

Bridge Spread Design for Scuppers

CUY-00480-06.120_LT

														5-yr		
CUY-00480-06.120_LT		STATION	#	AREA (acres)	LENGTH (ft)	LONG. SLOPE (%)	C	k	V (fps)	CALC. Td (min)	Td (min)	I-5 YR	Q-5 YR (cfs)	Intercepted Flow (cfs)	Bypass Flow (cfs)	
		8+58														
		8+90		0.027	42.00	0.68	0.90	0.62	1.68	0.42	10.00	4.41	0.1072	0.0360	0.0712	
		9+00		0.007	42.00	0.68	0.90	0.62	1.68	0.42	10.00	4.41	0.0989	0.0340	0.0649	
		9+10		0.007	10.00	0.68	0.90	0.62	1.68	0.10	10.00	4.41	0.0927	0.0320	0.0607	
		9+20		0.007	10.00	0.68	0.90	0.62	1.68	0.10	10.00	4.41	0.0885	0.0320	0.0565	
		11+00		0.128	10.00	0.68	0.90	0.62	1.68	0.10	10.00	4.41	0.5645	0.1090	0.4555	
		11+10		0.007	10.00	0.68	0.90	0.62	1.68	0.10	10.00	4.41	0.4833	0.0990	0.3843	
		11+20		0.007	10.00	0.68	0.90	0.62	1.68	0.10	10.00	4.41	0.4121	0.0890	0.3231	

Hydraulic Analysis Report

Project Data

Project Title: CUY-00480-06.120

Designer:

Project Date: Thursday, July 18, 2024

Project Units: U.S. Customary Units

Notes:

Curb and Gutter Analysis: STA 8+90 LT

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0068 ft/ft

Cross-Slope of Pavement: 0.0160 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 1.0000 ft

Design Flow: 0.1070 cfs

Gutter Result Parameters

Width of Spread: 3.7611 ft

Gutter Depression: 0.0000 in

Area of Flow: 0.1132 ft²

Eo (Gutter Flow to Total Flow): 0.5619

Gutter Depth at Curb: 0.7221 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.5000 ft

Grate Length: 0.5000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 0.0356 cfs

Bypass Flow: 0.0714 cfs

Approach Velocity: 0.9455 ft/s

Splash-over Velocity: 4.0789 ft/s

Efficiency: 0.3327

Curb and Gutter Analysis: STA 9+00 LT

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0068 ft/ft

Cross-Slope of Pavement: 0.0160 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 1.0000 ft

Width of Spread: 3.6517 ft

Gutter Result Parameters

Design Flow: 0.0989 cfs

Gutter Depression: 0.0000 in

Area of Flow: 0.1067 ft²

E_o (Gutter Flow to Total Flow): 0.5745

Gutter Depth at Curb: 0.7011 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.5000 ft

Grate Length: 0.5000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 0.0338 cfs

Bypass Flow: 0.0651 cfs

Approach Velocity: 0.9271 ft/s

Splash-over Velocity: 4.0789 ft/s

Efficiency: 0.3414

Curb and Gutter Analysis: STA 9+10 LT

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0068 ft/ft

Cross-Slope of Pavement: 0.0160 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 1.0000 ft

Width of Spread: 3.5641 ft

Gutter Result Parameters

Design Flow: 0.0927 cfs

Gutter Depression: 0.0000 in

Area of Flow: 0.1016 ft²

E_o (Gutter Flow to Total Flow): 0.5849

Gutter Depth at Curb: 0.6843 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.5000 ft

Grate Length: 0.5000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 0.0323 cfs

Bypass Flow: 0.0604 cfs

Approach Velocity: 0.9122 ft/s

Splash-over Velocity: 4.0789 ft/s

Efficiency: 0.3487

Curb and Gutter Analysis: STA 9+20 LT

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0074 ft/ft

Cross-Slope of Pavement: 0.0164 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 1.0000 ft

Design Flow: 0.0885 cfs

Gutter Result Parameters

Width of Spread: 3.3948 ft

Gutter Depression: 0.0000 in

Area of Flow: 0.0945 ft²

E_o (Gutter Flow to Total Flow): 0.6061

Gutter Depth at Curb: 0.6681 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.5000 ft

Grate Length: 0.5000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 0.0321 cfs

Bypass Flow: 0.0564 cfs

Approach Velocity: 0.9365 ft/s

Splash-over Velocity: 4.0789 ft/s

Efficiency: 0.3624

Curb and Gutter Analysis: STA 11+00 LT

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0074 ft/ft

Cross-Slope of Pavement: 0.0164 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 1.0000 ft

Design Flow: 0.5645 cfs

Gutter Result Parameters

Width of Spread: 6.8011 ft

Gutter Depression: 0.0000 in

Area of Flow: 0.3793 ft²

E_o (Gutter Flow to Total Flow): 0.3460

Gutter Depth at Curb: 1.3385 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.5000 ft

Grate Length: 0.5000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 0.1091 cfs

Bypass Flow: 0.4554 cfs

Approach Velocity: 1.4883 ft/s

Splash-over Velocity: 4.0789 ft/s

Efficiency: 0.1932

Curb and Gutter Analysis: STA 11+10 LT

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0074 ft/ft

Cross-Slope of Pavement: 0.0164 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 1.0000 ft

Design Flow: 0.4833 cfs

Gutter Result Parameters

Width of Spread: 6.4163 ft

Gutter Depression: 0.0000 in

Area of Flow: 0.3376 ft²

E_o (Gutter Flow to Total Flow): 0.3639

Gutter Depth at Curb: 1.2627 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.5000 ft

Grate Length: 0.5000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 0.0986 cfs

Bypass Flow: 0.3847 cfs

Approach Velocity: 1.4316 ft/s

Splash-over Velocity: 4.0789 ft/s

Efficiency: 0.2040

Curb and Gutter Analysis: STA 11+20 LT

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0074 ft/ft

Cross-Slope of Pavement: 0.0164 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 1.0000 ft

Design Flow: 0.4121 cfs

Gutter Result Parameters

Width of Spread: 6.0441 ft

Gutter Depression: 0.0000 in

Area of Flow: 0.2996 ft²

E_o (Gutter Flow to Total Flow): 0.3830

Gutter Depth at Curb: 1.1895 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.5000 ft

Grate Length: 0.5000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 0.0889 cfs

Bypass Flow: 0.3232 cfs

Approach Velocity: 1.3757 ft/s

Splash-over Velocity: 4.0789 ft/s

Efficiency: 0.2157