Appendix G:
Hydrology and Water Quality Supporting Information

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G.1 - Preliminary Stormwater Hydromodification Management Report

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CONSTRUCTION MANAGERS

Preliminary
Stormwater Hydromodification
Management Report
for
Masson Estates

December 2023

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I. Project Data

Table 1. Project Data

Project Name/ APN Number	Masson Estates APN 503-46-005
Application Submittal Date	December 2023
Owner	Chateau Masson, LLC
Project Location	Pierce Road Saratoga, CA
Project Phase No.	n/a
Project Type and Description	Proposed 25-lot Residential Subdivision
Total Project Site Area (acres)	75.19 AC
Total Area of Land Disturbed (acres)	11.18 AC
Total New Impervious Surface Area	198,362 sf
Total Replaced Impervious Surface Area	0 sf
Total Pre-Project Impervious Surface Area	0 sf
Total Post-Project Impervious Surface Area	198,362 sf
Net Impervious Area	0 sf
Soils Type	C/D
Groundwater Depth	Unknown
Name of Receiving Body	Saratoga Creek
Flood Zone	X
Flood Elevation	n/a

II. Setting & Proposed Stormwater Infrastructure

II.A. Project Location and Description

The Masson Estates project is located on Pierce Road in Saratoga, CA and is 75.19 acres and shall disturb approximately 11.18 acres. The project proposes a new 25-lot residential subdivision, streets, parking, and landscaping.

The proposed development proposes a total post-project impervious area of 198,362-sf. The project created 8 drainage management areas (DMA) that will be routed to the designated treatment control measure (TCM) which are bioretention ponds.

II.B. Existing Site Features and Conditions

The existing site has moderate to high slopes and is currently vacant. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 inches per hour.

III. Technical Approach & Modeling

The Masson Estates project will drain to 8 Treatment Control Measures (TCM 1 - TCM 8) that are all bioretention ponds. Per the Municipal Regional Stormwater Permit, a Stormwater Hydromodification Management Report is required for this site since the project proposes to create one acre or more of impervious surface. The Bay Area Hydrology Model (BAHM) was used to analyze the hydromodification effects of the proposed development by providing sizing solutions to mitigate the increased runoff while considering long-term pattern flow rates. The recommended effective method for hydromodification control is flow duration control which was implemented using an orifice at each bioretention pond. The orifices are used to regulate the flow from post-development conditions to a level at or below the pre-development conditions. Please see the supporting BAHM data found in section, V.III. Flow-Duration Curves and Model Analysis, of this report which demonstrates how each treatment control measure meets the flow duration criteria.

The proposed bioretention areas were sized using the 4% Method (Impervious Area x 0.04) to determine the required treatment area for each drainage management area (DMA). We then used the BAHM software to design the appropriate pond. The infiltration and storage calculations incorporated the available treatment area and the infiltration rate with a Factor of Safety (FS) of 1. All in all, each treatment control measure will be hydromodified with the controlled release to match the pre-development rate through a sized orifice which will then be conveyed to a discharge location as shown on the plans. Please see section, V. Drainage Management Areas, for further details on each treatment control measure.

IV. Conclusion

The Bay Area Hydrology Model (BAHM) shows a passing result for each Treatment Control Measure (TCM). TCM 1 will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-inch diameter orifice. TCM 2 will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-inch diameter orifice. TCM 3 will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-inch diameter orifice. TCM 4 will be hydromodified

with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-inch diameter orifice. TCM 5 will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-inch diameter orifice. TCM 6 will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 0.95-inch diameter orifice. TCM 7 will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 0.9-inch diameter orifice. TCM 8 will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 1-inch diameter orifice. Appropriately, an overflow riser (height varies) will be placed at each TCM to allow for infiltration. Each riser will then convey and discharge stormwater onto a vegetated area.

V. Drainage Management Areas – Post–Project Analysis

V.A. Drainage Management Area 1 Summary

DMA 1, totaling 33,524 square feet, drains rooftops, streets, street parking, landscaping, and sidewalks. **DMA 1** drains to **TCM 1** which is a bioretention pond with a total system area of 1,346-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 0.1 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-in diameter orifice set 6-in above the bottom of the permeable rock section. An overflow riser shall be set 18-in above the bottom of the pond to allow for infiltration. See detail on Stormwater Control Plan on sheet 17 of plans.

V.A.1. Table of Drainage Management Area 1

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 1	Roof, Parking, Streets, Sidewalk, Landscape	33,524	11,066	22,458	TCM 1	1,320	1,346

V.B. Drainage Management Area 2 Summary

DMA 2, totaling 111,298 square feet, drains rooftops, streets, street parking, landscaping, and sidewalks. **DMA 2** drains to **TCM 2** which is a bioretention pond with a total system area of 3,200-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 2 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-in diameter orifice set 6-in

above the bottom of the permeable rock section. An overflow riser shall be set 12-in above the bottom of the pond to allow for infiltration. See detail on Stormwater Control Plan on sheet 17 of plans.

V.B.1. Table of Drainage Management Area 2

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 2	Roof, Parking, Streets, Sidewalk, Landscape	111,298	52,724	58,574	TCM 2	2,400	3,200

V.C. Drainage Management Area 2 Summary

DMA 3, totaling 139,304 square feet, drains rooftops, streets, street parking, landscaping, and sidewalks. **DMA 3** drains to **TCM 3** which is a bioretention pond with a total system area of 2,453-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 0.1 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-in diameter orifice set 6-in above the bottom of the permeable rock section. An overflow riser shall be set 18-in above the bottom of the pond to allow for infiltration. See detail on Stormwater Control Plan on sheet 17 of plans.

V.C.1. Table of Drainage Management Area 3

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 3	Roof, Parking, Streets, Sidewalk, Landscape	139,304	53,688	85,616	TCM 3	2,452	2,453

V.D. Drainage Management Area 4 Summary

DMA 4, totaling 129,857 square feet, drains rooftops, streets, street parking, landscaping, and sidewalks. **DMA 4** drains to **TCM 4** which is a bioretention pond with a total system area of 1,673-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 0.1 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the

available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-in diameter orifice set 6-in above the bottom of the permeable rock section. An overflow riser shall be set 12-in above the bottom of the pond to allow for infiltration. See detail on Stormwater Control Plan on sheet 17 of plans.

V.D.1. Table of Drainage Management Area 4

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 4	Roof, Parking, Streets, Sidewalk, Landscape	129,857	39,050	90,807	TCM 4	1,672	1,673

V.E. Drainage Management Area 5 Summary

DMA 5, totaling 33,010 square feet, drains rooftops, streets, street parking, landscaping, and sidewalks. **DMA 5** drains to **TCM 5** which is a bioretention pond with a total system area of 710-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 0.1 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 2.25-in diameter orifice set 6-in above the bottom of the permeable rock section. An overflow riser shall be set 12-in above the bottom of the pond to allow for infiltration. See detail on Stormwater Control Plan on sheet 17 of plans.

V.E.1. Table of Drainage Management Area 5

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 5	Roof, Parking, Streets, Sidewalk, Landscape	33,010	17,752	15,258	TCM 5	708	710

V.F. Drainage Management Area 6 Summary

DMA 6, totaling 12,834 square feet, drains rooftops, streets, street parking, landscaping, and sidewalks. **DMA 6** drains to **TCM 6** which is a bioretention pond with a total system area of 278-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration

rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 0.1 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 0.95-in diameter orifice set 6-in above the bottom of the permeable rock section. An overflow riser shall be set 21-in above the bottom of the pond to allow for infiltration.. See detail on Stormwater Control Plan on sheet 17 of plans.

V.F.1. Table of Drainage Management Area 6

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 6	Roof, Parking, Streets, Sidewalk, Landscape	12,834	6,680	6,154	TCM 6	272	278

V.G. Drainage Management Area 7 Summary

DMA 7, totaling 11,488 square feet, drains rooftops, streets, street parking, landscaping, and sidewalks. **DMA 7** drains to **TCM 7** which is a bioretention pond with a total system area of 227-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 0.1 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 0.90-in diameter orifice set 6-in above the bottom of the permeable rock section. An overflow riser shall be set 21-in above the bottom of the pond to allow for infiltration. See detail on Stormwater Control Plan on sheet 17 of plans.

V.G.1. Table of Drainage Management Area 7

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 7	Roof, Parking, Streets, Sidewalk, Landscape	11,488	4,533	6,955	TCM 7	225	227

V.H. Drainage Management Area 8 Summary

DMA 8, totaling 15,514 square feet, drains streets. **DMA 8** drains to **TCM 8** which is a bioretention pond with a total system area of 554-sf with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock. A soils report was completed by Quantum Geotechnical and found that the soil has a low infiltration rate of 0.1 in/hr. The design used a factor of safety of 1 or a rate of 0.1 in/hr. With this infiltration rate, the drawdown time of less than 5 days was calculated. Any stormwater volume that exceeds the available capacity in the drain rock and BSM sections will be hydromodified with controlled release to limit the flow to, at or below, the pre-development rate through a 0.50-in diameter orifice set 6-in above the bottom of the permeable rock section. An overflow riser shall be set 24-in above the bottom of the pond to allow for infiltration. See detail on Stormwater Control Plan on sheet 17 of plans.

V.H.1. Table of Drainage Management Area 8

DMA ID	Description of Area	Total Area (SF)	New Impervious Area (SF)	Pervious Area (SF)	TCM ID	Treatment Required (SF)	Treatment Provided (SF)
DMA 8	Streets	15,514	12,869	2,645	TCM 8	583	554

VI. Hydromodification Modeling Analysis

The Bay Area Hydrology Model (BAHM) was used to simulate the runoff from the project's site under pre- and post-project conditions. Below are data tables from the BAHM software which summarize the dimensions, treatment area, and the underdrain sizes for each Treatment Control Measure.

Table 1: TCM 1 Details

Bioretention 1	
Bottom Length:	34.00 ft.
Bottom Width:	40.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	16.772
Total Volume Through Riser (ac-ft.):	41.989
Total Volume Through Facility (ac-ft.):	138.371
Percent Infiltrated:	12.12
Total Precip Applied to Facility:	3.2
Total Evap From Facility:	1.252
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	2.25
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	79.61
Total Outflow (ac-ft.):	138.371
Percent Through Underdrain:	57.53
Discharge Structure	
Riser Height:	1.5 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Table 2: TCM 2 Details

Bioretention 2	
Bottom Length:	40.00 ft.
Bottom Width:	60.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	2
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	107.42
Total Volume Through Riser (ac-ft.):	25.409
Total Volume Through Facility (ac-ft.):	173.206
Percent Infiltrated:	62.02
Total Precip Applied to Facility:	4.88
Total Evap From Facility:	2.11
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	2.25
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	40.377
Total Outflow (ac-ft.):	173.206
Percent Through Underdrain:	23.31
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Table 3: TCM 3 Details

Bioretention 3

Bottom Length:		61.30 ft.
Bottom Width:		40.00 ft.
Material thickness of first layer:		1.5
Material type for first layer:		BAHM 5
Material thickness of second layer:		1
Material type for second layer:		GRAVEL
Material thickness of third layer:		0
Material type for third layer:		GRAVEL
Infiltration On		
Infiltration rate:		0.1
Infiltration safety factor:		1
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		16.772
Total Volume Through Riser (ac-ft.):		41.989
Total Volume Through Facility (ac-ft.):		138.371
Percent Infiltrated:		12.12
Total Precip Applied to Facility:		3.2
Total Evap From Facility:		1.437
Underdrain used		
Underdrain Diameter (feet):		0.5
Orifice Diameter (in.):		2.25
Offset (in.):		6
Flow Through Underdrain (ac-ft.):		79.61
Total Outflow (ac-ft.):		138.371
Percent Through Underdrain:		57.53
Discharge Structure		
Riser Height:	1.5 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Table 4: TCM 4 Details

Bioretention 4

Bottom Length:		41.80 ft.
Bottom Width:		40.00 ft.
Material thickness of first layer:		1.5
Material type for first layer:		BAHM 5
Material thickness of second layer:		1
Material type for second layer:		GRAVEL
Material thickness of third layer:		0
Material type for third layer:		GRAVEL
Infiltration On		
Infiltration rate:		0.1
Infiltration safety factor:		1
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		22.282
Total Volume Through Riser (ac-ft.):		68.467
Total Volume Through Facility (ac-ft.):		188.723
Percent Infiltrated:		11.81
Total Precip Applied to Facility:		3.863
Total Evap From Facility:		1.626
Underdrain used		
Underdrain Diameter (feet):		0.5
Orifice Diameter (in.):		2.25
Offset (in.):		6
Flow Through Underdrain (ac-ft.):		97.974
Total Outflow (ac-ft.):		188.723
Percent Through Underdrain:		51.91
Discharge Structure		
Riser Height:	1 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Table 5: TCM 5 Details

Bioretention 5		
Bottom Length:		23.60 ft.
Bottom Width:		30.00 ft.
Material thickness of first layer:		1.5
Material type for first layer:		BAHM 5
Material thickness of second layer:		1
Material type for second layer:		GRAVEL
Material thickness of third layer:		0
Material type for third layer:		GRAVEL
Infiltration On		
Infiltration rate:		0.1
Infiltration safety factor:		1
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		8.658
Total Volume Through Riser (ac-ft.):		6.947
Total Volume Through Facility (ac-ft.):		56.904
Percent Infiltrated:		15.22
Total Precip Applied to Facility:		1.594
Total Evap From Facility:		0.67
Underdrain used		
Underdrain Diameter (feet):		0.5
Orifice Diameter (in.):		2.25
Offset (in.):		6
Flow Through Underdrain (ac-ft.):		41.299
Total Outflow (ac-ft.):		56.904
Percent Through Underdrain:		72.58
Discharge Structure		
Riser Height:	1 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Table 6: TCM 6 Details

Bioretention 6

Bottom Length:		16.50 ft.
Bottom Width:		16.50 ft.
Material thickness of first layer:		1.5
Material type for first layer:		BAHM 5
Material thickness of second layer:		1
Material type for second layer:		GRAVEL
Material thickness of third layer:		0
Material type for third layer:		GRAVEL
Infiltration On		
Infiltration rate:		0.1
Infiltration safety factor:		1
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		3.488
Total Volume Through Riser (ac-ft.):		2.625
Total Volume Through Facility (ac-ft.):		21.511
Percent Infiltrated:		16.21
Total Precip Applied to Facility:		0.703
Total Evap From Facility:		0.249
Underdrain used		
Underdrain Diameter (feet):		0.5
Orifice Diameter (in.):		0.95
Offset (in.):		6
Flow Through Underdrain (ac-ft.):		15.398
Total Outflow (ac-ft.):		21.511
Percent Through Underdrain:		71.58
Discharge Structure		
Riser Height:	1.75 ft.	
Riser Diameter:	6 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Table 7: TCM 7 Details

Bioretention 7

Bottom Length:		15.00 ft.
Bottom Width:		15.00 ft.
Material thickness of first layer:		1.5
Material type for first layer:		BAHM 5
Material thickness of second layer:		1
Material type for second layer:		GRAVEL
Material thickness of third layer:		0
Material type for third layer:		GRAVEL
Infiltration On		
Infiltration rate:		0.1
Infiltration safety factor:		1
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		2.873
Total Volume Through Riser (ac-ft.):		2.27
Total Volume Through Facility (ac-ft.):		17.636
Percent Infiltrated:		16.29
Total Precip Applied to Facility:		0.585
Total Evap From Facility:		0.212
Underdrain used		
Underdrain Diameter (feet):		0.5
Orifice Diameter (in.):		0.9
Offset (in.):		6
Flow Through Underdrain (ac-ft.):		12.493
Total Outflow (ac-ft.):		17.636
Percent Through Underdrain:		70.84
Discharge Structure		
Riser Height:	1.75 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Table 8: TCM 8 Details

Bioretention 8	
Bottom Length:	24.50 ft.
Bottom Width:	23.80 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	7.119
Total Volume Through Riser (ac-ft.):	2.391
Total Volume Through Facility (ac-ft.):	32.422
Percent Infiltrated:	21.96
Total Precip Applied to Facility:	1.377
Total Evap From Facility:	0.525
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	1
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	22.912
Total Outflow (ac-ft.):	32.422
Percent Through Underdrain:	70.67
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

VII. Dimensions & Features of Hydromodification System

VII.A. Treatment Control Measure #1

Drainage Management Area #1 will be treated using a bioretention pond. TCM 1 has a total system area of 1,346-sf comprised of a riser set 18" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VII.B. Treatment Control Measure #2

Drainage Management Area #2 will be treated using a bioretention pond. TCM 2 has a total system area of 3,200-sf comprised of a riser set 12" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VII.C. Treatment Control Measure #3

Drainage Management Area #3 will be treated using a bioretention pond. TCM 3 has a total system area of 2,453-sf comprised of a riser set 18" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VII.D. Treatment Control Measure #4

Drainage Management Area #4 will be treated using a bioretention pond. TCM 4 has a total system area of 1,673-sf comprised of a riser set 12" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VII.E. Treatment Control Measure #5

Drainage Management Area #5 will be treated using a bioretention pond. TCM 5 has a total system area of 710-sf comprised of a riser set 12" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VII.F. Treatment Control Measure #6

Drainage Management Area #6 will be treated using a bioretention pond. TCM 6 has a total system area of 278-sf comprised of a riser set 21" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VII.G. Treatment Control Measure #7

Drainage Management Area #7 will be treated using a bioretention pond. TCM 7 has a total system area of 227-sf comprised of a riser set 21" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VII.H. Treatment Control Measure #8

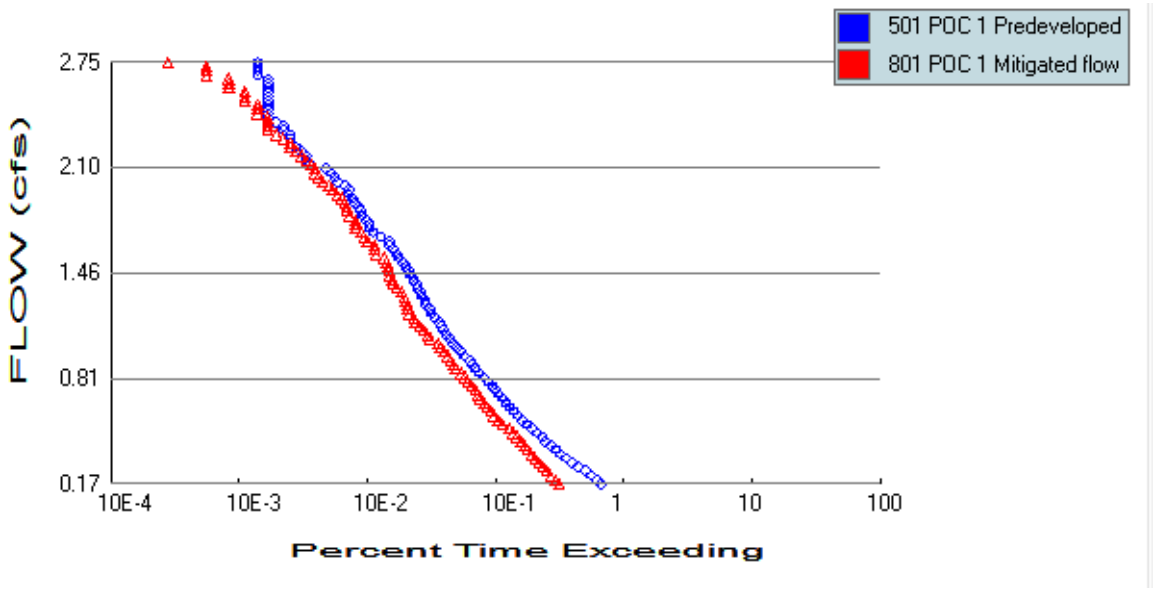
Drainage Management Area #8 will be treated using a bioretention pond. TCM 8 has a total system area of 554-sf comprised of a riser set 24" above the bottom of the pond with an 18" section of Bio-Treatment Soil Mix (BSM) over a 12" section of class II permeable rock.

VIII. Flow–Duration Curves & Model Analysis

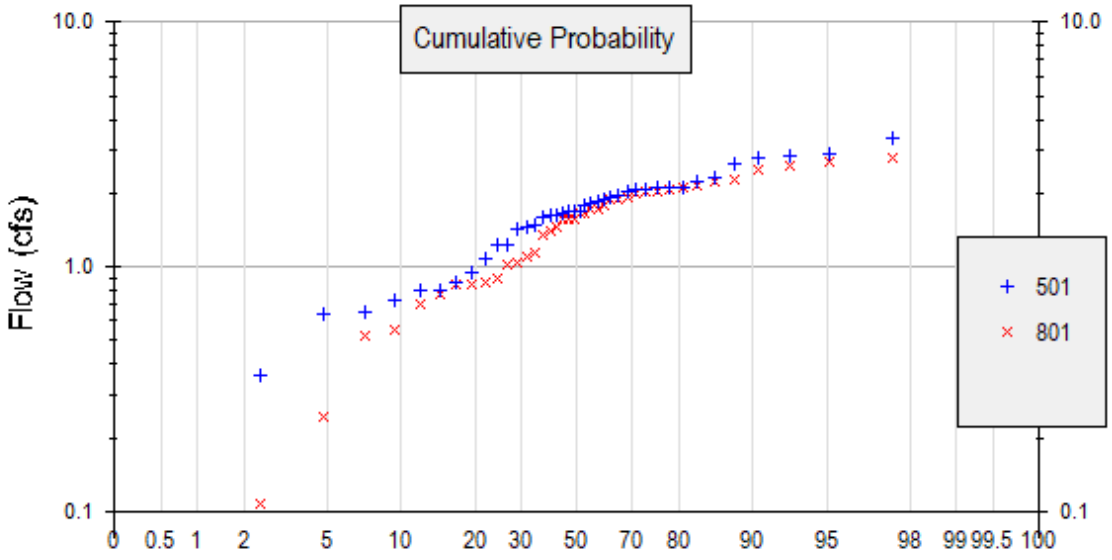
V.III.A. Point of Compliance #1 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #1 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.A.1. POC#1 – Flow vs. Percent Time Exceeding



V.III.A.2. POC#1 – Cumulative Probability



V.III.A.3. Tabulation of Flow Frequency Return Periods for POC #1

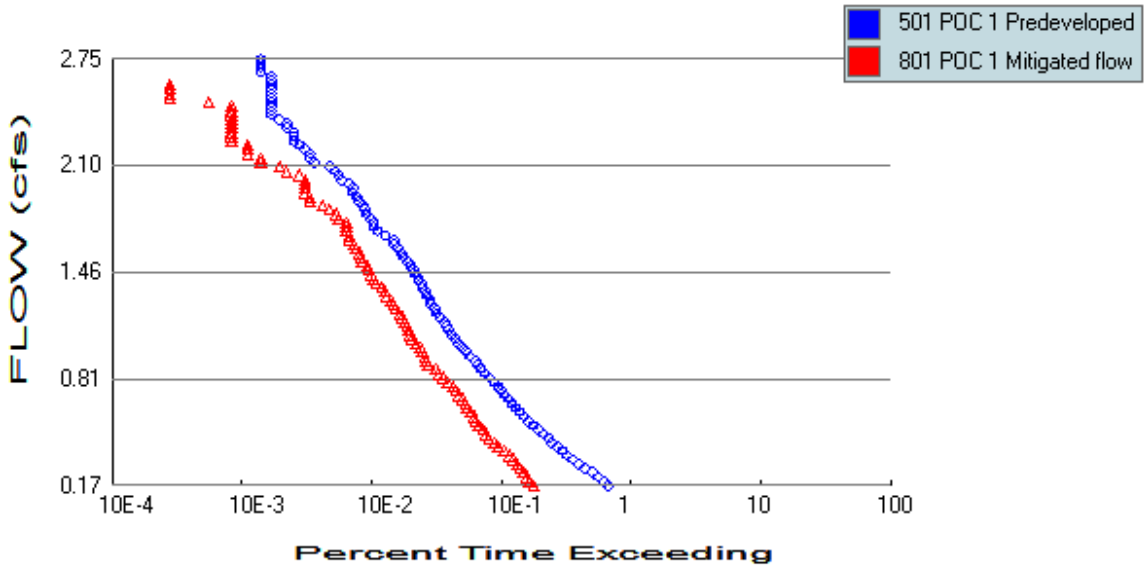
Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	1.69	1.57
5-year	2.12	2.09
10-year	2.75	2.43
25-year	2.98	2.69

The table shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #1. Please see attached BAHM analysis under "Duration Flows" for POC #1 on page 15 showing all passed.

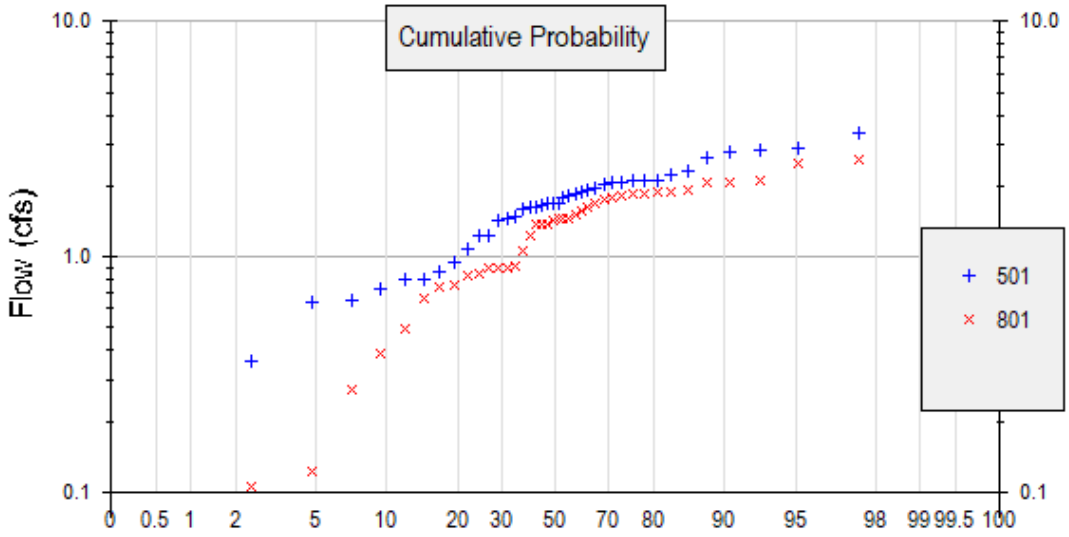
V.III.B. Point of Compliance #2 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #2 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.B.1. POC #2 – Flow vs. Percent Time Exceeding



V.III.B.2. POC #2 – Cumulative Probability



V.III.B.3. Tabulation of Flow Frequency Return Periods for POC #2

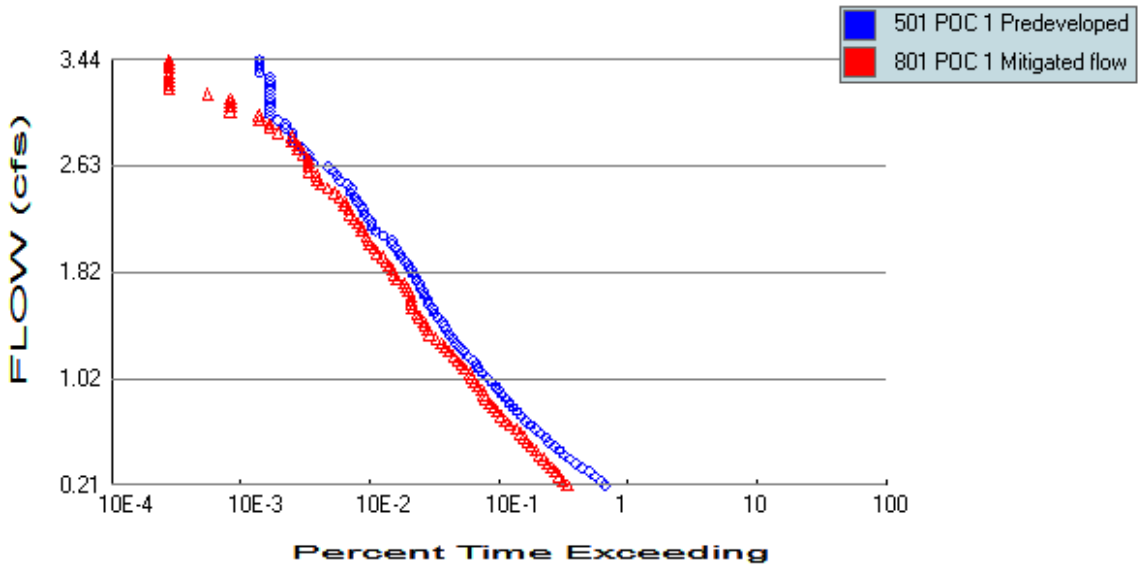
Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	1.69	1.41
5-year	2.12	1.87
10-year	2.75	2.06
25-year	2.98	2.51

The table above shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #2. Please see attached BAHM analysis under "Duration Flows" for POC #2 on page 15 showing all passed.

