STORMWATER MANAGEMENT CONCEPT COMPUTATIONS

FOR

New Market – East Main

HSA JOB NO. 7705-00000

BY

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April 2023

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NARRATIVE

INTRODUCTION

The site is located on Old National Pike (MD-144) across from Marley Street, in Frederick County, MD. The site is currently vacant/wooded. This project is for the proposed construction of both residential and non-residential development. The site consists of hydrologic soils type 'B' and 'C' per the NRCS web soil survey .

Table 5.1 Natural Resources and the corresponding Regulatory Authorities:

Federal

Wetlands –None
Major Waterways – None
Floodplains – None

State

Tidal and Non-Tidal Wetlands – None
Wetlands of Special Concern – None
Wetland Buffers – None
Stream Buffers – None
Perennial Stream – Not applicable
Floodplains – None
Forests – None
Forest Buffers – None
Critical Areas – None

Local

Steep Slopes – None
Highly erodible soils – None
Enhanced stream buffers – None
Topography / slopes – Shown per surveyed topography.
Springs – None
Seeps – None
Intermittent streams – None
Vegetative cover – Existing trees to be removed where grading/ development is necessary.
Soils – identified on plan – Hydrologic Soil Groups B/C.
Bedrock / geology – N/A
Existing drainage areas – The site currently drains to the east through "Davis Branch", which ultimately conveys the stormwater to the Monocacy River.

Table 5.2 Site Development Strategies:

During the initial site assessment, the following better site design techniques were considered:
Using narrower, shorter streets – None, streets designed to fit needs of site.
Cul-de-sacs – N/A, no proposed cul-de-sacs within the limits of the site.
Open vegetated channels– N/A
Parking rations, parking codes, parking lots and structured parking – In accordance with Frederick County regulations.
Parking lots – Provided in accordance to Frederick County regulations.
Parking lot runoff – Parking lot runoff will be captured and treated in proposed ESD.
Open Space – SWM facilities are proposed to be used in available open areas as needed.
Setbacks and frontages – Have been designed per Frederick County regulations.
Driveways – N/A
Rooftop runoff – Roof drains will be directed to ESD facilities, if possible.
Buffer systems –N/A
Clearing and grading – Clearing, grading and disturbance will be limited to that required to construct the development.
Tree conservation – N/A
Conservation incentives – N/A

ESD Treatment Practices:

During the initial site assessment, the following ESD treatment practices have been considered:
Alternative Surfaces – Not considered in SWM computations.
Natural Area Conservation – N/A
Disconnection of Rooftop Runoff – Not considered in SWM computations.
Disconnection of Non-Rooftop Runoff – Not considered in SWM computations.
Sheet flow to Conservation Areas – Not considered in SWM computations.
Rainwater Harvesting – This option not viable for this site.
Submerged Gravel Wetlands – This option is being considered for this site.
Micro-Bioretention – This option is being considered for this site.
Infiltration Berms – This option is not considered viable for this site.
Dry Wells – This option is not considered viable for this site.
Rain Gardens – This option is not practical for this development.

STORMWATER MANAGEMENT DESIGN

The site (disturbed) area is approx. 261,200 sf (6.00 Ac.) with a total impervious area of approx. 143,474sf (3.29 Ac.). A required Environmental Site Design (ESD) volume was calculated to be 21,328 CF for the site.

First, alternative surfaces were considered. This option is not currently proposed. Next, non-structural practices were considered however are not applicable for this site. Next, micro-scale practices were considered. Four Micro-bioretention areas and a submerged gravel wetland (for the ability to treat larger drainage areas) were selected for treatment. Design assessment information is as follows:

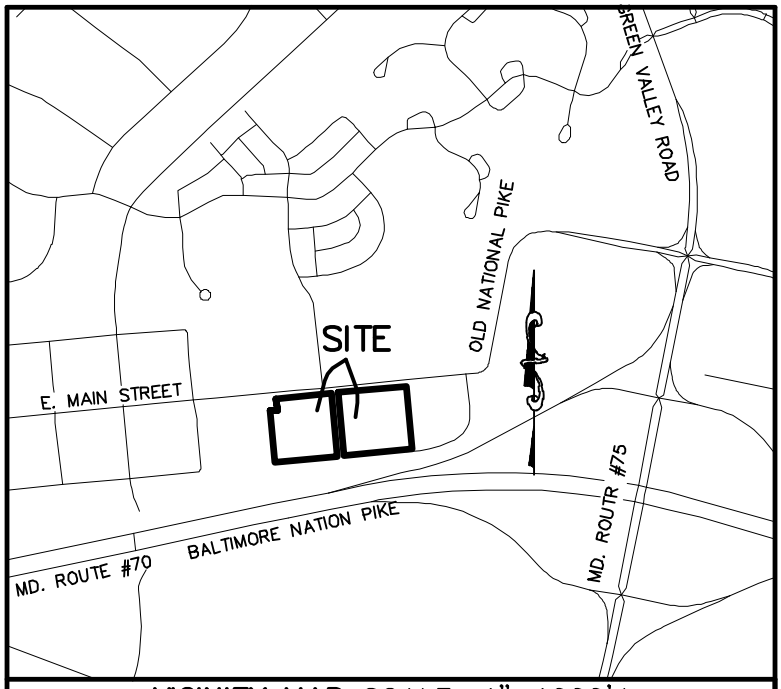
Design Assessment

ESD #	D.A. (SF)	Imp. Area (SF)	ESDv (CF)
1	85,450	29,100	4,945
2	14,740	9,600	1,043
3	15,754	10.300	2,095
4	10,262	5,200	1,056
5	24,150	16,650	2,505

