Stormwater Management System Report Addendum 1

LOGAL, LLC
PROPOSED SITE IMPROVEMENTS

100 DUCHAINE BOULEVARD NEW BEDFORD, MASSACHUSETTS

Prepared for:

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May 21, 2014 Project No. 1998



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2-Year Storm Event 10-Year Storm Event 25-Year Storm Event 100-Year Storm Event

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Section 1

Hydrologic Overview

1.0 HYDROLOGIC OVERVIEW

1.1 Purpose of Addendum

The purpose of this Addendum is to address a revision to the re-development program for the proposed site. We have revised the layout of the proposed paved loading area to better accommodate turning maneuvers of the trucks accessing the loading docks. This has required us to eliminate one of the bioretention areas previously proposed and replace that with a subsurface detention system. Any updated Post-Development Hydrologic Summary and comparison with the previously submitted Pre-Development Analysis is included in the following sections.

1.3 Pre-Development Hydrologic Summary

A summary of the pre development hydrologic conditions for the 2, 10, 25, and 100-year storm events is submitted in Table 1.3 below. These numbers remain unchanged from the previous submittal.

Storm Event	Analysis	Analysis	Analysis	Analysis	Analysis
	Point	Point	Point	Point	Point
	AP-1	AP-2	AP-3	AP-4	AP-5
	Rate of Flow	Rate of Flow	Rate of Flow	Rate of	Rate of
WITH 1	(c.f.s.)	(c.f.s.)	(c.f.s.)	Flow (c.f.s.)	Flow (c.f.s.)
2-уеаг	2.62	2.60	11.36	3.22	7.68
storm					
10-year	3.65	4.55	17.17	5.17	11.35
storm					
25-year	4.28	5.81	20.74	6.39	13.60
storm					
100-year	5.39	8.07	26.96	8.55	17.50
storm					

Table 1.3 - Pre Development Hydrologic Summary

1.4 Post Development Hydrologic Summary

In the developed condition, the site is now comprised of eight (8) watershed areas as shown on the attached Post Development Watershed Plan. The designated post development analysis points correspond to the previously described pre development analysis points. The watershed designations and corresponding analysis points for each of the post development watersheds are as follows:

- Subcatchment POST 1 is a 1.89 acre portion of the overall watershed area consisting of a proposed gravel trailer parking lot and grassed area abutting the access drive. Stormwater run-off flows overland from the gravel lot to a rip rap waterway that discharges to a sediment forebay. The forebay is hydraulically connected to a bioretention area (Basin-1) which will discharge runoff at a controlled rate towards an existing bordering vegetated wetland system (WET-1) being considered Analysis Point 2 in the hydrologic calculations. (POST 1 remains unchanged from the Original Stormwater Management System Report)
- Subcatchment POST 1A is a 1.10 acre portion of the overall watershed area which consists of existing grass and wooded areas which will continue to flow unattenuated towards the existing bordering vegetated