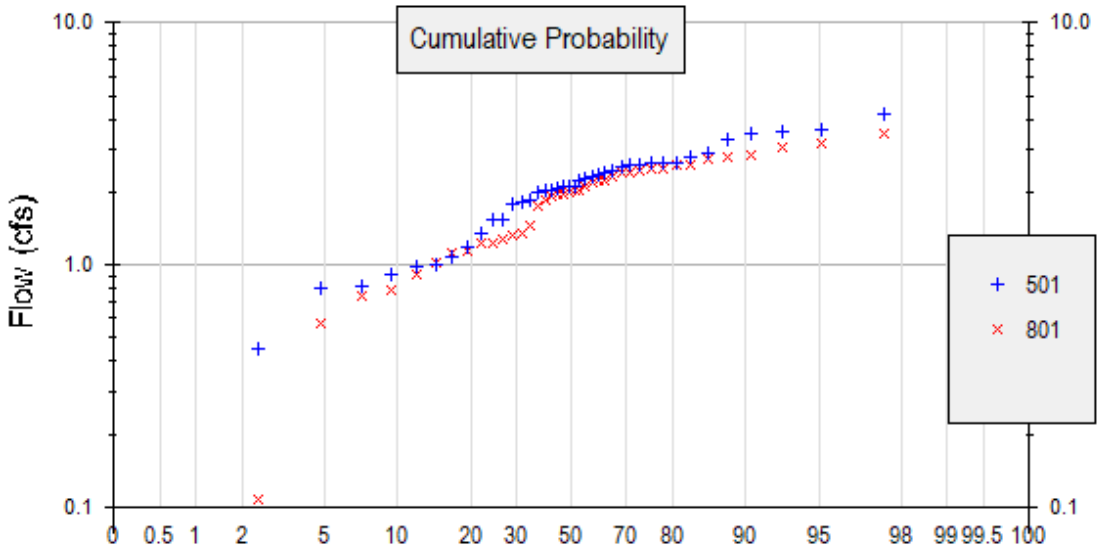
V.III.C. Point of Compliance #3 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #3 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.C.1. POC #3 – Flow vs. Percent Time Exceeding



V.III.C.2. POC #3 – Cumulative Probability



V.III.C.3. Tabulation of Flow Frequency Return Periods for POC #3

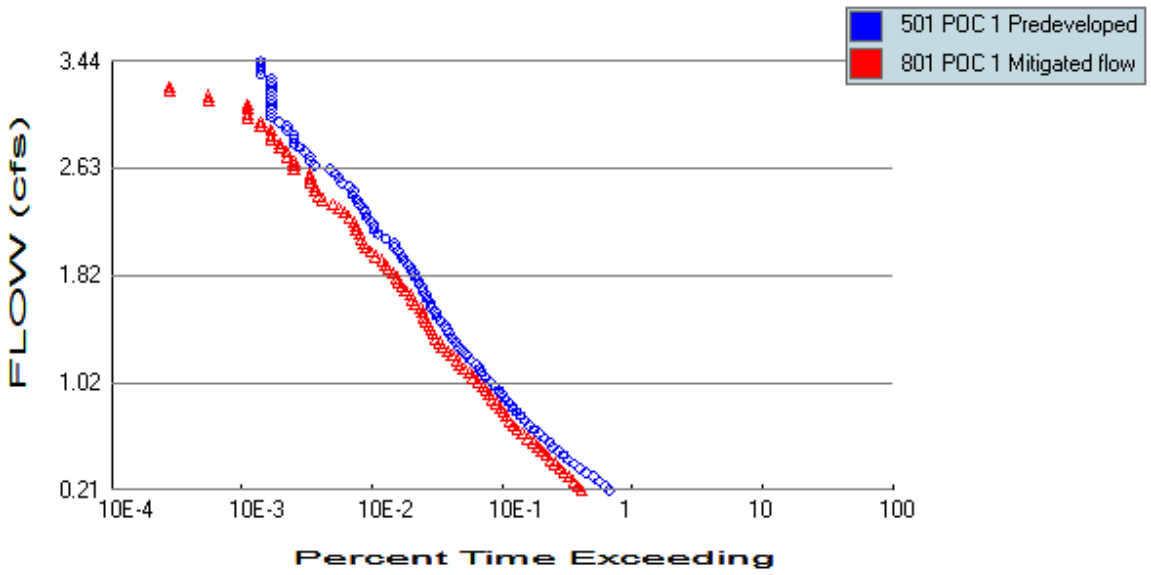
Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	2.11	1.57
5-year	2.65	2.09
10-year	3.44	2.43
25-year	3.72	2.69

The table above shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #3. Please see attached BAHM analysis under "Duration Flows" for POC #3 on page 15 showing all passed.

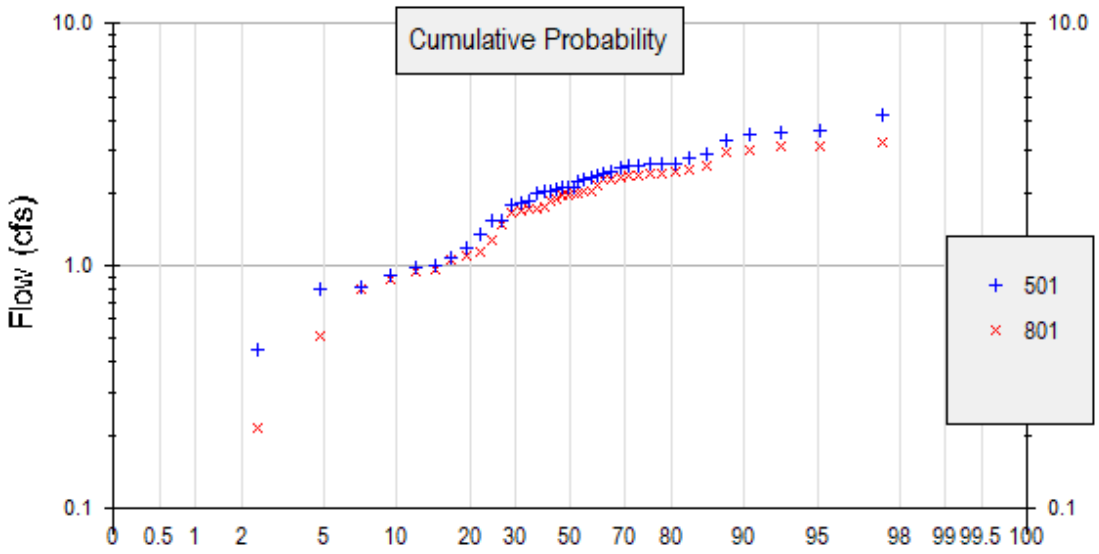
V.III.D. Point of Compliance #4 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #4 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.D.1. POC #4 – Flow vs. Percent Time Exceeding



V.III.D.2. POC #4 – Cumulative Probability



V.III.D.3. Tabulation of Flow Frequency Return Periods for POC #4

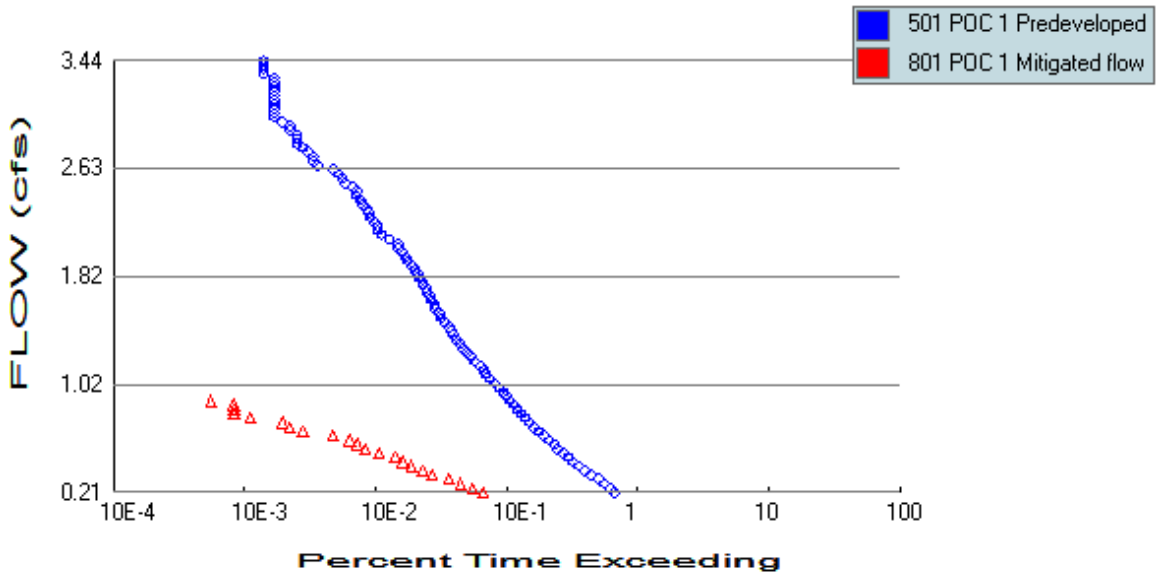
Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	2.11	1.97
5-year	2.65	2.42
10-year	3.44	2.97
25-year	3.72	3.15

The table above shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #4. Please see attached BAHM analysis under "Duration Flows" for POC #4 on page 15 showing all passed.

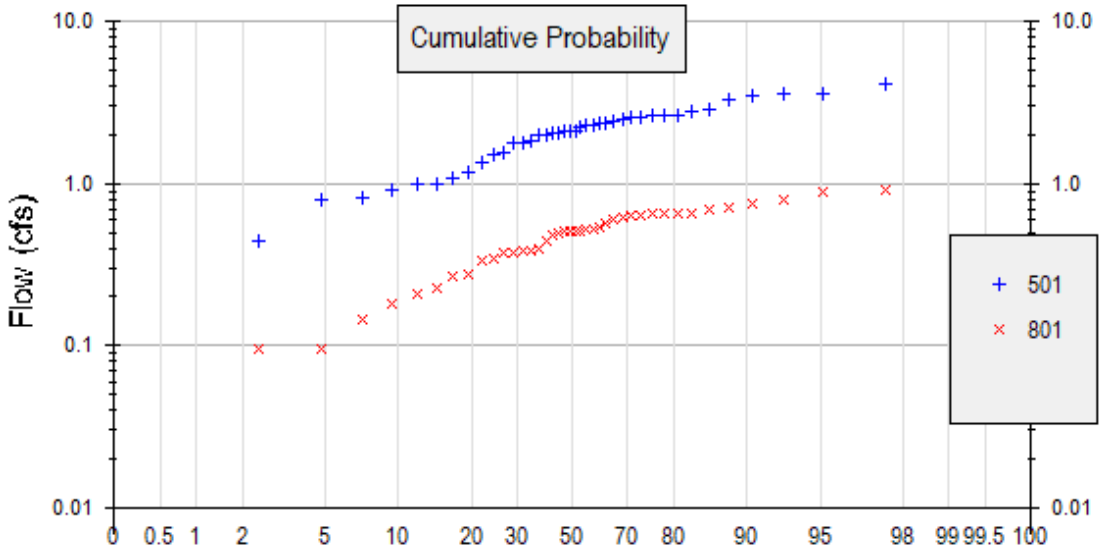
V.III.E. Point of Compliance #5 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #5 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.E.1. POC #5 – Flow vs. Percent Time Exceeding



V.III.E.2. POC #5 – Cumulative Probability



V.III.E.3. Tabulation of Flow Frequency Return Periods for POC #5

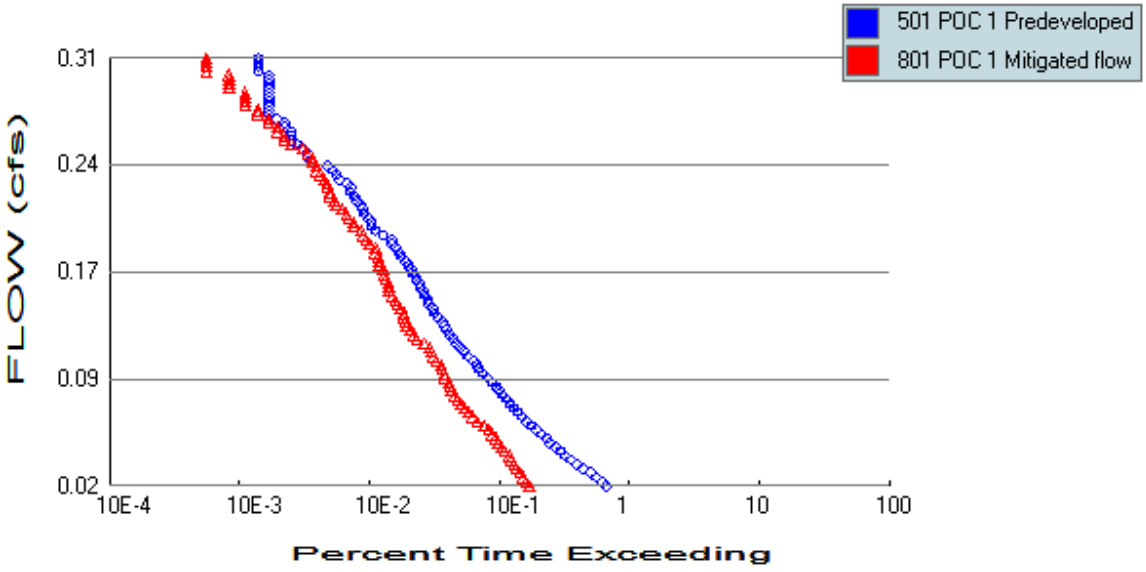
Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	2.11	0.51
5-year	2.65	0.66
10-year	3.44	0.74
25-year	3.72	0.90

The table above shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #5. Please see attached BAHM analysis under "Duration Flows" for POC #5 on page 15 showing all passed.

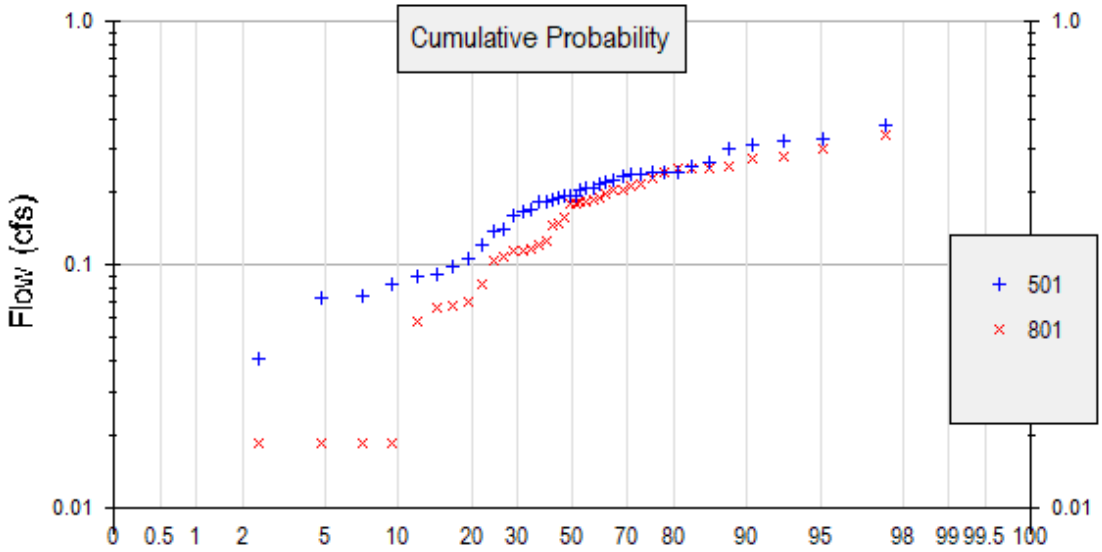
V.III.F. Point of Compliance #6 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #6 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.F.1. POC #6 – Flow vs. Percent Time Exceeding



V.III.F.2. POC #6 – Cumulative Probability



V.III.F.3. Tabulation of Flow Frequency Return Periods for POC #6

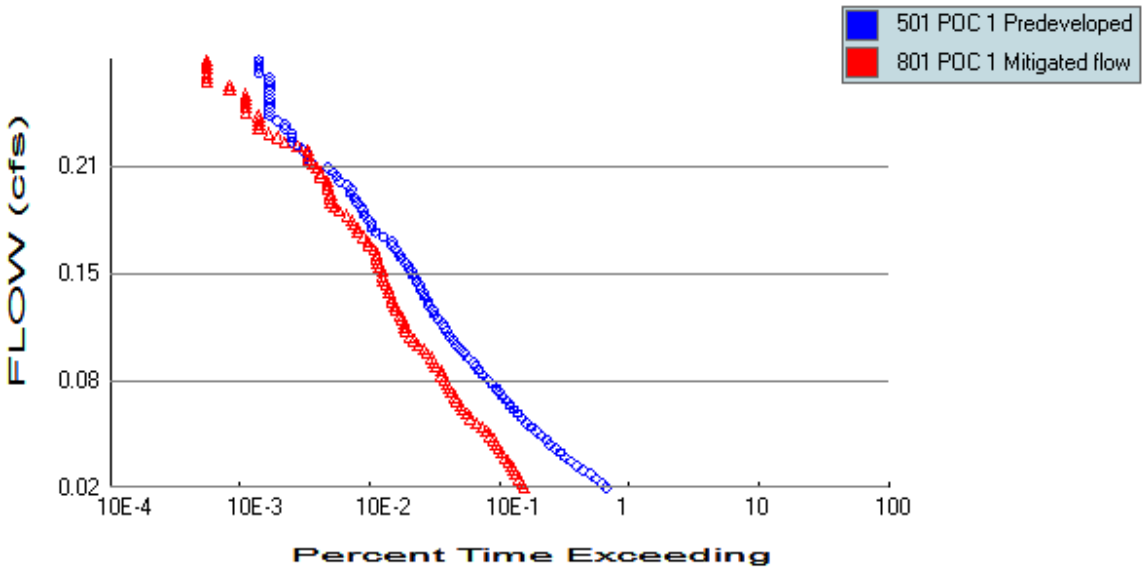
Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	0.19	0.18
5-year	0.24	0.24
10-year	0.31	0.27
25-year	0.34	0.31

The table above shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #6. Please see attached BAHM analysis under "Duration Flows" for POC #6 on page 15 showing all passed.

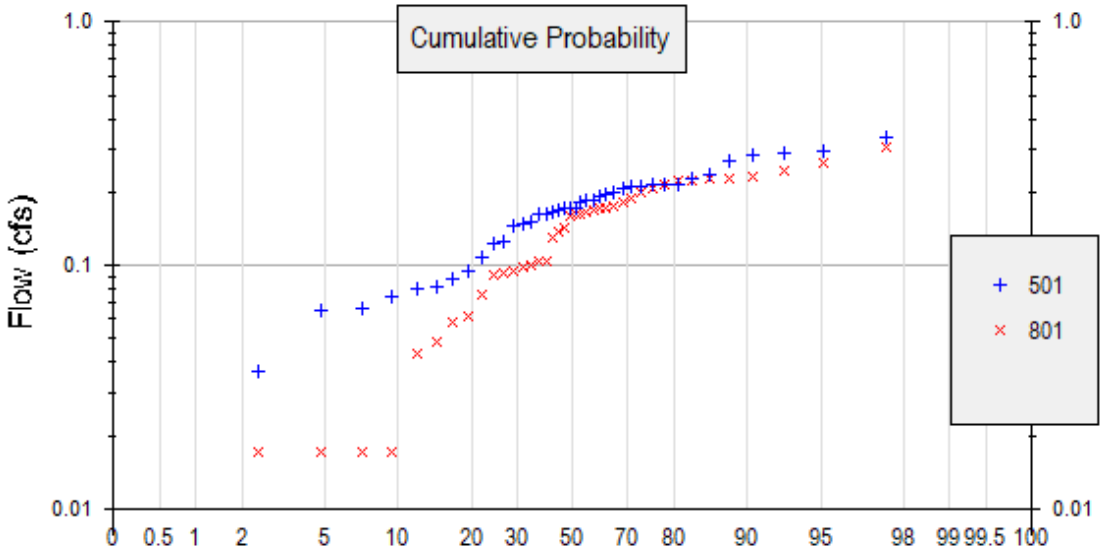
V.III.G. Point of Compliance #7 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #7 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.G.1. POC #7 – Flow vs. Percent Time Exceeding



V.III.G.2. POC #7 – Cumulative Probability



V.III.G.3. Tabulation of Flow Frequency Return Periods for POC #7

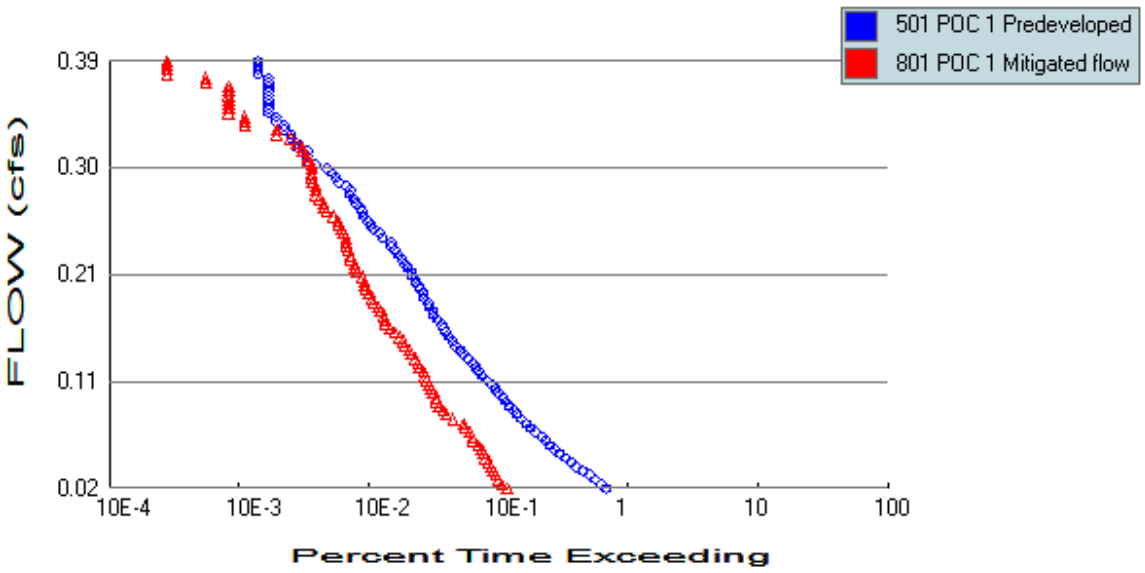
Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	0.17	0.16
5-year	0.22	0.22
10-year	0.28	0.23
25-year	0.30	0.27

The table above shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #7. Please see attached BAHM analysis under "Duration Flows" for POC #7 on page 15 showing all passed.

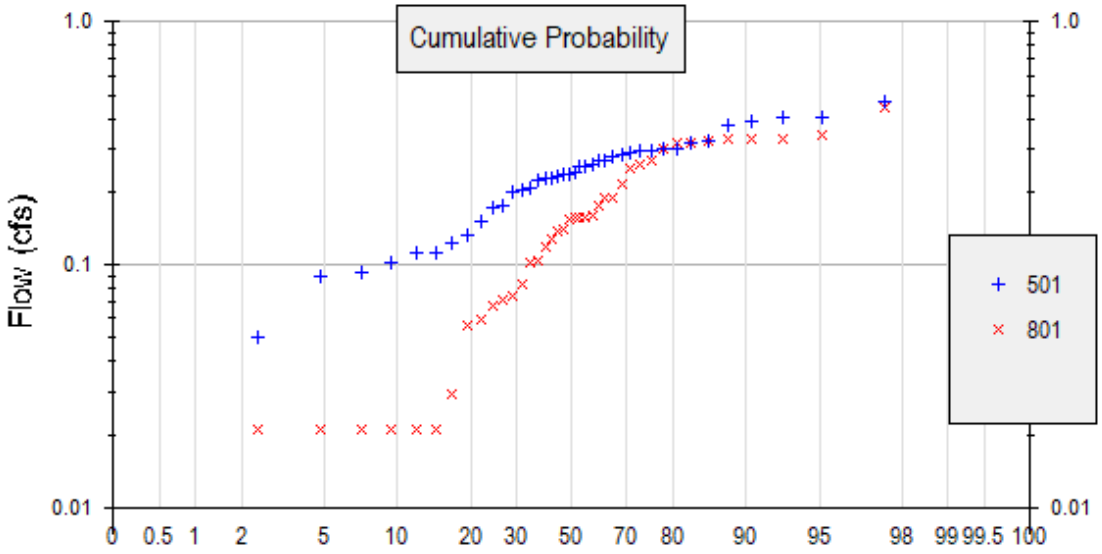
V.III.H. Point of Compliance #8 – BAHM Analysis

The graphs in this section were created using the BAHM software that used continuous simulated hydrology to compute stormwater runoff for both pre-development and post-development conditions. Each flow-duration curve's pre-development and mitigated flows are compared at Point of Compliance (POC) – the mitigated flows are not to exceed flow duration standards. The flow duration ranges from 2-year to 25-years. The graphs below for POC #8 demonstrate how the mitigated flow (shown in red) is far to the left of the pre-developed flow (shown in blue) which indicates that the project meets the flow duration criteria since the mitigated flow rate is below the pre-development flow rate.

