STORMWATER MANAGEMENT REPORT ADDENDUM

5 ORCHARD LANE TOPSFIELD, MASSACHUSETTS March 30, 2018 Revised: April 18, 2018

SUBMITTED TO:

TOWN OF TOPSFIELD TOPSFIELD PLANNING BOARD 461 BOSTON STREET, UNIT E-6 TOPSFIELD, MA 01983

APPLICANT:

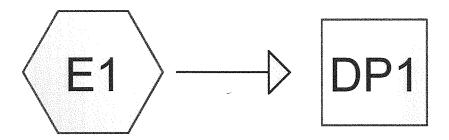
JAY KOLLIAS 107 WENHAM ROAD TOPSFIELD, MA 01983

PREPARED BY:

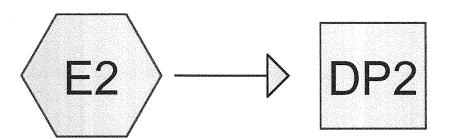
THE MORIN-CAMERON GROUP, INC.
66 ELM STREET
DANVERS, MA 01923

Comparison of Existing and Proposed Rates of Runoff

Event (Frequency in Years)	Existing Conditions (Peak CFS)	Proposed Conditions (Peak CFS)	Change in Peak (CFS)
DP1			
2	0.25	0.25	0.00
10	0.60	0.56	-0.04
100	1.18	1.14	-0.04
DP2			
2	0.45	0.34	-0.11
10	1.08	0.92	-0.16
100	2.12	1.65	-0.47



Drainage to Orchard Street



Drainage to Abutter









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Area Listing (all nodes)

Area	CN	Description		
(sq-ft)		(subcatchment-numbers)		
40,000	70	Woods, Good, HSG C (E1, E2)		

Type III 24-hr 2-Year Rainfall=3.10" Printed 4/18/2018

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Drainage to Orchard

Runoff Area=14,106 sf 0.00% Impervious Runoff Depth=0.77" Flow Length=265' Tc=6.8 min CN=70 Runoff=0.25 cfs 906 cf

Subcatchment E2: Drainage to Abutter

Runoff Area=25,894 sf 0.00% Impervious Runoff Depth=0.77" Flow Length=415' Tc=7.4 min CN=70 Runoff=0.45 cfs 1,663 cf

Reach DP1:

Inflow=0.25 cfs 906 cf Outflow=0.25 cfs 906 cf

Reach DP2:

Inflow=0.45 cfs 1,663 cf Outflow=0.45 cfs 1,663 cf Prepared by The Morin-Cameron Group, Inc.

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Summary for Subcatchment E1: Drainage to Orchard Street

Runoff = 0.25 cfs @ 12.11 hrs, Volume= 906 cf, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

_	Α	rea (sf)	CN [Description		
		14,106	70 V	Noods, Go	od, HSG C	
14,106 100.00% Pervious Area					ervious Are	а
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.1	50	0.1200	0.14		Sheet Flow,
	0.4	120	0.1250	5.69		Woods: Light underbrush n= 0.400 P2= 3.10" Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
	0.3	95	0.0737	5.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
	6.8	265	Total			

Summary for Subcatchment E2: Drainage to Abutter

Runoff = 0.45 cfs @ 12.12 hrs, Volume= 1,663 cf, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

	Α	rea (sf)	CN [Description						
		25,894	4 70 Woods, Good, HSG C							
25,894 100.00% Perviou			00.00% Pe	ervious Are	а					
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
	5.8	50	0.1400	0.14		Sheet Flow,				
	1.6	365	0.0575	3.86		Woods: Light underbrush n= 0.400 P2= 3.10" Shallow Concentrated Flow, Unpaved Kv= 16.1 fps				
	7.4	415	Total							

Summary for Reach DP1:

Inflow Area = 14,106 sf, 0.00% Impervious, Inflow Depth = 0.77" for 2-Year event

Inflow = 0.25 cfs @ 12.11 hrs, Volume= 906 cf

Outflow = 0.25 cfs @ 12.11 hrs, Volume= 906 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-Year Rainfall=3.10" Printed 4/18/2018

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Summary for Reach DP2:

Inflow Area = 25,894 sf, 0.00% Impervious, Inflow Depth = 0.77" for 2-Year event

Inflow = 0.45 cfs @ 12.12 hrs, Volume= 1,663 cf

Outflow = 0.45 cfs @ 12.12 hrs, Volume= 1,663 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Type III 24-hr 10-Year Rainfall=4.50" Printed 4/18/2018

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Drainage to Orchard

Runoff Area=14,106 sf 0.00% Impervious Runoff Depth=1.67" Flow Length=265' Tc=6.8 min CN=70 Runoff=0.60 cfs 1,967 cf

Subcatchment E2: Drainage to Abutter

Runoff Area=25,894 sf 0.00% Impervious Runoff Depth=1.67" Flow Length=415' Tc=7.4 min CN=70 Runoff=1.08 cfs 3,612 cf

Reach DP1:

Inflow=0.60 cfs 1,967 cf Outflow=0.60 cfs 1,967 cf

Reach DP2:

Inflow=1.08 cfs 3,612 cf Outflow=1.08 cfs 3,612 cf

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Summary for Subcatchment E1: Drainage to Orchard Street

Runoff =

0.60 cfs @ 12.10 hrs, Volume=

1,967 cf, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

	Α	rea (sf)	CN E	escription		
		14,106	70 V	Voods, Go	od, HSG C	
14,106 100.00% Pervious Area						a
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
_	6.1	50	0.1200	0.14		Sheet Flow,
	0.4	120	0.1250	5.69		Woods: Light underbrush n= 0.400 P2= 3.10" Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
	0.3	95	0.0737	5.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
_	6.8	265	Total			

Summary for Subcatchment E2: Drainage to Abutter

Runoff =

1.08 cfs @ 12.11 hrs, Volume=

3,612 cf, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

	Α	rea (sf)	CN E	escription						
		25,894	70 Woods, Good, HSG C							
_	25,894 100.00% Pervious Area					a				
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
-	5.8	50	0.1400	0.14		Sheet Flow,				
	1.6	365	0.0575	3.86		Woods: Light underbrush n= 0.400 P2= 3.10" Shallow Concentrated Flow, Unpaved Kv= 16.1 fps				
_	7 4	415	Total							

Summary for Reach DP1:

Inflow Area =

14,106 sf, 0.00% Impervious, Inflow Depth = 1.67" for 10-Year event

Inflow =

0.60 cfs @ 12.10 hrs, Volume=

1,967 cf

Outflow =

0.60 cfs @ 12.10 hrs, Volume=

1,967 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Type III 24-hr 10-Year Rainfall=4.50" Printed 4/18/2018

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Summary for Reach DP2:

Inflow Area = 25,894 sf, 0.00% Impervious, Inflow Depth = 1.67" for 10-Year event

Inflow = 1.08 cfs @ 12.11 hrs, Volume= 3,612 cf

Outflow = 1.08 cfs @ 12.11 hrs, Volume= 3,612 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Type III 24-hr 100-Year Rainfall=6.50" Printed 4/18/2018

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: Drainage to Orchard

Runoff Area=14,106 sf 0.00% Impervious Runoff Depth=3.21" Flow Length=265' Tc=6.8 min CN=70 Runoff=1.18 cfs 3,770 cf

Subcatchment E2: Drainage to Abutter

Runoff Area=25,894 sf 0.00% Impervious Runoff Depth=3.21" Flow Length=415' Tc=7.4 min CN=70 Runoff=2.12 cfs 6,920 cf

Reach DP1:

Inflow=1.18 cfs 3,770 cf

Outflow=1.18 cfs 3,770 cf

Reach DP2:

Inflow=2.12 cfs 6,920 cf Outflow=2.12 cfs 6,920 cf

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Summary for Subcatchment E1: Drainage to Orchard Street

Runoff

=

1.18 cfs @ 12.10 hrs, Volume=

3,770 cf, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

	Α	rea (sf)	CN [Description		
		14,106	70 \	Noods, Go	od, HSG C	
14,106			1	100.00% Pe	ervious Are	a
	Tc (min)	Length (feet)	Slope (ft/ft)	,	Capacity (cfs)	Description
-	6.1	50	0.1200	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
	0.4	120	0.1250	5.69		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
	0.3	95	0.0737	5.51		Shallow Concentrated Flow, Paved Kv= 20.3 fps
-	6.8	265	Total			

Summary for Subcatchment E2: Drainage to Abutter

Runoff

2.12 cfs @ 12.11 hrs, Volume=

6,920 cf, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

	Α	rea (sf)	CN E	escription							
		25,894	4 70 Woods, Good, HSG C								
_	7 77 77 77 77	25,894	1	00.00% Pe	ervious Are	a					
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description					
_	5.8	50	0.1400	0.14		Sheet Flow,					
	1.6	365	0.0575	3.86		Woods: Light underbrush n= 0.400 P2= 3.10" Shallow Concentrated Flow, Unpaved Kv= 16.1 fps					
	7.4	415	Total								

Summary for Reach DP1:

Inflow Area =

14,106 sf, 0.00% Impervious, Inflow Depth = 3.21" for 100-Year event

Inflow =

1.18 cfs @ 12.10 hrs, Volume=

3,770 cf

Outflow =

1.18 cfs @ 12.10 hrs, Volume=

3,770 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Type III 24-hr 100-Year Rainfall=6.50"

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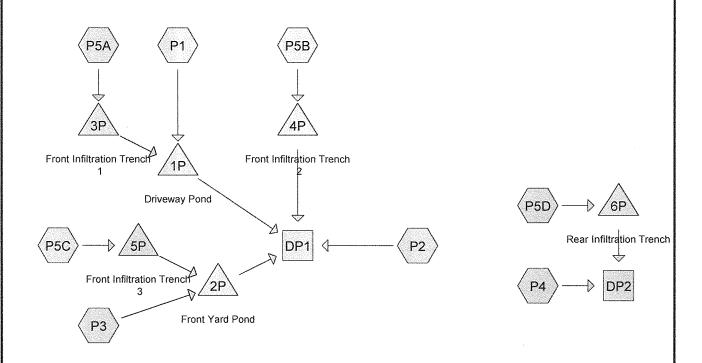
Summary for Reach DP2:

25,894 sf, 0.00% Impervious, Inflow Depth = 3.21" for 100-Year event Inflow Area =

2.12 cfs @ 12.11 hrs, Volume= Inflow = 6,920 cf

Outflow 2.12 cfs @ 12.11 hrs, Volume= 6,920 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs











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Area Listing (all nodes)

Area	CN	Description
(sq-ft)		(subcatchment-numbers)
25,844	74	>75% Grass cover, Good, HSG C (P1, P2, P3, P4, P5A, P5B, P5C, P5D)
2,119	98	Paved parking, HSG C (P1, P2)
2,632	98	Roofs, HSG C (P5A, P5B, P5C, P5D)
319	98	Unconnected pavement, HSG C (P1, P2, P3)
9,086	70	Woods, Good, HSG C (P1, P4)

Type III 24-hr 2-Year Rainfall=3.10"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Runoff Area=13,573 sf 14.59% Impervious Runoff Depth=1.08"

Tc=6.0 min CN=76 Runoff=0.38 cfs 1,225 cf

Subcatchment P2: Runoff Area=4,668 sf 9.60% Impervious Runoff Depth=1.08"

Tc=6.0 min CN=76 Runoff=0.13 cfs 421 cf

Subcatchment P3: Runoff Area=3,065 sf 0.33% Impervious Runoff Depth=0.97"

Flow Length=165' Tc=6.2 min CN=74 Runoff=0.07 cfs 248 cf

Subcatchment P4: Runoff Area=15,634 sf 0.00% Impervious Runoff Depth=0.92"

Flow Length=230' Tc=7.3 min CN=73 Runoff=0.34 cfs 1,198 cf

Subcatchment P5A: Runoff Area=481 sf 85.65% Impervious Runoff Depth=2.55"

Tc=6.0 min CN=95 Runoff=0.03 cfs 102 cf

Subcatchment P5B: Runoff Area=312 sf 89.10% Impervious Runoff Depth=2.55"

Tc=6.0 min CN=95 Runoff=0.02 cfs 66 cf

Subcatchment P5C: Runoff Area=520 sf 85.00% Impervious Runoff Depth=2.45"

Tc=6.0 min CN=94 Runoff=0.03 cfs 106 cf

Subcatchment P5D: Runoff Area=1.747 sf 85.86% Impervious Runoff Depth=2.55"

Tc=6.0 min CN=95 Runoff=0.11 cfs 371 cf

Reach DP1: Inflow=0.25 cfs 1,923 cf

Outflow=0.25 cfs 1,923 cf

Reach DP2: Inflow=0.34 cfs 1,214 cf

Outflow=0.34 cfs 1,214 cf

Pond 1P: Driveway Pond Peak Elev=97.87' Storage=355 cf Inflow=0.38 cfs 1,226 cf

Outflow=0.09 cfs 1,225 cf

Pond 2P: Front Yard Pond Peak Elev=88.25' Storage=20 cf Inflow=0.08 cfs 267 cf

Outflow=0.06 cfs 267 cf

Pond 3P: Front Infiltration Trench 1 Peak Elev=103.50' Storage=45 cf Inflow=0.03 cfs 102 cf

Discarded=0.00 cfs 101 cf Primary=0.00 cfs 1 cf Outflow=0.00 cfs 102 cf

Pond 4P: Front Infiltration Trench 2 Peak Elev=103.51' Storage=23 cf Inflow=0.02 cfs 66 cf

Discarded=0.00 cfs 57 cf Primary=0.01 cfs 9 cf Outflow=0.01 cfs 66 cf

Pond 5P: Front Infiltration Trench 3 Peak Elev=103.51' Storage=43 cf Inflow=0.03 cfs 106 cf

Discarded=0.00 cfs 86 cf Primary=0.02 cfs 19 cf Outflow=0.02 cfs 105 cf

Pond 6P: Rear Infiltration Trench Peak Elev=103.50' Storage=176 cf Inflow=0.11 cfs 371 cf

Discarded=0.01 cfs 355 cf Primary=0.03 cfs 16 cf Outflow=0.04 cfs 371 cf

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Summary for Subcatchment P1:

Runoff

0.38 cfs @ 12.09 hrs, Volume=

1,225 cf, Depth= 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

Ar	ea (sf)	CN I	Description					
	5,900	74	>75% Gras	s cover, Go	ood, HSG C			
	167	98	Jnconnecte	ed pavemer	nt, HSG C			
	1,813	98	Paved park	ing, HSG C	;			
	5,693	70 '	Noods, Go	od, HSG C				
	13,573	76	Neighted A	verage		-		
	11,593	;	35.41% Per	vious Area				
	1,980		14.59% Imp	pervious Are	ea			
	167	;	3.43% Unco	onnected				
-		01	V () (1)	~ ''	D ' '			
Tc	Length	Slope		Capacity	Description			
<u>(min)</u>	(feet)	(ft/ft)	(ft/sec)	(cfs)				
6.0					Direct Entry,			

Summary for Subcatchment P2:

Runoff

0.13 cfs @ 12.09 hrs, Volume=

421 cf, Depth= 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

A	rea (sf)	CN	Description								
	4,220	74	>75% Grass cover, Good, HSG C								
	142	98	Unconnected pavement, HSG C								
	306	98	Paved park	ing, HSG C	•						
	4,668	76	Weighted Average								
	4,220	!	90.40% Pervious Area								
	448	!	9.60% Impe	ervious Area	а						
	142	;	31.70% Und	connected							
Тс	Length	Slope	,	Capacity	Description						
(min)_	(feet)	(ft/ft)	(ft/sec)	(cfs)							
6.0					Direct Entry.						

Summary for Subcatchment P3:

Runoff

0.07 cfs @ 12.10 hrs, Volume=

248 cf, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

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Area ((sf)	CN E	Description					
3,0)55	74 >	>75% Grass cover, Good, HSG C					
	10	98 L	98 Unconnected pavement, HSG C					
3,0)65	74 Weighted Average						
3,0)55	9	9.67% Per	vious Area				
	10	C	.33% Impe	ervious Are	a			
	10 100.00% Unconnected				1			
	ngth	Slope	Velocity	Capacity	Description			
	eet)	(ft/ft)	(ft/sec)	(cfs)				
5.8	50	0.1400	0.14		Sheet Flow,			
					Woods: Light underbrush n= 0.400 P2= 3.10"			
0.3	85	0.1200	5.58		Shallow Concentrated Flow,			
					Unpaved Kv= 16.1 fps			
0.1	30	0.0500	4.54		Shallow Concentrated Flow,			
					Paved Kv= 20.3 fps			
6.2	165	Total						

Summary for Subcatchment P4:

Runoff = 0.34 cfs @ 12.11 hrs, Volume=

1,198 cf, Depth= 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

	Α	rea (sf)	CN [Description				
		12,241	74 >	>75% Grass cover, Good, HSG C				
		3,393	70 ١	Woods, Good, HSG C				
15,634 73 Weighted Average								
	15,634 100.00% Pervious Are			00.00% Pe	ervious Are	a ·		
	Tc	Length	Slope	•	Capacity	Description		
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
	6.6	50	0.1000	0.13		Sheet Flow,		
						Woods: Light underbrush n= 0.400 P2= 3.10"		
	0.7	180	0.0780	4.50		Shallow Concentrated Flow,		
						Unpaved Kv= 16.1 fps		
	7.3	230	Total					

Summary for Subcatchment P5A:

Runoff = 0.03 cfs @ 12.08 hrs, Volume=

102 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

Type III 24-hr 2-Year Rainfall=3.10" Printed 4/18/2018

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A	rea (sf)	CN	Description			
	412	98	Roofs, HSG C			
	69	74	>75% Gras	s cover, Go	ood, HSG C	
	481	95	Weighted Average			
	69		14.35% Per	vious Area		
	412		85.65% Imp	pervious Ar	ea	
Tc (min)	Length (feet)	Slope (ft/ft)	,	Capacity (cfs)	Description	
6.0					Direct Entry,	

Summary for Subcatchment P5B:

Runoff = 0.02 cfs @ 12.08 hrs, Volume=

66 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

A	rea (sf)	CN	Description			
	278	98	Roofs, HSG	G C		
	34	74	>75% Gras	s cover, Go	ood, HSG C	
	312	95	Weighted A	verage		
	34		10.90% Per	vious Area		
	278		89.10% Imp	pervious Ar	ea	
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description	
6.0					Direct Entry,	

Summary for Subcatchment P5C:

Runoff = 0.03 cfs @ 12.08 hrs, Volume=

106 cf, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

Α	rea (sf)	CN I	Description				
	442	98	Roofs, HSG	C C			
	78	74	>75% Grass cover, Good, HSG C				
	520	94 \	Neighted A	verage			
	78	,	15.00% Per	vious Area			
	442	3	35.00% Imp	pervious Ar	ea		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description		
					D: 4 E4		

6.0

Direct Entry,

Type III 24-hr 2-Year Rainfall=3.10"

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Summary for Subcatchment P5D:

Runoff

0.11 cfs @ 12.08 hrs, Volume=

371 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 2-Year Rainfall=3.10"

A	rea (sf)	CN	Description			
	1,500	98	Roofs, HSC	S C		
	247	74	>75% Gras	s cover, Go	ood, HSG C	
	1,747	95	Weighted A	verage		
	247		14.14% Per	vious Area		
	1,500		85.86% Imp	pervious Ar	ea	
Tc (min)	Length (feet)	Slope (ft/ft)		Capacity (cfs)	Description	
6.0					Direct Entry,	

Summary for Reach DP1:

Inflow Area =

22,619 sf, 15.78% Impervious, Inflow Depth = 1.02" for 2-Year event

Inflow

Outflow

0.25 cfs @ 12.11 hrs, Volume= 1,923 cf 0.25 cfs @ 12.11 hrs, Volume=

1,923 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Reach DP2:

Inflow Area =

17,381 sf, 8.63% Impervious, Inflow Depth = 0.84" for 2-Year event

Inflow

Outflow

0.34 cfs @ 12.11 hrs, Volume= 0.34 cfs @ 12.11 hrs, Volume=

1.214 cf

1,214 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Driveway Pond

Inflow Area =

14,054 sf, 17.02% Impervious, Inflow Depth = 1.05" for 2-Year event

Inflow

0.38 cfs @ 12.09 hrs, Volume=

1,226 cf

Outflow

0.09 cfs @ 12.53 hrs, Volume=

1,225 cf. Atten= 75%, Lag= 26.0 min

0.09 cfs @ 12.53 hrs, Volume=

Primary

1,225 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 97.87' @ 12.53 hrs Surf.Area= 538 sf Storage= 355 cf

Plug-Flow detention time= 45.1 min calculated for 1,225 cf (100% of inflow) Center-of-Mass det. time= 44.8 min (902.2 - 857.4)

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Volume	Inver	t Avail.Sto	rage Storage	Description	
#1	97.00	' 1,23	31 cf Custom	Stage Data (Prismatic) Listed below (Recalc)	
Elevatio	-	urf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
97.0	00	278	0	0	
98.0	00	577	428	428	
99.0	00	1,029	803	1,231	
Device	Routing	Invert	Outlet Device	S	
#1	Primary	97.00'	Inlet / Outlet I	Culvert L= 50.0' Ke= 0.500 nvert= 97.00' / 89.00' S= 0.1600 '/' Cc= 0.900 ow Area= 0.20 sf	·
#2	Device 1	97.00'	2.0" Vert. Ori	fice/Grate C= 0.600	
#3	Device 1	98.00'	4.0" Vert. Ori	fice/Grate C= 0.600	
#4	Device 1	98.90'	6.0" Horiz. O	rifice/Grate C= 0.600 Limited to weir flow at l	ow heads
Primary OutFlow Max=0.09 cfs @ 12.53 hrs HW=97.87' TW=0.00' (Dynamic Tailwater) 1=Culvert (Passes 0.09 cfs of 0.74 cfs potential flow)					

Summary for Pond 2P: Front Yard Pond

Inflow Area = 3,585 sf, 12.61% Impervious, Inflow Depth = 0.90" for 2-Year event

Inflow 267 cf

-2=Orifice/Grate (Orifice Controls 0.09 cfs @ 4.27 fps)

0.08 cfs @ 12.18 hrs, Volume= 0.06 cfs @ 12.22 hrs, Volume= 267 cf, Atten= 18%, Lag= 2.4 min Outflow

0.06 cfs @ 12.22 hrs, Volume= Primary 267 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 88.25' @ 12.22 hrs Surf.Area= 104 sf Storage= 20 cf

Plug-Flow detention time= 9.3 min calculated for 267 cf (100% of inflow)

Center-of-Mass det. time= 9.3 min (865.4 - 856.0)

-3=Orifice/Grate (Controls 0.00 cfs) -4=Orifice/Grate (Controls 0.00 cfs)

Volume	Inve	ert Avail.Stor	rage Storage D	escription			_
#1	88.0	0' 21	5 cf Custom S	itage Data (Prisr	matic) Listed below	v (Recalc)	
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)			
88.0	0	59	0	0			
89.0	0	241	150	150			
89.2	25	277	65	215			
Device	Routing	Invert	Outlet Devices				
#1	Primary	88.00'	6.0" Round Cu	ilvert L= 10.0'	Ke= 0.500		_
	·		Inlet / Outlet Inv	vert= 88.00' / 87.	50' S= 0.0500 '/'	Cc= 0.900	
			n= 0.012, Flow	Area= 0.20 sf			
#2	Device 1	88.00'	2.5" Vert. Orific	ce/Grate C= 0.	600		
#3	Device 1	88.75'	3.0" Vert. Orific	ce/Grate C= 0.	600		

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89.10' 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.06 cfs @ 12.22 hrs HW=88.25' TW=0.00' (Dynamic Tailwater)

-1=Culvert (Passes 0.06 cfs of 0.17 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.06 cfs @ 1.83 fps)

-3=Orifice/Grate (Controls 0.00 cfs)

-4=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 3P: Front Infiltration Trench 1

Inflow Area = 481 sf, 85.65% Impervious, Inflow Depth = 2.55" for 2-Year event

Inflow 0.03 cfs @ 12.08 hrs, Volume= 102 cf

Outflow 0.00 cfs @ 12.60 hrs, Volume= 102 cf, Atten= 86%, Lag= 30.8 min

0.00 cfs @ 12.60 hrs, Volume= Discarded = 101 cf 0.00 cfs @ 12.60 hrs, Volume= Primary 1 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 103.50' @ 12.60 hrs Surf.Area= 112 sf Storage= 45 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 281.7 min (1,063.6 - 782.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	101.50'	45 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 112 cf Overall x 40.0% Voids	
#2	103.50'	3 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
		48 cf	Total Available Storage	
Elevation	Surf.A	rea Ind	c.Store Cum.Store	

(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)
101.50	56	0	0
103.50	56	112	112
Elevation	Surf.Area	Inc.Store	Cum.Store
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)
103.50	56	0	0
103 55	56	વ	3

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	26.0' long x 1.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32
#2	Discarded	101.50'	1.020 in/hr Exfiltration over Surface area
			Conductivity to Groundwater Flevation = 0.00'

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Discarded OutFlow Max=0.00 cfs @ 12.60 hrs HW=103.50' (Free Discharge) 2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 12.60 hrs HW=103.50' TW=97.86' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.08 fps)

Summary for Pond 4P: Front Infiltration Trench 2

Inflow Area =	312 sf, 89.10% Impervious,	Inflow Depth = 2.55" for 2-Year event
Inflow =	0.02 cfs @ 12.08 hrs, Volume=	66 cf
Outflow =	0.01 cfs @ 12.20 hrs, Volume=	66 cf, Atten= 32%, Lag= 7.1 min
Discarded =	0.00 cfs @ 12.20 hrs, Volume=	57 cf
Primary =	0.01 cfs @ 12.20 hrs, Volume=	9 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.51' @ 12.20 hrs Surf.Area= 56 sf Storage= 23 cf

Avail.Storage Storage Description

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 243.0 min (1,024.9 - 782.0)

Volume

Invert

VOIGITIC	1114016	7 (V (411. C	norage	Otorage D	Coompach	
#1	101.50'		22 cf	Custom S	tage Data (Pr	rismatic) Listed below (Recalc)
				56 cf Ove	rall x 40.0% \	/oids
#2	103.50'		1 cf	Custom S	tage Data (Pr	ismatic) Listed below (Recalc)
			24 cf	Total Avai	lable Storage	
Elevation	Surf.	Area	Inc	:.Store	Cum.Store	
(feet)	(s	q-ft)	(cubi	c-feet)	(cubic-feet)	
101.50		28		0	0	
103.50		28		56	56	
Elevation	Surf.	Area	Inc	:Store	Cum.Store	
(feet)	(8	q-ft)	(cubi	c-feet)	(cubic-feet)	
103.50		28		0	0	
103.55		28		1	1	
Device R	outing	Inve	rt Outl	et Devices		

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	12.0' long x 1.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32
#2	Discarded	101.50'	1.020 in/hr Exfiltration over Surface area
			Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.00 cfs @ 12.20 hrs HW=103.51' (Free Discharge) 2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.01 cfs @ 12.20 hrs HW=103.51' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.01 cfs @ 0.19 fps)