TOTAL ESDv PROVIDED = 11,644 CF

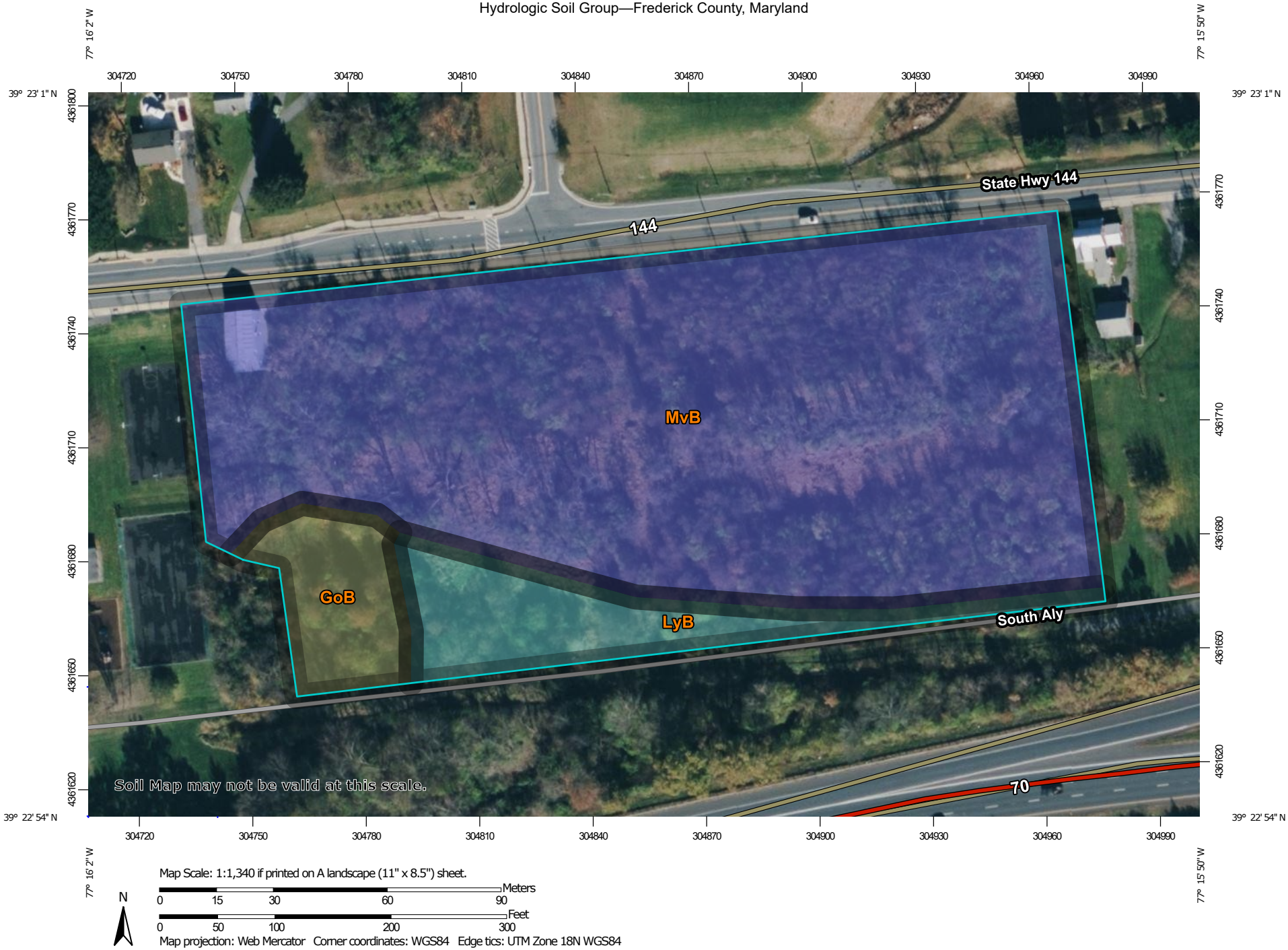
Conclusion

Since the provided ESDv (11,644 CF) is less than the required (21,328 CF) but the minimum Pe of 1.0" has been achieved, the remaining water quality will be addressed with an on-site SWM pond that will also address the site's water quantity requirements. The SWM pond will control the site's drainage to pre-development rates.



VICINITY MAP SCALE: 1"=1000'±

T.M.79, PARCEL 3812, TAX ID NO. 09-232788
T.M.79, PARCEL 3813, TAX ID NO. 09-232761



Map Scale: 1:1,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Frederick County, Maryland
Survey Area Data: Version 19, Sep 14, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 23, 2020—Nov 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GoB	Glenville silt loam, 3 to 8 percent slopes	C/D	0.4	6.7%
LyB	Linganore-Hyattstown channery silt loams, 3 to 8 percent slopes	C	0.6	10.8%
MvB	Myersville silt loam, 3 to 8 percent slopes	B	4.9	82.5%
Totals for Area of Interest			**5.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

IMPERVIOUS AREA BREAKDOWN

SITE AREA (DISTURBANCE) =	**261,200**	**SF =**	**6.00 AC**

PROPOSED IMPERVIOUS AREA BREAKDOWN

IMPERVIOUS AREA =	**143,474**	**SF=**	**3.29 AC**
BLDG:	**45,886**	**SF =**	**1.05 AC**
PAVEMENT:	**80,864**	**SF =**	**1.86 AC**
SIDEWALK:	**16,724**	**SF =**	**0.38 AC**

ESD REQUIREMENTS

SITE AREA =		**261,200 SF =**		**6.00 AC**
IMPERVIOUS AREA =		**143,474 SF =**		**3.29 AC**
I = % IMPERVIOUS =				**55** %
Rv = 0.05 + 0.09 (I)		Rv =		**0.54**
SOILS TYPE:	HSG "B" 82.5%			**4.95 AC**
	HSG "C" 17.5%			**1.05 AC**
RCN =				**58**
PER TABLE 5.3, TARGET **Pe** =		**1.80**	SOILS 'B'	**1.8 "**
			SOILS 'C'	**1.8 "**

ESDv = (Pe)(Rv)(A)/12

ESDv=	**0.490**	**Ac ft**
	21,328	**CF**

SWM DESIGN COMPS

Submerged Gravel Wetland

ESD # 1

Drainage Area (DA) = 85,450 sf

Impervious Area (I) = 29,100 sf = 34.1 % Impervious

Surface Area of Practice (Af) = 1,902 sf

Rv = 0.05+0.009(I)

Rv = 0.356

Surface Area Check

Af shall be at least 2% of contributing surface area

Af min = .02 x DA

Af min. = 1709 sf

Provided Af = 1,902 sf

The maximum amount of runoff that can be captured by this practice is limited to the 1-year 24-hour storm, which is 2.5" for Frederick County, MD:

$$ESDv = \frac{(PE)\ (RV)\ (A)}{12} = \mathbf{6,346}\ cf$$ = Max. allowable

Volume Provided :

The gravel wetland has a surface area of 1,902 sf

A ponding depth of 1.0' will be provided. The filter media and gravel layer will be 4.0' deep.