V.III.H.1. POC #8 – Flow vs. Percent Time Exceeding



V.III.H.2. POC #8 – Cumulative Probability



V.III.H.3. Tabulation of Flow Frequency Return Periods for POC #8

Return Period	Flow Rate (cfs) – Predeveloped	Flow Rate (cfs) – Mitigated
2-year	0.24	0.15
5-year	0.30	0.31
10-year	0.39	0.33
25-year	0.42	0.36

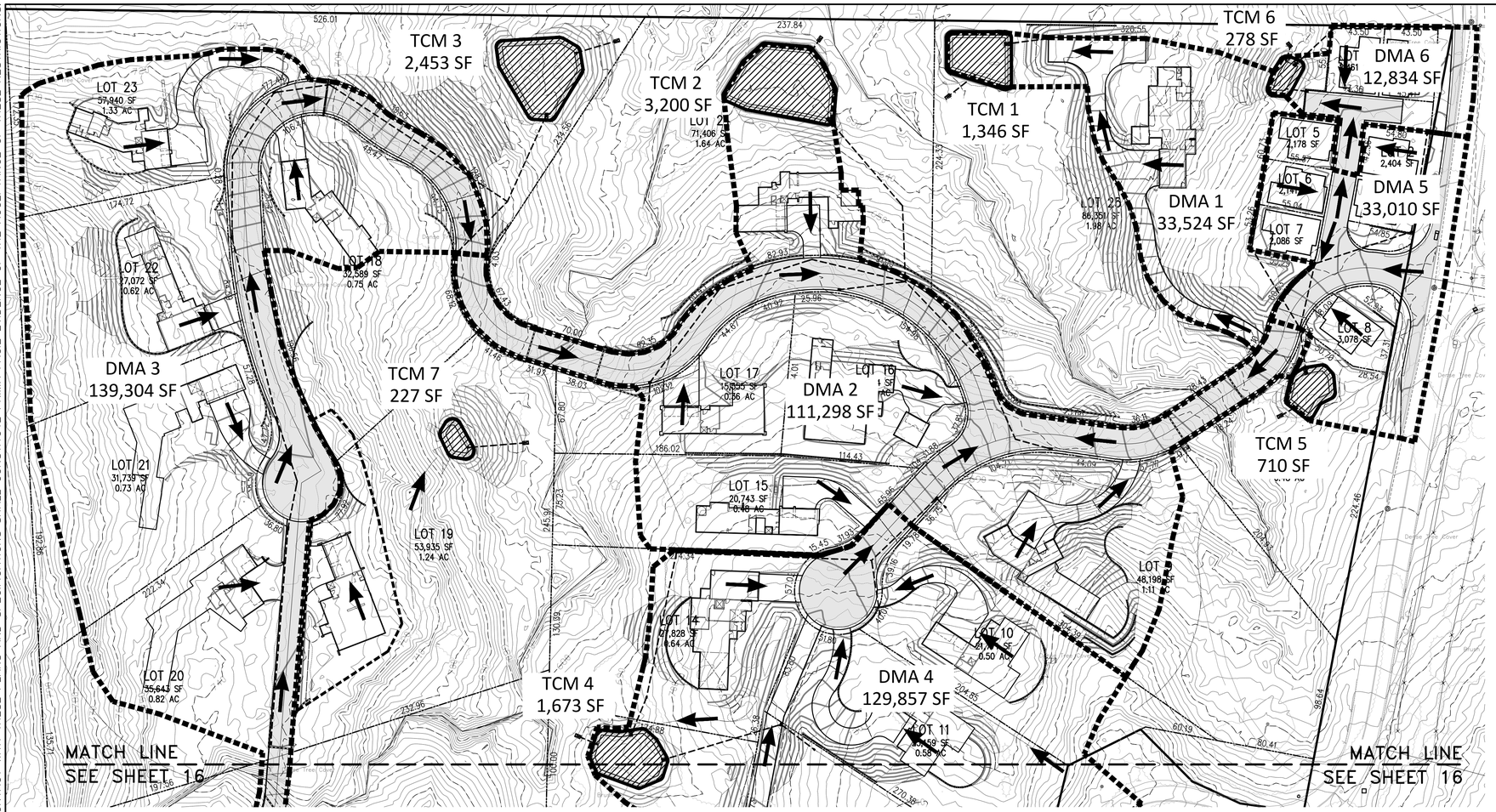
The table above shows that the proposed control measure meets the duration flow criteria for the flow frequency periods for POC #8. Please see attached BAHM analysis under "Duration Flows" for POC #8 on page 15 showing all passed.

IX. Site Plan

Please see attachment on page 33.

Stormwater Control Plan Exhibit

THE USE OF THESE PLANS AND SPECIFICATIONS SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY WERE PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. REPRODUCTION OR PUBLICATION BY ANY METHOD, IN WHOLE OR PART, IS PROHIBITED. TITLE TO THE PLANS AND SPECIFICATIONS REMAINS IN THE ENGINEER WITHOUT PREJUDICE. VISUAL CONTACT WITH THESE PLANS AND SPECIFICATIONS SHALL CONSTITUTE PRIMA FACIE EVIDENCE OF THE ACCEPTANCE OF THESE RESTRICTIONS.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

LEGEND

- DIRECTION OF FLOW
- STORM WATER
- DRAINAGE MANAGEMENT AREA DELINEATION
- TREATMENT CONTROL MEASURE

STANDARD STORMWATER CONTROL NOTES:

- STANDING WATER SHALL NOT REMAIN IN THE TREATMENT MEASURES FOR MORE THAN FIVE DAYS, TO PREVENT MOSQUITO GENERATION. SHOULD ANY MOSQUITO ISSUES ARISE, CONTACT THE SANTA CLARA VALLEY VECTOR CONTROL DISTRICT (DISTRICT). MOSQUITO LARVICIDES SHALL BE APPLIED ONLY AND WHEN ABSOLUTELY NECESSARY, AS INDICATED BY THE DISTRICT AND THEN ONLY BY A LICENSED PROFESSIONAL OR CONTRACTOR. CONTACT INFORMATION FOR THE DISTRICT IS PROVIDED BELOW.
- DO NOT USE PESTICIDES OR OTHER CHEMICAL APPLICATIONS TO TREAT DISEASED PLANTS, CONTROLS WEEDS OR REMOVED UNWANTED GROWTH. EMPLOY NON-CHEMICAL CONTROLS (BIOLOGICAL, PHYSICAL, AND CULTURAL CONTROLS) TO TREAT A PEST PROBLEM. PRUNE PLANTS PROPERLY AND AT THE APPROPRIATE TIME OF YEAR. PROVIDE ADEQUATE IRRIGATION FOR LANDSCAPE PLANTS. DO NO OVER WATER.

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

TABLE 1
ROUTINE MAINTENANCE ACTIVITIES FOR BIORETENTION AREAS

NO.	MAINTENANCE TASK	FREQUENCY OF TASK
1	REMOVE OBSTRUCTIONS, WEEDS, DEBRIS AND TRASH FROM BIORETENTION AREA AND ITS INLETS AND OUTLETS; AND DISPOSE OF PROPERLY.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
2	INSPECT BIORETENTION AREA FOR STANDING WATER. IF STANDING WATER DOES NOT DRAIN WITHIN 2-3 DAYS, TILL AND REPLACE THE SURFACE BIOTREATMENT SOIL WITH THE APPROVED SOIL MIX AND REPLANT.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
3	CHECK UNDERDRAINS FOR CLOGGING. USE THE CLEANOUT RISER TO CLEAN ANY CLOGGED UNDERDRAINS.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
4	MAINTAIN THE IRRIGATION SYSTEM AND ENSURE THAT PLANTS ARE RECEIVING THE CORRECT AMOUNT OF WATER (IF APPLICABLE).	QUARTERLY
5	ENSURE THAT THE VEGETATION IS HEALTHY AND DENSE ENOUGH TO PROVIDE FILTERING AND PROTECT SOILS FROM EROSION. PRUNE AND WEED THE BIORETENTION AREA. REMOVE AND/OR REPLACE ANY DEAD PLANTS.	ANNUALLY, BEFORE THE WET SEASON BEGINS
6	USE COMPOST AND OTHER NATURAL SOIL AMENDMENTS AND FERTILIZERS INSTEAD OF SYNTHETIC FERTILIZERS, ESPECIALLY IF THE SYSTEM USES AN UNDERDRAIN.	ANNUALLY, BEFORE THE WET SEASON BEGINS
7	CHECK THAT MULCH IS AT APPROPRIATE DEPTH (2 - 3 INCHES PER SOIL SPECIFICATIONS) AND REPLENISH AS NECESSARY BEFORE WET SEASON BEGINS. IT IS RECOMMENDED THAT 2" – 3" OF ARBOR MULCH BE REAPPLIED EVERY YEAR.	ANNUALLY, BEFORE THE WET SEASON BEGINS
8	INSPECT THE ENERGY DISSIPATION AT THE INLET TO ENSURE IT IS FUNCTIONING ADEQUATELY, AND THAT THERE IS NO SCOUR OF THE SURFACE MULCH. REMOVE ACCUMULATED SEDIMENT.	ANNUALLY, BEFORE THE WET SEASON BEGINS
9	INSPECT OVERFLOW PIPE TO ENSURE THAT IT CAN SAFELY CONVEY EXCESS FLOWS TO A STORM DRAIN. REPAIR OR REPLACE DAMAGED PIPING.	ANNUALLY, BEFORE THE WET SEASON BEGINS
10	REPLACE BIOTREATMENT SOIL AND MULCH, IF NEEDED. CHECK FOR STANDING WATER, STRUCTURAL FAILURE AND CLOGGED OVERFLOWS. REMOVE TRASH AND DEBRIS. REPLACE DEAD PLANTS.	
11	INSPECT BIORETENTION AREA USING THE ATTACHED INSPECTION CHECKLIST.	ANNUALLY, BEFORE THE WET SEASON

OPERATION AND MAINTENANCE INFORMATION:

I. **PROPERTY INFORMATION:**

I.A. PROPERTY ADDRESS:
PIERCE ROAD
SARATOGA, CA

I.B. PROPERTY OWNER:
CHATEAU MASSON, LLC

II. **RESPONSIBLE PARTY FOR MAINTENANCE:**

II.A. CONTACT:
WILLIAM HIRSCHMAN

II.B. PHONE NUMBER OF CONTACT:
408-210-1998

II.C. EMAIL:
WHIRSCHMAN@LEXORBUILDERS.COM

II.D. ADDRESS:
258 UNION AVENUE
LOS GATOS, CA 95032

PROJECT SITE INFORMATION:

1. **SOILS TYPE: C/D**
2. **GROUND WATER DEPTH: UNKNOWN**
3. **NAME OF RECEIVING BODY: SARATOGA CREEK**
4. **FLOOD ZONE: X**
5. **FLOOD ELEVATION (IF APPLICABLE): N/A**

SOURCE CONTROL MEASURES:

1. BENEFICIAL LANDSCAPING.
2. USE OF WATER EFFICIENT IRRIGATION SYSTEMS.
3. MAINTENANCE (PAVEMENT SWEEPING, CATCH BASIN CLEANING, GOOD HOUSEKEEPING).
4. STORM DRAIN LABELING.

SITE DESIGN MEASURES:

1. DIRECT RUNOFF FROM ROOFS, SIDEWALKS, PATIOS TO LANDSCAPED AREAS.
2. PLANT TREES ADJACENT TO AND IN PARKING AREAS AND ADJACENT TO OTHER IMPERVIOUS AREAS.

TCM NO. 1:

1,346 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 18" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 2:

3,200 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 12" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 3:

2,453 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 18" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 4:

1,673 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 12" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 5:

710 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 12" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 6:

278 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 21" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 7:

227 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 21" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 8:

554 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 24" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

REVISIONS:

DATE	DESCRIPTION	BY:

HANNA-BRUNETTI
EST. 1910
CIVIL ENGINEERS • LAND SURVEYORS
CONSTRUCTION MANAGERS
7651 EIGLEBERRY STREET • GILROY • 95020 • CALIFORNIA
OFFICE (408) 842-2173
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DATE: DECEMBER 2023
HORIZ. SCALE: 1"=20
VERT. SCALE: NONE
DESIGNED BY: A.M.
CHECKED BY:
DRAWN BY: T.M.

date:
Hanna – Brunetti

Amanda Joy Musy-Verdel
R.C.E. # 69278

REGISTERED PROFESSIONAL ENGINEER
AMANDA JOY MUSY-VERDEZ
NO. 69278
CIVIL
STATE OF CALIFORNIA

REFERENCES

Stormwater Control Plan

Chateau Masson LLC - Pierce Road - apn 503-46-005

CITY OF SARATOGA
DECEMBER 2023

SANTA CLARA COUNTY
CALIFORNIA

SHEET 15 OF 18

JOB NO. 19012

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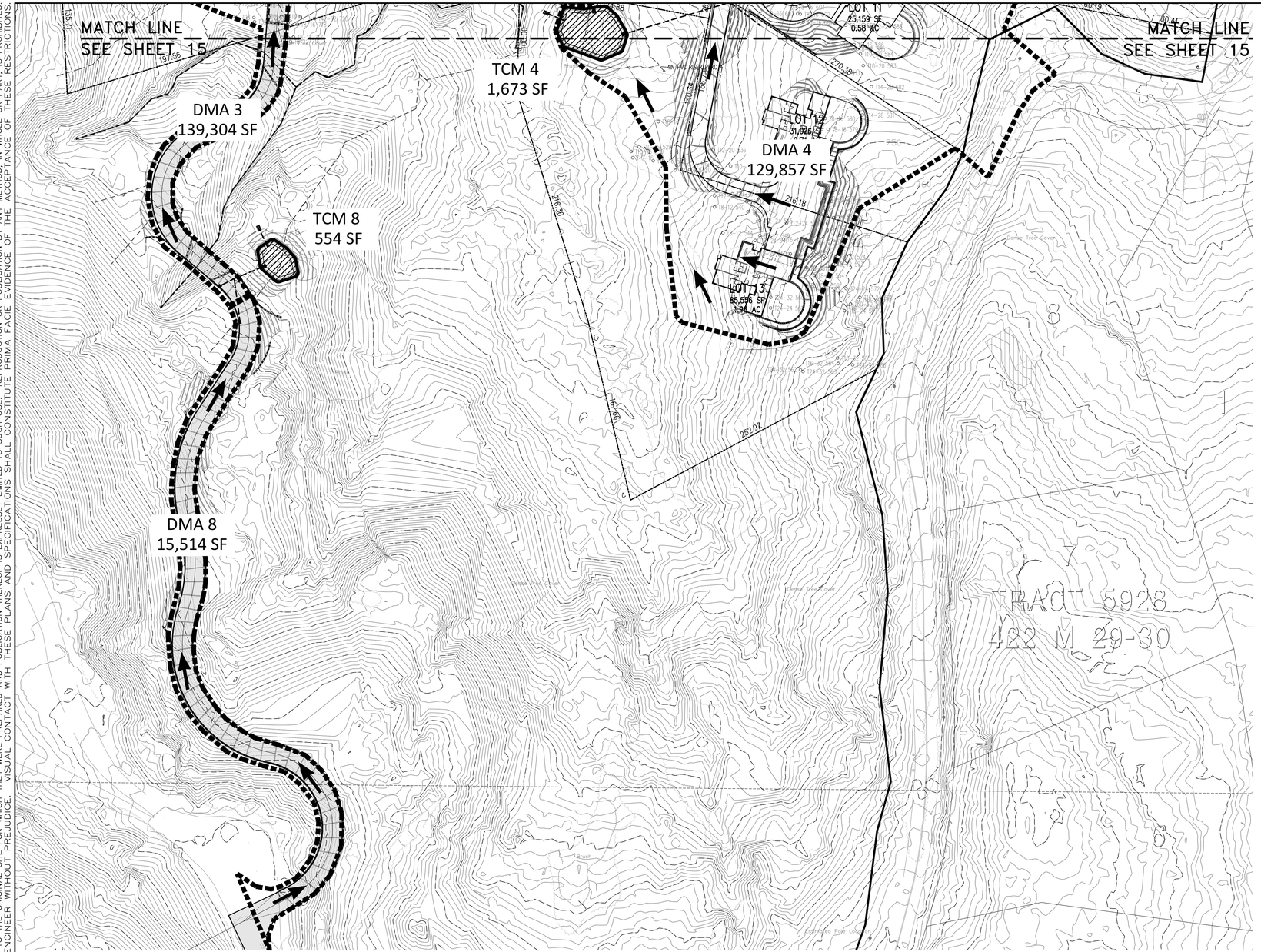

TABLE 1 ROUTINE MAINTENANCE ACTIVITIES FOR BIORETENTION AREAS		
NO.	MAINTENANCE TASK	FREQUENCY OF TASK
1	REMOVE OBSTRUCTIONS, WEEDS, DEBRIS AND TRASH FROM BIORETENTION AREA AND ITS INLETS AND OUTLETS; AND DISPOSE OF PROPERLY.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
2	INSPECT BIORETENTION AREA FOR STANDING WATER. IF STANDING WATER DOES NOT DRAIN WITHIN 2-3 DAYS, TILL AND REPLACE THE SURFACE BIOTREATMENT SOIL WITH THE APPROVED SOIL MIX AND REPLANT.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
3	CHECK UNDERDRAINS FOR CLOGGING. USE THE CLEANOUT RISER TO CLEAN ANY CLOGGED UNDERDRAINS.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
4	MAINTAIN THE IRRIGATION SYSTEM AND ENSURE THAT PLANTS ARE RECEIVING THE CORRECT AMOUNT OF WATER (IF APPLICABLE).	QUARTERLY
5	ENSURE THAT THE VEGETATION IS HEALTHY AND DENSE ENOUGH TO PROVIDE FILTERING AND PROTECT SOILS FROM EROSION. PRUNE AND WEED THE BIORETENTION AREA. REMOVE AND/OR REPLACE ANY DEAD PLANTS.	ANNUALLY, BEFORE THE WET SEASON BEGINS
6	USE COMPOST AND OTHER NATURAL SOIL AMENDMENTS AND FERTILIZERS INSTEAD OF SYNTHETIC FERTILIZERS, ESPECIALLY IF THE SYSTEM USES AN UNDERDRAIN.	ANNUALLY, BEFORE THE WET SEASON BEGINS
7	CHECK THAT MULCH IS AT APPROPRIATE DEPTH (2 - 3 INCHES PER SOIL SPECIFICATIONS) AND REPLENISH AS NECESSARY BEFORE WET SEASON BEGINS. IT IS RECOMMENDED THAT 2" – 3" OF ARBOR MULCH BE REAPPLIED EVERY YEAR.	ANNUALLY, BEFORE THE WET SEASON BEGINS
8	INSPECT THE ENERGY DISSIPATION AT THE INLET TO ENSURE IT IS FUNCTIONING ADEQUATELY, AND THAT THERE IS NO SCOUR OF THE SURFACE MULCH. REMOVE ACCUMULATED SEDIMENT.	ANNUALLY, BEFORE THE WET SEASON BEGINS
9	INSPECT OVERFLOW PIPE TO ENSURE THAT IT CAN SAFELY CONVEY EXCESS FLOWS TO A STORM DRAIN. REPAIR OR REPLACE DAMAGED PIPING.	ANNUALLY, BEFORE THE WET SEASON BEGINS
10	REPLACE BIOTREATMENT SOIL AND MULCH, IF NEEDED. CHECK FOR STANDING WATER, STRUCTURAL FAILURE AND CLOGGED OVERFLOWS. REMOVE TRASH AND DEBRIS. REPLACE DEAD PLANTS.	
11	INSPECT BIORETENTION AREA USING THE ATTACHED INSPECTION CHECKLIST.	ANNUALLY, BEFORE THE WET SEASON

STANDARD STORMWATER CONTROL NOTES:

- STANDING WATER SHALL NOT REMAIN IN THE TREATMENT MEASURES FOR MORE THAN FIVE DAYS, TO PREVENT MOSQUITO GENERATION. SHOULD ANY MOSQUITO ISSUES ARISE, CONTACT THE SANTA CLARA VALLEY VECTOR CONTROL DISTRICT (DISTRICT). MOSQUITO LARVICIDES SHALL BE APPLIED ONLY AND WHEN ABSOLUTELY NECESSARY, AS INDICATED BY THE DISTRICT AND THEN ONLY BY A LICENSED PROFESSIONAL OR CONTRACTOR. CONTACT INFORMATION FOR THE DISTRICT IS PROVIDED BELOW.
- DO NOT USE PESTICIDES OR OTHER CHEMICAL APPLICATIONS TO TREAT DISEASED PLANTS, CONTROLS WEEDS OR REMOVED UNWANTED GROWTH. EMPLOY NON–CHEMICAL CONTROLS (BIOLOGICAL, PHYSICAL, AND CULTURAL CONTROLS) TO TREAT A PEST PROBLEM. PRUNE PLANTS PROPERLY AND AT THE APPROPRIATE TIME OF YEAR. PROVIDE ADEQUATE IRRIGATION FOR LANDSCAPE PLANTS. DO NO OVER WATER.

TCM NO. 1:

1,346 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 18" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 2:

3,200 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 12" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 3:

2,453 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 18" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 4:

1,673 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 12" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 5:

710 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 12" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 6:

278 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 21" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 7:

227 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 21" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

TCM NO. 8:

554 SQUARE FEET OF BIORETENTION AREA UNLINED WITH UNDERDRAIN. OVERFLOW RISER HEIGHT SHALL BE PLACED 24" ABOVE THE BOTTOM OF POND; SEE DETAIL 5 ON SHEET 17.

LEGEND

- DIRECTION OF FLOW
- STORM WATER
- DRAINAGE MANAGEMENT AREA DELINEATION
- TREATMENT CONTROL MEASURE

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

REVISIONS:

DATE	DESCRIPTION	BY:

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REGISTERED PROFESSIONAL ENGINEER
AMANDA JOY MUSY-VERDEZ
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SHEET 16 OF 18
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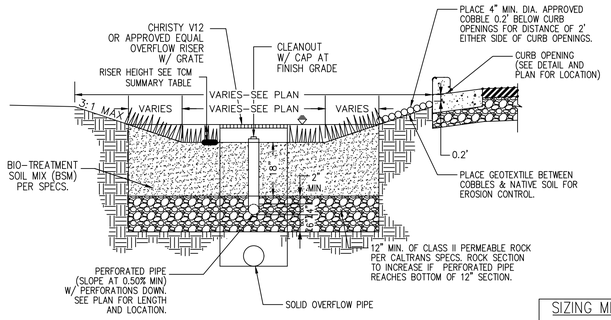

SIZING METHOD:

4%

5 BIORETENTION BASIN W/O LINER

N.T.S.

NOTE:

OVERFLOW RISER HEIGHT VARIES PER TREATMENT CONTROL MEASURE (TCM). SEE TABLE BELOW.

TREATMENT CONTROL MEASURE SUMMARY TABLE

											Bioretention			
DMA #	TCM #	Location[1]	Treatment Type[2]	LID or Non-LID	Sizing Method	Drainage Area (s.f.)	Impervious Area[4] (s.f.)	Pervious Area (Permeable Pavement) (s.f.)	Pervious Area (Other) (s.f.)	% Onsite Area Treated by LID or Non-LID TCM	Bioretention Area Required (s.f.)	Bioretention Area Provided (s.f.)	Overflow Riser Height (in)	Comments
1	1	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	33,524	11,066		22,458	6.89%	1,320	1,346	18	
2	2	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	111,298	52,724		58,574	22.86%	2,400	3,200	12	
3	3	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	139,304	53,688		85,616	28.61%	2,452	2,453	18	
4	4	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	129,857	39,050		90,807	26.67%	1,672	1,673	12	
5	5	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	33,010	17,752		15,258	6.78%	708	710	12	
6	6	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	12,834	6,680		6,154	2.64%	272	278	21	
7	7	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	11,488	4,533		6,955	2.36%	225	227	21	
8	8	Onsite	Bioretention unlined w/ underdrain	LID	2C. Flow: 4% Method **	15,514	12,869		2,645	3.19%	583	554	24	
					Totals:	486,829	198,362	0	288,467	100.00%				

Footnotes:

1 Per the Municipal Regional Stormwater Permit, sidewalks and other parts of the right-of-way should be included in the new and/or replaced impervious surface calculation and treated as required
2 Sizing for Bioretention Area Required calculated using the 4% Method (Impervious Area x 0.04)
3 Gravel is considered as an impervious surface unless it is part of an infiltration trench.
4 Treatment type of Self-Treating or Self-Retaining should only be used with landscape based treatment. If previous pavement is proposed for Self-Treating or Retaining, use the Pervious Pavement selection.

