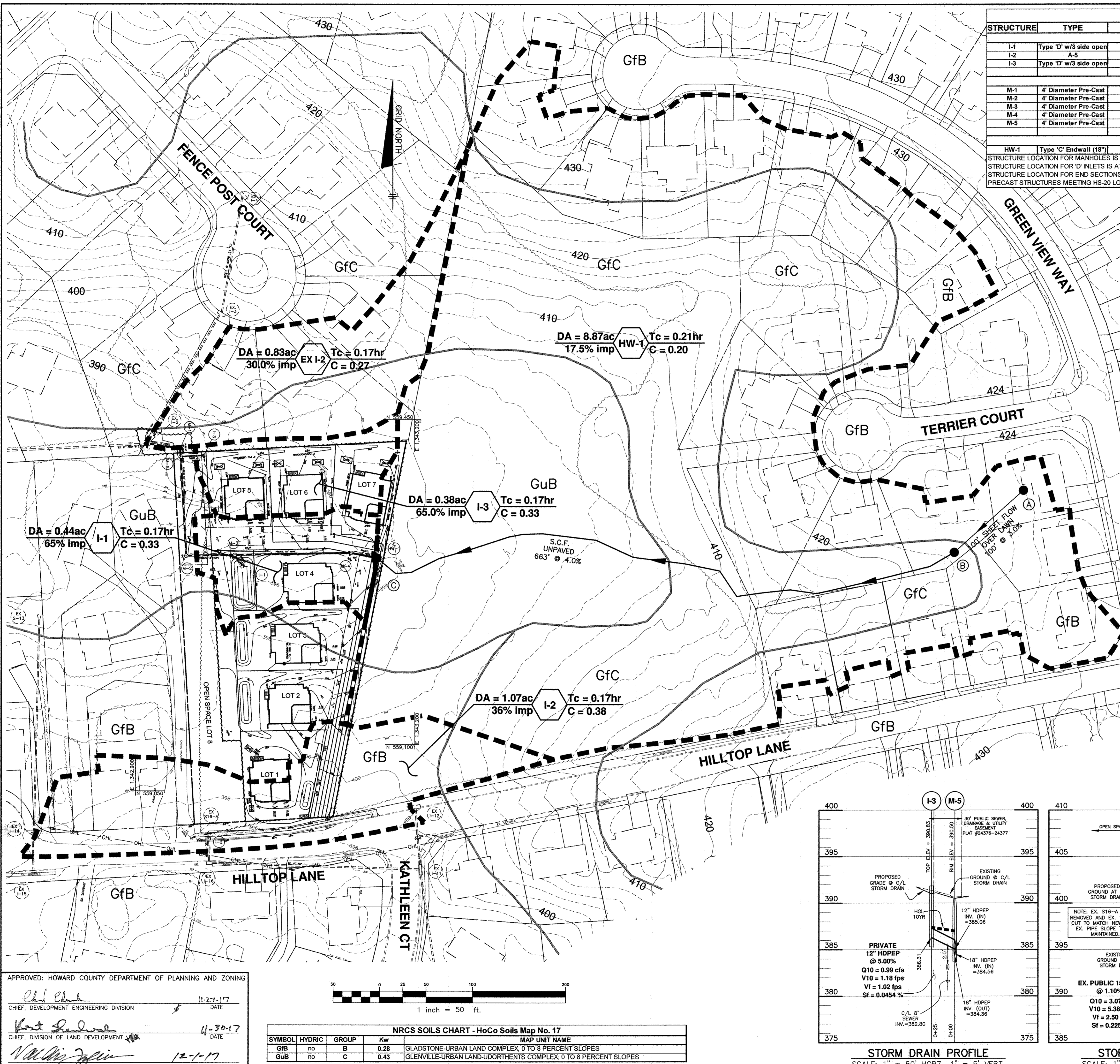
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 11-27-17  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 11-30-17  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 12-1-17  
DIRECTOR DATE

NO.	DATE	REVISION
<p><b>BENCHMARK ENGINEERING, INC.</b></p> <p>8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 WWW.BE-CIVILENGINEERING.COM</p>		
<p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer in the State of Maryland. License No. 12229 Date: 6-30-2019.</p>		
OWNER:	RESIDENTIAL - SINGLE FAMILY DETACHED	
DEVELOPER:	HILL TOP LANDING LOTS 1-7 AND OPEN SPACE LOT 8	
DESIGN:	DBT	DRAFT: MCR
DATE:	NOVEMBER 2, 2017	BEI PROJECT NO. 2615
SCALE:	AS SHOWN	SHEET 7 OF 10