Given that the porosity (n) for these layers is 0.4, the total combined storage within this practice is

Vf = ((Af)(hf)) + ((Af)(df)(n))

Where:

Af=	1,902	provided surface area
hf =	1	ponding depth in landscaping
df =	4.0	Depth of media
n =	0.4	porosity of media

Vf = 4,945

The treated volume is controlled by the smaller of the two amounts:

Vf **>** Max. allowable therefore,

Treated Volume = **4,945** **CF**

Pe Provided :

$$Pe = \frac{ESDv * 12}{(Rv)\ (A)} = \mathbf{1.9}\ "$$

Post **RCN** = **56**

SWM DESIGN COMPS

Micro-Bioretention

ESD # 2

Drainage Area (DA) = 14,740 sf

Impervious Area (I) = 9,600 sf = 65.1 % Impervious

Surface Area of Practice (Af) = 401 sf

Rv = 0.05+0.009(I)

Rv = 0.636

Surface Area Check

Af shall be at least 2% of contributing surface area

Af min = .02 x DA

Af min. = 295 sf

Provided Af = 401 sf

The maximum amount of runoff that can be captured by this practice is limited to the 1-year 24-hour storm, which is 2.5" for Frederick County, MD:

$$ESDv = \frac{(PE)\ (RV)\ (A)}{12} = \mathbf{1,954}\ cf$$ = Max. allowable

Volume Provided :

The micro-bioretention has a surface area of 401 sf

A ponding depth of 1.0' will be provided. The filter media and gravel layer will be 4.0' deep.

Given that the porosity (n) for these layers is 0.4, the total combined storage within this practice is

Vf = ((Af)(hf)) + ((Af)(df)(n))

Where:

Af=	401	provided surface area
hf =	1	ponding depth in landscaping
df =	4.0	Depth of media
n =	0.4	porosity of media

Vf = 1,043

The treated volume is controlled by the smaller of the two amounts:

Vf **>** Max. allowable therefore,

Treated Volume = **1,043** **CF**

Pe Provided :

$$Pe = \frac{ESDv * 12}{(Rv)\ (A)} = \mathbf{1.3}\ "$$

Post **RCN** = **56**

SWM DESIGN COMPS

Micro-Bioretention

ESD # 3

Drainage Area (DA) = 15,754 sf

Impervious Area (I) = 10,300 sf = 65.4 % Impervious

Surface Area of Practice (Af) = 897 sf

Rv = 0.05+0.009(I)

Rv = 0.638

Surface Area Check

Af shall be at least 2% of contributing surface area

Af min = .02 x DA

Af min. = 315 sf

Provided Af = 897 sf

The maximum amount of runoff that can be captured by this practice is limited to the 1-year 24-hour storm, which is 2.5" for Frederick County, MD:

$$ESDv = \frac{(PE)\ (RV)\ (A)}{12} = \mathbf{2,095}\ cf$$ = Max. allowable

Volume Provided :

The micro-bioretention has a surface area of 897 sf

A ponding depth of 1.0' will be provided. The filter media and gravel layer will be 4.0' deep.

Given that the porosity (n) for these layers is 0.4, the total combined storage within this practice is

Vf = ((Af)(hf)) + ((Af)(df)(n))

Where:

Af=	897	provided surface area
hf =	1	ponding depth in landscaping
df =	4.0	Depth of media
n =	0.4	porosity of media

Vf = 2,332

The treated volume is controlled by the smaller of the two amounts:

Vf **>** Max. allowable therefore,

Treated Volume = **2,095** **CF**

Pe Provided :

$$Pe = \frac{ESDv * 12}{(Rv)\ (A)} = \mathbf{2.5}\ "$$

Post **RCN** = **56**

SWM DESIGN COMPS

Micro-Bioretention

ESD # 4

Drainage Area (DA) = 10,262 sf

Impervious Area (I) = 5,200 sf = 50.7 % Impervious

Surface Area of Practice (Af) = 621 sf

Rv = 0.05+0.009(I)

Rv = 0.506

Surface Area Check

Af shall be at least 2% of contributing surface area

Af min = .02 x DA

Af min. = 205 sf

Provided Af = 621 sf

The maximum amount of runoff that can be captured by this practice is limited to the 1-year 24-hour storm, which is 2.5" for Frederick County, MD:

$$ESDv = \frac{(PE)\ (RV)\ (A)}{12} = \mathbf{1,082}\ cf$$ = Max. allowable

Volume Provided :

The micro-bioretention has a surface area of 621 sf

A ponding depth of 0.5' will be provided. The filter media and gravel layer will be 3.0' deep.