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

REVISIONS:

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DMA 1 Hydromodification

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C D,Shrub,St(10-20%)	2.56
Pervious Total	2.56
Impervious Land Use	acre
Impervious Total	0
Basin Total	2.56

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	2.31
Pervious Total	2.31

Impervious Land Use	acre
Roof Area	0.08
Driveways,St(10-20%)	0.15
Sidewalks,St(10-20%)	0.02
Impervious Total	0.25
Basin Total	2.56

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 1	Surface retention 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 1

Bottom Length:	34.00 ft.
Bottom Width:	40.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	16.772
Total Volume Through Riser (ac-ft.):	41.989
Total Volume Through Facility (ac-ft.):	138.371
Percent Infiltrated:	12.12
Total Precip Applied to Facility:	3.2
Total Evap From Facility:	1.252
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	2.25
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	79.61
Total Outflow (ac-ft.):	138.371
Percent Through Underdrain:	57.53
Discharge Structure	
Riser Height:	1.5 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0312	0.0000	0.0000	0.0000
0.0549	0.0312	0.0007	0.0000	0.0000
0.1099	0.0312	0.0013	0.0000	0.0000
0.1648	0.0312	0.0020	0.0000	0.0000
0.2198	0.0312	0.0026	0.0000	0.0000
0.2747	0.0312	0.0033	0.0000	0.0000
0.3297	0.0312	0.0039	0.0000	0.0000
0.3846	0.0312	0.0046	0.0000	0.0031
0.4396	0.0312	0.0052	0.0000	0.0031
0.4945	0.0312	0.0059	0.0000	0.0031
0.5495	0.0312	0.0065	0.0000	0.0031
0.6044	0.0312	0.0072	0.0000	0.0031
0.6593	0.0312	0.0078	0.0000	0.0031
0.7143	0.0312	0.0085	0.0000	0.0031
0.7692	0.0312	0.0091	0.0000	0.0031
0.8242	0.0312	0.0098	0.0000	0.0031
0.8791	0.0312	0.0104	0.0000	0.0031
0.9341	0.0312	0.0111	0.0000	0.0031
0.9890	0.0312	0.0117	0.0000	0.0031

1.0440	0.0312	0.0124	0.0000	0.0031
1.0989	0.0312	0.0130	0.0000	0.0031
1.1538	0.0312	0.0137	0.0000	0.0031
1.2088	0.0312	0.0143	0.0000	0.0031
1.2637	0.0312	0.0150	0.0000	0.0031
1.3187	0.0312	0.0156	0.0000	0.0031
1.3736	0.0312	0.0163	0.0178	0.0031
1.4286	0.0312	0.0169	0.0290	0.0031
1.4835	0.0312	0.0176	0.0370	0.0031
1.5385	0.0312	0.0183	0.0435	0.0031
1.5934	0.0312	0.0190	0.0492	0.0031
1.6484	0.0312	0.0197	0.0543	0.0031
1.7033	0.0312	0.0204	0.0589	0.0031
1.7582	0.0312	0.0212	0.0629	0.0031
1.8132	0.0312	0.0219	0.0671	0.0031
1.8681	0.0312	0.0226	0.0711	0.0031
1.9231	0.0312	0.0233	0.0747	0.0031
1.9780	0.0312	0.0240	0.0782	0.0031
2.0330	0.0312	0.0247	0.0815	0.0031
2.0879	0.0312	0.0254	0.0847	0.0031
2.1429	0.0312	0.0261	0.0878	0.0031
2.1978	0.0312	0.0269	0.0909	0.0031
2.2527	0.0312	0.0276	0.0940	0.0031
2.3077	0.0312	0.0283	0.0987	0.0031
2.3626	0.0312	0.0290	0.1013	0.0031
2.4176	0.0312	0.0297	0.1038	0.0031
2.4725	0.0312	0.0304	0.1063	0.0031
2.5000	0.0312	0.0308	0.1075	0.0031

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0312	0.0308	0.0000	0.1593	0.0000
2.5549	0.0316	0.0325	0.0000	0.1593	0.0001
2.6099	0.0320	0.0342	0.0000	0.1730	0.0001
2.6648	0.0324	0.0360	0.0000	0.1810	0.0002
2.7198	0.0327	0.0378	0.0000	0.1892	0.0002
2.7747	0.0331	0.0396	0.0000	0.1975	0.0002
2.8297	0.0335	0.0414	0.0000	0.2060	0.0003
2.8846	0.0339	0.0433	0.0000	0.2147	0.0003
2.9396	0.0343	0.0452	0.0000	0.2235	0.0003
2.9945	0.0347	0.0471	0.0000	0.2324	0.0004
3.0495	0.0351	0.0490	0.0000	0.2415	0.0004
3.1044	0.0355	0.0509	0.0000	0.2508	0.0005
3.1593	0.0359	0.0529	0.0000	0.2603	0.0005
3.2143	0.0363	0.0549	0.0000	0.2699	0.0005
3.2692	0.0367	0.0569	0.0000	0.2797	0.0006
3.3242	0.0371	0.0589	0.0000	0.2896	0.0006
3.3791	0.0375	0.0609	0.0000	0.2997	0.0007
3.4341	0.0379	0.0630	0.0000	0.3100	0.0007
3.4890	0.0383	0.0651	0.0000	0.3204	0.0008
3.5440	0.0387	0.0672	0.0000	0.3310	0.0008
3.5989	0.0391	0.0693	0.0000	0.3418	0.0008
3.6538	0.0396	0.0715	0.0000	0.3528	0.0009
3.7088	0.0400	0.0737	0.0000	0.3639	0.0009
3.7637	0.0404	0.0759	0.0000	0.3752	0.0010
3.8187	0.0408	0.0781	0.0000	0.3867	0.0010
3.8736	0.0412	0.0804	0.0000	0.3984	0.0011
3.9286	0.0417	0.0827	0.0000	0.4103	0.0011

3.9835	0.0421	0.0850	0.0000	0.4223	0.0011
4.0385	0.0425	0.0873	0.0800	0.4345	0.0012
4.0934	0.0430	0.0896	0.3014	0.4469	0.0012
4.1484	0.0434	0.0920	0.5952	0.4595	0.0013
4.2033	0.0439	0.0944	0.9282	0.4722	0.0013
4.2582	0.0443	0.0968	1.2676	0.4852	0.0014
4.3132	0.0447	0.0993	1.5809	0.4983	0.0014
4.3681	0.0452	0.1018	1.8406	0.5117	0.0015
4.4231	0.0456	0.1042	2.0318	0.5252	0.0015
4.4780	0.0461	0.1068	2.1614	0.5389	0.0015
4.5330	0.0466	0.1093	2.2994	0.5528	0.0016
4.5879	0.0470	0.1119	2.4150	0.5669	0.0016
4.6429	0.0475	0.1145	2.5253	0.5812	0.0017
4.6978	0.0479	0.1171	2.6310	0.5957	0.0017
4.7527	0.0484	0.1197	2.7327	0.6104	0.0018
4.8077	0.0489	0.1224	2.8306	0.6253	0.0018
4.8626	0.0493	0.1251	2.9253	0.6404	0.0019
4.9176	0.0498	0.1278	3.0170	0.6557	0.0019
4.9725	0.0503	0.1306	3.1061	0.6712	0.0019
5.0000	0.0505	0.1320	3.1926	0.6790	0.0900

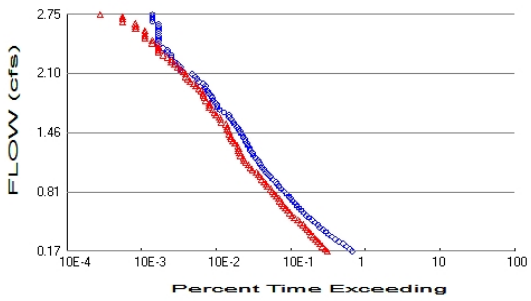
Surface retention 1

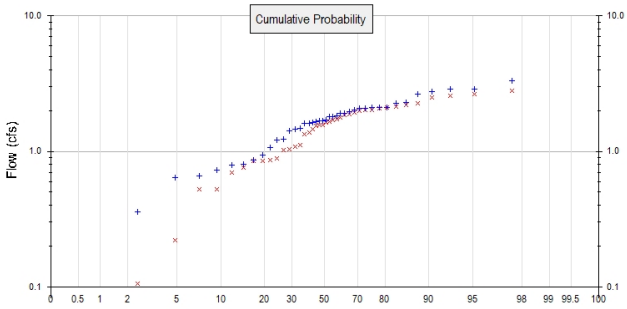
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 1

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.56
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.31
Total Impervious Area: 0.25

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	1.68858
5 year	2.119384
10 year	2.748249
25 year	2.979388

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	1.56858
5 year	2.0936
10 year	2.429868
25 year	2.685504

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	1.072	1.044
1961	0.658	0.522
1962	1.919	1.922
1963	2.071	2.027
1964	2.860	2.658
1965	1.449	1.117
1966	0.729	0.692
1967	2.078	2.013
1968	2.897	2.801
1969	1.689	1.707
1970	1.973	1.894
1971	1.838	1.789
1972	0.794	0.527
1973	2.248	2.151

1974	1.629	1.569
1975	1.797	1.080
1976	0.111	0.080
1977	0.359	0.222
1978	1.481	1.462
1979	1.895	1.338
1980	2.309	2.259
1981	0.941	0.850
1982	2.776	2.567
1983	2.121	2.113
1984	1.238	0.890
1985	2.660	2.186
1986	2.118	2.068
1987	0.867	0.865
1988	1.421	1.386
1989	0.640	0.106
1990	1.221	0.852
1991	1.610	1.019
1992	2.027	1.978
1993	2.103	1.856
1994	1.599	1.554
1995	1.701	1.727
1996	3.330	2.483
1997	1.661	1.653
1998	1.815	1.554
1999	0.802	0.762
2000	1.689	1.643

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	3.3296	2.8013
2	2.8970	2.6583
3	2.8603	2.5669
4	2.7757	2.4834
5	2.6603	2.2585
6	2.3090	2.1855
7	2.2479	2.1508
8	2.1208	2.1127
9	2.1176	2.0682
10	2.1026	2.0265
11	2.0781	2.0126
12	2.0708	1.9780
13	2.0268	1.9218
14	1.9731	1.8937
15	1.9187	1.8565
16	1.8953	1.7890
17	1.8381	1.7272
18	1.8149	1.7070
19	1.7969	1.6532
20	1.7009	1.6426
21	1.6886	1.5686
22	1.6885	1.5538
23	1.6611	1.5536
24	1.6290	1.4617
25	1.6104	1.3856
26	1.5994	1.3379
27	1.4811	1.1168

28	1.4485	1.0798
29	1.4209	1.0439
30	1.2378	1.0190
31	1.2205	0.8896
32	1.0725	0.8645
33	0.9415	0.8524
34	0.8667	0.8502
35	0.8019	0.7618
36	0.7937	0.6919
37	0.7287	0.5273
38	0.6582	0.5223
39	0.6397	0.2221
40	0.3594	0.1064
41	0.1114	0.0801

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1689	2400	1107	46	Pass
0.1949	2212	1032	46	Pass
0.2210	2015	952	47	Pass
0.2470	1800	885	49	Pass
0.2731	1596	835	52	Pass
0.2991	1419	779	54	Pass
0.3252	1287	725	56	Pass
0.3512	1169	673	57	Pass
0.3773	1062	637	59	Pass
0.4033	964	595	61	Pass
0.4294	886	560	63	Pass
0.4555	836	527	63	Pass
0.4815	760	483	63	Pass
0.5076	685	447	65	Pass
0.5336	632	402	63	Pass
0.5597	583	374	64	Pass
0.5857	538	347	64	Pass
0.6118	497	324	65	Pass
0.6378	462	306	66	Pass
0.6639	433	286	66	Pass
0.6899	409	272	66	Pass
0.7160	386	258	66	Pass
0.7421	357	250	70	Pass
0.7681	338	229	67	Pass
0.7942	316	216	68	Pass
0.8202	290	204	70	Pass
0.8463	268	192	71	Pass
0.8723	249	177	71	Pass
0.8984	238	169	71	Pass
0.9244	229	159	69	Pass
0.9505	205	147	71	Pass
0.9765	193	140	72	Pass
1.0026	179	132	73	Pass
1.0287	167	124	74	Pass
1.0547	159	110	69	Pass
1.0808	148	102	68	Pass
1.1068	142	97	68	Pass
1.1329	135	89	65	Pass
1.1589	130	85	65	Pass
1.1850	121	83	68	Pass
1.2110	115	77	66	Pass
1.2371	110	73	66	Pass
1.2631	104	72	69	Pass
1.2892	101	72	71	Pass
1.3153	97	70	72	Pass
1.3413	93	64	68	Pass
1.3674	88	60	68	Pass
1.3934	87	57	65	Pass
1.4195	82	56	68	Pass
1.4455	79	54	68	Pass
1.4716	75	53	70	Pass
1.4976	72	51	70	Pass
1.5237	68	50	73	Pass

1.5497	64	49	76	Pass
1.5758	61	42	68	Pass
1.6019	57	41	71	Pass
1.6279	54	40	74	Pass
1.6540	53	36	67	Pass
1.6800	46	34	73	Pass
1.7061	40	32	80	Pass
1.7321	37	29	78	Pass
1.7582	37	29	78	Pass
1.7842	35	29	82	Pass
1.8103	33	26	78	Pass
1.8363	32	25	78	Pass
1.8624	31	24	77	Pass
1.8885	29	24	82	Pass
1.9145	28	23	82	Pass
1.9406	26	21	80	Pass
1.9666	26	19	73	Pass
1.9927	24	18	75	Pass
2.0187	21	16	76	Pass
2.0448	20	15	75	Pass
2.0708	19	14	73	Pass
2.0969	17	14	82	Pass
2.1229	13	13	100	Pass
2.1490	12	12	100	Pass
2.1751	12	11	91	Pass
2.2011	11	10	90	Pass
2.2272	10	9	90	Pass
2.2532	9	9	100	Pass
2.2793	9	8	88	Pass
2.3053	9	7	77	Pass
2.3314	8	6	75	Pass
2.3574	8	6	75	Pass
2.3835	7	6	85	Pass
2.4095	6	6	100	Pass
2.4356	6	5	83	Pass
2.4617	6	5	83	Pass
2.4877	6	4	66	Pass
2.5138	6	4	66	Pass
2.5398	6	4	66	Pass
2.5659	6	4	66	Pass
2.5919	6	3	50	Pass
2.6180	6	3	50	Pass
2.6440	6	3	50	Pass
2.6701	5	2	40	Pass
2.6961	5	2	40	Pass
2.7222	5	2	40	Pass
2.7482	5	1	20	Pass

DMA 2 Hydromodification

Landuse Basin Data

Predeveloped Land Use

Basin 2

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C D,Shrub,St(10-20%)	2.56
Pervious Total	2.56
Impervious Land Use	acre
Impervious Total	0
Basin Total	2.56

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	1.35
Pervious Total	1.35

Impervious Land Use	acre
Roads,Steep(10-20%)	0.57
Roof Area	0.36
Driveways,St(10-20%)	0.17
Impervious Total	1.1
Basin Total	2.45

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 2	Surface retention 2	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 2

Bottom Length:	40.00 ft.
Bottom Width:	60.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	2
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	107.42
Total Volume Through Riser (ac-ft.):	25.409
Total Volume Through Facility (ac-ft.):	173.206
Percent Infiltrated:	62.02
Total Precip Applied to Facility:	4.88
Total Evap From Facility:	2.11
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	2.25
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	40.377
Total Outflow (ac-ft.):	173.206
Percent Through Underdrain:	23.31
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0551	0.0000	0.0000	0.0000
0.0495	0.0551	0.0010	0.0000	0.0000
0.0989	0.0551	0.0021	0.0000	0.0000
0.1484	0.0551	0.0031	0.0000	0.0000
0.1978	0.0551	0.0041	0.0000	0.0000
0.2473	0.0551	0.0052	0.0000	0.0000
0.2967	0.0551	0.0062	0.0000	0.0000
0.3462	0.0551	0.0072	0.0000	0.0000
0.3956	0.0551	0.0083	0.0000	0.0125
0.4451	0.0551	0.0093	0.0000	0.0153
0.4945	0.0551	0.0104	0.0000	0.0169
0.5440	0.0551	0.0114	0.0000	0.0187
0.5934	0.0551	0.0124	0.0000	0.0206
0.6429	0.0551	0.0135	0.0000	0.0227
0.6923	0.0551	0.0145	0.0000	0.0250
0.7418	0.0551	0.0155	0.0000	0.0274
0.7912	0.0551	0.0166	0.0000	0.0299
0.8407	0.0551	0.0176	0.0000	0.0327
0.8901	0.0551	0.0186	0.0000	0.0356

0.9396	0.0551	0.0197	0.0000	0.0387
0.9890	0.0551	0.0207	0.0000	0.0420
1.0385	0.0551	0.0217	0.0000	0.0454
1.0879	0.0551	0.0228	0.0000	0.0491
1.1374	0.0551	0.0238	0.0000	0.0529
1.1868	0.0551	0.0248	0.0000	0.0569
1.2363	0.0551	0.0259	0.0000	0.0612
1.2857	0.0551	0.0269	0.0000	0.0656
1.3352	0.0551	0.0280	0.0000	0.0703
1.3846	0.0551	0.0290	0.0049	0.0703
1.4341	0.0551	0.0300	0.0099	0.0703
1.4835	0.0551	0.0311	0.0152	0.0703
1.5330	0.0551	0.0322	0.0207	0.0703
1.5824	0.0551	0.0333	0.0264	0.0703
1.6319	0.0551	0.0345	0.0322	0.0704
1.6813	0.0551	0.0356	0.0361	0.0726
1.7308	0.0551	0.0367	0.0401	0.0750
1.7802	0.0551	0.0378	0.0442	0.0776
1.8297	0.0551	0.0390	0.0483	0.0803
1.8791	0.0551	0.0401	0.0526	0.0831
1.9286	0.0551	0.0412	0.0570	0.0860
1.9780	0.0551	0.0424	0.0615	0.0890
2.0275	0.0551	0.0435	0.0662	0.0921
2.0769	0.0551	0.0446	0.0710	0.0953
2.1264	0.0551	0.0458	0.0760	0.0986
2.1758	0.0551	0.0469	0.0812	0.1020
2.2253	0.0551	0.0480	0.0865	0.1054
2.2747	0.0551	0.0492	0.0921	0.1089
2.3242	0.0551	0.0503	0.0985	0.1111
2.3736	0.0551	0.0514	0.1008	0.1111
2.4231	0.0551	0.0525	0.1031	0.1111
2.4725	0.0551	0.0537	0.1053	0.1111
2.5000	0.0551	0.0543	0.1066	0.1111

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0551	0.0543	0.0000	0.2801	0.0009
2.5495	0.0556	0.0570	0.0000	0.2801	0.0018
2.5989	0.0560	0.0598	0.0000	0.3010	0.0028
2.6484	0.0565	0.0626	0.0000	0.3128	0.0037
2.6978	0.0569	0.0654	0.0000	0.3249	0.0046
2.7473	0.0574	0.0682	0.0000	0.3370	0.0056
2.7967	0.0579	0.0711	0.0000	0.3494	0.0065
2.8462	0.0583	0.0739	0.0000	0.3619	0.0074
2.8956	0.0588	0.0768	0.0000	0.3745	0.0084
2.9451	0.0593	0.0797	0.0000	0.3874	0.0093
2.9945	0.0597	0.0827	0.0000	0.4004	0.0103
3.0440	0.0602	0.0857	0.0000	0.4136	0.0112
3.0934	0.0607	0.0886	0.0000	0.4269	0.0122
3.1429	0.0612	0.0917	0.0000	0.4404	0.0132
3.1923	0.0616	0.0947	0.0000	0.4541	0.0141
3.2418	0.0621	0.0977	0.0000	0.4680	0.0151
3.2912	0.0626	0.1008	0.0000	0.4820	0.0161
3.3407	0.0631	0.1039	0.0000	0.4962	0.0171
3.3901	0.0636	0.1071	0.0000	0.5106	0.0181
3.4396	0.0640	0.1102	0.0000	0.5252	0.0190
3.4890	0.0645	0.1134	0.0000	0.5399	0.0200
3.5385	0.0650	0.1166	0.0800	0.5548	0.0210

3.5879	0.0655	0.1198	0.2754	0.5699	0.0220
3.6374	0.0660	0.1231	0.5323	0.5852	0.0230
3.6868	0.0665	0.1264	0.8261	0.6006	0.0240
3.7363	0.0670	0.1297	1.1332	0.6163	0.0250
3.7857	0.0675	0.1330	1.4294	0.6321	0.0260
3.8352	0.0680	0.1363	1.6924	0.6481	0.0271
3.8846	0.0685	0.1397	1.9054	0.6643	0.0281
3.9341	0.0690	0.1431	2.0620	0.6807	0.0291
3.9835	0.0695	0.1465	2.1721	0.6972	0.0301
4.0330	0.0700	0.1500	2.2994	0.7140	0.0312
4.0824	0.0705	0.1535	2.4037	0.7309	0.0322
4.1319	0.0711	0.1570	2.5036	0.7480	0.0332
4.1813	0.0716	0.1605	2.5998	0.7653	0.0343
4.2308	0.0721	0.1640	2.6925	0.7828	0.0353
4.2802	0.0726	0.1676	2.7821	0.8005	0.0364
4.3297	0.0731	0.1712	2.8689	0.8184	0.0374
4.3791	0.0736	0.1749	2.9531	0.8365	0.0385
4.4286	0.0742	0.1785	3.0351	0.8547	0.0395
4.4780	0.0747	0.1822	3.1148	0.8732	0.0400
4.5000	0.0749	0.1838	3.1926	0.8815	0.0900

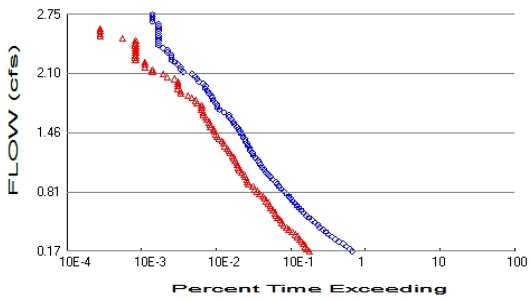
Surface retention 2

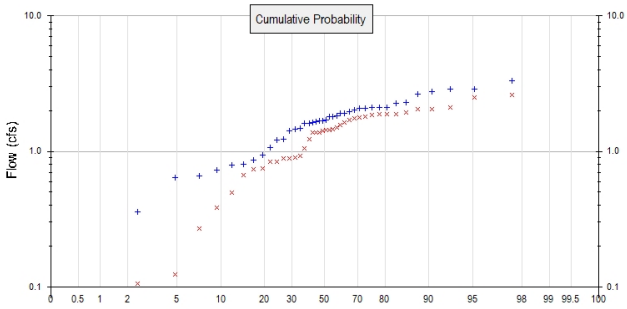
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 2

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.56
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.35
Total Impervious Area: 1.1

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	1.68858
5 year	2.119384
10 year	2.748249
25 year	2.979388

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	1.41484
5 year	1.869403
10 year	2.056425
25 year	2.50563

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	1.072	0.920
1961	0.658	0.496
1962	1.919	1.764
1963	2.071	1.868
1964	2.860	2.485
1965	1.449	0.889
1966	0.729	0.666
1967	2.078	1.857
1968	2.897	2.592
1969	1.689	1.506
1970	1.973	1.696
1971	1.838	1.633
1972	0.794	0.271
1973	2.248	1.870

1974	1.629	1.387
1975	1.797	0.894
1976	0.111	0.104
1977	0.359	0.123
1978	1.481	1.238
1979	1.895	1.374
1980	2.309	2.055
1981	0.941	0.739
1982	2.776	1.790
1983	2.121	1.936
1984	1.238	0.840
1985	2.660	2.057
1986	2.118	1.881
1987	0.867	0.751
1988	1.421	1.053
1989	0.640	0.105
1990	1.221	0.835
1991	1.610	0.890
1992	2.027	1.811
1993	2.103	1.440
1994	1.599	1.415
1995	1.701	1.554
1996	3.330	2.106
1997	1.661	1.446
1998	1.815	1.368
1999	0.802	0.385
2000	1.689	1.464

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	3.3296	2.5922
2	2.8970	2.4853
3	2.8603	2.1061
4	2.7757	2.0569
5	2.6603	2.0548
6	2.3090	1.9362
7	2.2479	1.8814
8	2.1208	1.8703
9	2.1176	1.8682
10	2.1026	1.8574
11	2.0781	1.8114
12	2.0708	1.7899
13	2.0268	1.7638
14	1.9731	1.6962
15	1.9187	1.6326
16	1.8953	1.5540
17	1.8381	1.5057
18	1.8149	1.4644
19	1.7969	1.4457
20	1.7009	1.4403
21	1.6886	1.4148
22	1.6885	1.3866
23	1.6611	1.3739
24	1.6290	1.3683
25	1.6104	1.2381
26	1.5994	1.0527
27	1.4811	0.9197

28	1.4485	0.8938
29	1.4209	0.8902
30	1.2378	0.8891
31	1.2205	0.8399
32	1.0725	0.8347
33	0.9415	0.7505
34	0.8667	0.7387
35	0.8019	0.6657
36	0.7937	0.4956
37	0.7287	0.3848
38	0.6582	0.2710
39	0.6397	0.1232
40	0.3594	0.1054
41	0.1114	0.1040

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1689	2400	641	26	Pass
0.1949	2212	590	26	Pass
0.2210	2015	561	27	Pass
0.2470	1800	534	29	Pass
0.2731	1596	501	31	Pass
0.2991	1419	476	33	Pass
0.3252	1287	444	34	Pass
0.3512	1169	415	35	Pass
0.3773	1062	375	35	Pass
0.4033	964	338	35	Pass
0.4294	886	316	35	Pass
0.4555	836	289	34	Pass
0.4815	760	272	35	Pass
0.5076	685	259	37	Pass
0.5336	632	241	38	Pass
0.5597	583	227	38	Pass
0.5857	538	221	41	Pass
0.6118	497	208	41	Pass
0.6378	462	196	42	Pass
0.6639	433	191	44	Pass
0.6899	409	182	44	Pass
0.7160	386	169	43	Pass
0.7421	357	160	44	Pass
0.7681	338	151	44	Pass
0.7942	316	139	43	Pass
0.8202	290	127	43	Pass
0.8463	268	117	43	Pass
0.8723	249	112	44	Pass
0.8984	238	98	41	Pass
0.9244	229	93	40	Pass
0.9505	205	92	44	Pass
0.9765	193	88	45	Pass
1.0026	179	85	47	Pass
1.0287	167	79	47	Pass
1.0547	159	73	45	Pass
1.0808	148	70	47	Pass
1.1068	142	69	48	Pass
1.1329	135	68	50	Pass
1.1589	130	65	50	Pass
1.1850	121	62	51	Pass
1.2110	115	59	51	Pass
1.2371	110	55	50	Pass
1.2631	104	53	50	Pass
1.2892	101	51	50	Pass
1.3153	97	47	48	Pass
1.3413	93	45	48	Pass
1.3674	88	43	48	Pass
1.3934	87	39	44	Pass
1.4195	82	37	45	Pass
1.4455	79	36	45	Pass
1.4716	75	34	45	Pass
1.4976	72	33	45	Pass
1.5237	68	30	44	Pass

1.5497	64	30	46	Pass
1.5758	61	29	47	Pass
1.6019	57	27	47	Pass
1.6279	54	26	48	Pass
1.6540	53	24	45	Pass
1.6800	46	24	52	Pass
1.7061	40	23	57	Pass
1.7321	37	23	62	Pass
1.7582	37	23	62	Pass
1.7842	35	20	57	Pass
1.8103	33	19	57	Pass
1.8363	32	17	53	Pass
1.8624	31	15	48	Pass
1.8885	29	12	41	Pass
1.9145	28	12	42	Pass
1.9406	26	11	42	Pass
1.9666	26	11	42	Pass
1.9927	24	11	45	Pass
2.0187	21	11	52	Pass
2.0448	20	10	50	Pass
2.0708	19	8	42	Pass
2.0969	17	7	41	Pass
2.1229	13	5	38	Pass
2.1490	12	5	41	Pass
2.1751	12	4	33	Pass
2.2011	11	4	36	Pass
2.2272	10	4	40	Pass
2.2532	9	3	33	Pass
2.2793	9	3	33	Pass
2.3053	9	3	33	Pass
2.3314	8	3	37	Pass
2.3574	8	3	37	Pass
2.3835	7	3	42	Pass
2.4095	6	3	50	Pass
2.4356	6	3	50	Pass
2.4617	6	3	50	Pass
2.4877	6	2	33	Pass
2.5138	6	1	16	Pass
2.5398	6	1	16	Pass
2.5659	6	1	16	Pass
2.5919	6	1	16	Pass
2.6180	6	0	0	Pass
2.6440	6	0	0	Pass
2.6701	5	0	0	Pass
2.6961	5	0	0	Pass
2.7222	5	0	0	Pass
2.7482	5	0	0	Pass