### STRUCTURE SCHEDULE

STRUCTURE	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	THROAT ELEV.	STD. DETAIL	MAINTENANCE
<b>INLETS</b>								
I-1	Type 'D' w/3 side open	N 559290.96 E 1343014.80	-	388.92 (4")	388.24 (12")	393.83	D-4.11	PRIVATE
I-2	A-5	N 558996.91 E 1342978.09	-	-	392.65	397.07	D-4.02	PUBLIC
I-3	Type 'D' w/3 side open	N 559410.92 E 1342971.01	-	-	386.18	391.17	D-4.11	PRIVATE
<b>MANHOLES</b>								
M-1	4' Diameter Pre-Cast	N 559418.66 E 1342948.04	384.27 (18")	384.07 (18")	390.73		G-5.12	PUBLIC
M-2	4' Diameter Pre-Cast	N 559354.02 E 1342951.70	385.83 (18")	385.63 (18")	394.00		G-5.12	PUBLIC
M-3	4' Diameter Pre-Cast	N 559303.71 E 1343006.90	387.94 (12")	386.78 (18")	393.50		G-5.12	PRIVATE
M-4	4' Diameter Pre-Cast	N 559306.02 E 1343131.92	392.82 (18")	391.78 (18")	397.20		G-5.12	PRIVATE
M-5	4' Diameter Pre-Cast	N 559409.70 E 1342948.55	385.06 (12")	384.56 (18")	390.50		G-5.12	PUBLIC
<b>HEADWALLS/END SECTIONS</b>								
HW-1	Type 'C' Endwall (18")	N 559300.62 E 1343159.6743	-	-	394.50	397.75	D-5.21 (w/mod. Height)	PRIVATE