- wetland (WET-1) being considered Analysis Point 1 in the hydrologic calculations. (POST 1A remains unchanged from the Original Stormwater Management System Report)
- Subcatchment POST 2 is now a 1.30 acre portion of the overall watershed area consisting of the new loading dock area and access driveways that will flow through a subsurface detention system prior to discharge at a controlled rate to Analysis Point 3.
- NEW Subcatchment POST 2A is 2.32 acre portion of the overall watershed area consisting a portion of the
 existing roof area and smaller areas surrounding the existing building that will continue to flow via an existing
 24" drainage line to Analysis Point 3.
- Subcatchment POST 3 is a 0.68 acre portion of the overall watershed area consisting of the existing paved loading area and associated landscaped areas that will now flow through a proposed bioretention area prior to discharge at a controlled rate to an existing bordering vegetated wetland system (WET-2) being taken as Analysis Point 4 in the hydrologic calculations. (POST 3 remains unchanged from the Original Stormwater Management System Report)
- Subcatchment POST 3A is 1.09 acre portion of the overall watershed area consisting of the undeveloped areas surrounding the existing bordering vegetated wetland system (WET-2) that will continue to flow unattenuated towards the wetland being taken as Analysis Point 4 in the hydrologic calculations. (POST 3A remains unchanged from the Original Stormwater Management System Report)
- Subcatchment POST 4 is a 1.90 acre portion of the overall watershed area consisting of a portion of the
 remaining concrete slab, the new paved parking area and existing paved access driveways that will now
 flow through a proposed sediment forebay and bioretention area prior to discharging at a controlled rate to
 another existing bordering vegetated wetland system (WET-3), being taken as Analysis Point 5 in the
 hydrologic calculations. (POST 4 remains unchanged from the Original Stormwater Management System
 Report)
- Subcatchment POST 4A is a 0.82 acre portion of the overall watershed area consisting of portions of the
 existing paved access drive, and vegetated areas surrounding an existing bordering vegetated wetland
 system (WET-3), which will continue to flow unattenuated towards the wetland. (POST 4A remains
 unchanged from the Original Stormwater Management System Report)

A summary of the post-development hydrologic conditions for the 2, 10, 25, and 100-year storm events is submitted in Table 1.4 below.

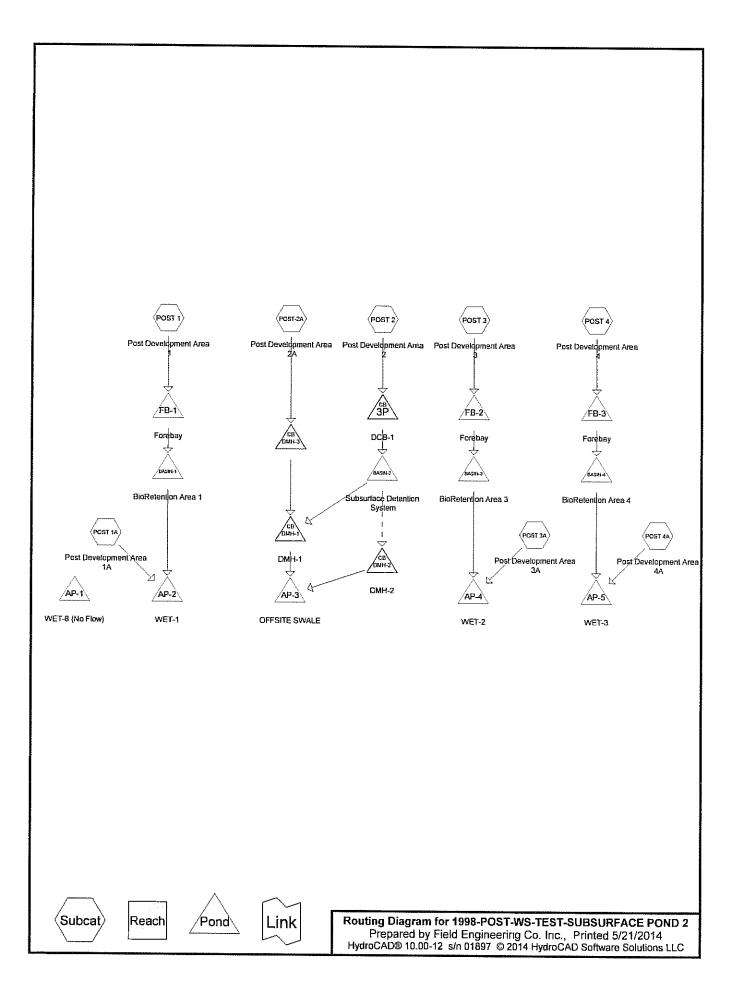
Table 1.4 – Post Development Hydrologic Summary