DMA 3 Hydromodification

Landuse Basin Data

Predeveloped Land Use

Basin 3

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C D,Shrub,St(10-20%)	3.2
Pervious Total	3.2
Impervious Land Use	acre
Impervious Total	0
Basin Total	3.2

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 3

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	1.97
Pervious Total	1.97

Impervious Land Use	acre
Roads,Steep(10-20%)	0.6
Roof Area	0.37
Driveways,St(10-20%)	0.15
Sidewalks,St(10-20%)	0.11
Impervious Total	1.23
Basin Total	3.2

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 3	Surface retention 3	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 3

Bottom Length:	61.30 ft.
Bottom Width:	40.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	16.772
Total Volume Through Riser (ac-ft.):	41.989
Total Volume Through Facility (ac-ft.):	138.371
Percent Infiltrated:	12.12
Total Precip Applied to Facility:	3.2
Total Evap From Facility:	1.437
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	2.25
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	79.61
Total Outflow (ac-ft.):	138.371
Percent Through Underdrain:	57.53
Discharge Structure	
Riser Height:	1.5 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0563	0.0000	0.0000	0.0000
0.0549	0.0563	0.0012	0.0000	0.0000
0.1099	0.0563	0.0024	0.0000	0.0000
0.1648	0.0563	0.0035	0.0000	0.0000
0.2198	0.0563	0.0047	0.0000	0.0000
0.2747	0.0563	0.0059	0.0000	0.0000
0.3297	0.0563	0.0071	0.0000	0.0000
0.3846	0.0563	0.0082	0.0000	0.0057
0.4396	0.0563	0.0094	0.0000	0.0057
0.4945	0.0563	0.0106	0.0000	0.0057
0.5495	0.0563	0.0118	0.0000	0.0057
0.6044	0.0563	0.0129	0.0000	0.0057
0.6593	0.0563	0.0141	0.0000	0.0057
0.7143	0.0563	0.0153	0.0000	0.0057
0.7692	0.0563	0.0165	0.0000	0.0057
0.8242	0.0563	0.0176	0.0000	0.0057
0.8791	0.0563	0.0188	0.0000	0.0057
0.9341	0.0563	0.0200	0.0000	0.0057
0.9890	0.0563	0.0212	0.0000	0.0057

1.0440	0.0563	0.0223	0.0000	0.0057
1.0989	0.0563	0.0235	0.0000	0.0057
1.1538	0.0563	0.0247	0.0000	0.0057
1.2088	0.0563	0.0259	0.0000	0.0057
1.2637	0.0563	0.0270	0.0000	0.0057
1.3187	0.0563	0.0282	0.0000	0.0057
1.3736	0.0563	0.0294	0.0178	0.0057
1.4286	0.0563	0.0306	0.0290	0.0057
1.4835	0.0563	0.0317	0.0370	0.0057
1.5385	0.0563	0.0330	0.0435	0.0057
1.5934	0.0563	0.0343	0.0492	0.0057
1.6484	0.0563	0.0356	0.0543	0.0057
1.7033	0.0563	0.0369	0.0589	0.0057
1.7582	0.0563	0.0382	0.0632	0.0057
1.8132	0.0563	0.0394	0.0673	0.0057
1.8681	0.0563	0.0407	0.0711	0.0057
1.9231	0.0563	0.0420	0.0747	0.0057
1.9780	0.0563	0.0433	0.0782	0.0057
2.0330	0.0563	0.0446	0.0815	0.0057
2.0879	0.0563	0.0459	0.0847	0.0057
2.1429	0.0563	0.0471	0.0878	0.0057
2.1978	0.0563	0.0484	0.0909	0.0057
2.2527	0.0563	0.0497	0.0940	0.0057
2.3077	0.0563	0.0510	0.0987	0.0057
2.3626	0.0563	0.0523	0.1013	0.0057
2.4176	0.0563	0.0536	0.1038	0.0057
2.4725	0.0563	0.0548	0.1063	0.0057
2.5000	0.0563	0.0555	0.1075	0.0057

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0563	0.0555	0.0000	0.2864	0.0001
2.5549	0.0568	0.0586	0.0000	0.2864	0.0001
2.6099	0.0573	0.0617	0.0000	0.3101	0.0002
2.6648	0.0578	0.0649	0.0000	0.3236	0.0002
2.7198	0.0584	0.0681	0.0000	0.3373	0.0003
2.7747	0.0589	0.0713	0.0000	0.3512	0.0003
2.8297	0.0594	0.0745	0.0000	0.3653	0.0004
2.8846	0.0599	0.0778	0.0000	0.3796	0.0004
2.9396	0.0604	0.0811	0.0000	0.3941	0.0005
2.9945	0.0610	0.0845	0.0000	0.4088	0.0005
3.0495	0.0615	0.0878	0.0000	0.4237	0.0006
3.1044	0.0620	0.0912	0.0000	0.4389	0.0006
3.1593	0.0626	0.0946	0.0000	0.4542	0.0007
3.2143	0.0631	0.0981	0.0000	0.4698	0.0007
3.2692	0.0637	0.1016	0.0000	0.4856	0.0008
3.3242	0.0642	0.1051	0.0000	0.5016	0.0009
3.3791	0.0648	0.1086	0.0000	0.5178	0.0009
3.4341	0.0653	0.1122	0.0000	0.5342	0.0010
3.4890	0.0658	0.1158	0.0000	0.5509	0.0010
3.5440	0.0664	0.1195	0.0000	0.5678	0.0011
3.5989	0.0670	0.1231	0.0000	0.5849	0.0011
3.6538	0.0675	0.1268	0.0000	0.6022	0.0012
3.7088	0.0681	0.1305	0.0000	0.6198	0.0012
3.7637	0.0686	0.1343	0.0000	0.6375	0.0013
3.8187	0.0692	0.1381	0.0000	0.6556	0.0014
3.8736	0.0698	0.1419	0.0000	0.6738	0.0014
3.9286	0.0703	0.1457	0.0000	0.6923	0.0015

3.9835	0.0709	0.1496	0.0000	0.7110	0.0015
4.0385	0.0715	0.1535	0.0800	0.7299	0.0016
4.0934	0.0720	0.1575	0.3014	0.7491	0.0016
4.1484	0.0726	0.1615	0.5952	0.7685	0.0017
4.2033	0.0732	0.1655	0.9282	0.7881	0.0018
4.2582	0.0738	0.1695	1.2676	0.8080	0.0018
4.3132	0.0744	0.1736	1.5809	0.8281	0.0019
4.3681	0.0749	0.1777	1.8406	0.8485	0.0019
4.4231	0.0755	0.1818	2.0318	0.8691	0.0020
4.4780	0.0761	0.1860	2.1614	0.8899	0.0021
4.5330	0.0767	0.1902	2.2994	0.9110	0.0021
4.5879	0.0773	0.1944	2.4150	0.9324	0.0022
4.6429	0.0779	0.1987	2.5253	0.9539	0.0022
4.6978	0.0785	0.2030	2.6310	0.9758	0.0023
4.7527	0.0791	0.2073	2.7327	0.9978	0.0024
4.8077	0.0797	0.2117	2.8306	1.0202	0.0024
4.8626	0.0803	0.2160	2.9253	1.0428	0.0025
4.9176	0.0809	0.2205	3.0170	1.0656	0.0025
4.9725	0.0815	0.2249	3.1061	1.0887	0.0026
5.0000	0.0818	0.2272	3.1926	1.1003	0.0900

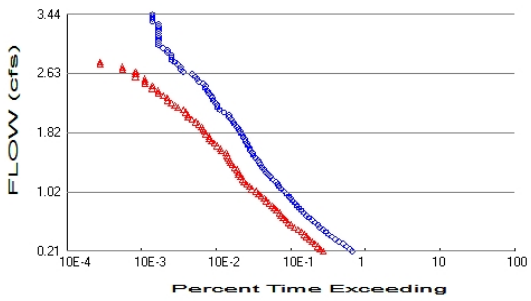
Surface retention 3

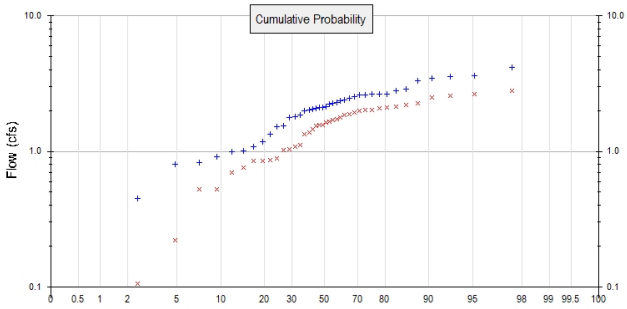
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 3

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 3.2
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.97
Total Impervious Area: 1.23

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.11072
5 year	2.649231
10 year	3.435318
25 year	3.724238

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	1.56858
5 year	2.0936
10 year	2.429868
25 year	2.685504

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	1.341	1.044
1961	0.823	0.522
1962	2.398	1.922
1963	2.589	2.027
1964	3.575	2.658
1965	1.811	1.117
1966	0.911	0.692
1967	2.598	2.013
1968	3.621	2.801
1969	2.111	1.707
1970	2.466	1.894
1971	2.298	1.789
1972	0.992	0.527
1973	2.810	2.151

1974	2.036	1.569
1975	2.246	1.080
1976	0.139	0.080
1977	0.449	0.222
1978	1.851	1.462
1979	2.369	1.338
1980	2.886	2.259
1981	1.177	0.850
1982	3.470	2.567
1983	2.651	2.113
1984	1.547	0.890
1985	3.325	2.186
1986	2.647	2.068
1987	1.083	0.865
1988	1.776	1.386
1989	0.800	0.106
1990	1.526	0.852
1991	2.013	1.019
1992	2.533	1.978
1993	2.628	1.856
1994	1.999	1.554
1995	2.126	1.727
1996	4.162	2.483
1997	2.076	1.653
1998	2.269	1.554
1999	1.002	0.762
2000	2.111	1.643

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.1620	2.8013
2	3.6212	2.6583
3	3.5754	2.5669
4	3.4697	2.4834
5	3.3254	2.2585
6	2.8862	2.1855
7	2.8099	2.1508
8	2.6510	2.1127
9	2.6469	2.0682
10	2.6282	2.0265
11	2.5976	2.0126
12	2.5885	1.9780
13	2.5335	1.9218
14	2.4664	1.8937
15	2.3984	1.8565
16	2.3691	1.7890
17	2.2977	1.7272
18	2.2686	1.7070
19	2.2462	1.6532
20	2.1261	1.6426
21	2.1107	1.5686
22	2.1107	1.5538
23	2.0764	1.5536
24	2.0362	1.4617
25	2.0130	1.3856
26	1.9992	1.3379
27	1.8514	1.1168

28	1.8107	1.0798
29	1.7761	1.0439
30	1.5472	1.0190
31	1.5257	0.8896
32	1.3406	0.8645
33	1.1769	0.8524
34	1.0834	0.8502
35	1.0024	0.7618
36	0.9922	0.6919
37	0.9109	0.5273
38	0.8228	0.5223
39	0.7997	0.2221
40	0.4493	0.1064
41	0.1393	0.0801

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2111	2391	980	40	Pass
0.2436	2208	894	40	Pass
0.2762	2009	832	41	Pass
0.3088	1801	757	42	Pass
0.3413	1596	689	43	Pass
0.3739	1425	642	45	Pass
0.4065	1288	589	45	Pass
0.4390	1166	548	46	Pass
0.4716	1063	504	47	Pass
0.5042	963	450	46	Pass
0.5368	886	398	44	Pass
0.5693	836	359	42	Pass
0.6019	760	332	43	Pass
0.6345	684	308	45	Pass
0.6670	632	284	44	Pass
0.6996	582	265	45	Pass
0.7322	535	253	47	Pass
0.7647	497	232	46	Pass
0.7973	462	216	46	Pass
0.8299	433	201	46	Pass
0.8624	408	185	45	Pass
0.8950	386	169	43	Pass
0.9276	358	159	44	Pass
0.9601	338	144	42	Pass
0.9927	317	134	42	Pass
1.0253	290	124	42	Pass
1.0578	268	109	40	Pass
1.0904	249	100	40	Pass
1.1230	239	92	38	Pass
1.1555	229	85	37	Pass
1.1881	204	82	40	Pass
1.2207	193	76	39	Pass
1.2533	179	72	40	Pass
1.2858	167	72	43	Pass
1.3184	159	69	43	Pass
1.3510	148	63	42	Pass
1.3835	142	59	41	Pass
1.4161	135	56	41	Pass
1.4487	130	54	41	Pass
1.4812	121	52	42	Pass
1.5138	115	51	44	Pass
1.5464	110	49	44	Pass
1.5789	104	42	40	Pass
1.6115	101	41	40	Pass
1.6441	96	37	38	Pass
1.6766	93	34	36	Pass
1.7092	88	31	35	Pass
1.7418	87	29	33	Pass
1.7743	82	29	35	Pass
1.8069	79	26	32	Pass
1.8395	75	25	33	Pass
1.8720	72	24	33	Pass
1.9046	68	23	33	Pass

1.9372	64	21	32	Pass
1.9698	61	19	31	Pass
2.0023	57	17	29	Pass
2.0349	54	15	27	Pass
2.0675	53	15	28	Pass
2.1000	46	14	30	Pass
2.1326	40	13	32	Pass
2.1652	37	11	29	Pass
2.1977	37	10	27	Pass
2.2303	35	9	25	Pass
2.2629	33	8	24	Pass
2.2954	32	8	25	Pass
2.3280	31	7	22	Pass
2.3606	29	6	20	Pass
2.3931	28	6	21	Pass
2.4257	26	5	19	Pass
2.4583	26	5	19	Pass
2.4908	24	4	16	Pass
2.5234	21	4	19	Pass
2.5560	20	4	20	Pass
2.5885	19	3	15	Pass
2.6211	17	3	17	Pass
2.6537	13	3	23	Pass
2.6863	12	2	16	Pass
2.7188	12	2	16	Pass
2.7514	11	1	9	Pass
2.7840	10	1	10	Pass
2.8165	9	0	0	Pass
2.8491	9	0	0	Pass
2.8817	9	0	0	Pass
2.9142	8	0	0	Pass
2.9468	8	0	0	Pass
2.9794	7	0	0	Pass
3.0119	6	0	0	Pass
3.0445	6	0	0	Pass
3.0771	6	0	0	Pass
3.1096	6	0	0	Pass
3.1422	6	0	0	Pass
3.1748	6	0	0	Pass
3.2073	6	0	0	Pass
3.2399	6	0	0	Pass
3.2725	6	0	0	Pass
3.3050	6	0	0	Pass
3.3376	5	0	0	Pass
3.3702	5	0	0	Pass
3.4027	5	0	0	Pass
3.4353	5	0	0	Pass

DMA 4 Hydromodification

Landuse Basin Data
Predeveloped Land Use

Basin 4

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	2.98
Pervious Total	2.98

Impervious Land Use	acre
Impervious Total	0
Basin Total	2.98

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 4

Bypass: No

GroundWater: No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	2.09
Pervious Total	2.09

Impervious Land Use	acre
Roads,Steep(10-20%)	0.11
Roof Area	0.36
Driveways,St(10-20%)	0.31
Sidewalks,St(10-20%)	0.11
Impervious Total	0.89
Basin Total	2.98

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 4	Surface retention 4	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 4

Bottom Length:	41.80 ft.
Bottom Width:	40.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	22.282
Total Volume Through Riser (ac-ft.):	68.467
Total Volume Through Facility (ac-ft.):	188.723
Percent Infiltrated:	11.81
Total Precip Applied to Facility:	3.863
Total Evap From Facility:	1.626
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	2.25
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	97.974
Total Outflow (ac-ft.):	188.723
Percent Through Underdrain:	51.91
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0384	0.0000	0.0000	0.0000
0.0495	0.0384	0.0007	0.0000	0.0000
0.0989	0.0384	0.0014	0.0000	0.0000
0.1484	0.0384	0.0022	0.0000	0.0000
0.1978	0.0384	0.0029	0.0000	0.0000
0.2473	0.0384	0.0036	0.0000	0.0000
0.2967	0.0384	0.0043	0.0000	0.0000
0.3462	0.0384	0.0050	0.0000	0.0000
0.3956	0.0384	0.0058	0.0000	0.0039
0.4451	0.0384	0.0065	0.0000	0.0039
0.4945	0.0384	0.0072	0.0000	0.0039
0.5440	0.0384	0.0079	0.0000	0.0039
0.5934	0.0384	0.0087	0.0000	0.0039
0.6429	0.0384	0.0094	0.0000	0.0039
0.6923	0.0384	0.0101	0.0000	0.0039
0.7418	0.0384	0.0108	0.0000	0.0039
0.7912	0.0384	0.0115	0.0000	0.0039
0.8407	0.0384	0.0123	0.0000	0.0039
0.8901	0.0384	0.0130	0.0000	0.0039

0.9396	0.0384	0.0137	0.0000	0.0039
0.9890	0.0384	0.0144	0.0000	0.0039
1.0385	0.0384	0.0151	0.0000	0.0039
1.0879	0.0384	0.0159	0.0000	0.0039
1.1374	0.0384	0.0166	0.0000	0.0039
1.1868	0.0384	0.0173	0.0000	0.0039
1.2363	0.0384	0.0180	0.0000	0.0039
1.2857	0.0384	0.0188	0.0000	0.0039
1.3352	0.0384	0.0195	0.0000	0.0039
1.3846	0.0384	0.0202	0.0146	0.0039
1.4341	0.0384	0.0209	0.0262	0.0039
1.4835	0.0384	0.0216	0.0340	0.0039
1.5330	0.0384	0.0224	0.0404	0.0039
1.5824	0.0384	0.0232	0.0459	0.0039
1.6319	0.0384	0.0240	0.0508	0.0039
1.6813	0.0384	0.0248	0.0552	0.0039
1.7308	0.0384	0.0256	0.0594	0.0039
1.7802	0.0384	0.0264	0.0632	0.0039
1.8297	0.0384	0.0272	0.0669	0.0039
1.8791	0.0384	0.0279	0.0703	0.0039
1.9286	0.0384	0.0287	0.0736	0.0039
1.9780	0.0384	0.0295	0.0768	0.0039
2.0275	0.0384	0.0303	0.0799	0.0039
2.0769	0.0384	0.0311	0.0828	0.0039
2.1264	0.0384	0.0319	0.0856	0.0039
2.1758	0.0384	0.0327	0.0884	0.0039
2.2253	0.0384	0.0335	0.0912	0.0039
2.2747	0.0384	0.0342	0.0940	0.0039
2.3242	0.0384	0.0350	0.0985	0.0039
2.3736	0.0384	0.0358	0.1008	0.0039
2.4231	0.0384	0.0366	0.1031	0.0039
2.4725	0.0384	0.0374	0.1053	0.0039
2.5000	0.0384	0.0378	0.1066	0.0039

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0384	0.0378	0.0000	0.1954	0.0000
2.5495	0.0388	0.0397	0.0000	0.1954	0.0001
2.5989	0.0391	0.0417	0.0000	0.2103	0.0001
2.6484	0.0395	0.0436	0.0000	0.2189	0.0002
2.6978	0.0399	0.0456	0.0000	0.2276	0.0002
2.7473	0.0403	0.0476	0.0000	0.2365	0.0002
2.7967	0.0406	0.0496	0.0000	0.2455	0.0003
2.8462	0.0410	0.0516	0.0000	0.2546	0.0003
2.8956	0.0414	0.0536	0.0000	0.2639	0.0003
2.9451	0.0418	0.0557	0.0000	0.2733	0.0004
2.9945	0.0422	0.0577	0.0000	0.2828	0.0004
3.0440	0.0426	0.0598	0.0000	0.2925	0.0005
3.0934	0.0430	0.0620	0.0000	0.3023	0.0005
3.1429	0.0434	0.0641	0.0000	0.3123	0.0005
3.1923	0.0438	0.0662	0.0000	0.3225	0.0006
3.2418	0.0442	0.0684	0.0000	0.3327	0.0006
3.2912	0.0446	0.0706	0.0000	0.3431	0.0007
3.3407	0.0450	0.0728	0.0000	0.3537	0.0007
3.3901	0.0454	0.0751	0.0000	0.3644	0.0007
3.4396	0.0458	0.0773	0.0000	0.3753	0.0008
3.4890	0.0462	0.0796	0.0000	0.3863	0.0008
3.5385	0.0466	0.0819	0.0800	0.3974	0.0009

3.5879	0.0470	0.0842	0.2754	0.4087	0.0009
3.6374	0.0474	0.0865	0.5323	0.4202	0.0010
3.6868	0.0478	0.0889	0.8261	0.4318	0.0010
3.7363	0.0482	0.0913	1.1332	0.4436	0.0010
3.7857	0.0486	0.0936	1.4294	0.4555	0.0011
3.8352	0.0491	0.0961	1.6924	0.4676	0.0011
3.8846	0.0495	0.0985	1.9054	0.4798	0.0012
3.9341	0.0499	0.1010	2.0620	0.4922	0.0012
3.9835	0.0503	0.1034	2.1721	0.5048	0.0012
4.0330	0.0508	0.1059	2.2994	0.5175	0.0013
4.0824	0.0512	0.1085	2.4037	0.5303	0.0013
4.1319	0.0516	0.1110	2.5036	0.5434	0.0014
4.1813	0.0521	0.1136	2.5998	0.5566	0.0014
4.2308	0.0525	0.1161	2.6925	0.5699	0.0015
4.2802	0.0529	0.1188	2.7821	0.5835	0.0015
4.3297	0.0534	0.1214	2.8689	0.5971	0.0016
4.3791	0.0538	0.1240	2.9531	0.6110	0.0016
4.4286	0.0542	0.1267	3.0351	0.6250	0.0016
4.4780	0.0547	0.1294	3.1148	0.6392	0.0017
4.5000	0.0549	0.1306	3.1926	0.6456	0.0900

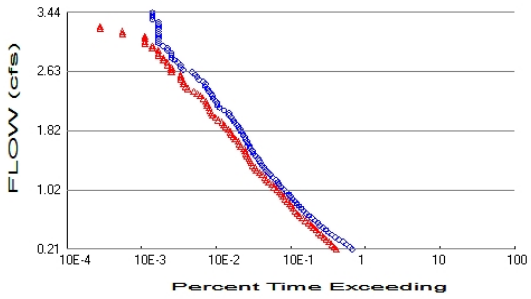
Surface retention 4

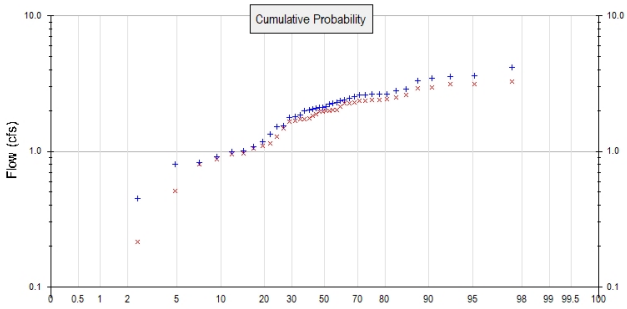
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 4

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.98
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.09
Total Impervious Area: 0.89

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.11072
5 year	2.649231
10 year	3.435318
25 year	3.724238

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	1.97013
5 year	2.424943
10 year	2.969382
25 year	3.152033

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	1.341	1.282
1961	0.823	0.802
1962	2.398	2.256
1963	2.589	2.363
1964	3.575	3.117
1965	1.811	1.749
1966	0.911	0.967
1967	2.598	2.391
1968	3.621	3.265
1969	2.111	2.002
1970	2.466	2.259
1971	2.298	2.150
1972	0.992	0.876
1973	2.810	2.512

1974	2.036	1.841
1975	2.246	1.722
1976	0.139	0.105
1977	0.449	0.509
1978	1.851	1.731
1979	2.369	2.003
1980	2.886	2.605
1981	1.177	1.099
1982	3.470	2.980
1983	2.651	2.446
1984	1.547	1.141
1985	3.325	2.937
1986	2.647	2.397
1987	1.083	1.055
1988	1.776	1.664
1989	0.800	0.215
1990	1.526	1.469
1991	2.013	1.689
1992	2.533	2.308
1993	2.628	2.370
1994	1.999	1.887
1995	2.126	2.020
1996	4.162	3.125
1997	2.076	1.960
1998	2.269	2.031
1999	1.002	0.947
2000	2.111	1.970

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.1620	3.2654
2	3.6212	3.1254
3	3.5754	3.1166
4	3.4697	2.9796
5	3.3254	2.9366
6	2.8862	2.6046
7	2.8099	2.5125
8	2.6510	2.4457
9	2.6469	2.3972
10	2.6282	2.3906
11	2.5976	2.3699
12	2.5885	2.3629
13	2.5335	2.3076
14	2.4664	2.2594
15	2.3984	2.2557
16	2.3691	2.1497
17	2.2977	2.0306
18	2.2686	2.0199
19	2.2462	2.0029
20	2.1261	2.0018
21	2.1107	1.9701
22	2.1107	1.9596
23	2.0764	1.8870
24	2.0362	1.8409
25	2.0130	1.7488
26	1.9992	1.7314
27	1.8514	1.7215

28	1.8107	1.6885
29	1.7761	1.6636
30	1.5472	1.4689
31	1.5257	1.2822
32	1.3406	1.1410
33	1.1769	1.0991
34	1.0834	1.0547
35	1.0024	0.9675
36	0.9922	0.9468
37	0.9109	0.8756
38	0.8228	0.8018
39	0.7997	0.5093
40	0.4493	0.2149
41	0.1393	0.1054

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2111	2391	1466	61	Pass
0.2436	2208	1372	62	Pass
0.2762	2009	1268	63	Pass
0.3088	1801	1162	64	Pass
0.3413	1596	1077	67	Pass
0.3739	1425	996	69	Pass
0.4065	1288	915	71	Pass
0.4390	1166	841	72	Pass
0.4716	1063	784	73	Pass
0.5042	963	727	75	Pass
0.5368	886	680	76	Pass
0.5693	836	631	75	Pass
0.6019	760	571	75	Pass
0.6345	684	514	75	Pass
0.6670	632	466	73	Pass
0.6996	582	439	75	Pass
0.7322	535	407	76	Pass
0.7647	497	387	77	Pass
0.7973	462	367	79	Pass
0.8299	433	346	79	Pass
0.8624	408	324	79	Pass
0.8950	386	299	77	Pass
0.9276	358	286	79	Pass
0.9601	338	269	79	Pass
0.9927	317	254	80	Pass
1.0253	290	235	81	Pass
1.0578	268	216	80	Pass
1.0904	249	201	80	Pass
1.1230	239	182	76	Pass
1.1555	229	169	73	Pass
1.1881	204	162	79	Pass
1.2207	193	148	76	Pass
1.2533	179	136	75	Pass
1.2858	167	124	74	Pass
1.3184	159	119	74	Pass
1.3510	148	110	74	Pass
1.3835	142	106	74	Pass
1.4161	135	102	75	Pass
1.4487	130	99	76	Pass
1.4812	121	93	76	Pass
1.5138	115	89	77	Pass
1.5464	110	87	79	Pass
1.5789	104	85	81	Pass
1.6115	101	77	76	Pass
1.6441	96	73	76	Pass
1.6766	93	71	76	Pass
1.7092	88	65	73	Pass
1.7418	87	61	70	Pass
1.7743	82	57	69	Pass
1.8069	79	56	70	Pass
1.8395	75	52	69	Pass
1.8720	72	48	66	Pass
1.9046	68	46	67	Pass

