Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Post Construction - Project Summary

Project Data		Units
Project EDA	22.15	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	0.92	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)	19.6	acres
Ain (New Impervious Area in New Permanent R/W)	0.92	acres
T% (Treatment Percent)	**23.59**	**%**
Treatment Requirement	**5.22**	**acres**

BMPs Provided

BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
VBF1	Vegetated Biofilter	1.87	1.87
VBF2	Vegetated Biofilter	1.95	1.95
VBF3	Vegetated Biofilter	1.80	1.80

Treatment Provided

Total Area with ODOT R/W Treated (acres)	**5.62**
Treatment Requirements (acres)	**5.22**
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**

Water Quality Flow Rate (WQ_F)

Drainage Area #1	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W	1.87	0.9
Impervious Trib. Area Outside Existing R/W	0.00	0.9
Tributary Area Land Use #3	0.00	
Tributary Area Land Use #4	0.00	
Total Tributary Area	1.87	0.900
BMP Type	Vegetated Biofilter	
Time of Concentration (minutes)	NA	
Intensity, i (in/hr)	0.65	
Water Quality Flow (WQ_F)	**1.094**	**cfs**

Drainage Area #2	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W	1.95	0.9
Impervious Trib. Area Outside Existing R/W		0.9
Tributary Area Land Use #3		
Tributary Area Land Use #4		
Total Tributary Area	1.95	0.900
BMP Type	Vegetated Biofilter	
Time of Concentration (minutes)	NA	
Intensity, i (in/hr)	0.65	
Water Quality Flow (WQ_F)	**1.141**	**cfs**

Drainage Area #3	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W	1.80	0.9
Impervious Trib. Area Outside Existing R/W		0.9
Tributary Area Land Use #3		
Tributary Area Land Use #4		
Total Tributary Area	1.80	0.900
BMP Type	Vegetated Biofilter	
Time of Concentration (minutes)		
Intensity, i (in/hr)	0.65	
Water Quality Flow (WQ_F)	**1.053**	**cfs**

Drainage Area #4	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W		0.9
Impervious Trib. Area Outside Existing R/W		0.9
Tributary Area Land Use #3		
Tributary Area Land Use #4		
Total Tributary Area	0.00	
BMP Type		
Time of Concentration (minutes)		
Intensity, i (in/hr)		
Water Quality Flow (WQ_F)		**cfs**

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Vegetated Biofilter

Location Information					Hydrology			Channel Characteristics					Analysis Results			
VBF	Route	Begin Station	End Station	Side	Total Drainage Area (acres)	EDA Treatment Credit (acres)[1]	WQ_F (cfs)	VBF Bottom Width (ft)[note2]	VBF Fore Slope (z:1)	VBF Back Slope (z:1)	VBF Longitudinal Slope (ft/ft)	Manning's Roughness Coefficient[3]	Depth of Runoff at WQ_F (inches)[4]	Velocity of Runoff at WQ_F (ft/sec)[4]	Standard Ditch Width (feet)[5]	Required Ditch Width (feet)
VBF#1	Ramp B	0+63	07+31	RT	22.15	1.87	1.094	6	3	2	0.017	0.15	3.62	0.54	2	6
VBF#2	Ramp B	01+22	07+31	LT	22.15	1.95	1.140	6	13	3	0.024	0.15	3.16	0.54	2	6
VBF#3	Ramp C	01+72	06+65	RT	22.15	1.80	1.053	6	3	2	0.023	0.15	3.24	0.58	2	6
VBF#4												0.15				
VBF#5												0.15				
VBF#6												0.15				
VBF#7												0.15				
VBF#8												0.15				
VBF#9												0.15				
VBF#10												0.15				

Total Treatment Credit Earned from VBFs (within R/W): 5.62 acres

(Treatment is for quality only, not quantity)

Yellow: Requires Input (See instructions tab)

BMP Design Considerations

1	Do the VBF characteristics match the calculated flow and velocity checks using Manning's Equation above?	Yes	Good
2	Is the VBF a trapezoidal ditch with a flat bottom, not a radius ditch?	Yes	Good
3	Is the VBF width at least 4 feet?	Yes	Good
4	Is the depth of runoff for the WQ_F for each VBF less than or equal to 4 inches?	Yes	Good
5	Is the velocity of runoff for the WQ_F for each VBF less than or equal to 1.0 ft/sec?	Yes	Good
6	Does the "Total Drainage Area" include all onsite and off-site drainage to the VBF?	Yes	Good
7	Does each VBF include 4" of Item 659 Topsoil on the vegetated portion of the shoulder and foreslope?	Yes	Good
8	Does each VBF include Item 670, Ditch Erosion Protection?	Yes	Good
9	Are the station ranges and locations of the VBFs labeled on the Project Site Plan drawing?	Yes	Good

LEGEND

Ain (NEW IMPERVIOUS AREA IN NEW PERMANENT R/W = 0.96 AC.

Aix (PROJECT EDA THAT IS INSIDE THE EXISTING RIGHT-OF-WAY) = 19.60 AC.

℄ CONSTR. RAMP A

℄ CONSTR. I-70

℄ CONSTR. RAMP D

℄ CONSTR. S.R. 149

℄ CONSTR. RAMP B

℄ CONSTR. RAMP C

BEGIN VBF #1
STA. 0+63

BEGIN VBF #2
STA. 1+22

BEGIN VBF #3
STA. 1+72

TREATED DRAINAGE AREA #1
AREA = 1.80 AC.

TREATED DRAINAGE AREA #2
AREA = 1.95 AC.

TREATED DRAINAGE AREA #3
AREA = 1.80 AC.

VBF#1

VBF#2

VBF#3

PROJECT LIMITS
PROJECT EDA = 22.15 AC.

END VBF # 1 AND #2
STA. 7+31

END VBF #3
STA. 6+65

Ex CH

HORIZONTAL
SCALE IN FEET
0 55 110 220

BEL-70 INTERCHANGE IMPROVEMENT
BMP SCHEMATIC PLAN

DESIGN AGENCY
AECOM

DESIGNER
FTA

REVIEWER
MAW 09-27-24

PROJECT ID
120547

SHEET 1 TOTAL 1

BEL-70-9.35

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