Storm Event	Analysis	Analysis	Analysis	Analysis	Analysis
	Point	Point	Point	Point	Point
	AP-1	AP-2	AP-3	AP-4	AP-5
	Rate of				
	Flow	Flow	Flow	Flow	Flow
	(c.f.s.)	(c.f.s.)	(c.f.s.)	(c.f.s.)	(c.f.s.)
2-year storm	N/A	1.19	7.92	2.07	6.49
10-year storm	N/A	2.38	11.64	3.73	9.70
25-year storm	N/A	3.07	13.85	4.85	11.47
100-year storm	N/A	7.54	18.06	8.03	15.33

The hydrologic analysis indicates that the stormwater management system design for the site meets or reduces peak runoff rates for the 2, 10, 25, and 100 year, 24 hour, Type III storm events from the pre developed levels at the subject analysis points. The analysis shows that the proposed re-development of this project area will not result in an increase in the rates of runoff to the respective analysis points.

Section 2

Updated Post Development Hydrologic Analysis



Type III 24-hr 2 YR Rainfall=3.50"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 4
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 POST 1: Post Development Runoff Area=81,936 sf 4.31% Impervious Runoff Depth=2.02"

Tc=6.0 min CN=85 Runoff=4.45 cfs 13.768 cf

Subcatchment POST 1A: Post Development Runoff Area=47,737 sf 0.00% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=70 Runoff=1.19 cfs 4,010 cf

Subcatchment POST 2: Post Development Runoff Area=56,802 sf 85.28% Impervious Runoff Depth=2.94"

Tc=6.0 min CN=95 Runoff=4.22 cfs 13.912 cf

Subcatchment POST 3: Post Development Runoff Area=29,735 sf 63.13% Impervious Runoff Depth=2.36" Tc=6.0 min CN=89 Runoff=1.87 cfs 5,841 cf

Subcatchment POST 3A: Post Runoff Area=47,475 sf 35.05% Impervious Runoff Depth=1.64"

Tc=6.0 min CN=80 Runoff=2.08 cfs 6,474 cf

Subcatchment POST 4: Post Development Runoff Area=82,787 sf 85.50% Impervious Runoff Depth=2.94"

Tc=6.0 min CN=95 Runoff=6.16 cfs 20,276 cf

Subcatchment POST 4A: Post Runoff Area=35,765 sf 10.20% Impervious Runoff Depth=1.18"

Tc=6.0 min CN=73 Runoff=1.08 cfs 3.516 cf

Subcatchment POST-2A: Post Runoff Area=77,418 sf 100.00% Impervious Runoff Depth=3.27"

Tc=6.0 min CN=98 Runoff=6.05 cfs 21,074 cf

Pond 3P: DCB-1 Peak Elev=76.89' Inflow=4.22 cfs 13.912 cf

12.0" Round Culvert x 2.00 n=0.013 L=6.0' S=0.0133 '/' Outflow=4.22 cfs 13,912 cf

Pond AP-1: WET-8 (No Flow)

Primary=0.00 cfs 0 cf

Pond AP-2: WET-1 Inflow=1.19 cfs 5,694 cf

Primary=1.19 cfs 5,694 cf

Pond AP-3: OFFSITE SWALE Inflow=7.92 cfs 33,878 cf

Primary=7.92 cfs 33,878 cf

Pond AP-4: WET-2 Inflow=2.20 cfs 11,324 cf

Primary=2.20 cfs 11,324 cf

Pond AP-5: WET-3 Inflow=6.49 cfs 19,286 cf

Primary=6.49 cfs 19,286 cf

Pond BASIN-1: BioRetention Area 1 Peak Elev=78.53' Storage=7,831 cf Inflow=3.93 cfs 9,328 cf

Outflow=0.08 cfs 1,684 cf

Pond BASIN-2: Subsurface Detention Peak Elev=76.63' Storage=4,187 cf Inflow=4.22 cfs 13,912 cf

Primary=1.42 cfs 7,558 cf Secondary=1.49 cfs 5,247 cf Outflow=2.90 cfs 12,804 cf

Type III 24-hr 2 YR Rainfall=3.50"