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

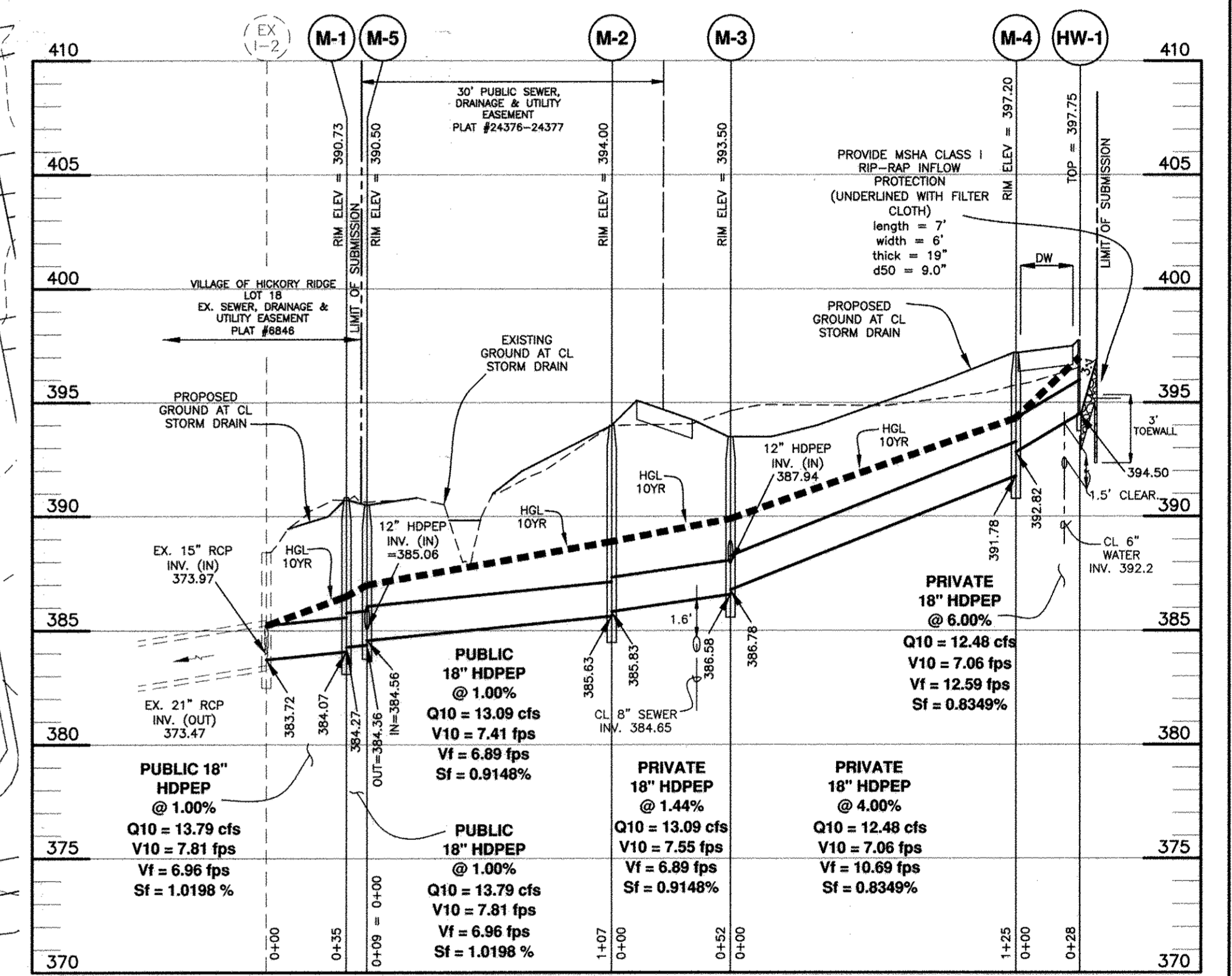
### LEGEND

PROJECT BOUNDARY  
 DRAINAGE DIVIDE  
 Tc TRAVEL PATH  
 SOILS DELINEATION  
 SOILS CLASSIFICATION

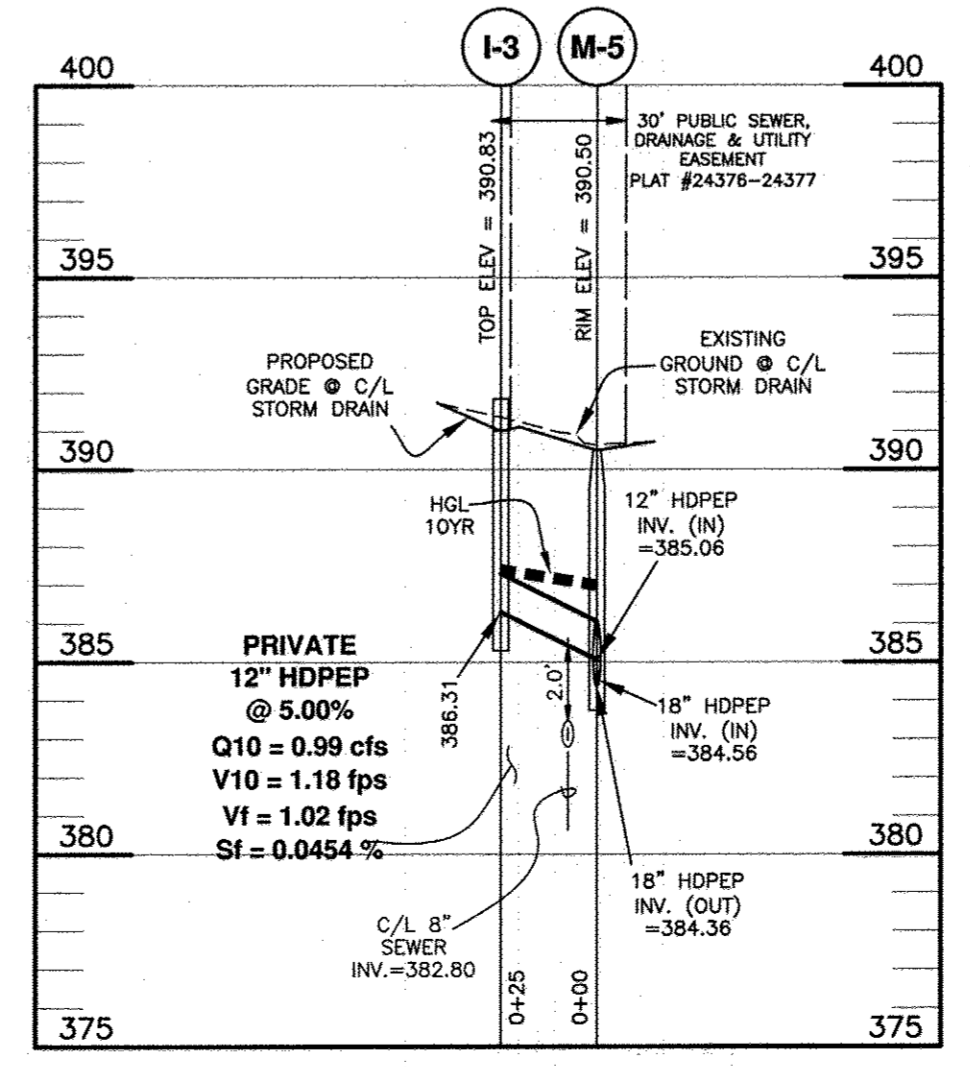
### PIPE SCHEDULE

SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
12"	HDPEP	40	PRIVATE
18"	HDPEP	205	PRIVATE
18"	HDPEP	151	PUBLIC

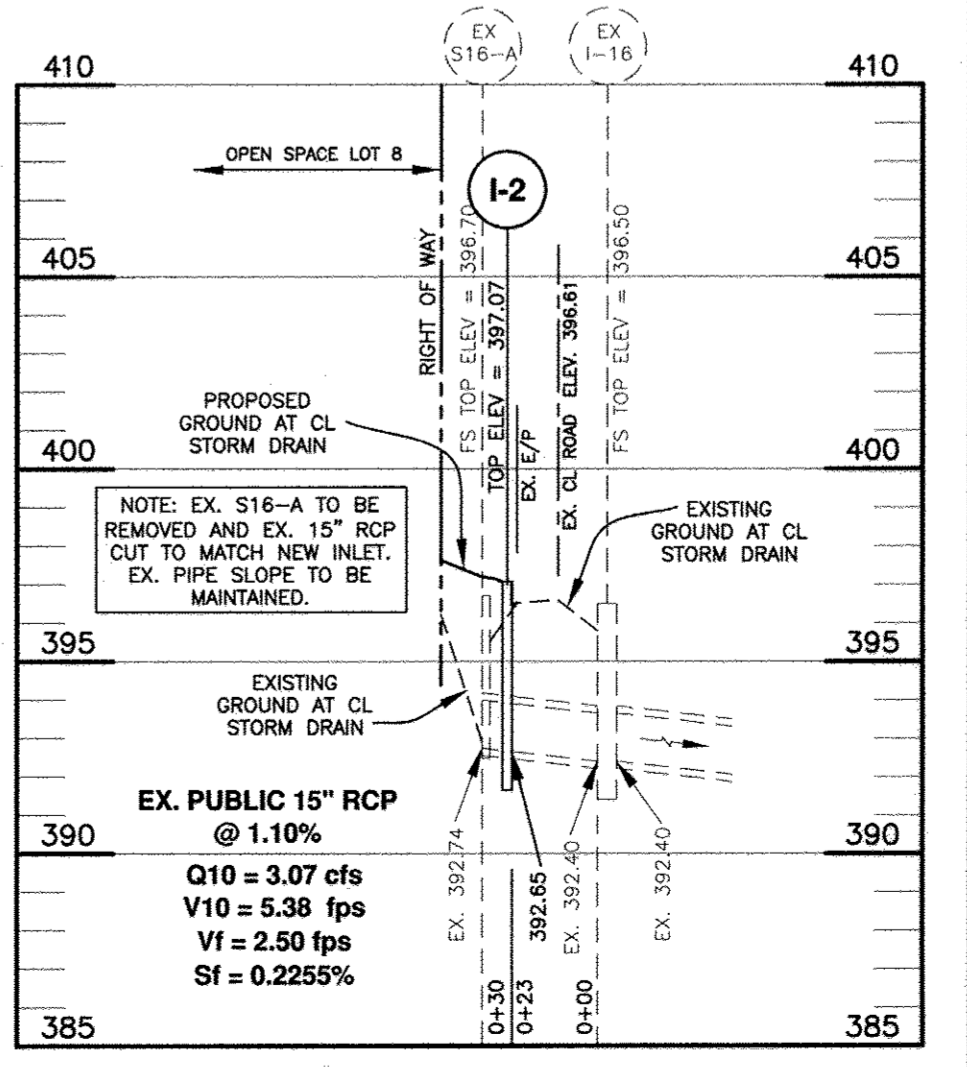
All pipes shall have smooth interior. No interior corrugations.



**STORM DRAIN PROFILE**  
SCALE: 1" = 50' HORZ., 1" = 5' VERT.



**STORM DRAIN PROFILE**  
SCALE: 1" = 50' HORZ., 1" = 5' VERT.



**STORM DRAIN PROFILE**  
SCALE: 1" = 50' HORZ., 1" = 5' VERT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 11-27-17  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 11-30-17  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 12-1-17  
DIRECTOR DATE