Given that the porosity (n) for these layers is 0.4, the total combined storage within this practice is

Vf = ((Af)(hf)) + ((Af)(df)(n))

Where:	Af=	621	provided surface area
	hf =	0.5	ponding depth in landscaping
	df =	3.0	Depth of media
	n =	0.4	porosity of media
Vf =		**1,056**	

The treated volume is controlled by the smaller of the two amounts:

Vf > Max. allowable therefore,

Treated Volume = **1,056** **CF**

Pe Provided :

$$Pe = \frac{ESDv * 12}{(Rv)\ (A)} = \mathbf{2.4}\ "$$

Post **RCN** = **56**

SWM DESIGN COMPS

Micro-Bioretention

ESD # 5

Drainage Area (DA) = 24,150 sf

Impervious Area (I) = 16,650 sf = 68.9 % Impervious

Surface Area of Practice (Af) = 1,670 sf

Rv = 0.05+0.009(I)

Rv = 0.670

Surface Area Check

Af shall be at least 2% of contributing surface area

Af min = .02 x DA

Af min. = 483 sf

Provided Af = 1,670 sf

The maximum amount of runoff that can be captured by this practice is limited to the 1-year 24-hour storm, which is 2.5" for Frederick County, MD:

$$ESDv = \frac{(PE)\ (RV)\ (A)}{12} = \mathbf{3,373}\ cf$$ = Max. allowable

Volume Provided :

The micro-bioretention has a surface area of 1,670 sf

A ponding depth of 0.5' will be provided. The filter media and gravel layer will be 2.5' deep.

Given that the porosity (n) for these layers is 0.4, the total combined storage within this practice is

Vf = ((Af)(hf)) + ((Af)(df)(n))

Where:	Af=	1,670	provided surface area
	hf =	0.5	ponding depth in landscaping
	df =	2.5	Depth of media
	n =	0.4	porosity of media
Vf =		**2,505**	

The treated volume is controlled by the smaller of the two amounts:

Vf **>** Max. allowable therefore,

Treated Volume = **2,505** **CF**

Pe Provided :

$$Pe = \frac{ESDv * 12}{(Rv)\ (A)} = \mathbf{1.9}\ "$$

Post **RCN** = **56**

SITE DESIGN ASSESSMENT

TARGET P_E=	**1.80**	TARGET ESD_V=	**21,328**	**CF**

TOTAL ESD_V CAPTURED:

#1	4,945	**CF**
#2	1,043	**CF**
#3	2,095	**CF**
#4	1,056	**CF**
#5	2,505	**CF**

TOTAL=	**11,644**	**CF**

11,644 < 21,328

SITE DESIGN ASSESSMENT- Pe

TARGET P_E=	**1.80**	TARGET ESD_V=	**21,328**	**CF**
		CALCULATED ESD_V=	**11,644**	**CF**

Pe= (ESDv*12)/(A)(Rv)

Rv=	**0.54**	
A=	**6.00**	**AC**
CALCULATED ESD_V=	**0.27**	**AC. FT**

Pe= **1.0** "

The calculated Pe is greater than 1", therefore the minimum has been achieved and the remaining ESDv will be met with an on-site SWM Pond

NEWMPRE
RUNOFF CURVE NUMBER COMPUTATION Version 2.10

Project : NEW MARKET User: HGD Date: 04-21-2023
County : FREDERICK State: MD Checked: ____ Date: ________
Subtitle: PRE-DEVELOPMENT

COVER DESCRIPTION		Hydrologic Soil Group A	B	C	D
			Acres (CN)		
FULLY DEVELOPED URBAN AREAS (Veg Estab.)					
Open space (Lawns,parks etc.)					
Good condition; grass cover > 75%		-	1.42(61)	.3(74)	-
Impervious Areas					
Paved parking lots, roofs, driveways		-	.55(98)	-	-
OTHER AGRICULTURAL LANDS					
Woods - grass combination	good	-	4.95(58)	1.05(72)	-
Total Area (by Hydrologic Soil Group)			6.92	1.35	

TOTAL DRAINAGE AREA: 8.27 Acres WEIGHTED CURVE NUMBER: 64*

* - Generated for use by GRAPHIC method

TIME OF CONCENTRATION AND TRAVEL TIME Version 2.10

Project : NEW MARKET User: HGD Date: 04-21-2023
County : FREDERICK State: MD Checked: ____ Date: ________
Subtitle:

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.1	100	.033	E					0.136
Shallow Concent'd		660	.075	U					0.041
Shallow Concent'd		790	.033	U					0.075
								Time of Concentration =	0.25*

--- Sheet Flow Surface Codes ---
A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense
J Range, Natural

--- Shallow Concentrated --- Surface Codes ---
P Paved
U Unpaved

* - Generated for use by GRAPHIC method

GRAPHICAL PEAK DISCHARGE METHOD Version 2.10

Project : NEW MARKET User: HGD Date: 04-21-2023
County : FREDERICK State: MD Checked: _____ Date: _____
Subtitle: PRE-DEVELOPMENT