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Pond BASIN-3: BioRetention Area 3

Peak Elev=76.55' Storage=2,089 cf Inflow=1.83 cfs 4,902 cf

Outflow=0.26 cfs 4.850 cf

Pond BASIN-4: BioRetention Area 4

Peak Elev=78.36' Storage=4,584 cf Inflow=6.06 cfs 19,003 cf

Outflow=5.48 cfs 15,770 cf

Pond DMH-1: DMH-1

Peak Elev=76.41' Inflow=6.70 cfs 28,631 cf

18.0" Round Culvert x 2.00 n=0.010 L=50.0' S=0.0044 '/' Outflow=6.70 cfs 28,631 cf

Pond DMH-2: DMH-2

Peak Elev=76,44' Inflow=1.49 cfs 5,247 cf

18.0" Round Culvert n=0.011 L=50.0' S=0.0074'/ Outflow=1.49 cfs 5,247 cf

Pond DMH-3:

Peak Elev=77.38' inflow=6.05 cfs 21,074 cf

24.0" Round Culvert n=0.013 L=171.0' S=0.0040 '/' Outflow=6.05 cfs 21,074 cf

Pond FB-1: Forebay

Peak Elev=78.53' Storage=4,523 cf Inflow=4.45 cfs 13,768 cf

Outflow=3.93 cfs 9,328 cf

Pond FB-2: Forebay

Peak Elev=76.78' Storage=1,099 cf Inflow=1.87 cfs 5,841 cf

Outflow=1.83 cfs 4,902 cf

Pond FB-3: Forebay

Peak Elev=78.46' Storage=1,475 cf Inflow=6.16 cfs 20,276 cf

Outflow=6.06 cfs 19,003 cf

Total Runoff Area = 459,655 sf Runoff Volume = 88,871 cf Average Runoff Depth = 2.32" 47.95% Pervious = 220,424 sf 52.05% Impervious = 239,231 sf

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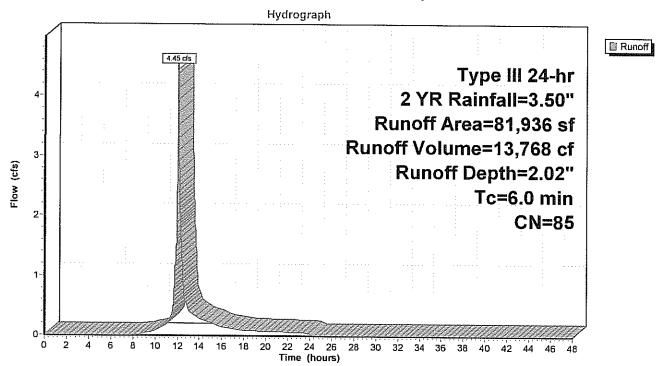
Summary for Subcatchment POST 1: Post Development Area 1

Runoff = 4.45 cfs @ 12.09 hrs, Volume= 13,768 cf, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfall=3.50"

	Area (sf)	CN	Description						
	51,749	89	Gravel roads, HSG C						
	3,528	98	Paved park	Paved parking, HSG C					
	26,659		75% Grass cover, Good, HSG C						
	81,936 78,408 3,528		Weighted Average 95.69% Pervious Area 4.31% Impervious Area						
Tc (min)		Slope (ft/ft)		Capacity (cfs)	Description				
6.0					Direct Entry				