### NRCS SOILS CHART - HoCo Soils Map No. 17

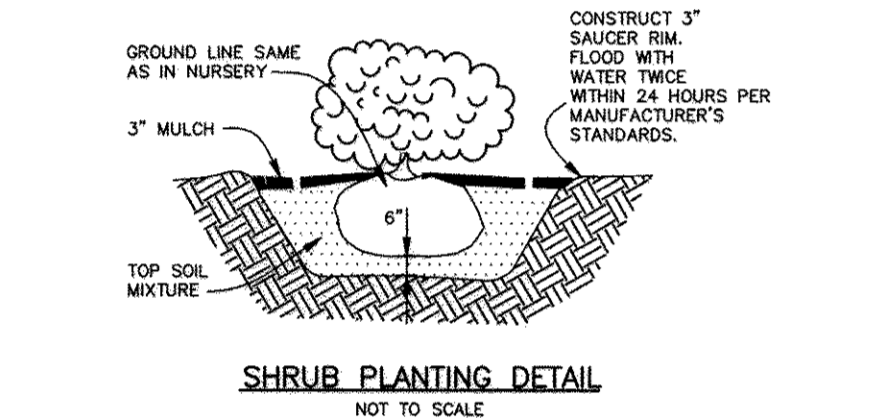
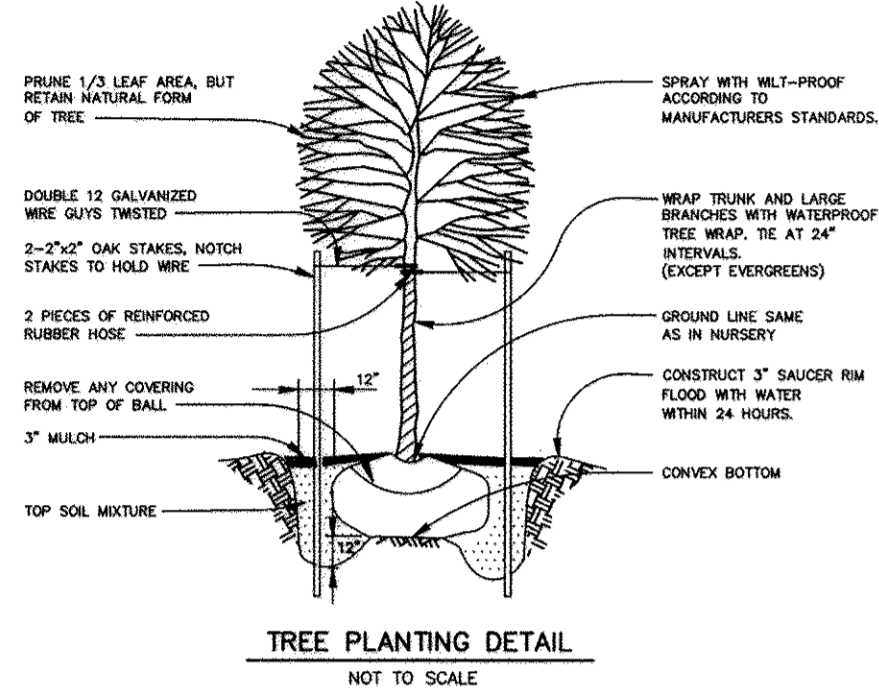
SYMBOL	HYDRIC	GROUP	K <sub>w</sub>	MAP UNIT NAME
GfB	no	B	0.28	GLADSTONE-URBAN LAND COMPLEX 0 TO 8 PERCENT SLOPES
GuB	no	C	0.43	GLENVILLE-URBAN LAND-UDORTHEMUS COMPLEX 0 TO 8 PERCENT SLOPES

NO. DATE REVISION		<p>Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer in the State of Maryland. License No. 36228. Date of Issue: 6-30-2019.</p>
<p><b>BENCHMARK ENGINEERS &amp; LAND SURVEYORS &amp; PLANNERS</b>        8480 BALTIMORE NATIONAL PIKE &amp; SUITE 315 &amp; ELLICOTT CITY, MARYLAND 21043        (P) 410-465-4100 (F) 410-465-6644        WWW.BE-CIVILENGINEERING.COM</p>		
OWNER:		<p>RESIDENTIAL - SINGLE FAMILY DETACHED  <b>HILLTOP LANDING</b>        LOTS 1-7 AND OPEN SPACE LOT 8</p> <p>TAX MAP: 35 -- GRID: 11 -- PARCEL: 41        ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p>
DEVELOPER:		
DESIGN: DBT DRAFT: DBT		DATE: NOVEMBER 2, 2017 BEI PROJECT NO. 2615
		SCALE: AS SHOWN SHEET 8 OF 10



**LANDSCAPE NOTES:**

- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.
- AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
- THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
- FINANCIAL SURETY IN THE AMOUNT OF \$7,200.00 FOR THE REQUIRED PERIMETER LANDSCAPING AND ADDITIONAL TREES PER THE APPROVAL OF WP-16-148 AND WP-17-069 WAS POSTED AS PART OF THE F-16-037 DEVELOPERS AGREEMENT.



**LEGEND**

	EXISTING TREELINE
	EXISTING FENCELINE
	PROJECT BOUNDARY
	EXISTING OVERHEAD LINES
	PROPOSED TREELINE
	STEEP SLOPES 25% OR GREATER
	MICRO-BIORETTENTION SURFACE AREA
	PROP. STORM DRAIN PIPE
	WATER HOUSE CONNECTION
	SEWER HOUSE CONNECTION
	TREE PROTECTION FENCE

**DEVELOPER'S/BUILDER'S CERTIFICATE**

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION OF A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE-YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

*Justin M. Boy* 11/3/17 DATE  
 JUSTIN M. BOY DEVELOPMENT PARTNERS, LLC

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chad Edmondson* 11-27-17 DATE  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

*Vestal* 11-30-17 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT

*William J. Piv* 12-1-17 DATE  
 DIRECTOR

**SCHEDULE A PERIMETER LANDSCAPE EDGE**

LANDSCAPE TYPE	ADJACENT TO PERIM. PROPERTY			TOTALS
	① A - LIGHT 1:60 shade	② A - LIGHT 1:60 shade	③ A - LIGHT 1:60 shade	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	412 LF	251 LF	400 LF	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	
NUMBER OF PLANTS REQUIRED	412 LF	251 LF	400 LF	24 ~
SHADE TREES	0	4	7	0
EVERGREEN TREES	0	0	0	0
OTHER TREES (2:1 SUBSTITUTE)	0	0	0	0
SHRUBS	0	0	0	0
NUMBER OF PLANTS PROVIDED	1	6 ~	11 ~	18 ~
SHADE TREES	0	0	0	0
EVERGREEN TREES	0	0	0	0
OTHER TREES (2:1 SUBSTITUTE)	0	0	0	0
SHRUBS (10:1 SUBSTITUTE)	60*	0	0	60

\* SHRUBS HAVE BEEN SUBSTITUTED AT A 10:1 RATIO.

