

Colerain Township, Hamilton County

HAM 3.92 Springdale Rd. Sidewalk Storm Water BMP Calculations

Site Description:

The proposed linear pedestrian facility will be disturbing greater than an acre of land and therefore will require water quality post construction BMPs. Even though greater than one acre of pavement is being added as part of this project, per section 111.6.3 of the ODOT L&D Manual, Volume 2, quantity treatment is not required for pedestrian facility and shared use path projects. The chosen BMPs will treat the disturbed area required by ODOT L&D Manual, Volume 2. Below the required treatment calculation and water quality BMP sizing calculations can be seen.

BMP Calculations

- Total Project Earth Disturbed Area = 1.20 Acres
- Treatment Percent Calculation
 - $T\% = (A_{ix} * 20) + (A_{in} * 100) / (A_{ix} + A_{in})$
 - A_{ix} = Project EDA that is inside the existing right of way = 0.91 Acres
 - A_{in} = New impervious area = 0.01 Acres
 - $T\% = (0.91 * 20) + (0.01 * 100) / (0.91 + 0.01) = 20.87\%$
 - Required Treatment Area = Project EDA * T%
 - Required Treatment Area = 1.20 Acres * 0.2087 = .25 Acres
- 0.66 Acres of the pedestrian path earth disturbed area will sheet flow directly off-site outside the R/W into existing brush/vegetation/grass and therefore does not need any additional BMP per section 1116.1 of the ODOT L&D Manual, Volume 2.
- Required Treatment Area = Original Required Treatment Area – Sheet Flow Area = 1.20 Acres – 0.66 Acres = 0.54 Acres
- Required Treatment Area = 0.54 Acres * 0.2087 = 0.11 Acres
- Vegetated filter strips will be placed along the project route and will act as the final water quality BMP. Treatment credit was calculated based on the earth disturbed area that will be draining through the vegetated filter strips.

Treatment Areas:

- Station 112+65 to 113+25 = 0.01 Acres
- Station 113+00 to 113+75 = 0.02 Acres
- Station 123+25 to 127+00 = 0.08 Acres

Total Treatment = 0.11 Acres

- The treatment credit of 0.11 Acres is equal to the required treatment of 0.11 Acres, and therefore the post-construction BMP requirement is satisfied.



Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Post Construction - Project Summary

Project Data

Project EDA	0.54	acres
Is the Project Routine Maintenance per L&D Vol. 2, Sec. 1112.2	No	
BMPs Required?	BMPs Required	NA
Ain (New Impervious Area in New Permanent R/W	0.01	acres
Does Entire Site Drain to Large River (>100 sq. miles)?	No	
Water Quality Treatment Required	Yes	
Water Quantity Treatment Required	No	

Treatment Percent and Treatment Requirement

Aix (Project EDA that is inside the existing right-of-way)	0.91	acres
Ain (New Impervious Area in New Permanent R/W)	0.01	acres
T% (Treatment Percent)	20.87	%
Treatment Requirement	0.11	acres

BMPs Provided

BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
BMP1	Vegetated Filter Strip	0.01	0.01
BMP2	Vegetated Filter Strip	0.02	0.02
BMP3	Vegetated Filter Strip	0.08	0.08

Treatment Provided

Total Area with ODOT R/W Treated (acres)	0.11
Treatment Requirements (acres)	0.11
Treatment Check	Good

BMP Submittal Requirements (Per L&D, Vol. 2, Sec. 1116.2)

1. Estimated Project Earth Disturbed Area	Yes	Good
2. Treatment Percent Calculation	Yes	Good
3. BMP Selected for use	Yes	Good
4. Drainage area mapping for post-construction BMPs that show the total contributing drainage area and the amount of contributing area within ODOT right-of-way	Yes	Good
5. Plan sheets showing locations of post-construction BMP	Yes	Good
6. Calculations for each BMP	Yes	Good
7. Explanation for any area that is not treated	Yes	Good



Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Vegetated Filter Strip

Filter Strip	Route	Begin Station	End Station	Side	Pavement Width (FT)	Filter Strip Width (FT)	Filter Strip Slope (z:1)	Filter Strip Length (FT)	Drainage Area (acres)	Filter Strip Area (SF)	Item 659 Topsoil Volume (CY)	Item 670 Erosion Protection Area (SY)
Filter Strip #1	BP	112+65	113+25	RT	5	5	4	60	0.01	309	3.8	34.3
Filter Strip #2	BP	113+00	113+75	LT	5	5	4	75	0.02	366	4.5	40.7
Filter Strip #3	BP	123+25	127+00	LT	5	5	4	375	0.08	1,971	24.3	219.0
Filter Strip #4								0			0.0	0.0
Filter Strip #5								0			0.0	0.0
Filter Strip #6								0			0.0	0.0
Filter Strip #7								0			0.0	0.0
Filter Strip #8								0			0.0	0.0
Filter Strip #9								0			0.0	0.0
Filter Strip #10								0			0.0	0.0

Total Treatment Credit Earned from Vegetated Filter Strips **0.11** acres
(Treatment is for quality only, not quantity)

BMP Design Considerations

	Answer	Design Check
1 Is the min. filter strip width 15-25 ft wide depending on L&D Table 1117-3?	NA	CHECK DESIGN
2 Is the slope 3:1 or flatter for 34 ft or narrower pavement drainage width	Yes	Good
3 Is the slope 6:1 or flatter for 35 - 48 ft pavement drainage width	NA	Good
4 Is the only contributing drainage to the filter strip from the road and shoulder?	Yes	Good
5 Does any concentrated flow or any outlets discharge to the filter strip?	No	Good
6 Is 4" of Item 659, Topsoil, included for the filter strip?	Yes	Good
7 Is Item 670, Slope Erosion Protection, included for the filter strip?	Yes	Good