Subcatchment POST 1: Post Development Area 1



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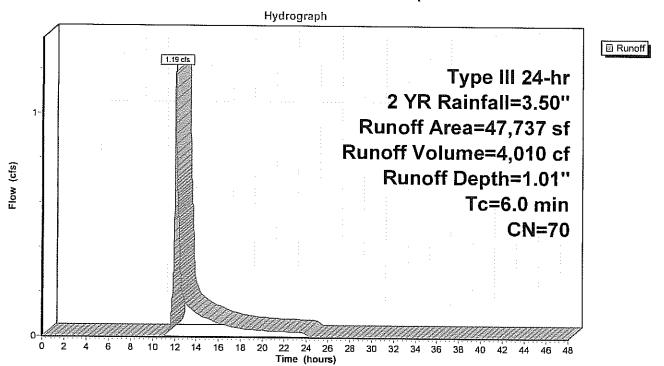
Summary for Subcatchment POST 1A: Post Development Area 1A

Runoff = 1.19 cfs @ 12.10 hrs, Volume= 4,010 cf, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfall=3.50"

A	rea (sf)	CN	Description					
	942	89	Gravel roads, HSG C					
	46,795	70	Woods, Good, HSG C					
	47,737 47,737	70	Weighted Average 100.00% Pervious Area					
Tc (min)	Length (feet)	Slope (ft/ft		Capacity (cfs)	Description			
6.0					Direct Entry			

Subcatchment POST 1A: Post Development Area 1A



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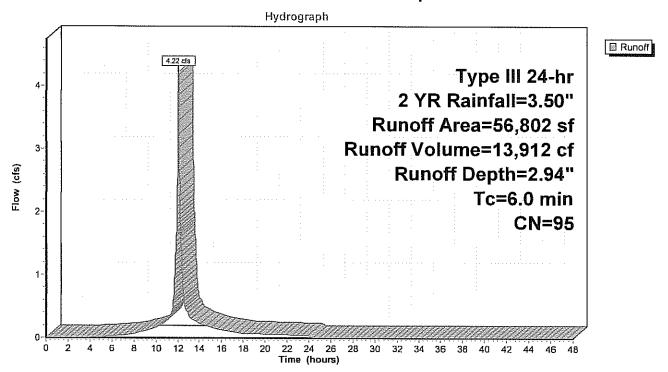
Summary for Subcatchment POST 2: Post Development Area 2

Runoff = 4.22 cfs @ 12.08 hrs, Volume= 13,912 cf, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfall=3.50"

	\rea (sf)	CN	Description						
	48,439	98	Paved park	ing, HSG C	,				
	2,831	89	Gravel road	Gravel roads, HSG C					
	5,532	74	75% Grass cover, Good, HSG C						
	56,802	95	Veighted Average						
	8,363		14.72% Pervious Area						
	48,439		35.28% Imp	ervious Ar	ea				
		-							
Tc	-	Slope	,	Capacity	Description				
(min)	(feet)	(ft/ft)) (ft/sec) (cfs)						
6.0					Direct Entry.				

Subcatchment POST 2: Post Development Area 2



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Summary for Subcatchment POST 3: Post Development Area 3

Runoff =

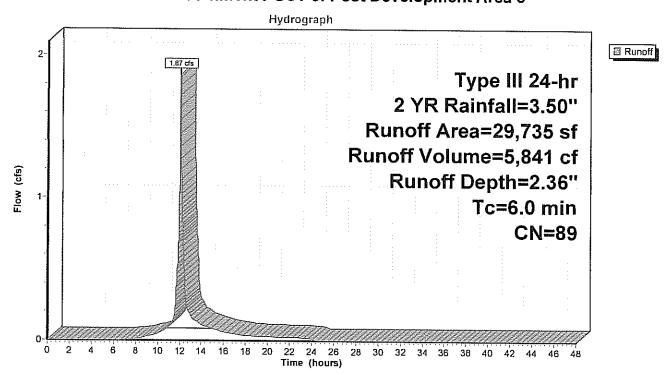
1.87 cfs @ 12.09 hrs, Volume=

5,841 cf, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfall=3.50"

A	rea (sf)	CN	Description					
	18,773	98	Paved parking, HSG C					
	10,962	74	>75% Grass cover, Good, HSG C					
	29,735	89	Weighted Average					
	10,962		36.87% Pervious Area					
	18,773		63.13% lmp	ervious Are	ea			
Tc (min)	Length (feet)	Slope (ft/ft)	•	Capacity (cfs)	Description			
6.0					Direct Entry,			