~ ADDITIONAL SHADE TREES ABOVE THE PERIMETER REQUIREMENT HAVE BEEN PROVIDED AS A CONDITION OF APPROVAL OF WP-16-148 AND WP-17-069. (SEE PLAN VIEW FOR THESE LOCATIONS)

**PERIMETER LANDSCAPE PLANTING LIST**

SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	18	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2.5" - 3" cal.	SHADE TREES ALONG PERIMETER EDGES TO BE PROVIDED BY THE BUILDER.
	6	QUERCUS PHELLOS (Willow Oak)	3" min. dbh	SHADE TREES AS REQUIRED BY THE APPROVAL OF WP-16-148 AND WP-17-069
	2	ACER RUBRUM 'RED SUBSET' (Red Sunset Red Maple)	2.5" - 3" cal.	STREET TREES TO BE PLANTED ALONG HILLTOP LANE BY THE DEVELOPER
	40	PIERIS JAPONICA (Japanese Pieris)	2' - 2.5' hgt.	NEEDLE EVERGREEN SHRUBS PLANTED AROUND REFUSE PAD AND USE-IN-COMMON DRIVE TO BE PROVIDED BY THE BUILDER.
	20	ILEX X CRERATA (Compacta) Compact Japanese Holly	2' - 2.5' hgt.	NEEDLE EVERGREEN SHRUBS PLANTED AROUND REFUSE PAD AND USE-IN-COMMON DRIVE TO BE PROVIDED BY THE BUILDER.