1.9372	64	43	67	Pass
1.9698	61	38	62	Pass
2.0023	57	35	61	Pass
2.0349	54	32	59	Pass
2.0675	53	31	58	Pass
2.1000	46	30	65	Pass
2.1326	40	29	72	Pass
2.1652	37	27	72	Pass
2.1977	37	27	72	Pass
2.2303	35	26	74	Pass
2.2629	33	24	72	Pass
2.2954	32	22	68	Pass
2.3280	31	20	64	Pass
2.3606	29	18	62	Pass
2.3931	28	15	53	Pass
2.4257	26	14	53	Pass
2.4583	26	13	50	Pass
2.4908	24	13	54	Pass
2.5234	21	12	57	Pass
2.5560	20	12	60	Pass
2.5885	19	12	63	Pass
2.6211	17	9	52	Pass
2.6537	13	9	69	Pass
2.6863	12	9	75	Pass
2.7188	12	8	66	Pass
2.7514	11	8	72	Pass
2.7840	10	7	70	Pass
2.8165	9	7	77	Pass
2.8491	9	6	66	Pass
2.8817	9	6	66	Pass
2.9142	8	6	75	Pass
2.9468	8	5	62	Pass
2.9794	7	5	71	Pass
3.0119	6	4	66	Pass
3.0445	6	4	66	Pass
3.0771	6	4	66	Pass
3.1096	6	4	66	Pass
3.1422	6	2	33	Pass
3.1748	6	2	33	Pass
3.2073	6	1	16	Pass
3.2399	6	1	16	Pass
3.2725	6	0	0	Pass
3.3050	6	0	0	Pass
3.3376	5	0	0	Pass
3.3702	5	0	0	Pass
3.4027	5	0	0	Pass
3.4353	5	0	0	Pass

DMA 5 Hydromodification

Landuse Basin Data

Predeveloped Land Use

Basin 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.76
Pervious Total	0.76
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.76

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 5

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.35
Pervious Total	0.35

Impervious Land Use	acre
Roads,Steep(10-20%)	0.18
Roof Area	0.19
Driveways,St(10-20%)	0.01
Sidewalks,St(10-20%)	0.03
Impervious Total	0.41
Basin Total	0.76

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 5	Surface retention 5	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 5

Bottom Length:	23.60 ft.
Bottom Width:	30.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	8.658
Total Volume Through Riser (ac-ft.):	6.947
Total Volume Through Facility (ac-ft.):	56.904
Percent Infiltrated:	15.22
Total Precip Applied to Facility:	1.594
Total Evap From Facility:	0.67
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	2.25
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	41.299
Total Outflow (ac-ft.):	56.904
Percent Through Underdrain:	72.58
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0163	0.0000	0.0000	0.0000
0.0495	0.0163	0.0003	0.0000	0.0000
0.0989	0.0163	0.0006	0.0000	0.0000
0.1484	0.0163	0.0009	0.0000	0.0000
0.1978	0.0163	0.0012	0.0000	0.0000
0.2473	0.0163	0.0015	0.0000	0.0000
0.2967	0.0163	0.0018	0.0000	0.0000
0.3462	0.0163	0.0021	0.0000	0.0000
0.3956	0.0163	0.0024	0.0000	0.0016
0.4451	0.0163	0.0027	0.0000	0.0016
0.4945	0.0163	0.0031	0.0000	0.0016
0.5440	0.0163	0.0034	0.0000	0.0016
0.5934	0.0163	0.0037	0.0000	0.0016
0.6429	0.0163	0.0040	0.0000	0.0016
0.6923	0.0163	0.0043	0.0000	0.0016
0.7418	0.0163	0.0046	0.0000	0.0016
0.7912	0.0163	0.0049	0.0000	0.0016
0.8407	0.0163	0.0052	0.0000	0.0016
0.8901	0.0163	0.0055	0.0000	0.0016

0.9396	0.0163	0.0058	0.0000	0.0016
0.9890	0.0163	0.0061	0.0000	0.0016
1.0385	0.0163	0.0064	0.0000	0.0016
1.0879	0.0163	0.0067	0.0000	0.0016
1.1374	0.0163	0.0070	0.0000	0.0016
1.1868	0.0163	0.0073	0.0000	0.0016
1.2363	0.0163	0.0076	0.0000	0.0016
1.2857	0.0163	0.0079	0.0000	0.0016
1.3352	0.0163	0.0082	0.0000	0.0016
1.3846	0.0163	0.0086	0.0146	0.0016
1.4341	0.0163	0.0089	0.0220	0.0016
1.4835	0.0163	0.0092	0.0236	0.0016
1.5330	0.0163	0.0095	0.0262	0.0016
1.5824	0.0163	0.0098	0.0304	0.0016
1.6319	0.0163	0.0102	0.0323	0.0016
1.6813	0.0163	0.0105	0.0340	0.0016
1.7308	0.0163	0.0108	0.0404	0.0016
1.7802	0.0163	0.0112	0.0428	0.0016
1.8297	0.0163	0.0115	0.0451	0.0016
1.8791	0.0163	0.0118	0.0499	0.0016
1.9286	0.0163	0.0122	0.0524	0.0016
1.9780	0.0163	0.0125	0.0550	0.0016
2.0275	0.0163	0.0128	0.0594	0.0016
2.0769	0.0163	0.0132	0.0632	0.0016
2.1264	0.0163	0.0135	0.0661	0.0016
2.1758	0.0163	0.0138	0.0690	0.0016
2.2253	0.0163	0.0142	0.0721	0.0016
2.2747	0.0163	0.0145	0.0752	0.0016
2.3242	0.0163	0.0148	0.0768	0.0016
2.3736	0.0163	0.0152	0.0838	0.0016
2.4231	0.0163	0.0155	0.0893	0.0016
2.4725	0.0163	0.0158	0.0951	0.0016
2.5000	0.0163	0.0160	0.0985	0.0016

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0163	0.0160	0.0000	0.0832	0.0000
2.5495	0.0165	0.0168	0.0000	0.0832	0.0000
2.5989	0.0167	0.0177	0.0000	0.0900	0.0001
2.6484	0.0170	0.0185	0.0000	0.0941	0.0001
2.6978	0.0172	0.0193	0.0000	0.0984	0.0001
2.7473	0.0175	0.0202	0.0000	0.1027	0.0002
2.7967	0.0177	0.0211	0.0000	0.1072	0.0002
2.8462	0.0180	0.0219	0.0000	0.1117	0.0002
2.8956	0.0183	0.0228	0.0000	0.1163	0.0002
2.9451	0.0185	0.0238	0.0000	0.1211	0.0003
2.9945	0.0188	0.0247	0.0000	0.1259	0.0003
3.0440	0.0190	0.0256	0.0000	0.1308	0.0003
3.0934	0.0193	0.0266	0.0000	0.1358	0.0003
3.1429	0.0196	0.0275	0.0000	0.1409	0.0004
3.1923	0.0198	0.0285	0.0000	0.1462	0.0004
3.2418	0.0201	0.0295	0.0000	0.1515	0.0004
3.2912	0.0204	0.0305	0.0000	0.1569	0.0004
3.3407	0.0207	0.0315	0.0000	0.1625	0.0005
3.3901	0.0209	0.0325	0.0000	0.1681	0.0005
3.4396	0.0212	0.0336	0.0000	0.1739	0.0005
3.4890	0.0215	0.0346	0.0000	0.1797	0.0006
3.5385	0.0218	0.0357	0.0800	0.1857	0.0006

3.5879	0.0220	0.0368	0.2754	0.1917	0.0006
3.6374	0.0223	0.0379	0.5323	0.1979	0.0006
3.6868	0.0226	0.0390	0.8261	0.2042	0.0007
3.7363	0.0229	0.0401	1.1332	0.2106	0.0007
3.7857	0.0232	0.0412	1.4294	0.2171	0.0007
3.8352	0.0235	0.0424	1.6924	0.2237	0.0008
3.8846	0.0238	0.0436	1.9054	0.2305	0.0008
3.9341	0.0241	0.0447	2.0620	0.2373	0.0008
3.9835	0.0244	0.0459	2.1721	0.2443	0.0008
4.0330	0.0247	0.0472	2.2994	0.2514	0.0009
4.0824	0.0250	0.0484	2.4037	0.2586	0.0009
4.1319	0.0253	0.0496	2.5036	0.2659	0.0009
4.1813	0.0256	0.0509	2.5998	0.2734	0.0010
4.2308	0.0259	0.0522	2.6925	0.2809	0.0010
4.2802	0.0262	0.0534	2.7821	0.2886	0.0010
4.3297	0.0265	0.0547	2.8689	0.2964	0.0011
4.3791	0.0268	0.0561	2.9531	0.3044	0.0011
4.4286	0.0271	0.0574	3.0351	0.3124	0.0011
4.4780	0.0274	0.0587	3.1148	0.3206	0.0011
4.5000	0.0276	0.0593	3.1926	0.3243	0.0900

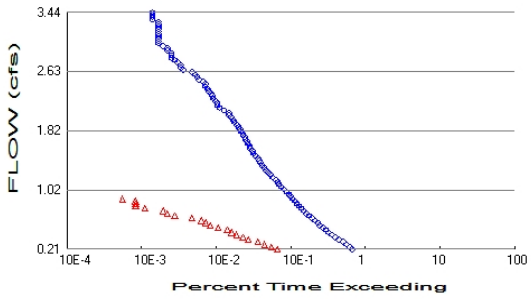
Surface retention 5

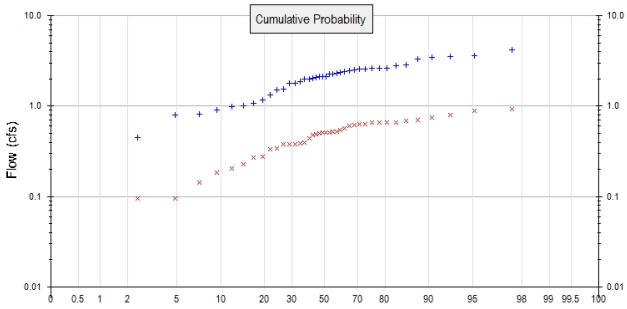
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 5

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.76
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.35
Total Impervious Area: 0.41

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.11072
5 year	2.649231
10 year	3.435318
25 year	3.724238

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.511223
5 year	0.657424
10 year	0.742802
25 year	0.900029

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	1.341	0.333
1961	0.823	0.206
1962	2.398	0.610
1963	2.589	0.653
1964	3.575	0.918
1965	1.811	0.382
1966	0.911	0.268
1967	2.598	0.664
1968	3.621	0.896
1969	2.111	0.522
1970	2.466	0.615
1971	2.298	0.571
1972	0.992	0.183
1973	2.810	0.689

1974	2.036	0.479
1975	2.246	0.378
1976	0.139	0.089
1977	0.449	0.095
1978	1.851	0.443
1979	2.369	0.546
1980	2.886	0.707
1981	1.177	0.278
1982	3.470	0.633
1983	2.651	0.660
1984	1.547	0.399
1985	3.325	0.754
1986	2.647	0.653
1987	1.083	0.227
1988	1.776	0.376
1989	0.800	0.095
1990	1.526	0.344
1991	2.013	0.384
1992	2.533	0.632
1993	2.628	0.513
1994	1.999	0.503
1995	2.126	0.526
1996	4.162	0.791
1997	2.076	0.511
1998	2.269	0.494
1999	1.002	0.144
2000	2.111	0.515

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.1620	0.9182
2	3.6212	0.8958
3	3.5754	0.7913
4	3.4697	0.7541
5	3.3254	0.7066
6	2.8862	0.6894
7	2.8099	0.6637
8	2.6510	0.6604
9	2.6469	0.6534
10	2.6282	0.6527
11	2.5976	0.6329
12	2.5885	0.6323
13	2.5335	0.6152
14	2.4664	0.6097
15	2.3984	0.5711
16	2.3691	0.5463
17	2.2977	0.5260
18	2.2686	0.5222
19	2.2462	0.5150
20	2.1261	0.5128
21	2.1107	0.5112
22	2.1107	0.5029
23	2.0764	0.4936
24	2.0362	0.4789
25	2.0130	0.4432
26	1.9992	0.3989
27	1.8514	0.3841

28	1.8107	0.3822
29	1.7761	0.3783
30	1.5472	0.3759
31	1.5257	0.3445
32	1.3406	0.3333
33	1.1769	0.2784
34	1.0834	0.2681
35	1.0024	0.2271
36	0.9922	0.2058
37	0.9109	0.1827
38	0.8228	0.1438
39	0.7997	0.0952
40	0.4493	0.0952
41	0.1393	0.0889

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2111	2391	238	9	Pass
0.2436	2208	197	8	Pass
0.2762	2009	160	7	Pass
0.3088	1801	131	7	Pass
0.3413	1596	97	6	Pass
0.3739	1425	82	5	Pass
0.4065	1288	68	5	Pass
0.4390	1166	58	4	Pass
0.4716	1063	51	4	Pass
0.5042	963	38	3	Pass
0.5368	886	30	3	Pass
0.5693	836	26	3	Pass
0.6019	760	23	3	Pass
0.6345	684	17	2	Pass
0.6670	632	10	1	Pass
0.6996	582	8	1	Pass
0.7322	535	7	1	Pass
0.7647	497	4	0	Pass
0.7973	462	3	0	Pass
0.8299	433	3	0	Pass
0.8624	408	3	0	Pass
0.8950	386	2	0	Pass
0.9276	358	0	0	Pass
0.9601	338	0	0	Pass
0.9927	317	0	0	Pass
1.0253	290	0	0	Pass
1.0578	268	0	0	Pass
1.0904	249	0	0	Pass
1.1230	239	0	0	Pass
1.1555	229	0	0	Pass
1.1881	204	0	0	Pass
1.2207	193	0	0	Pass
1.2533	179	0	0	Pass
1.2858	167	0	0	Pass
1.3184	159	0	0	Pass
1.3510	148	0	0	Pass
1.3835	142	0	0	Pass
1.4161	135	0	0	Pass
1.4487	130	0	0	Pass
1.4812	121	0	0	Pass
1.5138	115	0	0	Pass
1.5464	110	0	0	Pass
1.5789	104	0	0	Pass
1.6115	101	0	0	Pass
1.6441	96	0	0	Pass
1.6766	93	0	0	Pass
1.7092	88	0	0	Pass
1.7418	87	0	0	Pass
1.7743	82	0	0	Pass
1.8069	79	0	0	Pass
1.8395	75	0	0	Pass
1.8720	72	0	0	Pass
1.9046	68	0	0	Pass

1.9372	64	0	0	Pass
1.9698	61	0	0	Pass
2.0023	57	0	0	Pass
2.0349	54	0	0	Pass
2.0675	53	0	0	Pass
2.1000	46	0	0	Pass
2.1326	40	0	0	Pass
2.1652	37	0	0	Pass
2.1977	37	0	0	Pass
2.2303	35	0	0	Pass
2.2629	33	0	0	Pass
2.2954	32	0	0	Pass
2.3280	31	0	0	Pass
2.3606	29	0	0	Pass
2.3931	28	0	0	Pass
2.4257	26	0	0	Pass
2.4583	26	0	0	Pass
2.4908	24	0	0	Pass
2.5234	21	0	0	Pass
2.5560	20	0	0	Pass
2.5885	19	0	0	Pass
2.6211	17	0	0	Pass
2.6537	13	0	0	Pass
2.6863	12	0	0	Pass
2.7188	12	0	0	Pass
2.7514	11	0	0	Pass
2.7840	10	0	0	Pass
2.8165	9	0	0	Pass
2.8491	9	0	0	Pass
2.8817	9	0	0	Pass
2.9142	8	0	0	Pass
2.9468	8	0	0	Pass
2.9794	7	0	0	Pass
3.0119	6	0	0	Pass
3.0445	6	0	0	Pass
3.0771	6	0	0	Pass
3.1096	6	0	0	Pass
3.1422	6	0	0	Pass
3.1748	6	0	0	Pass
3.2073	6	0	0	Pass
3.2399	6	0	0	Pass
3.2725	6	0	0	Pass
3.3050	6	0	0	Pass
3.3376	5	0	0	Pass
3.3702	5	0	0	Pass
3.4027	5	0	0	Pass
3.4353	5	0	0	Pass

DMA 6 Hydromodification

Landuse Basin Data

Predeveloped Land Use

Basin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.29
Pervious Total	0.29
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.29

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 6

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.14
Pervious Total	0.14

Impervious Land Use	acre
Roads,Steep(10-20%)	0.07
Roof Area	0.07
Sidewalks,St(10-20%)	0.01
Impervious Total	0.15
Basin Total	0.29

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 6	Surface retention 6	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 6

Bottom Length:	16.50 ft.
Bottom Width:	16.50 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	3.488
Total Volume Through Riser (ac-ft.):	2.625
Total Volume Through Facility (ac-ft.):	21.511
Percent Infiltrated:	16.21
Total Precip Applied to Facility:	0.703
Total Evap From Facility:	0.249
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.95
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	15.398
Total Outflow (ac-ft.):	21.511
Percent Through Underdrain:	71.58
Discharge Structure	
Riser Height:	1.75 ft.
Riser Diameter:	6 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0063	0.0000	0.0000	0.0000
0.0522	0.0063	0.0001	0.0000	0.0000
0.1044	0.0063	0.0002	0.0000	0.0000
0.1566	0.0063	0.0004	0.0000	0.0000
0.2088	0.0063	0.0005	0.0000	0.0000
0.2610	0.0063	0.0006	0.0000	0.0000
0.3132	0.0063	0.0007	0.0000	0.0000
0.3654	0.0063	0.0009	0.0000	0.0006
0.4176	0.0063	0.0010	0.0000	0.0006
0.4698	0.0063	0.0011	0.0000	0.0006
0.5220	0.0063	0.0012	0.0000	0.0006
0.5742	0.0063	0.0014	0.0000	0.0006
0.6264	0.0063	0.0015	0.0000	0.0006
0.6786	0.0063	0.0016	0.0000	0.0006
0.7308	0.0063	0.0017	0.0000	0.0006
0.7830	0.0063	0.0019	0.0000	0.0006
0.8352	0.0063	0.0020	0.0000	0.0006
0.8874	0.0063	0.0021	0.0000	0.0006
0.9396	0.0063	0.0022	0.0000	0.0006

0.9918	0.0063	0.0024	0.0000	0.0006
1.0440	0.0063	0.0025	0.0000	0.0006
1.0962	0.0063	0.0026	0.0000	0.0006
1.1484	0.0063	0.0027	0.0000	0.0006
1.2005	0.0063	0.0029	0.0000	0.0006
1.2527	0.0063	0.0030	0.0000	0.0006
1.3049	0.0063	0.0031	0.0000	0.0006
1.3571	0.0063	0.0032	0.0030	0.0006
1.4093	0.0063	0.0033	0.0050	0.0006
1.4615	0.0063	0.0035	0.0064	0.0006
1.5137	0.0063	0.0036	0.0075	0.0006
1.5659	0.0063	0.0037	0.0085	0.0006
1.6181	0.0063	0.0039	0.0094	0.0006
1.6703	0.0063	0.0040	0.0102	0.0006
1.7225	0.0063	0.0041	0.0110	0.0006
1.7747	0.0063	0.0043	0.0117	0.0006
1.8269	0.0063	0.0044	0.0123	0.0006
1.8791	0.0063	0.0046	0.0130	0.0006
1.9313	0.0063	0.0047	0.0136	0.0006
1.9835	0.0063	0.0048	0.0141	0.0006
2.0357	0.0063	0.0050	0.0147	0.0006
2.0879	0.0063	0.0051	0.0152	0.0006
2.1401	0.0063	0.0052	0.0158	0.0006
2.1923	0.0063	0.0054	0.0163	0.0006
2.2445	0.0063	0.0055	0.0168	0.0006
2.2967	0.0063	0.0056	0.0176	0.0006
2.3489	0.0063	0.0058	0.0181	0.0006
2.4011	0.0063	0.0059	0.0185	0.0006
2.4533	0.0063	0.0060	0.0189	0.0006
2.5000	0.0063	0.0062	0.0193	0.0006

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0063	0.0062	0.0000	0.0323	0.0000
2.5522	0.0064	0.0065	0.0000	0.0323	0.0000
2.6044	0.0066	0.0068	0.0000	0.0354	0.0000
2.6566	0.0067	0.0072	0.0000	0.0375	0.0001
2.7088	0.0069	0.0075	0.0000	0.0396	0.0001
2.7610	0.0071	0.0079	0.0000	0.0418	0.0001
2.8132	0.0072	0.0083	0.0000	0.0441	0.0001
2.8654	0.0074	0.0087	0.0000	0.0464	0.0001
2.9176	0.0076	0.0090	0.0000	0.0489	0.0002
2.9698	0.0078	0.0094	0.0000	0.0513	0.0002
3.0220	0.0079	0.0099	0.0000	0.0539	0.0002
3.0742	0.0081	0.0103	0.0000	0.0565	0.0002
3.1264	0.0083	0.0107	0.0000	0.0593	0.0002
3.1786	0.0085	0.0111	0.0000	0.0621	0.0002
3.2308	0.0087	0.0116	0.0000	0.0649	0.0003
3.2830	0.0088	0.0120	0.0000	0.0679	0.0003
3.3352	0.0090	0.0125	0.0000	0.0709	0.0003
3.3874	0.0092	0.0130	0.0000	0.0740	0.0003
3.4396	0.0094	0.0135	0.0000	0.0773	0.0003
3.4918	0.0096	0.0140	0.0000	0.0805	0.0004
3.5440	0.0098	0.0145	0.0000	0.0839	0.0004
3.5962	0.0100	0.0150	0.0000	0.0874	0.0004
3.6484	0.0102	0.0155	0.0000	0.0909	0.0004
3.7005	0.0104	0.0161	0.0000	0.0946	0.0004
3.7527	0.0106	0.0166	0.0000	0.0983	0.0005

3.8049	0.0108	0.0172	0.0000	0.1021	0.0005
3.8571	0.0110	0.0177	0.0000	0.1060	0.0005
3.9093	0.0113	0.0183	0.0000	0.1100	0.0005
3.9615	0.0115	0.0189	0.0000	0.1141	0.0005
4.0137	0.0117	0.0195	0.0000	0.1183	0.0006
4.0659	0.0119	0.0201	0.0000	0.1226	0.0006
4.1181	0.0121	0.0208	0.0000	0.1270	0.0006
4.1703	0.0123	0.0214	0.0000	0.1315	0.0006
4.2225	0.0126	0.0221	0.0000	0.1360	0.0007
4.2747	0.0128	0.0227	0.0206	0.1407	0.0007
4.3269	0.0130	0.0234	0.1109	0.1455	0.0007
4.3791	0.0132	0.0241	0.2241	0.1504	0.0007
4.4313	0.0135	0.0248	0.3213	0.1554	0.0008
4.4835	0.0137	0.0255	0.3781	0.1605	0.0008
4.5357	0.0139	0.0262	0.4209	0.1657	0.0008
4.5879	0.0142	0.0269	0.4577	0.1710	0.0008
4.6401	0.0144	0.0277	0.4918	0.1764	0.0008
4.6923	0.0147	0.0284	0.5237	0.1819	0.0009
4.7445	0.0149	0.0292	0.5537	0.1876	0.0009
4.7500	0.0149	0.0293	0.5822	0.1882	0.0009

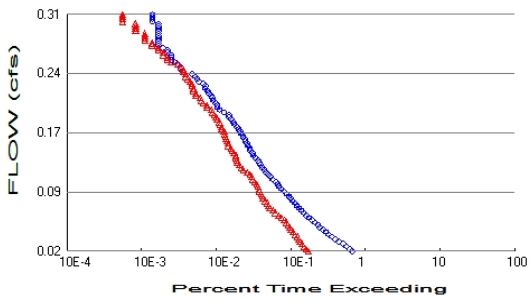
Surface retention 6

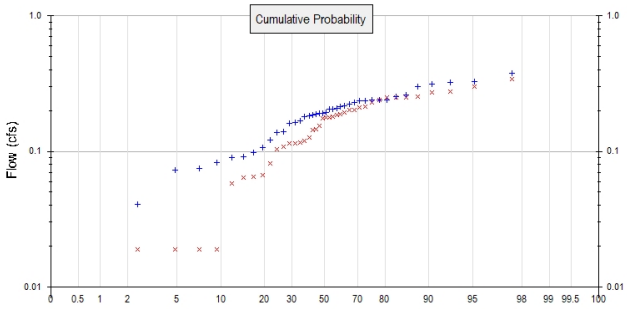
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 6

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.29
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.14
Total Impervious Area: 0.15

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.191284
5 year	0.240086
10 year	0.311326
25 year	0.337509

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.175145
5 year	0.244898
10 year	0.267851
25 year	0.308022

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	0.121	0.067
1961	0.075	0.065
1962	0.217	0.228
1963	0.235	0.250
1964	0.324	0.300
1965	0.164	0.064
1966	0.083	0.058
1967	0.235	0.249
1968	0.328	0.343
1969	0.191	0.194
1970	0.224	0.155
1971	0.208	0.211
1972	0.090	0.019
1973	0.255	0.215

1974	0.185	0.177
1975	0.204	0.117
1976	0.013	0.019
1977	0.041	0.019
1978	0.168	0.144
1979	0.215	0.126
1980	0.262	0.272
1981	0.107	0.104
1982	0.314	0.179
1983	0.240	0.254
1984	0.140	0.120
1985	0.301	0.201
1986	0.240	0.251
1987	0.098	0.108
1988	0.161	0.081
1989	0.072	0.019
1990	0.138	0.115
1991	0.182	0.114
1992	0.230	0.240
1993	0.238	0.175
1994	0.181	0.181
1995	0.193	0.203
1996	0.377	0.277
1997	0.188	0.186
1998	0.206	0.145
1999	0.091	0.019
2000	0.191	0.188