Subcatchment POST 3: Post Development Area 3



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Summary for Subcatchment POST 3A: Post Development Area 3A

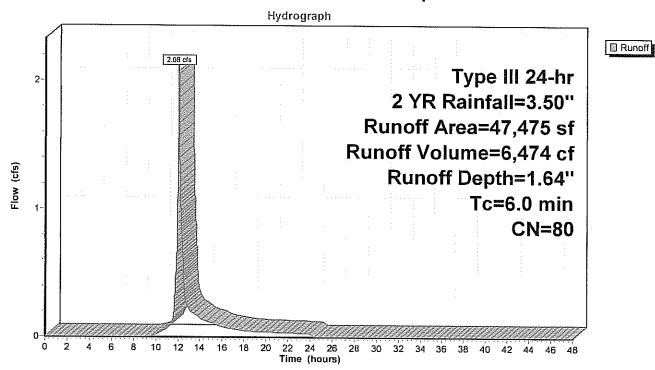
Runoff = 2.08 cfs @ 12.09 hrs, Volume= 6,474

6,474 cf, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfall=3.50"

	Area (sf)	CN	Description					
	14,950	98	Roofs, HSG C					
	1,689	98	Paved parking, HSG C					
	30,836	70	Noods, Good, HSG C					
	47,475	80	Weighted Average					
	30,836		64.95% Pervious Area					
	16,639		35.05% lmp	pervious Ar	ea			
_								
To		Slope		Capacity	Description			
<u>(min</u>) (feet)	(ft/ft)	t) (ft/sec) (cfs)					
6.0)				Direct Entry.			

Subcatchment POST 3A: Post Development Area 3A



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Summary for Subcatchment POST 4: Post Development Area 4

Runoff =

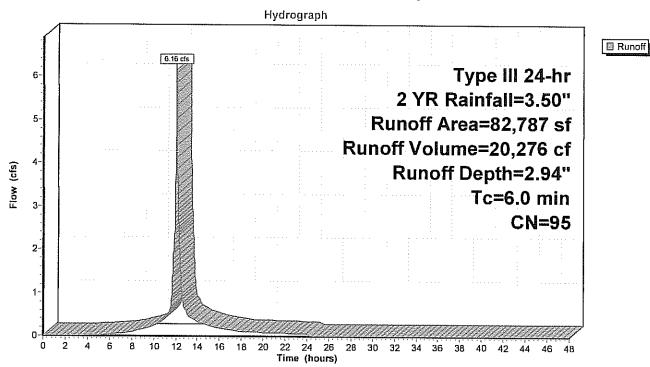
6.16 cfs @ 12.08 hrs, Volume=

20,276 cf, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfall=3.50"

Ar	ea (sf)	CN I	Description					
-	70,785	98	Paved parking, HSG C					
	12,002	74	>75% Grass cover, Good, HSG C					
	82,787 12,002 70,785	,	Weighted Average 14.50% Pervious Area 85.50% Impervious Area					
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description			
6.0					Direct Entry			

Subcatchment POST 4: Post Development Area 4



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Summary for Subcatchment POST 4A: Post Development Area 4A

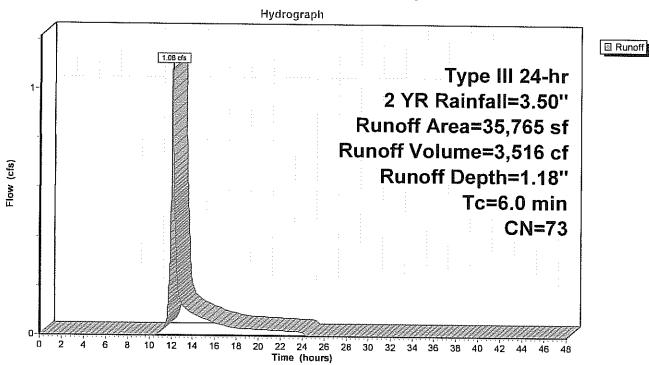
Runoff = 1.08 cfs @ 12.10 hrs, Volume=

3,516 cf, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfall=3.50"