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Summary for Pond 5P: Front Infiltration Trench 3

Inflow Area = 520 sf, 85.00% Impervious, Inflow Depth = 2.45" for 2-Year event
Inflow = 0.03 cfs @ 12.08 hrs, Volume= 106 cf
Outflow = 0.02 cfs @ 12.18 hrs, Volume= 105 cf, Atten= 31%, Lag= 5.7 min
Discarded = 0.00 cfs @ 12.18 hrs, Volume= 86 cf
Primary = 0.02 cfs @ 12.18 hrs, Volume= 19 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.51' @ 12.18 hrs Surf.Area= 74 sf Storage= 43 cf

Plug-Flow detention time= 297.4 min calculated for 105 cf (99% of inflow) Center-of-Mass det. time= 293.4 min (1,081.5 - 788.2)

Volume	Inve	ert Avail.Sto	rage	Storag	e Description	
#1	98.0	0'	40 cf		V x 24.0" H Box	Pipe Storage
					0' S= 0.2200 '/'	
		-01			Overall x 40.0%	
#2	101.5	0.	10 cf			ismatic) Listed below (Recalc)
#3	103.5	יחי	1 cf		Overall x 40.0% V	
	100.0		50 cf			ismatic) Listed below (Recalc)
		:	50 CI	i Otal F	vailable Storage	
Elevatio	n	Surf.Area	Inc	:Store	Cum.Store	
(fee		(sq-ft)		c-feet)	(cubic-feet)	
101.5	0	12		0	0	
103.5	0	12		24	24	
				<u>.</u> .		
Elevatio		Surf.Area		Store	Cum.Store	
(fee		(sq-ft)	(cubi	c-feet)	(cubic-feet)	
103.5	0	12		0	0	
103.5	5	12		1	1	
Device	Routing	Invert	Outl	et Devid	es	
#1	Primary	103.50'	6.0'	long x	1.0' breadth Broa	ad-Crested Rectangular Weir
					0.20 0.40 0.60	0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50	3.00		
			Coe	f. (Engli	sh) 2.69 2.72 2.	75 2.85 2.98 3.08 3.20 3.28 3.31
				3.31		
#2	Discarde	ed 98.00'	1.02	0 in/hr	Exfiltration over	Surface area

Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.00 cfs @ 12.18 hrs HW=103.51' (Free Discharge) 2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.02 cfs @ 12.18 hrs HW=103.51' TW=88.24' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.02 cfs @ 0.29 fps)

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Summary for Pond 6P: Rear Infiltration Trench

Inflow Area = 1,747 sf, 85.86% Impervious, Inflow Depth = 2.55" for 2-Year event

Inflow = 0.11 cfs @ 12.08 hrs, Volume= 371 cf

Outflow = 0.04 cfs @ 12.40 hrs, Volume= 371 cf, Atten= 67%, Lag= 19.1 min

Discarded = 0.01 cfs @ 12.40 hrs, Volume= 355 cf Primary = 0.03 cfs @ 12.40 hrs, Volume= 16 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.50' @ 12.40 hrs Surf.Area= 399 sf Storage= 176 cf

Plug-Flow detention time= 328.2 min calculated for 371 cf (100% of inflow)

Center-of-Mass det. time= 327.9 min (1,109.8 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	33 cf	24.0" W x 24.0" H Box Pipe Storage
			L= 20.5' S= 0.0268 '/'
			82 cf Overall x 40.0% Voids
#2	101.50'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
			358 cf Overall x 40.0% Voids
#3	103.50'	9 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

185 cf Total Available Storage

Cum.Store	Inc.Store	Surt.Area	Elevation
(cubic-feet)	(cubic-feet)	(sq-ft)	(feet)
0	0	179	101.50
358	358	179	103.50
Cum.Store	Inc.Store	Surf.Area	Elevation
(cubic-feet)	(cubic-feet)	(sq-ft)	(feet)
0	0	179	103.50
9	9	179	103.55

Devic	e Routing	Invert	Outlet Devices
#	l Primary	103.50'	80.0' long x 1.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32
#2	2 Discarded	98.00'	1.020 in/hr Exfiltration over Surface area
			Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.01 cfs @ 12.40 hrs HW=103.50' (Free Discharge) = 2=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.03 cfs @ 12.40 hrs HW=103.50' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.03 cfs @ 0.13 fps)

Type III 24-hr 10-Year Rainfall=4.50"
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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Runoff Area=13,573 sf 1

Runoff Area=13,573 sf 14.59% Impervious Runoff Depth=2.13"

Tc=6.0 min CN=76 Runoff=0.77 cfs 2,409 cf

Subcatchment P2:

Runoff Area=4,668 sf 9.60% Impervious Runoff Depth=2.13"

Tc=6.0 min CN=76 Runoff=0.27 cfs 828 cf

Subcatchment P3:

Runoff Area=3,065 sf 0.33% Impervious Runoff Depth=1.97" Flow Length=165' Tc=6.2 min CN=74 Runoff=0.16 cfs 504 cf

Subcatchment P4:

Runoff Area=15,634 sf 0.00% Impervious Runoff Depth=1.90" Flow Length=230' Tc=7.3 min CN=73 Runoff=0.75 cfs 2,470 cf

Subcatchment P5A:

Runoff Area=481 sf 85.65% Impervious Runoff Depth=3.92"

Tc=6.0 min CN=95 Runoff=0.05 cfs 157 cf

Subcatchment P5B:

Runoff Area=312 sf 89.10% Impervious Runoff Depth=3.92"

Tc=6.0 min CN=95 Runoff=0.03 cfs 102 cf

Subcatchment P5C:

Runoff Area=520 sf 85.00% Impervious Runoff Depth=3.82"

Tc=6.0 min CN=94 Runoff=0.05 cfs 165 cf

Subcatchment P5D:

Runoff Area=1,747 sf 85.86% Impervious Runoff Depth=3.92"

Tc=6.0 min CN=95 Runoff=0.17 cfs 571 cf

Reach DP1:

Inflow=0.56 cfs 3,872 cf

Outflow=0.56 cfs 3,872 cf

Reach DP2:

Inflow=0.92 cfs 2,609 cf

Outflow=0.92 cfs 2,609 cf

Pond 1P: Driveway Pond

Peak Elev=98.37' Storage=672 cf Inflow=0.81 cfs 2,443 cf

Outflow=0.31 cfs 2.442 cf

Pond 2P: Front Yard Pond

Peak Elev=88.62' Storage=72 cf Inflow=0.21 cfs 567 cf

Outflow=0.12 cfs 567 cf

Pond 3P: Front Infiltration Trench 1

Peak Elev=103.51' Storage=45 cf Inflow=0.05 cfs 157 cf

Discarded=0.00 cfs 123 cf Primary=0.06 cfs 34 cf Outflow=0.06 cfs 157 cf

Pond 4P: Front Infiltration Trench 2

Peak Elev=103.51' Storage=23 cf Inflow=0.03 cfs 102 cf

Discarded=0.00 cfs 68 cf Primary=0.03 cfs 34 cf Outflow=0.03 cfs 102 cf

Pond 5P: Front Infiltration Trench 3

Peak Elev=103.52' Storage=43 cf Inflow=0.05 cfs 165 cf

Discarded=0.00 cfs 100 cf Primary=0.05 cfs 63 cf Outflow=0.05 cfs 164 cf

Pond 6P: Rear Infiltration Trench

Peak Elev=103.51' Storage=178 cf Inflow=0.17 cfs 571 cf

Discarded=0.01 cfs 430 cf Primary=0.19 cfs 139 cf Outflow=0.20 cfs 568 cf

Type III 24-hr 10-Year Rainfall=4.50"

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Summary for Subcatchment P1:

Runoff

=

0.77 cfs @ 12.09 hrs, Volume=

2,409 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

Ar	ea (sf)	CN	Description								
	5,900	74	>75% Gras	s cover, Go	od, HSG C						
	167	98	Jnconnecte	ed pavemer	nt, HSG C						
	1,813	98	Paved park	ing, HSG C	;						
	5,693	70	Noods, Go	od, HSG C							
	13,573	76	Neighted A	verage							
,	11,593	;	35.41% Per	vious Area							
	1,980		14.59% Imp	ervious Are	ea						
	167	;	3.43% Unco	onnected							
	Length	Slope	•	Capacity	Description						
<u>(min)</u>	(feet)	(ft/ft)	(ft/sec)	(cfs)							
6.0					Direct Entry,						

Summary for Subcatchment P2:

Runoff

0.27 cfs @ 12.09 hrs, Volume=

828 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

A	rea (sf)	CN	Description								
	4,220	74	>75% Gras	s cover, Go	ood, HSG C						
	142	98	Jnconnecte	ed pavemer	ent, HSG C						
	306	98	Paved park	ing, HSG C	C						
	4,668	76	Neighted A	verage							
	4,220			vious Area	a						
	448	•	9.60% Impe	ervious Area	ea						
	142	;	31.70% Un	connected							
_		٥.									
Тс	Length	Slope		Capacity	· · · · · · · · · · · · · · · · · · ·						
(min)_	(feet)	(ft/ft)	(ft/sec)	(cfs)							
6.0					Direct Entry,						