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3772	0.3432
2	0.3282	0.2998
3	0.3240	0.2775
4	0.3144	0.2723
5	0.3014	0.2536
6	0.2616	0.2512
7	0.2547	0.2500
8	0.2402	0.2489
9	0.2399	0.2396
10	0.2382	0.2283
11	0.2354	0.2145
12	0.2346	0.2107
13	0.2296	0.2033
14	0.2235	0.2012
15	0.2174	0.1939
16	0.2147	0.1882
17	0.2082	0.1856
18	0.2056	0.1805
19	0.2036	0.1790
20	0.1927	0.1772
21	0.1913	0.1751
22	0.1913	0.1550
23	0.1882	0.1451
24	0.1845	0.1439
25	0.1824	0.1261
26	0.1812	0.1202
27	0.1678	0.1170

28	0.1641	0.1151
29	0.1610	0.1143
30	0.1402	0.1080
31	0.1383	0.1041
32	0.1215	0.0812
33	0.1067	0.0669
34	0.0982	0.0653
35	0.0908	0.0644
36	0.0899	0.0583
37	0.0826	0.0189
38	0.0746	0.0189
39	0.0725	0.0189
40	0.0407	0.0189
41	0.0126	0.0189

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0191	2391	621	25	Pass
0.0221	2206	576	26	Pass
0.0250	2007	540	26	Pass
0.0280	1800	510	28	Pass
0.0309	1596	481	30	Pass
0.0339	1418	460	32	Pass
0.0368	1287	440	34	Pass
0.0398	1166	410	35	Pass
0.0427	1061	383	36	Pass
0.0457	963	362	37	Pass
0.0486	885	347	39	Pass
0.0516	836	330	39	Pass
0.0545	758	316	41	Pass
0.0575	683	297	43	Pass
0.0604	632	270	42	Pass
0.0634	582	245	42	Pass
0.0664	535	224	41	Pass
0.0693	497	208	41	Pass
0.0723	461	189	40	Pass
0.0752	433	180	41	Pass
0.0782	408	174	42	Pass
0.0811	386	163	42	Pass
0.0841	357	153	42	Pass
0.0870	338	149	44	Pass
0.0900	316	145	45	Pass
0.0929	290	139	47	Pass
0.0959	268	135	50	Pass
0.0988	249	131	52	Pass
0.1018	239	126	52	Pass
0.1047	229	117	51	Pass
0.1077	207	112	54	Pass
0.1106	193	107	55	Pass
0.1136	179	103	57	Pass
0.1165	166	93	56	Pass
0.1195	159	83	52	Pass
0.1224	148	78	52	Pass
0.1254	142	73	51	Pass
0.1283	135	69	51	Pass
0.1313	130	68	52	Pass
0.1342	121	66	54	Pass
0.1372	115	66	57	Pass
0.1401	110	62	56	Pass
0.1431	104	59	56	Pass
0.1460	101	57	56	Pass
0.1490	97	52	53	Pass
0.1519	93	52	55	Pass
0.1549	88	50	56	Pass
0.1578	87	49	56	Pass
0.1608	82	48	58	Pass
0.1638	79	47	59	Pass
0.1667	75	46	61	Pass
0.1697	72	42	58	Pass
0.1726	68	42	61	Pass

0.1756	64	41	64	Pass
0.1785	61	40	65	Pass
0.1815	57	37	64	Pass
0.1844	54	36	66	Pass
0.1874	53	34	64	Pass
0.1903	46	32	69	Pass
0.1933	40	31	77	Pass
0.1962	37	27	72	Pass
0.1992	37	27	72	Pass
0.2021	35	24	68	Pass
0.2051	33	23	69	Pass
0.2080	32	22	68	Pass
0.2110	31	19	61	Pass
0.2139	29	19	65	Pass
0.2169	28	18	64	Pass
0.2198	26	18	69	Pass
0.2228	26	17	65	Pass
0.2257	24	17	70	Pass
0.2287	21	16	76	Pass
0.2316	20	15	75	Pass
0.2346	19	14	73	Pass
0.2375	17	14	82	Pass
0.2405	13	13	100	Pass
0.2434	12	13	108	Pass
0.2464	12	12	100	Pass
0.2493	11	11	100	Pass
0.2523	10	9	90	Pass
0.2552	9	8	88	Pass
0.2582	9	8	88	Pass
0.2612	9	7	77	Pass
0.2641	8	7	87	Pass
0.2671	8	6	75	Pass
0.2700	7	6	85	Pass
0.2730	6	5	83	Pass
0.2759	6	5	83	Pass
0.2789	6	4	66	Pass
0.2818	6	4	66	Pass
0.2848	6	4	66	Pass
0.2877	6	4	66	Pass
0.2907	6	3	50	Pass
0.2936	6	3	50	Pass
0.2966	6	3	50	Pass
0.2995	6	3	50	Pass
0.3025	5	2	40	Pass
0.3054	5	2	40	Pass
0.3084	5	2	40	Pass
0.3113	5	2	40	Pass

DMA 7 Hydromodification

Landuse Basin Data
Predeveloped Land Use

Basin 7

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.26
Pervious Total	0.26
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.26

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 7

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.16
Pervious Total	0.16

Impervious Land Use	acre
Roof Area	0.07
Driveways,St(10-20%)	0.01
Sidewalks,St(10-20%)	0.02
Impervious Total	0.1
Basin Total	0.26

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 7	Surface retention 7	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 7

Bottom Length:	15.00 ft.
Bottom Width:	15.00 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	2.873
Total Volume Through Riser (ac-ft.):	2.27
Total Volume Through Facility (ac-ft.):	17.636
Percent Infiltrated:	16.29
Total Precip Applied to Facility:	0.585
Total Evap From Facility:	0.212
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.9
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	12.493
Total Outflow (ac-ft.):	17.636
Percent Through Underdrain:	70.84
Discharge Structure	
Riser Height:	1.75 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0052	0.0000	0.0000	0.0000
0.0577	0.0052	0.0001	0.0000	0.0000
0.1154	0.0052	0.0002	0.0000	0.0000
0.1731	0.0052	0.0003	0.0000	0.0000
0.2308	0.0052	0.0005	0.0000	0.0000
0.2885	0.0052	0.0006	0.0000	0.0000
0.3462	0.0052	0.0007	0.0000	0.0000
0.4038	0.0052	0.0008	0.0000	0.0005
0.4615	0.0052	0.0009	0.0000	0.0005
0.5192	0.0052	0.0010	0.0000	0.0005
0.5769	0.0052	0.0011	0.0000	0.0005
0.6346	0.0052	0.0012	0.0000	0.0005
0.6923	0.0052	0.0014	0.0000	0.0005
0.7500	0.0052	0.0015	0.0000	0.0005
0.8077	0.0052	0.0016	0.0000	0.0005
0.8654	0.0052	0.0017	0.0000	0.0005
0.9231	0.0052	0.0018	0.0000	0.0005
0.9808	0.0052	0.0019	0.0000	0.0005
1.0385	0.0052	0.0020	0.0000	0.0005

1.0962	0.0052	0.0022	0.0000	0.0005
1.1538	0.0052	0.0023	0.0000	0.0005
1.2115	0.0052	0.0024	0.0000	0.0005
1.2692	0.0052	0.0025	0.0000	0.0005
1.3269	0.0052	0.0026	0.0000	0.0005
1.3846	0.0052	0.0027	0.0027	0.0005
1.4423	0.0052	0.0028	0.0046	0.0005
1.5000	0.0052	0.0030	0.0060	0.0005
1.5577	0.0052	0.0031	0.0071	0.0005
1.6154	0.0052	0.0032	0.0080	0.0005
1.6731	0.0052	0.0033	0.0088	0.0005
1.7308	0.0052	0.0034	0.0096	0.0005
1.7885	0.0052	0.0036	0.0103	0.0005
1.8462	0.0052	0.0037	0.0110	0.0005
1.9038	0.0052	0.0038	0.0116	0.0005
1.9615	0.0052	0.0039	0.0122	0.0005
2.0192	0.0052	0.0041	0.0128	0.0005
2.0769	0.0052	0.0042	0.0133	0.0005
2.1346	0.0052	0.0043	0.0139	0.0005
2.1923	0.0052	0.0044	0.0144	0.0005
2.2500	0.0052	0.0046	0.0149	0.0005
2.3077	0.0052	0.0047	0.0157	0.0005
2.3654	0.0052	0.0048	0.0161	0.0005
2.4231	0.0052	0.0049	0.0166	0.0005
2.4808	0.0052	0.0051	0.0170	0.0005
2.5000	0.0052	0.0051	0.0171	0.0005

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0052	0.0051	0.0000	0.0268	0.0000
2.5577	0.0053	0.0054	0.0000	0.0268	0.0000
2.6154	0.0055	0.0057	0.0000	0.0298	0.0000
2.6731	0.0057	0.0060	0.0000	0.0318	0.0001
2.7308	0.0058	0.0064	0.0000	0.0339	0.0001
2.7885	0.0060	0.0067	0.0000	0.0360	0.0001
2.8462	0.0062	0.0071	0.0000	0.0382	0.0001
2.9038	0.0063	0.0074	0.0000	0.0406	0.0001
2.9615	0.0065	0.0078	0.0000	0.0430	0.0002
3.0192	0.0067	0.0082	0.0000	0.0454	0.0002
3.0769	0.0069	0.0086	0.0000	0.0480	0.0002
3.1346	0.0071	0.0090	0.0000	0.0507	0.0002
3.1923	0.0072	0.0094	0.0000	0.0534	0.0002
3.2500	0.0074	0.0098	0.0000	0.0563	0.0002
3.3077	0.0076	0.0102	0.0000	0.0592	0.0003
3.3654	0.0078	0.0107	0.0000	0.0622	0.0003
3.4231	0.0080	0.0111	0.0000	0.0653	0.0003
3.4808	0.0082	0.0116	0.0000	0.0685	0.0003
3.5385	0.0084	0.0121	0.0000	0.0719	0.0003
3.5962	0.0086	0.0126	0.0000	0.0753	0.0004
3.6538	0.0088	0.0131	0.0000	0.0788	0.0004
3.7115	0.0090	0.0136	0.0000	0.0824	0.0004
3.7692	0.0093	0.0141	0.0000	0.0861	0.0004
3.8269	0.0095	0.0147	0.0000	0.0900	0.0005
3.8846	0.0097	0.0152	0.0000	0.0939	0.0005
3.9423	0.0099	0.0158	0.0000	0.0979	0.0005
4.0000	0.0101	0.0164	0.0000	0.1021	0.0005
4.0577	0.0103	0.0169	0.0000	0.1063	0.0005
4.1154	0.0106	0.0176	0.0000	0.1107	0.0006

4.1731	0.0108	0.0182	0.0000	0.1152	0.0006
4.2308	0.0110	0.0188	0.0000	0.1198	0.0006
4.2885	0.0113	0.0194	0.0800	0.1245	0.0006
4.3462	0.0115	0.0201	0.3147	0.1294	0.0007
4.4038	0.0117	0.0208	0.6273	0.1343	0.0007
4.4615	0.0120	0.0215	0.9795	0.1394	0.0007
4.5192	0.0122	0.0222	1.3333	0.1446	0.0007
4.5769	0.0125	0.0229	1.6517	0.1499	0.0008
4.6346	0.0127	0.0236	1.9054	0.1554	0.0008
4.6923	0.0130	0.0243	2.0830	0.1610	0.0008
4.7500	0.0132	0.0251	2.2033	0.1667	0.0008
4.8077	0.0135	0.0259	2.3521	0.1725	0.0009
4.8654	0.0137	0.0266	2.4708	0.1785	0.0009
4.9231	0.0140	0.0274	2.5840	0.1846	0.0009
4.9808	0.0143	0.0283	2.6925	0.1908	0.0009
5.0385	0.0145	0.0291	2.7967	0.1972	0.0010
5.0962	0.0148	0.0299	2.8972	0.2037	0.0010
5.1538	0.0151	0.0308	2.9944	0.2103	0.0010
5.2115	0.0153	0.0317	3.0885	0.2171	0.0010
5.2500	0.0155	0.0323	3.1798	0.2217	0.0900

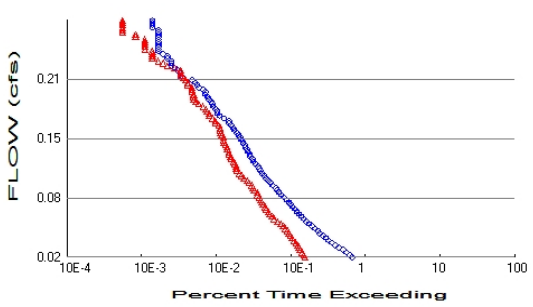
Surface retention 7

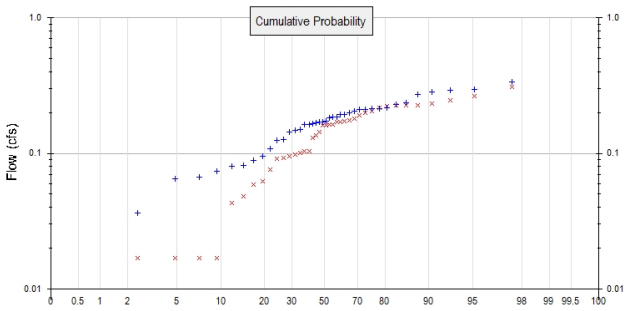
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 7

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.26
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.16
Total Impervious Area: 0.1

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.171496
5 year	0.21525
10 year	0.27912
25 year	0.302594

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.160852
5 year	0.220663
10 year	0.231431
25 year	0.272123

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	0.109	0.059
1961	0.067	0.043
1962	0.195	0.206
1963	0.210	0.225
1964	0.290	0.264
1965	0.147	0.062
1966	0.074	0.048
1967	0.211	0.224
1968	0.294	0.309
1969	0.171	0.176
1970	0.200	0.144
1971	0.187	0.190
1972	0.081	0.017
1973	0.228	0.199

1974	0.165	0.161
1975	0.183	0.103
1976	0.011	0.017
1977	0.037	0.017
1978	0.150	0.130
1979	0.192	0.095
1980	0.235	0.246
1981	0.096	0.091
1982	0.282	0.162
1983	0.215	0.227
1984	0.126	0.103
1985	0.270	0.172
1986	0.215	0.226
1987	0.088	0.092
1988	0.144	0.076
1989	0.065	0.017
1990	0.124	0.098
1991	0.164	0.101
1992	0.206	0.216
1993	0.214	0.163
1994	0.162	0.164
1995	0.173	0.181
1996	0.338	0.233
1997	0.169	0.170
1998	0.184	0.136
1999	0.081	0.017
2000	0.171	0.171

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3382	0.3085
2	0.2942	0.2636
3	0.2905	0.2456
4	0.2819	0.2327
5	0.2702	0.2275
6	0.2345	0.2263
7	0.2283	0.2248
8	0.2154	0.2241
9	0.2151	0.2161
10	0.2135	0.2060
11	0.2111	0.1989
12	0.2103	0.1897
13	0.2058	0.1814
14	0.2004	0.1763
15	0.1949	0.1716
16	0.1925	0.1707
17	0.1867	0.1700
18	0.1843	0.1641
19	0.1825	0.1634
20	0.1727	0.1620
21	0.1715	0.1609
22	0.1715	0.1435
23	0.1687	0.1363
24	0.1654	0.1295
25	0.1636	0.1033
26	0.1624	0.1031
27	0.1504	0.1006

28	0.1471	0.0985
29	0.1443	0.0953
30	0.1257	0.0922
31	0.1240	0.0908
32	0.1089	0.0761
33	0.0956	0.0621
34	0.0880	0.0588
35	0.0814	0.0482
36	0.0806	0.0432
37	0.0740	0.0170
38	0.0669	0.0170
39	0.0650	0.0170
40	0.0365	0.0170
41	0.0113	0.0170

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0171	2392	557	23	Pass
0.0198	2206	539	24	Pass
0.0224	2007	510	25	Pass
0.0251	1800	481	26	Pass
0.0277	1596	462	28	Pass
0.0304	1418	446	31	Pass
0.0330	1287	422	32	Pass
0.0357	1165	394	33	Pass
0.0383	1061	372	35	Pass
0.0410	963	355	36	Pass
0.0436	885	339	38	Pass
0.0463	836	323	38	Pass
0.0489	758	302	39	Pass
0.0515	683	285	41	Pass
0.0542	632	262	41	Pass
0.0568	582	237	40	Pass
0.0595	535	215	40	Pass
0.0621	497	203	40	Pass
0.0648	461	186	40	Pass
0.0674	433	181	41	Pass
0.0701	408	171	41	Pass
0.0727	386	162	41	Pass
0.0754	357	154	43	Pass
0.0780	338	147	43	Pass
0.0807	316	142	44	Pass
0.0833	290	136	46	Pass
0.0859	268	129	48	Pass
0.0886	249	127	51	Pass
0.0912	238	116	48	Pass
0.0939	229	112	48	Pass
0.0965	204	108	52	Pass
0.0992	193	99	51	Pass
0.1018	179	93	51	Pass
0.1045	167	84	50	Pass
0.1071	159	79	49	Pass
0.1098	148	73	49	Pass
0.1124	142	68	47	Pass
0.1151	135	67	49	Pass
0.1177	130	66	50	Pass
0.1204	121	65	53	Pass
0.1230	115	61	53	Pass
0.1256	110	57	51	Pass
0.1283	104	56	53	Pass
0.1309	101	53	52	Pass
0.1336	97	53	54	Pass
0.1362	93	51	54	Pass
0.1389	88	50	56	Pass
0.1415	87	48	55	Pass
0.1442	82	46	56	Pass
0.1468	79	45	56	Pass
0.1495	75	45	60	Pass
0.1521	72	42	58	Pass
0.1548	68	41	60	Pass

0.1574	64	41	64	Pass
0.1600	61	41	67	Pass
0.1627	57	39	68	Pass
0.1653	54	35	64	Pass
0.1680	53	35	66	Pass
0.1706	46	32	69	Pass
0.1733	40	29	72	Pass
0.1759	37	29	78	Pass
0.1786	37	27	72	Pass
0.1812	35	26	74	Pass
0.1839	33	24	72	Pass
0.1865	32	21	65	Pass
0.1892	31	19	61	Pass
0.1918	29	18	62	Pass
0.1944	28	18	64	Pass
0.1971	26	18	69	Pass
0.1997	26	17	65	Pass
0.2024	24	17	70	Pass
0.2050	21	17	80	Pass
0.2077	20	15	75	Pass
0.2103	19	15	78	Pass
0.2130	17	14	82	Pass
0.2156	13	13	100	Pass
0.2183	12	12	100	Pass
0.2209	12	12	100	Pass
0.2236	11	12	109	Pass
0.2262	10	10	100	Pass
0.2288	9	8	88	Pass
0.2315	9	7	77	Pass
0.2341	9	6	66	Pass
0.2368	8	5	62	Pass
0.2394	8	5	62	Pass
0.2421	7	5	71	Pass
0.2447	6	5	83	Pass
0.2474	6	4	66	Pass
0.2500	6	4	66	Pass
0.2527	6	4	66	Pass
0.2553	6	4	66	Pass
0.2580	6	4	66	Pass
0.2606	6	3	50	Pass
0.2632	6	3	50	Pass
0.2659	6	2	33	Pass
0.2685	6	2	33	Pass
0.2712	5	2	40	Pass
0.2738	5	2	40	Pass
0.2765	5	2	40	Pass
0.2791	5	2	40	Pass

DMA 8 Hydromodification

Landuse Basin Data
Predeveloped Land Use

Basin 8

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.36
Pervious Total	0.36
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.36

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 8

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C D,Shrub,St(10-20%)	0.06
Pervious Total	0.06

Impervious Land Use	acre
Roads,Steep(10-20%)	0.3
Impervious Total	0.3
Basin Total	0.36

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 8	Surface retention 8	

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 8

Bottom Length:	24.50 ft.
Bottom Width:	23.80 ft.
Material thickness of first layer:	1.5
Material type for first layer:	BAHM 5
Material thickness of second layer:	1
Material type for second layer:	GRAVEL
Material thickness of third layer:	0
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.1
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	7.119
Total Volume Through Riser (ac-ft.):	2.391
Total Volume Through Facility (ac-ft.):	32.422
Percent Infiltrated:	21.96
Total Precip Applied to Facility:	1.377
Total Evap From Facility:	0.525
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	1
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	22.912
Total Outflow (ac-ft.):	32.422
Percent Through Underdrain:	70.67
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0134	0.0000	0.0000	0.0000
0.0549	0.0134	0.0003	0.0000	0.0000
0.1099	0.0134	0.0006	0.0000	0.0000
0.1648	0.0134	0.0008	0.0000	0.0000
0.2198	0.0134	0.0011	0.0000	0.0000
0.2747	0.0134	0.0014	0.0000	0.0000
0.3297	0.0134	0.0017	0.0000	0.0000
0.3846	0.0134	0.0020	0.0000	0.0013
0.4396	0.0134	0.0022	0.0000	0.0013
0.4945	0.0134	0.0025	0.0000	0.0013
0.5495	0.0134	0.0028	0.0000	0.0013
0.6044	0.0134	0.0031	0.0000	0.0013
0.6593	0.0134	0.0034	0.0000	0.0013
0.7143	0.0134	0.0036	0.0000	0.0013
0.7692	0.0134	0.0039	0.0000	0.0013
0.8242	0.0134	0.0042	0.0000	0.0013
0.8791	0.0134	0.0045	0.0000	0.0013
0.9341	0.0134	0.0048	0.0000	0.0013
0.9890	0.0134	0.0050	0.0000	0.0013

1.0440	0.0134	0.0053	0.0000	0.0013
1.0989	0.0134	0.0056	0.0000	0.0013
1.1538	0.0134	0.0059	0.0000	0.0013
1.2088	0.0134	0.0061	0.0000	0.0013
1.2637	0.0134	0.0064	0.0000	0.0013
1.3187	0.0134	0.0067	0.0000	0.0013
1.3736	0.0134	0.0070	0.0035	0.0013
1.4286	0.0134	0.0073	0.0057	0.0013
1.4835	0.0134	0.0075	0.0073	0.0013
1.5385	0.0134	0.0079	0.0086	0.0013
1.5934	0.0134	0.0082	0.0097	0.0013
1.6484	0.0134	0.0085	0.0107	0.0013
1.7033	0.0134	0.0088	0.0116	0.0013
1.7582	0.0134	0.0091	0.0125	0.0013
1.8132	0.0134	0.0094	0.0133	0.0013
1.8681	0.0134	0.0097	0.0140	0.0013
1.9231	0.0134	0.0100	0.0148	0.0013
1.9780	0.0134	0.0103	0.0154	0.0013
2.0330	0.0134	0.0106	0.0161	0.0013
2.0879	0.0134	0.0109	0.0167	0.0013
2.1429	0.0134	0.0112	0.0173	0.0013
2.1978	0.0134	0.0115	0.0179	0.0013
2.2527	0.0134	0.0118	0.0186	0.0013
2.3077	0.0134	0.0121	0.0195	0.0013
2.3626	0.0134	0.0124	0.0200	0.0013
2.4176	0.0134	0.0127	0.0205	0.0013
2.4725	0.0134	0.0130	0.0210	0.0013
2.5000	0.0134	0.0132	0.0212	0.0013

Bioretention Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.5000	0.0134	0.0132	0.0000	0.0687	0.0000
2.5549	0.0136	0.0139	0.0000	0.0687	0.0000
2.6099	0.0139	0.0147	0.0000	0.0751	0.0001
2.6648	0.0141	0.0155	0.0000	0.0791	0.0001
2.7198	0.0144	0.0162	0.0000	0.0831	0.0001
2.7747	0.0146	0.0170	0.0000	0.0873	0.0002
2.8297	0.0149	0.0179	0.0000	0.0916	0.0002
2.8846	0.0151	0.0187	0.0000	0.0959	0.0002
2.9396	0.0154	0.0195	0.0000	0.1004	0.0002
2.9945	0.0157	0.0204	0.0000	0.1050	0.0003
3.0495	0.0159	0.0212	0.0000	0.1098	0.0003
3.1044	0.0162	0.0221	0.0000	0.1146	0.0003
3.1593	0.0165	0.0230	0.0000	0.1195	0.0003
3.2143	0.0167	0.0239	0.0000	0.1246	0.0004
3.2692	0.0170	0.0249	0.0000	0.1298	0.0004
3.3242	0.0173	0.0258	0.0000	0.1351	0.0004
3.3791	0.0176	0.0268	0.0000	0.1405	0.0005
3.4341	0.0178	0.0277	0.0000	0.1460	0.0005
3.4890	0.0181	0.0287	0.0000	0.1517	0.0005
3.5440	0.0184	0.0297	0.0000	0.1575	0.0005
3.5989	0.0187	0.0307	0.0000	0.1634	0.0006
3.6538	0.0190	0.0318	0.0000	0.1694	0.0006
3.7088	0.0193	0.0328	0.0000	0.1756	0.0006
3.7637	0.0196	0.0339	0.0000	0.1819	0.0007
3.8187	0.0199	0.0350	0.0000	0.1883	0.0007
3.8736	0.0202	0.0361	0.0000	0.1948	0.0007
3.9286	0.0205	0.0372	0.0000	0.2015	0.0007

3.9835	0.0208	0.0383	0.0000	0.2083	0.0008
4.0385	0.0211	0.0395	0.0000	0.2153	0.0008
4.0934	0.0214	0.0406	0.0000	0.2224	0.0008
4.1484	0.0217	0.0418	0.0000	0.2296	0.0009
4.2033	0.0220	0.0430	0.0000	0.2369	0.0009
4.2582	0.0223	0.0443	0.0000	0.2444	0.0009
4.3132	0.0226	0.0455	0.0000	0.2521	0.0010
4.3681	0.0230	0.0467	0.0000	0.2599	0.0010
4.4231	0.0233	0.0480	0.0000	0.2678	0.0010
4.4780	0.0236	0.0493	0.0000	0.2758	0.0011
4.5330	0.0239	0.0506	0.0635	0.2841	0.0011
4.5879	0.0242	0.0519	0.2754	0.2924	0.0011
4.6429	0.0246	0.0533	0.5635	0.3009	0.0012
4.6978	0.0249	0.0546	0.8940	0.3096	0.0012
4.7527	0.0252	0.0560	1.2343	0.3184	0.0012
4.8077	0.0256	0.0574	1.5516	0.3273	0.0013
4.8626	0.0259	0.0588	1.8176	0.3365	0.0013
4.9176	0.0263	0.0602	2.0158	0.3457	0.0013
4.9725	0.0266	0.0617	2.1504	0.3551	0.0013
5.0000	0.0268	0.0624	2.2875	0.3599	0.0900

