MARYLAND STATE GRID (1983/2011)

N

PROP. VEGETATIVE SCREENING, SEE LANDSCAPE PLAN SHEETS 10-13

PROP. STORMWATER MANAGEMENT FACIL

PROP. UNDERGROUND WATER TANK

LIMIT OF DISTURBANCE

MICRO-BIORETENTION #1

SCALE: 1" = 20'

MICRO-BIORETENTION #1 CROSS SECTION
NTS

CLEANOUT WITH WATERPROOF CAP
OVERFLOW
INFLOW
6" MIN FREEBOARD
3" MULCH LAYER
495.50'
495.00'
9" PONDING DEPTH
494.25'
492.25'
24" PLANTING MEDIA
491.75'
6" SAND BED
490.50'
6" STONE LAYER ABOVE UNDERDRAIN
488.75'
3" STONE LAYER ABOVE UNDERDRAIN
6"—SCH 40 SOLID PVC PIPE
6"—SCH 40 PERFORATED OR SLOTTED PVC PIPE @ 0.0% INVERT = 490.75'
24" OF ADDITIONAL DRAINAGE STONE TO PROMOTE INFILTRATION BELOW UNDERDRAIN PIPES

Calculating the Pe for the site

Site Area	3,664,828	SF	84.13	AC
Impervious Area	12,809	SF	0.29	AC
Pervious Area	3,652,019	SF	83.84	AC
Site Imperviousness (I)	0.003		0.3%	
PE (IN)	1.0	This value is taken from Table 5.3 in Chapter 5 of the MDE Manual		

Calculating the Required ESDv for the site

Disturbed Area	32,265	SF	0.74	AC
Impervious Area	7,537	SF	0.17	AC
Pervious Area	24,728	SF	0.57	AC
Site Imperviousness (I)	0.234		23%	

	SF	AC
Total Parcel Area =	4,770,691	109.52
Site Area (LOD) =	280,793	6.45
Disturbed Access Area =	32,265	SF
Disturbed Solar Area =	-	SF
Disturbed Area =	32,265	0.74 AC

PE	1.0	inches
Rv	0.260	
A	32,265	SF
ESDv Required	700	CF

$$Rv = 0.05 + 0.009 * I$$

$$ESDv = \frac{(Pe)(Rv)(A)}{12}$$

DETAIL D-4-1-A   ROCK OUTLET PROTECTION I

STANDARD SYMBOL
ROP1

DISCHARGE TO SEMI CONFINED CHANNEL SECTION

PLAN VIEW

FLOW
d/2

EMBED GEOTEXTILE LINING A MIN. OF 4 IN
NONWOVEN GEOTEXTILE OR STONE FILTER
SECTION A-A

CHANNEL CROSS SECTION WILL TRANSITION FROM A-A TO B-B

4 IN
W
NONWOVEN GEOTEXTILE OR STONE FILTER
SECTION B-B
6 IN

EXTEND RIPRAP TO A MIN. HEIGHT OF H
DEPTH DICTATED BY CHANNEL SECTION AT END OF APRON
0%
4 IN
SLOPE TO DRAIN
NONWOVEN GEOTEXTILE OR STONE FILTER
6 IN
3 FT MIN.
12 IN MIN.
PROFILE

RIPRAP

CLASS	THICKNESS (T)
I	19 IN
II	32 IN
III	46 IN

CONSTRUCTION SPECIFICATIONS

1. RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.

2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, 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 TOGETHER.

3. PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (⅜ TO 1½ INCH STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP 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. EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF THE RIPRAP.

5. CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE STONE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.

6. WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.

7. CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.

8. 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

Summary Table

Required ESDv	700	CF
Provided ESDv from MBF #1	817	CF
Total Provided ESDv	817	CF
Required Pe	1.00	IN
Provided Pe	1.17	IN

$$Provided\ Pe = \frac{12 * ESDv\ (Provided)}{Rv * A}$$

SWM #1 — Micro-Bioretention

SWM #1	Micro-Bioretention	
ESDv MAX	918	CF
PE	2.6	inches
Rv	0.260	
A	16,309	SF
ESDv MIN	353	CF
PE	1.0	inches
Rv	0.260	
A	16,309	SF

ESDv = Ponding Depth + Storage in Filter Media

$$ESDv\ Max/Min = \frac{(Pe)(Rv)(A)}{12}$$

Ponding Depth	9	inches
Size of Facility	467	SF
Media Layer	2.5	feet
ESDv	(Area of Facility x Ponding Depth) + (Porosity x (Area of Facility x Media Layer)) (467*0.75) + [0.4*(467*2.5)]	
ESDv Provided	817	CF
ESDv Max Allowed	918	CF

Imperviousness (I)

Impervious Area to Facility	3,800	SF
Total Area to Facility	16,309	SF
Imperviousness	23%	

$$Rv = 0.05 + 0.009 * I$$

Media Layer

Media Layer	2.5	feet
Planting Media	2	feet
Sand	0.5	feet