Data: Drainage Area : 8.27 * Acres
Runoff Curve Number : 64 *
Time of Concentration: 0.25 * Hours
Rainfall Type : II
Pond and Swamp Area : NONE

Storm Number	1	2	3	4	5	6	7
Frequency (yrs)	1	2	5	10	25	50	100
24-Hr Rainfall (in)	2.5	3.1	4	5	5.4	6.1	7
Ia/P Ratio	0.45	0.36	0.28	0.23	0.21	0.18	0.16
Runoff (in)	0.27	0.51	0.97	1.58	1.85	2.33	3.00
Unit Peak Discharge (cfs/acre/in)	0.662	0.868	0.996	1.042	1.055	1.074	1.094
Pond and Swamp Factor 0.0% Ponds Used	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Peak Discharge (cfs)	1	4	8	14	16	21	27

* - Value(s) provided from TR-55 system routines

NEWMPOST
RUNOFF CURVE NUMBER COMPUTATION Version 2.10

Project : NEW MARKET User: HGD Date: 04-21-2023
County : FREDERICK State: MD Checked: ____ Date: ________
Subtitle: POST-DEVELOPMENT

COVER DESCRIPTION	Hydrologic Soil Group A	B	C	D
		Acres (CN)		
FULLY DEVELOPED URBAN AREAS (Veg Estab.)				
Open space (Lawns,parks etc.)				
Good condition; grass cover > 75%	-	3.68(61)	.75(74)	-
Impervious Areas				
Paved parking lots, roofs, driveways	-	3.84(98)	-	-
Total Area (by Hydrologic Soil Group)		7.52	.75	

TOTAL DRAINAGE AREA: 8.27 Acres WEIGHTED CURVE NUMBER: 79*

* - Generated for use by GRAPHIC method

TIME OF CONCENTRATION AND TRAVEL TIME Version 2.10

Project : NEW MARKET User: HGD Date: 04-21-2023
County : FREDERICK State: MD Checked: ____ Date: ________
Subtitle: POST

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.1	100	.033	E					0.136
Shallow Concent'd		660	.075	U					0.041
Shallow Concent'd		250	.026	P					0.021
Open Channel		600						5	0.033
								Time of Concentration =	0.23*

--- Sheet Flow Surface Codes ---
A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense
J Range, Natural

--- Shallow Concentrated --- --- Surface Codes ---
P Paved
U Unpaved

* - Generated for use by GRAPHIC method

GRAPHICAL PEAK DISCHARGE METHOD Version 2.10

Project : NEW MARKET User: HGD Date: 04-21-2023
County : FREDERICK State: MD Checked: ____ Date: ________

NEWMPOST

Subtitle: POST-DEVELOPMENT

Data: Drainage Area : 8.27 * Acres
Runoff Curve Number : 79 *
Time of Concentration: 0.23 * Hours
Rainfall Type : II
Pond and Swamp Area : NONE

Storm Number	1	2	3	4	5	6	7
Frequency (yrs)	1	2	5	10	25	50	100
24-Hr Rainfall (in)	2.5	3.1	4	5	5.4	6.1	7
Ia/P Ratio	0.21	0.17	0.13	0.11	0.10	0.09	0.08
Used	0.21	0.17	0.13	0.11	0.10	0.10	0.10
Runoff (in)	0.84	1.26	1.96	2.80	3.15	3.77	4.58
Unit Peak Discharge (cfs/acre/in)	1.092	1.125	1.156	1.177	1.183	1.183	1.183
Pond and Swamp Factor 0.0% Ponds Used	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Peak Discharge (cfs)	8	12	19	27	31	37	45

* - Value(s) provided from TR-55 system routines

NEWMVOL
STORAGE VOLUME FOR DETENTION BASINS Version 2.10

Project : NEW MARKET User: HGD Date: 04-21-2023
County : FREDERICK State: MD Checked: _____ Date: _____
Subtitle: VOLUME

Drainage Area: 8.27 Acres Rainfall Frequency: 10 years
Rainfall-Type: II
Runoff: 2.8 inches
Peak Inflow: 27.00 cfs
Peak Outflow: 14.00 cfs
Detention Basin Storage Volume: 0.75 inches or 0.5 acre feet
= 21,780 CF OF STORAGE TO BE PROVIDED BY SWM POND