A	rea (sf)	CN	Description					
	32,116	70	Woods, Good, HSG C					
<u></u>	3,649	98	Paved parking, HSG C					
	35,765		Weighted Average					
	32,116		89.80% Pervious Area					
	3,649		10.20% Imp	pervious Are	ea			
Tc	Length	Slope	Velocity	Capacity	Description			
<u>(min)</u>	(feet)	(ft/ft)						
6.0					Direct Entry			

Subcatchment POST 4A: Post Development Area 4A



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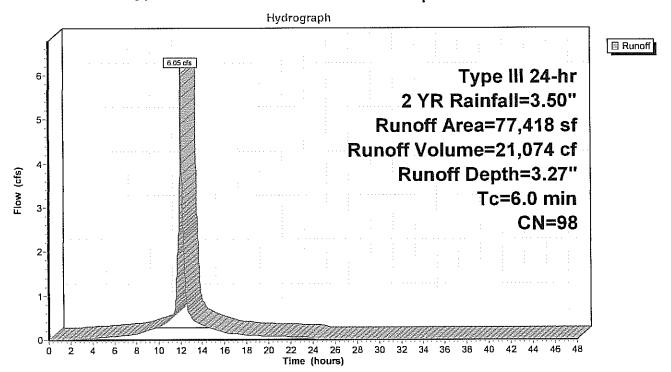
Summary for Subcatchment POST-2A: Post Development Area 2A

Runoff = 6.05 cfs @ 12.08 hrs, Volume= 21,074 cf, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 2 YR Rainfali=3.50"

_	Α	rea (sf)	CN I	Description						
		77,418	98	Roofs, HSG C						
		77,418		100.00% lm	pervious A	Area				
	Tc (min)	Length (feet)	Slope (ft/ft)	-	Capacity (cfs)	Description				
_	6.0					Direct Entry,				

Subcatchment POST-2A: Post Development Area 2A



Type III 24-hr 2 YR Rainfall=3.50" Printed 5/21/2014

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Summary for Pond 3P: DCB-1

Inflow Area = 56,802 sf, 85.28% Impervious, Inflow Depth = 2.94" for 2 YR event

Inflow = 4.22 cfs @ 12.08 hrs, Volume= 13,912 cf

Outflow = 4.22 cfs @ 12.08 hrs, Volume= 13,912 cf, Atten= 0%, Lag= 0.0 min

Primary = 4.22 cfs @ 12.08 hrs, Volume= 13,912 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.89' @ 12.08 hrs

Flood Elev= 78.40'

Device Routing Invert Outlet Devices

#1 Primary

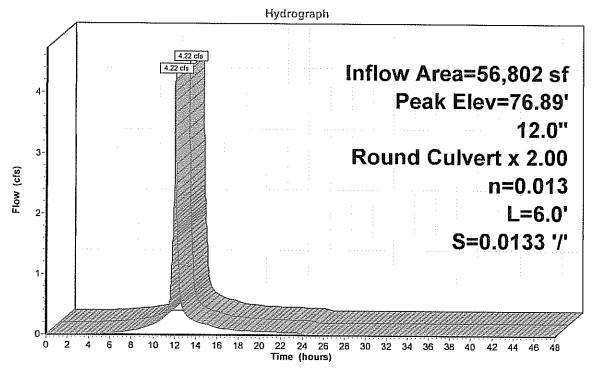
76.00' 12.0" Round Culvert X 2.00

L= 6.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 76.00' / 75.92' S= 0.0133 '/' Cc= 0.900

n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=4.22 cfs @ 12.08 hrs HW=76.89' TW=76.52' (Dynamic Tailwater)
1=Culvert (Barrel Controls 4.22 cfs @ 3.79 fps)