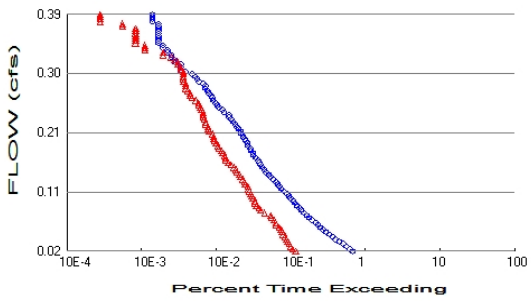
Surface retention 8

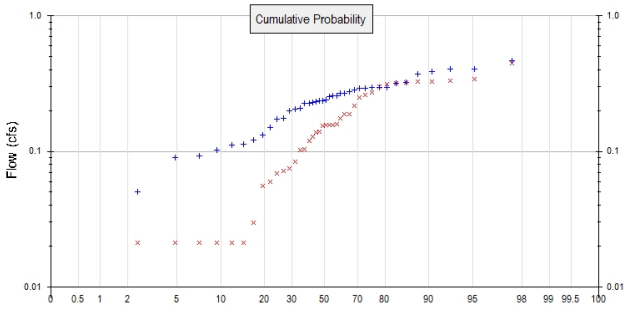
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 8

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.36
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.06
Total Impervious Area: 0.3

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.237457
5 year	0.298039
10 year	0.386473
25 year	0.418977

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.153499
5 year	0.308339
10 year	0.328217
25 year	0.361555

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1960	0.151	0.021
1961	0.093	0.075
1962	0.270	0.252
1963	0.291	0.328
1964	0.402	0.330
1965	0.204	0.056
1966	0.102	0.030
1967	0.292	0.328
1968	0.407	0.446
1969	0.237	0.140
1970	0.277	0.129
1971	0.258	0.271
1972	0.112	0.021
1973	0.316	0.189

1974	0.229	0.119
1975	0.253	0.157
1976	0.016	0.021
1977	0.051	0.021
1978	0.208	0.137
1979	0.267	0.068
1980	0.325	0.342
1981	0.132	0.060
1982	0.390	0.189
1983	0.298	0.321
1984	0.174	0.175
1985	0.374	0.153
1986	0.298	0.318
1987	0.122	0.083
1988	0.200	0.021
1989	0.090	0.021
1990	0.172	0.160
1991	0.226	0.103
1992	0.285	0.315
1993	0.296	0.155
1994	0.225	0.072
1995	0.239	0.259
1996	0.468	0.299
1997	0.234	0.217
1998	0.255	0.156
1999	0.113	0.021
2000	0.237	0.102

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.4682	0.4458
2	0.4074	0.3417
3	0.4022	0.3302
4	0.3903	0.3283
5	0.3741	0.3278
6	0.3247	0.3206
7	0.3161	0.3185
8	0.2982	0.3154
9	0.2978	0.2989
10	0.2957	0.2711
11	0.2922	0.2594
12	0.2912	0.2516
13	0.2850	0.2168
14	0.2775	0.1892
15	0.2698	0.1888
16	0.2665	0.1753
17	0.2585	0.1598
18	0.2552	0.1575
19	0.2527	0.1558
20	0.2392	0.1554
21	0.2375	0.1535
22	0.2375	0.1401
23	0.2336	0.1374
24	0.2291	0.1287
25	0.2265	0.1194
26	0.2249	0.1035
27	0.2083	0.1017

28	0.2037	0.0833
29	0.1998	0.0745
30	0.1741	0.0719
31	0.1716	0.0683
32	0.1508	0.0595
33	0.1324	0.0558
34	0.1219	0.0295
35	0.1128	0.0210
36	0.1116	0.0210
37	0.1025	0.0210
38	0.0926	0.0210
39	0.0900	0.0210
40	0.0505	0.0210
41	0.0157	0.0210

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0237	2439	416	17	Pass
0.0274	2226	381	17	Pass
0.0311	2011	355	17	Pass
0.0347	1831	344	18	Pass
0.0384	1613	329	20	Pass
0.0421	1424	312	21	Pass
0.0457	1310	304	23	Pass
0.0494	1184	287	24	Pass
0.0531	1063	275	25	Pass
0.0567	981	267	27	Pass
0.0604	893	252	28	Pass
0.0640	836	229	27	Pass
0.0677	774	227	29	Pass
0.0714	693	214	30	Pass
0.0750	632	198	31	Pass
0.0787	589	192	32	Pass
0.0824	540	161	29	Pass
0.0860	497	141	28	Pass
0.0897	469	135	28	Pass
0.0934	434	124	28	Pass
0.0970	408	121	29	Pass
0.1007	389	119	30	Pass
0.1044	360	112	31	Pass
0.1080	338	108	31	Pass
0.1117	319	104	32	Pass
0.1153	293	100	34	Pass
0.1190	268	98	36	Pass
0.1227	251	96	38	Pass
0.1263	240	88	36	Pass
0.1300	229	86	37	Pass
0.1337	210	82	39	Pass
0.1373	193	76	39	Pass
0.1410	182	73	40	Pass
0.1447	168	68	40	Pass
0.1483	159	66	41	Pass
0.1520	152	62	40	Pass
0.1556	142	57	40	Pass
0.1593	137	52	37	Pass
0.1630	132	48	36	Pass
0.1666	123	48	39	Pass
0.1703	115	47	40	Pass
0.1740	112	44	39	Pass
0.1776	105	42	40	Pass
0.1813	102	39	38	Pass
0.1850	97	38	39	Pass
0.1886	94	36	38	Pass
0.1923	89	34	38	Pass
0.1959	87	33	37	Pass
0.1996	82	33	40	Pass
0.2033	79	32	40	Pass
0.2069	77	29	37	Pass
0.2106	72	28	38	Pass
0.2143	68	28	41	Pass

0.2179	65	26	40	Pass
0.2216	62	26	41	Pass
0.2253	57	25	43	Pass
0.2289	54	24	44	Pass
0.2326	53	24	45	Pass
0.2363	46	24	52	Pass
0.2399	43	23	53	Pass
0.2436	39	22	56	Pass
0.2472	37	21	56	Pass
0.2509	35	21	60	Pass
0.2546	33	19	57	Pass
0.2582	32	17	53	Pass
0.2619	31	16	51	Pass
0.2656	29	16	55	Pass
0.2692	28	15	53	Pass
0.2729	26	14	53	Pass
0.2766	26	14	53	Pass
0.2802	24	14	58	Pass
0.2839	21	13	61	Pass
0.2875	20	13	65	Pass
0.2912	19	13	68	Pass
0.2949	17	13	76	Pass
0.2985	14	13	92	Pass
0.3022	12	12	100	Pass
0.3059	12	12	100	Pass
0.3095	12	11	91	Pass
0.3132	10	11	110	Pass
0.3169	10	10	100	Pass
0.3205	9	9	100	Pass
0.3242	9	7	77	Pass
0.3279	8	7	87	Pass
0.3315	8	4	50	Pass
0.3352	7	4	57	Pass
0.3388	7	4	57	Pass
0.3425	6	3	50	Pass
0.3462	6	3	50	Pass
0.3498	6	3	50	Pass
0.3535	6	3	50	Pass
0.3572	6	3	50	Pass
0.3608	6	3	50	Pass
0.3645	6	3	50	Pass
0.3682	6	2	33	Pass
0.3718	6	2	33	Pass
0.3755	5	1	20	Pass
0.3791	5	1	20	Pass
0.3828	5	1	20	Pass
0.3865	5	1	20	Pass

Soils Report

Operation & Maintenance

OPERATION AND MAINTENANCE INFORMATION:

I. **PROPERTY INFORMATION:**

I.A. PROPERTY ADDRESS:
PIERCE ROAD
SARATOGA, CA.

I.B. PROPERTY OWNER:
CHATEAU MASSON, LLC

II. **RESPONSIBLE PARTY FOR MAINTENANCE:**

II.A. CONTACT:
WILLIAM HIRSCHMAN

II.B. PHONE NUMBER OF CONTACT:
408-210-1998

II.C. EMAIL:
WHIRSCHMAN@LEXORBUILDERS.COM

II.D. ADDRESS:
258 UNION AVENUE
LOS GATOS, CA 95032

PROJECT SITE INFORMATION:

1. **SOILS TYPE:** C/D
2. **GROUND WATER DEPTH:** UNKNOWN
3. **NAME OF RECEIVING BODY:** SARATOGA CREEK
4. **FLOOD ZONE:** X
5. **FLOOD ELEVATION (IF APPLICABLE):** N/A

SOURCE CONTROL MEASURES:

1. BENEFICIAL LANDSCAPING.
2. USE OF WATER EFFICIENT IRRIGATION SYSTEMS.
3. MAINTENANCE (PAVEMENT SWEEPING, CATCH BASIN CLEANING, GOOD HOUSEKEEPING).
4. STORM DRAIN LABELING.

SITE DESIGN MEASURES:

1. DIRECT RUNOFF FROM ROOFS, SIDEWALKS, PATIOS TO LANDSCAPED AREAS.
2. PLANT TREES ADJACENT TO AND IN PARKING AREAS AND ADJACENT TO OTHER IMPERVIOUS AREAS.

TABLE 1
ROUTINE MAINTENANCE ACTIVITIES FOR BIORETENTION AREAS

NO.	MAINTENANCE TASK	FREQUENCY OF TASK
1	REMOVE OBSTRUCTIONS, WEEDS, DEBRIS AND TRASH FROM BIORETENTION AREA AND ITS INLETS AND OUTLETS; AND DISPOSE OF PROPERLY.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
2	INSPECT BIORETENTION AREA FOR STANDING WATER. IF STANDING WATER DOES NOT DRAIN WITHIN 2-3 DAYS, TILL AND REPLACE THE SURFACE BIOTREATMENT SOIL WITH THE APPROVED SOIL MIX AND REPLANT.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
3	CHECK UNDERDRAINS FOR CLOGGING. USE THE CLEANOUT RISER TO CLEAN ANY CLOGGED UNDERDRAINS.	QUARTERLY, OR AS NEEDED AFTER STORM EVENTS
4	MAINTAIN THE IRRIGATION SYSTEM AND ENSURE THAT PLANTS ARE RECEIVING THE CORRECT AMOUNT OF WATER (IF APPLICABLE).	QUARTERLY
5	ENSURE THAT THE VEGETATION IS HEALTHY AND DENSE ENOUGH TO PROVIDE FILTERING AND PROTECT SOILS FROM EROSION. PRUNE AND WEED THE BIORETENTION AREA. REMOVE AND/OR REPLACE ANY DEAD PLANTS.	ANNUALLY, BEFORE THE WET SEASON BEGINS
6	USE COMPOST AND OTHER NATURAL SOIL AMENDMENTS AND FERTILIZERS INSTEAD OF SYNTHETIC FERTILIZERS, ESPECIALLY IF THE SYSTEM USES AN UNDERDRAIN.	ANNUALLY, BEFORE THE WET SEASON BEGINS
7	CHECK THAT MULCH IS AT APPROPRIATE DEPTH (2 - 3 INCHES PER SOIL SPECIFICATIONS) AND REPLENISH AS NECESSARY BEFORE WET SEASON BEGINS. IT IS RECOMMENDED THAT 2" – 3" OF ARBOR MULCH BE REAPPLIED EVERY YEAR.	ANNUALLY, BEFORE THE WET SEASON BEGINS
8	INSPECT THE ENERGY DISSIPATION AT THE INLET TO ENSURE IT IS FUNCTIONING ADEQUATELY, AND THAT THERE IS NO SCOUR OF THE SURFACE MULCH. REMOVE ACCUMULATED SEDIMENT.	ANNUALLY, BEFORE THE WET SEASON BEGINS
9	INSPECT OVERFLOW PIPE TO ENSURE THAT IT CAN SAFELY CONVEY EXCESS FLOWS TO A STORM DRAIN. REPAIR OR REPLACE DAMAGED PIPING.	ANNUALLY, BEFORE THE WET SEASON BEGINS
10	REPLACE BIOTREATMENT SOIL AND MULCH, IF NEEDED. CHECK FOR STANDING WATER, STRUCTURAL FAILURE AND CLOGGED OVERFLOWS. REMOVE TRASH AND DEBRIS. REPLACE DEAD PLANTS.	
11	INSPECT BIORETENTION AREA USING THE ATTACHED INSPECTION CHECKLIST.	ANNUALLY, BEFORE THE WET SEASON

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G.2 - Santa Clara Valley Urban Runoff Pollution Prevention Program

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Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Date Form Completed: _____

Completed by: _____

Provision C.3 Data Form

Which Projects Must Comply with Stormwater Requirements?

Effective July 1, 2023, the following projects must comply with Stormwater Requirements:

- **All development/redevelopment projects** (except single-family home projects) that create and/or replace **5,000 sq. ft.** or more of impervious surface on the project site must fill out this worksheet and submit it with the development project application.
- **All large single-family home projects** that create and/or replace **10,000 sq. ft.** or more of impervious surface on the project site must also fill out this worksheet.

These projects are called **Regulated Projects.** The Regulated Project area includes portions of the public right-of-way that are developed or redeveloped as part of the Regulated Project.

Excluded Projects - Interior remodeling projects, routine maintenance or repair projects such as re-roofing and re-surfacing, and smaller single-family homes that are not part of a larger plan of development are **NOT** required to complete this worksheet.

What is an Impervious Surface?

An impervious surface is a surface covering or pavement that prevents the land's natural ability to absorb and infiltrate rainfall/stormwater. Impervious surfaces include, but are not limited to rooftops, walkways, paved patios, driveways, parking lots, storage areas, impervious concrete and asphalt, gravel surfaces, and any other continuous watertight pavement or covering.

Pervious pavement, underlain with pervious soil and pervious storage material (e.g., drain rock), that infiltrates rainfall at a rate equal to or greater than surrounding unpaved areas OR that stores and infiltrates the water quality design volume specified in Provision C.3.d of the Municipal Regional Stormwater Permit (MRP), is not considered an impervious surface.

For More Information

The SCVURPPP C.3 Stormwater Handbook provides more information on selection of site design, source control, and treatment measures for a development project as well as guidance on preparing a stormwater control plan.

1. Project Information

Project Name: Masson Estates **APN #** 503-46-005

Project Address: Pierce Road, Saratoga

Cross Streets: _____

Applicant/Developer Name: Hanna & Brunetti

Project Phase(s): _____ **of** _____ **Engineer:** Amanda Mus yVerde I

Project Type (Check all that apply): ☐ New Development ☐ Redevelopment

☐ Private ☐ Public ☐ Large Detached Single-Family Home

☑ Residential ☐ Commercial ☐ Industrial ☐ Mixed Use ☐ Institutional

☐ Other _____

Project Description: Proposed 25-lot residential subdivision with roads and associated improvements.

Project Watershed/Receiving Water (creek, river or bay): Saratoga

2. Project Size

a. Total Site Area: 4,275,276 (ft²)		b. Total Land Area Disturbed During Construction: 487,000 (ft²) (including clearing, grading, stockpiling, or excavating)			
Project Totals	**Total Existing (Pre-project) Area (ft²)**	**Existing Area Retained[1] (ft²)**	**Existing Area Replaced[2] (ft²)**	**New Area Created[2] (ft²)**	**Total Post-Project Area (ft²)**
Impervious Area (IA)					
c. Total on-site IA				171,312	171,312
d. Total off-site IA[3]				27,050	27,050
e. Total project IA	0	0	0	198,362	198,362
f. Total new and replaced IA			198,362		
Pervious Area (PA)[4]					
g. Total on-site PA	456,418				285,106
h. Total off-site PA[3]	30,582				3,532
i. Total project PA	487.000				288,638
j. **Total Project Area (2.e.+2.i.)**	487,000				487,000
k. Percent Replacement of IA in Redevelopment Projects: (Existing on-site IA Replaced ÷ Existing Total on-site IA) x 100% _____%					

[1] "Retained" means to leave existing IA in place. An IA that receives surface treatment (e.g., pavement resurfacing/slurry seal/grind) only is considered "retained". This category does not apply to off-site areas.

[2] The "new" and "replaced" IA are based on the total project area and not specific locations within the project. Constructed IA on a project that does not exceed the total pre-project IA will be considered "replaced" IA. A project will have "new" IA only if the total post-project IA exceeds the total pre-project IA (total post-project IA – total pre-project IA = New IA).

[3] Off-site areas include sidewalks and other parts of the public right-of-way (e.g., roads, bike lanes, curbs, ramps, park strip) that are being reconstructed as part of the project footprint. Note that gravel is considered an impervious surface.

[4] Include bioretention areas, infiltration areas, green roofs, and pervious pavement in PA calculations.

3. State Construction General Permit Applicability:

a. Is #2.b. equal to 43,560 ft² (1 acre) or more?

☑ Yes, applicant must obtain coverage under the State Construction General Permit (see https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html)

☐ No, applicant does not need coverage under the State Construction General Permit.

4. MRP Provision C.3 Applicability:

a. Is #2.f. equal to **5,000** ft² or more, or **10,000** ft² for single family homes?

☑ Yes, C.3. source control, site design and treatment requirements apply

☐ No, C.3. source control and site design requirements may apply – check with local agency

b. For redevelopment projects, is #2.k. equal to 50% or more?

☐ Yes, C.3. requirements (site design and source control, as appropriate, and stormwater treatment) apply to the entire on-site area

☐ No, C.3. requirements only apply to the impervious area created and/or replaced

5. Hydromodification Management (HM) Applicability:

a. Does the project create and/or replace one acre or more of impervious surface AND is the total post-project impervious area greater than the pre-project (existing) impervious area?

☑ Yes (continue) ☐ No – exempt from HM, go to page 3

b. Is the project located in an area of HM applicability (green area) on the HM Applicability Map? www.scvurppp.org/hmp-map

☑ Yes, the project must implement HM requirements

☐ No, the project is exempt from HM requirements

6. Selection of Specific Stormwater Control Measures:

Site Design Measures

- ☑ Minimize land disturbed (e.g., protect trees and soil)
- ☐ Minimize impervious surfaces (e.g., reduction in post-project impervious surface)
- ☐ Minimum-impact street or parking lot design (e.g., parking on top of or under buildings)
- ☐ Cluster structures/ pavement
- ☐ Disconnected downspouts (direct runoff from roofs, sidewalks, patios to landscaped areas)
- ☐ Pervious pavement
- ☐ Green roof
- ☐ Other self-treating[5] area (e.g., landscaped areas)
- ☐ Self-retaining[5] area
- ☐ Rainwater harvesting and use (e.g., rain barrel, cistern for designated use) [6]
- ☐ Preserved open space
- ☐ Protected riparian and wetland areas/buffers
- ☐ Other _____

Source Control Measures

- ☐ Wash area/racks, drain to sanitary sewer[7]
- ☐ Covered dumpster area, drain to sanitary sewer[7]
- ☐ Sanitary sewer connection or accessible cleanout for swimming pool/spa/fountain[7]
- ☐ Beneficial landscaping (minimize irrigation, runoff, pesticides and fertilizers; promotes treatment)
- ☐ Outdoor material storage protection
- ☐ Covers, drains for loading docks, maintenance bays, fueling areas
- ☑ Maintenance (pavement sweeping, catch basin cleaning, good housekeeping)
- ☑ Storm drain labeling
- ☐ Other _____

Treatment Measures

- ☐ None (all impervious surface drains to self-retaining areas)

LID Treatment

- ☑ Bioretention area
- ☐ Flow-through planter
- ☐ Tree Well Filter or Trench with bioretention soils
- ☐ Rainwater harvest/use (e.g., cistern for designated use, sized for C.3.d treatment)
- ☐ Pervious pavement, sized for C.3.d treatment
- ☐ Infiltration trench
- ☐ Infiltration well/dry well
- ☐ Subsurface Infiltration System (e.g., vault or large diameter conduit over drain rock)
- ☐ Other _____

Non-LID Treatment Methods

- ☐ Proprietary high flow rate tree box filter[8]
- ☐ Proprietary high flow media filter (sand, compost, or proprietary media)[8]
- ☐ Vegetated filter strip[9]
- ☐ Extended detention basin[9]
- ☐ Vegetated swale[9]
- ☐ Other _____

Flow Duration Controls for Hydromodification Management (HM)

- ☐ Extended Detention basin
- ☐ Underground tank or vault
- ☑ Bioretention with outlet control
- ☐ Other _____

[5] See SCVURPPP C.3 Stormwater Handbook for definitions.

[6] Optional site design measure; does not have to be sized to comply with Provision C.3.d treatment requirements.

[7] Subject to sanitary sewer authority requirements.

[8] These treatment measures are only allowed if the project qualifies as a "Special Project".

[9] These treatment measures are only allowed as part of a multi-step treatment process (i.e., for pretreatment).

7. Stormwater Treatment Measure (STM) Sizing for Projects with Treatment Requirements

Stormwater Treatment Measure (STM)	Hydraulic Sizing Criteria Used*
Bioretention unlined w/ underdrain	2c
Choose from list	Choose from list
Choose from list	Choose from list
Choose from list	Choose from list

*Key: 1a: Volume – WEF Method
1b: Volume – CASQA BMP Handbook Method
2a: Flow – Factored Flood Flow Method
2b: Flow – CASQA BMP Handbook Method
2c: Flow – Uniform Intensity Method
3: Combination Flow and Volume Design Basis

8. Additional Stormwater Treatment of Non-Regulated Areas - Is the project providing stormwater treatment for non-regulated impervious area that is not included in **Item 2 Project Size**? For example, stormwater treatment of right-of-way areas that are outside the project footprint, or treatment measures that are treating more right-of-way impervious area quantities than required.

☐ Yes, complete the table below
☑ No

Additional Stormwater Treatment of Non-Regulated Areas

Non-Regulated Area Draining to Treatment Measure			Treatment Measures	Hydraulic Sizing Criteria
Impervious Area Treated (ft^2)	Pervious Area Treated (ft^2)	Total Area Treated (ft^2)		
			Choose from list	Choose from list
			Choose from list	Choose from list
			Choose from list	Choose from list
			Choose from list	Choose from list
			Choose from list	Choose from list
			Choose from list	Choose from list

9. Alternative Certification: Was the treatment system sizing and design reviewed by a qualified third-party professional that is not a member of the project team or agency staff?

☐ Yes ☐ No Name of Third-party Reviewer_____

10. Operation & Maintenance Information

A. Property Owner's Name: William Hirschman

B. Responsible Party for Stormwater Treatment/Hydromodification Control O&M:

a. Name: William Hirschman

b. Address: 258 Union Avenue, Los Gatos

c. Phone/E-mail: (408) 210-1998 / whirschman@lexorbuilders.com

This section to be completed by Municipal staff.

O&M Responsibility Mechanism

Indicate how responsibility for O&M is assured. Check all that apply:

☐ O&M Agreement

☐ Other mechanism that assigns responsibility (describe below):

_____

This section to be completed by Municipal staff (Note: This is an optional section that agencies should modify per their internal review and tracking process.)

Reviewed:

Community Development Department

☐ **Planning Division**

☐ **Building Division**

Public Works Department

☐ **Engineering**

☐ **Other (Specify)**

Return form to: _____

Data entry performed by: _____

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G.3 - Infiltration Worksheet

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Infiltration Feasibility Worksheet

Municipal Regional Stormwater Permit (MRP)

Stormwater Controls for Development Projects

Complete this worksheet for **C.3 Regulated Projects*** *for which the soil hydraulic conductivity (Ksat) exceeds 1.6. Use this checklist to determine the feasibility of treating the* **C.3.d *amount of runoff**** *with infiltration. Where it is infeasible to treat the C.3.d amount of runoff* with infiltration or rainwater harvesting and use, stormwater may be treated with* **biotreatment*** *measures. See Glossary (Attachment 1) for definitions of terms marked with an asterisk (*).*

1. Enter Project Data.

1.1 Project Name: Masson Estates

1.2 Project Address: Pierce Road, Saratoga

1.3 Applicant/Agent Name: Amanda Musy-Verdel / Hanna-Brunetti

1.4 Applicant/Agent Address: 7651 Eigleberry St., Gilroy

1.5 Applicant/Agent Email: amanda@hannabrunetti.com Applicant / Agent Phone: (408) 842-2173

2. Evaluate infiltration feasibility.

Check "Yes" or "No" to indicate whether the following conditions apply to the project. If "Yes" is checked for any question, then infiltration is infeasible, and you can continue to Item 3.1 without answering any further questions in Section 2. If all of the answers in Section 2 are "No," then infiltration is feasible, and you may design ***infiltration facilities**** *for the area from which runoff must be treated. Items 2.1 through 2.3 address the feasibility of using* ***infiltration facilities****, as well as the potential need to line bioretention areas.*

		Yes	No
2.1	Would infiltration facilities at this site conflict with the location of existing or proposed underground utilities or easements, or would the siting of infiltration facilities at this site result in their placement on top of underground utilities, or otherwise oriented to underground utilities, such that they would discharge to the utility trench, restrict access, or cause stability concerns? (If yes, attach evidence documenting this condition.)	☐	■
2.2	Is there a documented concern that there is a potential on the site for soil or groundwater pollutants to be mobilized? (If yes, attach documentation of mobilization concerns.)	☐	■
2.3	Are geotechnical hazards present, such as steep slopes, areas with landslide potential, soils subject to liquefaction, or would an infiltration facility need to be built less than 10 feet from a building foundation or other improvements subject to undermining by saturated soils? (If yes, attach documentation of geotechnical hazard.)	■	☐

Respond to Questions 2.4 through 2.8 only if the project proposes to use an **infiltration device*.**

No infiltration device proposed.

2.4	Do local water district or other agency's policies or guidelines regarding the locations where infiltration may occur, the separation from seasonal high groundwater, or setbacks from potential sources of pollution prevent infiltration devices from being implemented at this site? (If yes, attach evidence documenting this condition.)	☐	☐
2.5	Would construction of an infiltration device require that it be located less than 100 feet away from a septic tank, underground storage tank with hazardous materials, or other potential underground source of pollution? (If yes, attach evidence documenting this claim.)	☐	☐

Infiltration Feasibility Worksheet

		Yes	No
2.6	Is there a seasonal high groundwater table or mounded groundwater that would be within 10 feet of the base of an infiltration device* constructed on the site? (If yes, attach documentation of high groundwater.)	☐	☐
2.7	Are there land uses that pose a high threat to water quality – including but not limited to industrial and light industrial activities, high vehicular traffic (i.e., 25,000 or greater average daily traffic on a main roadway or 15,000 or more average daily traffic on any intersecting roadway), automotive repair shops, car washes, fleet storage areas, or nurseries? (If yes, attach evidence documenting this claim.)	☐	☐
2.8	Is there a groundwater production well within 100 feet of the location where an infiltration device would be constructed? (If yes, attach map showing the well.)	☐	☐

3. Results of Feasibility Determination

		Infeasible	Feasible
3.1	Based on the results of the Section 2 feasibility analysis, infiltration is (check one):	☐	☐

→ If "FEASIBLE" is indicated for Item 3.1, then the amount of stormwater requiring treatment must be treated with infiltration (or rainwater harvest and use, if feasible). ***Infiltration facilities**** *may be designed for the area from which runoff must be treated.*

→ If "INFEASIBLE" is checked for item 3.1, then the applicant may use appropriately designed ***biotreatment facilities**** *for compliance with C.3 treatment requirements. The applicant is encouraged to maximize infiltration of stormwater if site conditions allow.*

Amanda Musy-Verdel
Name of Applicant (Print)

Amanda
Name of Applicant (Sign)

12/12/23
Date