Summary for Subcatchment P3:

Runoff

0.16 cfs @ 12.09 hrs, Volume=

504 cf, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

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A	rea (sf)	CN E	escription								
	3,055	74 >	74 >75% Grass cover, Good, HSG C								
	10	98 L	Inconnecte	ed pavemer	nt, HSG C						
	3,065	74 V	Veighted A	verage							
	3,055	9	9.67% Per	vious Area							
	10		•	ervious Area							
	10	1	00.00% Ui	nconnected							
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description						
5.8	50	0.1400	0.14		Sheet Flow,						
					Woods: Light underbrush n= 0.400 P2= 3.10"						
0.3	85	0.1200	5.58		Shallow Concentrated Flow,						
					Unpaved Kv= 16.1 fps						
0.1	30	0.0500	4.54		Shallow Concentrated Flow,						
	····			······································	Paved Kv= 20.3 fps						
6.2	165	Total									

Summary for Subcatchment P4:

Runoff = 0.75 cfs @ 12.11 hrs, Volume=

2,470 cf, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

_	Α	rea (sf)	CN	Description								
		12,241	74	74 >75% Grass cover, Good, HSG C								
		3,393	70	•								
15,634 73 Weighted Average												
		15,634		100.00% Pe	ervious Are	a						
	Тс	Length	Slope	•	Capacity	Description						
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	6.6	50	0.1000	0.13		Sheet Flow,						
						Woods: Light underbrush n= 0.400 P2= 3.10"						
	0.7	180	0.0780	4.50		Shallow Concentrated Flow,						
_						Unpaved Kv= 16.1 fps						
	7.3	230	Total									

Summary for Subcatchment P5A:

Runoff = 0.05 cfs @ 12.08 hrs, Volume=

157 cf, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

Type III 24-hr 10-Year Rainfall=4.50"

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A	rea (sf)	CN	Description								
	412	98	Roofs, HSC	Roofs, HSG C							
	69	74	>75% Gras	s cover, Go	ood, HSG C						
	481	481 95 Weighted Average									
	69		14.35% Per	rvious Area							
	412		85.65% Imp	pervious Ar	ea						
Tc	Length	Slope	,	Capacity	Description						
<u>(min)</u>	(feet)	(ft/ft	(ft/sec)	(cfs)							
6.0					Direct Entry,						

Summary for Subcatchment P5B:

Runoff =

0.03 cfs @ 12.08 hrs, Volume=

102 cf, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

A	rea (sf)	CN	CN Description								
	278	98	98 Roofs, HSG C								
	34	74	74 >75% Grass cover, Good, HSG C								
	312 95 Weighted Average										
	34 10.90% Pervious Area										
	278 89.10% Impervious Area										
Тс	Length	Slope	Velocity	Capacity	Description						
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	·						
6.0					Direct Entry,						

Summary for Subcatchment P5C:

Runoff

0.05 cfs @ 12.08 hrs, Volume=

165 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

A	rea (sf)	CN	Description					
	442	98	Roofs, HSC	G C				
	78	74	>75% Grass cover, Good, HSG C					
	520	94	Weighted Average					
	78		15.00% Pervious Area					
	442		85.00% Impervious Area					
Tc (min)	Length (feet)	Slope (ft/ft	,	Capacity (cfs)	Description			
6.0					Direct Entry,			

Type III 24-hr 10-Year Rainfall=4.50" Printed 4/18/2018

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Summary for Subcatchment P5D:

Runoff

= 0.17 cfs @ 12.08 hrs, Volume=

571 cf, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 10-Year Rainfall=4.50"

A	rea (sf)	CN	Description					
	1,500	98	Roofs, HSC	G C				
	247	74	>75% Grass cover, Good, HSG C					
	1,747	95	Weighted A	verage				
	247		14.14% Pervious Area					
	1,500	;	85.86% Impervious Area					
Tc	Length	Slope	•	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
6.0					Dina at Entre			

6.0

Direct Entry,

Summary for Reach DP1:

Inflow Area =

22,619 sf, 15.78% Impervious, Inflow Depth = 2.05" for 10-Year event

Inflow =

0.56 cfs @ 12.21 hrs, Volume=

3,872 cf

Outflow =

0.56 cfs @ 12.21 hrs, Volume=

3,872 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Reach DP2:

Inflow Area =

17,381 sf, 8.63% Impervious, Inflow Depth = 1.80" for 10-Year event

Inflow =

0.92 cfs @ 12.09 hrs. Volume=

2.609 cf

Outflow =

0.92 cfs @ 12.09 hrs, Volume=

2,609 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Driveway Pond

Inflow Area =

14,054 sf, 17.02% Impervious, Inflow Depth = 2.09" for 10-Year event

Inflow =

0.81 cfs @ 12.11 hrs, Volume= 2,443 cf

Outflow = 0.31 cfs @ 12.37 hrs, Volume=

2,442 cf, Atten= 62%, Lag= 15.7 min

Primary = 0.31 cfs @ 12.37 hrs, Volume=

2,442 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 98.37' @ 12.37 hrs Surf.Area= 744 sf Storage= 672 cf

Plug-Flow detention time= 45.6 min calculated for 2,442 cf (100% of inflow)

Center-of-Mass det. time= 45.5 min (881.5 - 836.0)

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Volume	Invert	Avail.Sto	rage Storage	Description	
#1	97.00	1,23	31 cf Custom	Stage Data (Pri	smatic) Listed below (Recalc)
Elovetio	C	urf Araa	Ina Ctora	Cum Storo	
Elevatio		urf.Area	Inc.Store	Cum.Store	
(fee	t)	(sq-ft)	(cubic-feet)	(cubic-feet)	
97.0	0	278	0	0	
98.0	0	577	428	428	
99.0	10	1,029	803	1,231	
		, -		,	
Device	Routing	Invert	Outlet Device	s	
#1	Primary	97.00'	6.0" Round (Culvert L= 50.0	' Ke= 0.500
			Inlet / Outlet I	nvert= 97.00' / 89	9.00' S= 0.1600 '/' Cc= 0.900
			n= 0.012, Flo	w Area= 0.20 sf	
#2	Device 1	97.00'	2.0" Vert. Ori	fice/Grate C= (0.600
#3	Device 1	98.00'	4.0" Vert. Ori	fice/Grate C= (0.600
#4	Device 1	98.90'	6.0" Horiz. O	rifice/Grate C=	0.600 Limited to weir flow at low heads
					0.00' (Dynamic Tailwater)
<u></u> —1=Cu	Ivert (Pass	es 0.31 cfs of	1.00 cfs potent	tial flow)	
 2=	Orifice/Gra	te (Orifice Co	ontrols 0.12 cfs	@ 5.46 fps)	

Summary for Pond 2P: Front Yard Pond

Inflow Are	ea =	3,585 sf, 12.61% Impervious,	Inflow Depth = 1.90" for 10-Year event
Inflow	=	0.21 cfs @ 12.09 hrs, Volume=	567 cf
Outflow	=	0.12 cfs @ 12.22 hrs, Volume=	567 cf, Atten= 43%, Lag= 7.5 min
Primary	=	0.12 cfs @ 12.22 hrs, Volume=	567 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 88.62' @ 12.22 hrs Surf.Area= 173 sf Storage= 72 cf

-3=Orifice/Grate (Orifice Controls 0.19 cfs @ 2.17 fps)

-4=Orifice/Grate (Controls 0.00 cfs)

Plug-Flow detention time= 8.9 min calculated for 567 cf (100% of inflow) Center-of-Mass det. time= 8.8 min (840.9 - 832.1)

<u>Volume</u>	Inve	ert Avail.Sto	rage Storage D	Description		
#1	88.0	0' 21	5 cf Custom S	Stage Data (Pris	smatic) Listed below	(Recalc)
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
88.0	00	59	0	0		
89.0	00	241	150	150		
89.2	25	277	65	215		
Device	Routing	Invert	Outlet Devices			
#1	Primary	88.00'	6.0" Round C	ulvert L= 10.0'	Ke= 0.500	
	-		Inlet / Outlet In	vert= 88.00' / 87	7.50' S= 0.0500 '/'	Cc= 0.900
			n= 0.012, Flow			
#2	Device 1	88.00'	2.5" Vert. Orifi	ce/Grate C= 0).600	
#3	Device 1	88.75'	3.0" Vert. Orifi	ce/Grate C= 0).600	

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Device 1

89.10' 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 12.22 hrs HW=88.62' TW=0.00' (Dynamic Tailwater)

-1=Culvert (Passes 0.12 cfs of 0.58 cfs potential flow)

-2=Orifice/Grate (Orifice Controls 0.12 cfs @ 3.47 fps)

-3=Orifice/Grate (Controls 0.00 cfs)

-4=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 3P: Front Infiltration Trench 1