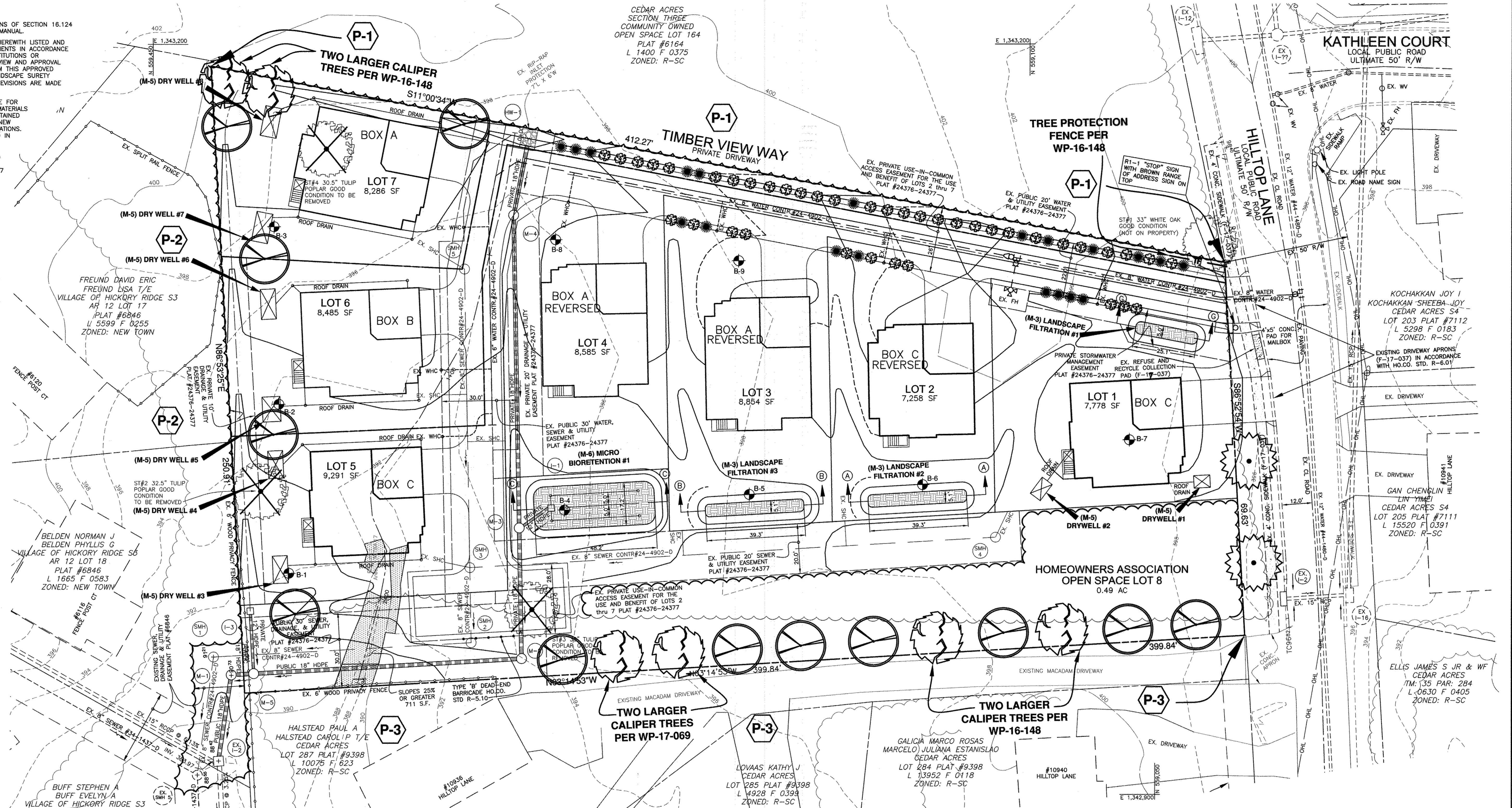
**STREET TREE SCHEDULE**

	HILLTOP LANE
LINEAR FEET OF RIGHT-OF-WAY	69.6'
LINEAR FEET OF CREDIT	0
LINEAR FEET OF REQUIRED PLANTING	69.6'
REQUIREMENT	LARGE (2.5" cal)
NUMBER OF TREES REQUIRED	2
NUMBER OF TREES PROVIDED	2

**SPECIMEN TREE CHART**

KEY	SPECIES	SIZE (IN DBH)	CRZ (FT. RADII)	COMMENTS
1	WHITE OAK	3.3	49.5	GOOD CONDITION - TO REMAIN - OFF SITE
2	TULIP POPLAR	32.5	48.75	GOOD CONDITION - TO BE REMOVED
3	TULIP POPLAR	35	52.5	GOOD CONDITION - TO BE REMOVED
4	TULIP POPLAR	30.5	45.75	GOOD CONDITION - TO BE REMOVED

(SEE SHEET 2 FOR LOCATIONS)



**NOTE: SEE SHEET 4 FOR INTERNAL SWMF PLANTING**

NO. DATE REVISION

**BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS**  
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043  
 (P) 410-665-6105 (F) 410-455-6644  
 WWW.BEI-CVLENGINEERING.COM

OWNER: DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565

DEVELOPER: DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565

RESIDENTIAL - SINGLE FAMILY DETACHED  
**HILLTOP LANDING**  
 LOTS 1-7 AND OPEN SPACE LOT 8

TAX MAP: 35 - GRID: 11 - PARCEL: 41  
 ZONED: R-SC  
 ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND

**LANDSCAPE PLAN**

DATE: NOVEMBER 2, 2017 BEI PROJECT NO. 2615  
 SCALE: AS SHOWN SHEET 9 OF 10

DESIGN: DBT DRAFT: MCR

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-5 (1 of 1) 10" 9.5 (See 398.2 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Brown clayey SILT with some fine sand, moist. (ML, USDA: Silty Loam)	Infiltration pipe was set at 4.76 feet.
	3.5		
	4.0		16.5
330.0	1.0	Auger refusal - End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-2 (1 of 1) 10" 9.5 (See 398.8 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Tan to brown clayey SILT with some fine sand, moist. (ML, USDA: Silty Loam)	
	5.0		23.0
	5.5		
330.0	1.0	Light brown fine to medium micaceous SAND with some silt and little clay, moist. (SM, USDA: Sandy Loam)	
	8.0		18.0
	8.5		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-3 (1 of 1) 10" 9.5 (See 397.8 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Reddish-brown silty fine to medium SAND with little clay and trace fine gravel, moist. (SM, USDA: Loam)	
	4.5		25.5
	5.0		
330.0	1.0	Light brown fine to medium micaceous SAND with little silt, moist. (SM, USDA: Sandy Loam)	
	9.0		14.7
	9.5		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-4 (1 of 1) 10" 9 (See 395.7 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Reddish-brown sandy SILT with little fine sand, moist. (ML, USDA: Silty Loam)	Infiltration pipe was set at 4.7 feet.
	6.0		11.0
	6.5		
330.0	1.0	Light brown fine to medium SAND with little silt and trace clay, moist. (SM, USDA: Loamy Sand)	
	8.0		10.0
	8.5		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-5 (1 of 1) 10" 9.5 (See 398.2 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Reddish-brown sandy SILT with little clay, moist. (ML, USDA: Silty Loam)	
	3.5		14.5
	4.0		
330.0	1.0	Light brown to tan fine to medium SAND with some silt, dry to moist. (SM, Loamy Sand)	
	6.0		8.7
	6.5		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-6 (1 of 1) 10" 9.5 (See 399.0 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Tan to light brown fine to medium SAND with little fine gravel and little silt and clay, moist. (SM, USDA: Sandy Loam)	
	3.5		9.6
	4.0		
330.0	1.0	Tan to light brown fine to medium SAND with little silt and clay, moist. (SM, USDA: Sandy Loam)	
	8.0		16.5
	8.5		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-7 (1 of 1) 10" 9.5 (See 398.3 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Brown clayey SILT with some fine sand, moist. (ML, USDA: Silty Loam)	Infiltration pipe was set at 5.5 feet.
	3.5		13.6
	4.0		
330.0	1.0	Reddish-brown clayey fine to medium SAND with little silt, moist. (SM, USDA: Sandy Clay Loam)	
	7.5		16.4
	8.0		
329.0	1.0	Light brown fine to medium SAND with little silt and clay, moist. (SM, USDA: Sandy Loam)	
	9.0		23.5
	9.5		
328.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-8 (1 of 1) 10" 10 (See 396.0 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Tan to brown sandy SILT, moist. (ML, USDA: Silty Loam)	
	3.5		18.8
	4.0		
330.0	1.0	Tan to light brown micaceous fine to medium SAND with some silt, moist. (SM, USDA: Sandy Loam)	
	9.0		23.5
	9.5		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-9 (1 of 1) 10" 10 (See 398.0 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Reddish-brown sandy SILT with trace fine gravel, moist. (ML, USDA: Silty Loam)	Infiltration pipe was set at 6.0 feet.
	6.0		12.4
	6.5		
330.0	1.0	Tan to light brown fine to medium micaceous SAND with some silt and trace clay, damp to moist. (SM, USDA: Sandy Loam)	
	9.5		28.9
	10.0		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-1 (1 of 1) 10" 9 (See 398.0 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Brown clayey SILT with some fine sand and gravel, moist. (ML, USDA: Silty Loam)	Infiltration pipe was set at 5.4 feet.
	5.0		23.0
	5.5		
330.0	1.0	Reddish-brown silty CLAY with some gravel and trace fine sand, moist. (CL, USDA: Clay Loam)	
	8.0		18.0
	8.5		
329.0	1.0	Reddish-brown & gray silty CLAY with little fine sand, moist. (CL, USDA: Silty Clay)	
	9.0		28.9
	9.5		
328.0	1.0	Auger refusal - End of boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-2 (1 of 1) 10" 12 (See 393.8 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Tan to brown clayey SILT with some fine sand, moist. (ML, USDA: Silty Loam)	Boring was originally drilled in November 2014 to a depth of 9.5 feet. In May 2017 the boring was drilled to 12.0 feet. Infiltration pipe was set at 7.6 feet.
	5.0		23.0
	5.5		
330.0	1.0	Light brown fine to medium micaceous SAND with little clay, moist. (SM, USDA: Sandy Loam)	
	8.0		18.0
	8.5		
329.0	1.0	End of Boring	

BORING LOG		GEOLAB, INC.	
Report No. 11/26/2014			
Client: Development Partners, LLC			
Project: Hilltop Landing			
Boring No. B-3 (1 of 1) 10" 8 (See 397.8 ft.) Location: See boring location plan			
Type of Boring: Hand Auger (11/26/2014) (See 11/26/2014) (See 11/26/2014) (See 11/26/2014)			
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	REMARKS
332.0	0.0	Topsoil with root (organic) matter and organic soil	Boring was dry during drilling and at completion.
331.0	1.0	Reddish-brown to gray micaceous silty fine to medium SAND with little clay and trace fine gravel, moist. (SM, USDA: Loam)	Infiltration pipe was set at 4.1 feet.
	4.0		11.0
	4.5		
330.0	1.0	Gray-brown micaceous fine to medium SAND with some gravel and little silt and fine clay, moist. (SM, USDA: Sandy Loam)	
	8.0		10.0
	8.5		
329.0	1.0	Auger refusal - End of boring	

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 11-27-17  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 11-30-17  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 12-1-17  
 DIRECTOR DATE

NO.	DATE	REVISION

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

OWNER: DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	<p><b>HILLTOP LANDING</b>          RESIDENTIAL DEVELOPMENT          LOTS 1-7 AND OPEN SPACE LOT 8          PLAT #</p> <p>TAX MAP: 35 - GRID: 11 - PARCEL: 41          ZONED: R-SC          ELECTION DISTRICT NO. 5 - HOWARD COUNTY, MARYLAND</p> <p><b>SOIL BORING LOGS          AND SITE PLAN DETAILS</b></p>
DEVELOPER: DEVELOPMENT PARTNERS LLC 9693 GERWIG LANE, SUITE L COLUMBIA, MD 21046 410-792-2565	<p>DATE: NOVEMBER 2, 2017 BEI PROJECT NO. 2615</p> <p>SCALE: AS SHOWN SHEET 10 OF 10</p>
DESIGN: DBT DRAFT: MCR	SDP-17-059