481 sf, 85.65% Impervious, Inflow Depth = 3.92" for 10-Year event Inflow Area =

Inflow 0.05 cfs @ 12.08 hrs, Volume= 157 cf

0.06 cfs @ 12.11 hrs, Volume= 157 cf, Atten= 0%, Lag= 1.7 min Outflow

0.00 cfs @ 12.11 hrs, Volume= Discarded = 123 cf 0.06 cfs @ 12.11 hrs, Volume= Primary 34 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 103.51' @ 12.11 hrs Surf.Area= 112 sf Storage= 45 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 217.4 min (988.5 - 771.1)

Volume	Inve	ert Avail.Sto	orage	Storage De	escription	
#1	101.5	50'	45 cf	Custom St	age Data (Pr	rismatic) Listed below (Recalc)
				112 cf Ove	rall x 40.0%	Voids
#2	103.5	50'	3 cf	Custom St	age Data (Pr	rismatic) Listed below (Recalc)
			48 cf	Total Availa	able Storage	
Elevation	n	Surf.Area	Inc	:Store	Cum.Store	
(feet	t)	(sq-ft)	(cubi	c-feet)	(cubic-feet)	
101.5	0	56		0	0	
103.5	0	56		112	112	
Elevation	n	Surf.Area	Inc	:Store	Cum.Store	
(feet	t)	(sq-ft)	(cubi	c-feet)	(cubic-feet)	
103.5	0	56		0	0	
103.5	5	56		3	3	
Device	Routing	Invert	Outl	et Devices		
#1	Primary	103.50'	26.0	' long x 1.0	' breadth Bro	oad-Crested Rectangular Weir

Device	Nouting	HIVEIL	Outlet Devices
#1	Primary	103.50'	26.0' long x 1.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32
#2	Discarded	101.50'	1.020 in/hr Exfiltration over Surface area
			Conductivity to Groundwater Elevation = 0.00'

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Discarded OutFlow Max=0.00 cfs @ 12.11 hrs HW=103.51' (Free Discharge) **2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.05 cfs @ 12.11 hrs HW=103.51' TW=98.09' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.05 cfs @ 0.25 fps)

Summary for Pond 4P: Front Infiltration Trench 2

Inflow Area = 312 sf, 89.10% Impervious, Inflow Depth = 3.92" for 10-Year event Inflow = 0.03 cfs @ 12.08 hrs, Volume= 102 cf
Outflow = 0.03 cfs @ 12.09 hrs, Volume= 102 cf, Atten= 0%, Lag= 0.1 min Discarded = 0.00 cfs @ 12.09 hrs, Volume= 68 cf
Primary = 0.03 cfs @ 12.09 hrs, Volume= 34 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.51' @ 12.09 hrs Surf.Area= 56 sf Storage= 23 cf

Avail.Storage Storage Description

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 188.3 min (959.4 - 771.1)

Volume

Invert

#1	101.50'		Stage Data (Pri erall_x 40.0% V	ismatic) Listed below (Recalc)
#2	103.50'			ismatic) Listed below (Recalc)
		24 cf Total Av	ailable Storage	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
101.50	28	0	0	
103.50	28	56	56	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
103.50	28	0	0	
103.55	28	1	1	

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	12.0' long x 1.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32
#2	Discarded	101.50'	1.020 in/hr Exfiltration over Surface area
			Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=103.51' (Free Discharge) 2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.09 hrs HW=103.51' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.03 cfs @ 0.26 fps)

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Summary for Pond 5P: Front Infiltration Trench 3

 Inflow Area =
 520 sf, 85.00% Impervious, Inflow Depth = 3.82" for 10-Year event

 Inflow =
 0.05 cfs @ 12.08 hrs, Volume=
 165 cf

 Outflow =
 0.05 cfs @ 12.09 hrs, Volume=
 164 cf, Atten= 0%, Lag= 0.1 min

 Discarded =
 0.00 cfs @ 12.09 hrs, Volume=
 100 cf

 Primary =
 0.05 cfs @ 12.09 hrs, Volume=
 63 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.52' @ 12.09 hrs Surf.Area= 74 sf Storage= 43 cf

Plug-Flow detention time= 223.3 min calculated for 164 cf (99% of inflow) Center-of-Mass det. time= 217.2 min (993.7 - 776.5)

Volume	Invert	Avail.St	orage	Storag	e Description	
#1	98.00'		40 cf		W x 24.0" H Box	Pipe Storage
					0' S= 0.2200 '/' Overall x 40.0%	Voids
#2	101.50'		10 cf			ismatic) Listed below (Recalc)
4 0	400 501		4 - 5		Overall x 40.0% V	
#3	103.50'		1 ct	Custo	m Stage Data (Pr	ismatic) Listed below (Recalc)
			50 cf	Total A	Available Storage	
					J	
Elevation	Sur	f.Area	Inc	.Store	Cum.Store	
(feet)		(sq-ft)	(cubi	c-feet)	(cubic-feet)	
101.50		12		0	0	
103.50		12		24	24	
Elevation	Sur	f.Area	Inc	.Store	Cum.Store	
(feet)		(sq-ft)	(cubi	c-feet)	(cubic-feet)	
103.50		12		0	0	
103.55		12		1	1	

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	6.0' long x 1.0' breadth Broad-Crested Rectangular Weir
	•		Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
			3.30 3.31 3.32
#2	Discarded	98.00'	1.020 in/hr Exfiltration over Surface area
			Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=103.52' (Free Discharge) **2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.05 cfs @ 12.09 hrs HW=103.52' TW=88.46' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.05 cfs @ 0.39 fps)

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Summary for Pond 6P: Rear Infiltration Trench

Inflow Area = 1,747 sf, 85.86% Impervious, Inflow Depth = 3.92" for 10-Year event
Inflow = 0.17 cfs @ 12.08 hrs, Volume= 571 cf
Outflow = 0.20 cfs @ 12.09 hrs, Volume= 568 cf, Atten= 0%, Lag= 0.5 min
Discarded = 0.19 cfs @ 12.09 hrs, Volume= 430 cf
Primary = 0.19 cfs @ 12.09 hrs, Volume= 139 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.51' @ 12.09 hrs Surf.Area= 399 sf Storage= 178 cf

Plug-Flow detention time= 250.5 min calculated for 568 cf (99% of inflow) Center-of-Mass det. time= 247.2 min (1,018.2 - 771.1)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	33 cf	24.0" W x 24.0" H Box Pipe Storage
			L= 20.5' S= 0.0268 '/'
			82 cf Overall x 40.0% Voids
#2	101.50'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
			358 cf Overall x 40.0% Voids
#3	103.50'	9 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Come Chaire

185 cf Total Available Storage

Ina Chasa

(cubic-feet)	inc.Store (cubic-feet)	Suп.Area (sq-ft)	Elevation (feet)
0	0	179	101.50
358	358	179	103.50
Cum.Store (cubic-feet)	Inc.Store (cubic-feet)	Surf.Area (sq-ft)	Elevation (feet)
0	0	179	103.50
9	9	179	103.55

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Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	80.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#2	Discarded	98.00'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.01 cfs @ 12.09 hrs HW=103.51' (Free Discharge) 2=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.18 cfs @ 12.09 hrs HW=103.51' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 0.25 fps)

Type III 24-hr 100-Year Rainfall=6.50" Printed 4/18/2018

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P1: Runoff Area=13,573 sf 14.59% Impervious Runoff Depth=3.82"

Tc=6.0 min CN=76 Runoff=1.39 cfs 4,315 cf

Subcatchment P2: Runoff Area=4,668 sf 9.60% Impervious Runoff Depth=3.82"

Tc=6.0 min CN=76 Runoff=0.48 cfs 1,484 cf

Subcatchment P3: Runoff Area=3,065 sf 0.33% Impervious Runoff Depth=3.61"

Flow Length=165' Tc=6.2 min CN=74 Runoff=0.30 cfs 922 cf

Subcatchment P4: Runoff Area=15,634 sf 0.00% Impervious Runoff Depth=3.51"

Flow Length=230' Tc=7.3 min CN=73 Runoff=1.41 cfs 4,570 cf

Subcatchment P5A: Runoff Area=481 sf 85.65% Impervious Runoff Depth=5.91"

Tc=6.0 min CN=95 Runoff=0.07 cfs 237 cf

Subcatchment P5B: Runoff Area=312 sf 89.10% Impervious Runoff Depth=5.91"

Tc=6.0 min CN=95 Runoff=0.04 cfs 154 cf

Subcatchment P5C: Runoff Area=520 sf 85.00% Impervious Runoff Depth=5.79"

Tc=6.0 min CN=94 Runoff=0.07 cfs 251 cf

Subcatchment P5D: Runoff Area=1,747 sf 85.86% Impervious Runoff Depth=5.91"

Tc=6.0 min CN=95 Runoff=0.25 cfs 860 cf

Reach DP1: Inflow=1.14 cfs 7,018 cf

Outflow=1.14 cfs 7,018 cf

Reach DP2: Inflow=1.65 cfs 4,917 cf

Outflow=1.65 cfs 4,917 cf

Pond 1P: Driveway Pond Peak Elev=98.97' Storage=1,195 cf Inflow=1.46 cfs 4,407 cf

Outflow=0.61 cfs 4,406 cf

Pond 2P: Front Yard Pond Peak Elev=88.99' Storage=148 cf Inflow=0.37 cfs 1,054 cf

Outflow=0.24 cfs 1,054 cf

Pond 3P: Front Infiltration Trench 1 Peak Elev=103.51' Storage=45 cf Inflow=0.07 cfs 237 cf

Discarded=0.00 cfs 145 cf Primary=0.07 cfs 92 cf Outflow=0.07 cfs 237 cf

Pond 4P: Front Infiltration Trench 2 Peak Elev=103.51' Storage=23 cf Inflow=0.04 cfs 154 cf

Discarded=0.00 cfs 80 cf Primary=0.04 cfs 74 cf Outflow=0.04 cfs 154 cf

Pond 5P: Front Infiltration Trench 3 Peak Elev=103.53' Storage=43 cf Inflow=0.07 cfs 251 cf

Discarded=0.00 cfs 116 cf Primary=0.07 cfs 132 cf Outflow=0.07 cfs 248 cf

Pond 6P: Rear Infiltration Trench Peak Elev=103.51' Storage=178 cf Inflow=0.25 cfs 860 cf

Discarded=0.01 cfs 505 cf Primary=0.24 cfs 347 cf Outflow=0.25 cfs 852 cf

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Summary for Subcatchment P1:

Runoff = 1.39 cfs @ 12.09 hrs, Volume=

4,315 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description	Description					
5,900	74	>75% Grass	s cover, Go	ood, HSG C				
167	98	Unconnecte	ed pavemer	ent, HSG C				
1,813	98	Paved park	ng, HSG C	C				
5,693	70	Woods, Go	od, HSG C	2				
13,573	76	Weighted A	Weighted Average					
11,593		85.41% Per	vious Area	a				
1,980		14.59% Imp	ervious Ar	rea				
167		8.43% Unco	onnected					
Tc Length	Slop	•	Capacity	Description				
(min) (feet)	(ft/	ft) (ft/sec)	(cfs)					
6.0				Direct Entry				

Summary for Subcatchment P2:

Runoff = 0.48 cfs @ 12.09 hrs, Volume=

1,484 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

Aı	rea (sf)	CN I	Description							
	4,220	74 :	>75% Grass cover, Good, HSG C							
	142	98 (Unconnected pavement, HSG C							
	306	98 I	Paved park	ing, HSG C						
	4,668	76 \	Weighted Average							
	4,220	ç	90.40% Pervious Area							
	448	Ç	9.60% Impe	ervious Area	3					
	142	;	31.70% Und	connected						
		01		0 "	m : //					
Tc	Length	Slope	•	Capacity	Description					
(min)	(feet)	(ft/ft)	t) (ft/sec) (cfs)							
6.0					Direct Entry,					

Summary for Subcatchment P3:

Runoff = 0.30 cfs @ 12.09 hrs, Volume=

922 cf, Depth= 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

Type III 24-hr 100-Year Rainfall=6.50"

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A	rea (sf)	CN E	escription							
	3,055	74 >	74 >75% Grass cover, Good, HSG C							
	10	98 L	Inconnecte	ed pavemer	nt, HSG C					
	3,065	74 V	Veighted A	verage						
	3,055	9	9.67% Per	vious Area						
	10			ervious Area						
	10	1	00.00% Uı	nconnected						
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description					
5.8	50	0.1400	0.14		Sheet Flow,					
					Woods: Light underbrush n= 0.400 P2= 3.10"					
0.3	85	0.1200	5.58		Shallow Concentrated Flow,					
					Unpaved Kv= 16.1 fps					
0.1	30	0.0500	4.54		Shallow Concentrated Flow,					
					Paved Kv= 20.3 fps					
6.2	165	Total								

Summary for Subcatchment P4:

Runoff = 1.41 cfs @ 12.11 hrs, Volume=

4,570 cf, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

 A	rea (sf)	CN	Description						
	12,241	74 >75% Grass cover, Good, HSG C							
	3,393	70 '	Woods, Go	od, HSG C					
	15,634	73	Weighted A	verage					
	15,634		100.00% Pe	ervious Are	a				
				_					
Tc	Length	Slope	•	Capacity	Description				
 (min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
6.6	50	0.1000	0.13		Sheet Flow,				
					Woods: Light underbrush n= 0.400 P2= 3.10"				
0.7	180	0.0780	4.50		Shallow Concentrated Flow,				
					Unpaved Kv= 16.1 fps				
7.3	230	Total							

Summary for Subcatchment P5A:

Runoff = 0.07 cfs @ 12.08 hrs, Volume=

237 cf, Depth= 5.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

Type III 24-hr 100-Year Rainfall=6.50"

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A	rea (sf)	CN	Description					
	412	98	Roofs, HSG C					
	69	74	>75% Grass cover, Good, HSG C					
	481	95	Weighted Average					
	69		14.35% Pervious Area					
	412		85.65% Imp	pervious Ar	ea			
Tc (min)	Length (feet)	Slope (ft/ft)		Capacity (cfs)	Description			
6.0		***************************************			Direct Entry,			

Summary for Subcatchment P5B:

Runoff

0.04 cfs @ 12.08 hrs, Volume=

154 cf, Depth= 5.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

A	rea (sf)	CN	Description						
	278	98	Roofs, HSG C						
	34	74	>75% Grass cover, Good, HSG C						
	312	95	Weighted Average						
	34		10.90% Pervious Area						
	278		89.10% Imp	pervious Ar	rea				
Tc (min)	Length (feet)	Slope (ft/ft	•	Capacity (cfs)	•				
6.0				(3.3)	Direct Entry,				

Summary for Subcatchment P5C:

Runoff

0.07 cfs @ 12.08 hrs, Volume=

251 cf, Depth= 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

A	rea (sf)	CN	Description					
	442	98	Roofs, HSG C					
	78	74	>75% Gras	>75% Grass cover, Good, HSG C				
	520	94	Weighted Average					
	78		15.00% Pervious Area					
	442		85.00% Impervious Area					
Tc (min)	Length (feet)	Slope (ft/ft)	,	Capacity (cfs)	Description			
6.0				······································	Direct Entry,			

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Type III 24-hr 100-Year Rainfall=6.50" Printed 4/18/2018

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Summary for Subcatchment P5D:

Runoff = 0.25 cfs @ 12.08 hrs, Volume=

860 cf, Depth= 5.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Type III 24-hr 100-Year Rainfall=6.50"

_	A	rea (sf)	CN	Description						
		1,500	98	Roofs, HSC	Roofs, HSG C					
		247	74	>75% Gras	>75% Grass cover, Good, HSG C					
		1,747	95	Weighted A	Veighted Average					
		247		14.14% Pervious Area						
		1,500		85.86% Imp	ervious Ar	rea				
	Tc (min)	Length (feet)	Slope (ft/ft	•	Capacity (cfs)	•				
_	6.0					Direct Entry,				

Summary for Reach DP1:

Inflow Area = 22,619 sf, 15.78% Impervious, Inflow Depth = 3.72" for 100-Year event

Inflow = 1.14 cfs @ 12.12 hrs, Volume= 7,018 cf

Outflow = 1.14 cfs @ 12.12 hrs, Volume= 7,018 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Reach DP2:

Inflow Area = 17,381 sf, 8.63% Impervious, Inflow Depth = 3.39" for 100-Year event

Inflow = 1.65 cfs @ 12.10 hrs, Volume= 4,917 cf

Outflow = 1.65 cfs @ 12.10 hrs, Volume= 4,917 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Driveway Pond

Inflow Area = 14,054 sf, 17.02% Impervious, Inflow Depth = 3.76" for 100-Year event

Inflow = 1.46 cfs @ 12.09 hrs, Volume= 4,407 cf

Outflow = 0.61 cfs @ 12.31 hrs, Volume= 4,406 cf, Atten= 58%, Lag= 13.5 min

Primary = 0.61 cfs @ 12.31 hrs, Volume= 4,406 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 98.97' @ 12.31 hrs Surf.Area= 1,014 sf Storage= 1,195 cf

Plug-Flow detention time= 42.7 min calculated for 4,406 cf (100% of inflow)

Center-of-Mass det. time= 42.6 min (861.5 - 818.9)

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Volume	Invert	Avail.Sto	rage Storage	Description	
#1	97.00'	1,23	31 cf Custom	n Stage Data (Prismatic) Listed below (Recalc)	
		c		0 0	
Elevation	on Sui	rf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
97.0	00	278	0	0	
98.0	00	577	428	428	
99.0	00	1,029	803	1,231	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	97.00'	6.0" Round	Culvert L= 50.0' Ke= 0.500	
	•		Inlet / Outlet I	Invert= 97.00' / 89.00' S= 0.1600 '/' Cc= 0.900	
			n= 0.012, Flo	ow Area= 0.20 sf	
#2	Device 1	97.00'	2.0" Vert. Ori	ifice/Grate C= 0.600	
#3	Device 1	98.00'	4.0" Vert. Ori	ifice/Grate C= 0.600	
#4	Device 1	98.90'	6.0" Horiz. O	Orifice/Grate C= 0.600 Limited to weir flow at low hea	ads
				W=98.97' TW=0.00' (Dynamic Tailwater)	
1=Cι	ı lve rt (Passe	s 0.61 cfs of	1.24 cfs poten	itial flow)	
- 2=	Orifice/Grate	e (Orifice Co	ntrols 0.14 cfs	@ 6.61 fps)	
#3 #4 Primary 1=Cu	2 Device 1 97.00' 3 Device 1 98.00' 4 Device 1 98.90' nary OutFlow Max=0.61 cfs @ =Culvert (Passes 0.61 cfs of 1 —2=Orifice/Grate (Orifice Cor		4.0" Vert. Ori 6.0" Horiz. O 2 12.31 hrs H' 1.24 cfs poten	ifice/Grate C= 0.600 prifice/Grate C= 0.600 Limited to weir flow at low head W=98.97' TW=0.00' (Dynamic Tailwater) ntial flow) @ 6.61 fps)	ads

Summary for Pond 2P: Front Yard Pond

Inflow Are	ea =	3,585 sf, 12.61% Impervious,	Inflow Depth = 3.53" for 100-Year event
Inflow	=	0.37 cfs @ 12.09 hrs, Volume=	1,054 cf
Outflow	=	0.24 cfs @ 12.19 hrs, Volume=	1,054 cf, Atten= 36%, Lag= 5.8 min
Primary	=	0.24 cfs @ 12.19 hrs, Volume=	1,054 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 88.99' @ 12.19 hrs Surf.Area= 240 sf Storage= 148 cf

-4=Orifice/Grate (Weir Controls 0.09 cfs @ 0.84 fps)

Plug-Flow detention time= 9.1 min calculated for 1,054 cf (100% of inflow) Center-of-Mass det. time= 9.0 min (824.6 - 815.6)

Volume	Inve	ert Avail.Sto	rage Storage I	Description		
#1	88.0	0' 2	15 cf Custom	Stage Data (Prismat	t ic) Listed below	v (Recalc)
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
88.0 89.0 89.2	00	59 241 277	0 150 65	0 150 215		
Device	Routing	Invert	Outlet Devices	;		
#1	Primary	88.00'	Inlet / Outlet In	ulvert L= 10.0' Ke overt= 88.00' / 87.50' ov Area= 0.20 sf		Cc= 0.900
#2 #3	Device 1 Device 1	88.00' 88.75'	2.5" Vert. Orif	ice/Grate C= 0.600 ice/Grate C= 0.600		

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Device 1

89.10' 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.24 cfs @ 12.19 hrs HW=88.99' TW=0.00' (Dynamic Tailwater)

-1=Culvert (Passes 0.24 cfs of 0.82 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.15 cfs @ 4.54 fps)

-3=Orifice/Grate (Orifice Controls 0.08 cfs @ 1.68 fps)

-4=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond 3P: Front Infiltration Trench 1

Inflow Area = 481 sf, 85.65% Impervious, Inflow Depth = 5.91" for 100-Year event

Inflow = 0.07 cfs @ 12.08 hrs, Volume= 237 cf

0.07 cfs @ 12.08 hrs, Volume= 237 cf, Atten= 0%, Lag= 0.1 min Outflow

0.00 cfs @ 12.08 hrs, Volume= Discarded = 145 cf 0.07 cfs @ 12.08 hrs, Volume= 92 cf Primary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Inc Store

Peak Elev= 103.51' @ 12.08 hrs Surf.Area= 112 sf Storage= 45 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 172.2 min (933.9 - 761.7)

Surf Area

Flevation

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	45 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
			112 cf Overall x 40.0% Voids
#2	103.50'	3 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		48 cf	Total Available Storage

Cum Store

LICVALION	Odii./ li Cd	1110.01010	Carri. Clorc
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)
101.50	56	0	0
103.50	56	112	112
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
103.50	56	0	0
103.55	56	3	3

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	26.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#2	Discarded	101.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'

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Discarded OutFlow Max=0.00 cfs @ 12.08 hrs HW=103.51' (Free Discharge) **2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.07 cfs @ 12.08 hrs HW=103.51' TW=98.58' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.26 fps)

Summary for Pond 4P: Front Infiltration Trench 2

Inflow Area	3 =	312 sf,	, 89.10% Impervious,	Inflow Depth = 5.91"	for 100-Year event
Inflow	=	0.04 cfs @	12.08 hrs, Volume=	154 cf	
Outflow	=	0.04 cfs @	12.08 hrs, Volume=	154 cf, Atte	en= 0%, Lag= 0.1 min
Discarded	=	0.00 cfs @	12.08 hrs, Volume=	80 cf	
Primary	=	0.04 cfs @	12.08 hrs, Volume=	74 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.51' @ 12.08 hrs Surf.Area= 56 sf Storage= 23 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 149.2 min (910.9 - 761.7)

Volume	Inve	ert Avail.S	orage	Storag	e Description	
#1	101.5	50'	22 cf			ismatic) Listed below (Recalc)
					Overall x 40.0% V	
#2	103.5	50'	1 cf	Custo	<u>m Stage Data (Pr</u>	ismatic) Listed below (Recalc)
			24 cf	Total A	wailable Storage	
Elevation		Surf.Area	Inc	.Store	Cum.Store	
(feet)		(sq-ft)	(cubi	c-feet)	(cubic-feet)	
101.50		28		0	0	
103.50	l	28		56	56	
Elevation		Surf.Area	Inc	.Store	Cum.Store	
(feet)		(sq-ft)	(cubi	c-feet)	(cubic-feet)	
103.50		28		0	0	
103.55		28		1	1	
, , , , , ,					•	
Device I	Routing	Inver	t Outl	et Devic	es	
#1	Primary	103.50	12.0	long >	1.0' breadth Bro	oad-Crested Rectangular Weir
	,			-		0.80 1.00 1.20 1.40 1.60 1.80 2.00
				3.00		
					sh) 269 272 2	75 2.85 2.98 3.08 3.20 3.28 3.31
				3.31		. 5 2.55 2.55 5.55 5.25 5.25
			. 5.00		·, · · · · · · · · · · · · · · · · · ·	

101.50' 1.020 in/hr Exfiltration over Surface area

Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.00 cfs @ 12.08 hrs HW=103.51' (Free Discharge) 2=Exfiltration (Controls 0.00 cfs)

#2

Discarded

Primary OutFlow Max=0.04 cfs @ 12.08 hrs HW=103.51' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.04 cfs @ 0.30 fps)

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Summary for Pond 5P: Front Infiltration Trench 3

Inflow Area = 520 sf, 85.00% Impervious, Inflow Depth = 5.79" for 100-Year event Inflow = 0.07 cfs @ 12.08 hrs, Volume= 251 cf

Outflow = 0.07 cfs @ 12.08 hrs, Volume= 248 cf, Atten= 0%, Lag= 0.1 min

Discarded = 0.00 cfs @ 12.08 hrs, Volume= 116 cf Primary = 0.07 cfs @ 12.08 hrs, Volume= 132 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.53' @ 12.08 hrs Surf.Area= 74 sf Storage= 43 cf

Plug-Flow detention time= 171.9 min calculated for 248 cf (99% of inflow)

Center-of-Mass det. time= 164.5 min (931.0 - 766.4)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	40 cf	24.0" W x 24.0" H Box Pipe Storage
			L= 25.0' S= 0.2200 '/'
			100 cf Overall x 40.0% Voids
#2	101.50'	10 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
			24 cf Overall x 40.0% Voids
#3	103.50'	1 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
		50 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	12	0	0
103.50	12	24	24
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
103.50	12	0	0
103.55	12	1	1

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	6.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#2	Discarded	98.00'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.00 cfs @ 12.08 hrs HW=103.53' (Free Discharge) = 2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.07 cfs @ 12.08 hrs HW=103.53' TW=88.82' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.44 fps)

Type III 24-hr 100-Year Rainfall=6.50"

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Summary for Pond 6P: Rear Infiltration Trench

1,747 sf, 85.86% Impervious, Inflow Depth = 5.91" for 100-Year event Inflow Area = 0.25 cfs @ 12.08 hrs, Volume= Inflow 860 cf 0.25 cfs @ 12.08 hrs, Volume= 852 cf, Atten= 0%, Lag= 0.1 min Outflow Discarded = 0.01 cfs @ 12.08 hrs, Volume= 505 cf Primary = 0.24 cfs @ 12.08 hrs, Volume= 347 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs Peak Elev= 103.51' @ 12.08 hrs Surf.Area= 399 sf Storage= 178 cf

Plug-Flow detention time= 194.2 min calculated for 852 cf (99% of inflow) Center-of-Mass det. time= 188.0 min (949.7 - 761.7)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	33 cf	24.0" W x 24.0" H Box Pipe Storage
			L= 20.5' S= 0.0268 '/'
			82 cf Overall x 40.0% Voids
#2	101.50'	143 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
			358 cf Overall x 40.0% Voids
#3	103.50'	9 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

185 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	179	0	0
103.50	179	358	358
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
103.50	179	0	0
103.55	179	9	9

Device	Routing	Invert	Outlet Devices
#1	Primary	103.50'	80.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00
			Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#2	Discarded	98.00'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=103.51' (Free Discharge) 2=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.24 cfs @ 12.08 hrs HW=103.51' TW=0.00' (Dynamic Tailwater) -1=Broad-Crested Rectangular Weir (Weir Controls 0.24 cfs @ 0.28 fps)