Pond 3P: DCB-1





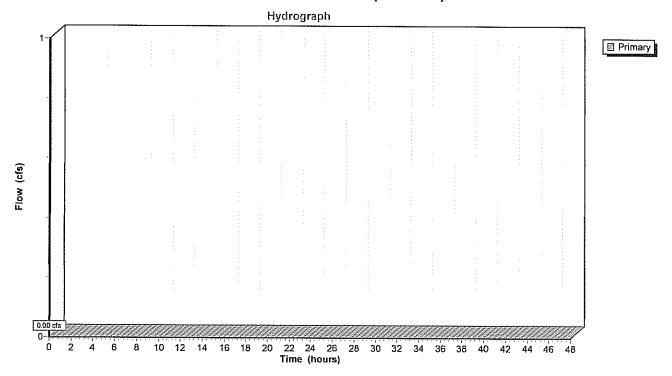
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Summary for Pond AP-1: WET-8 (No Flow)

[40] Hint: Not Described (Outflow=Inflow)

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

Pond AP-1: WET-8 (No Flow)



Type III 24-hr 2 YR Rainfall=3.50"

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Summary for Pond AP-2: WET-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =

129,673 sf, 2.72% Impervious, Inflow Depth = 0.53" for 2 YR event

inflow

1.19 cfs @ 12.10 hrs, Volume=

5,694 cf

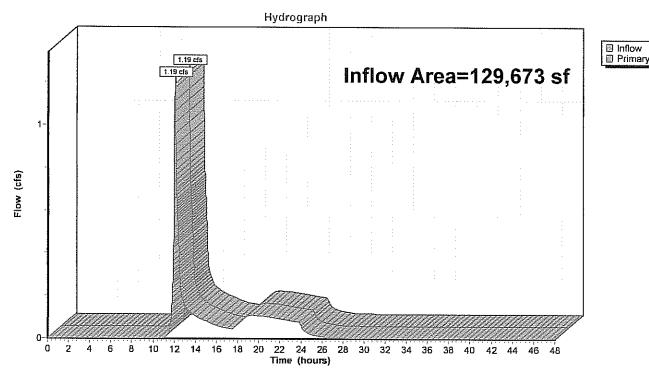
Primary

1.19 cfs @ 12.10 hrs, Volume=

5,694 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-2: WET-1



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Summary for Pond AP-3: OFFSITE SWALE

[40] Hint: Not Described (Outflow=Inflow)

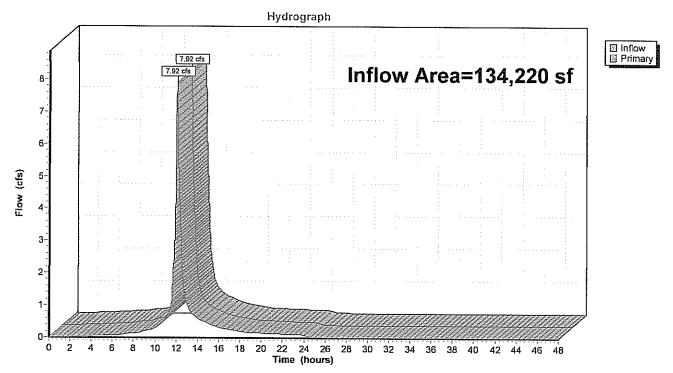
Inflow Area = 134,220 sf, 93.77% Impervious, Inflow Depth = 3.03" for 2 YR event

Inflow = 7.92 cfs @ 12.10 hrs, Volume= 33,878 cf

Primary = 7.92 cfs @ 12.10 hrs, Volume= 33,878 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-3: OFFSITE SWALE



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Summary for Pond AP-4: WET-2

[40] Hint: Not Described (Outflow=Inflow)

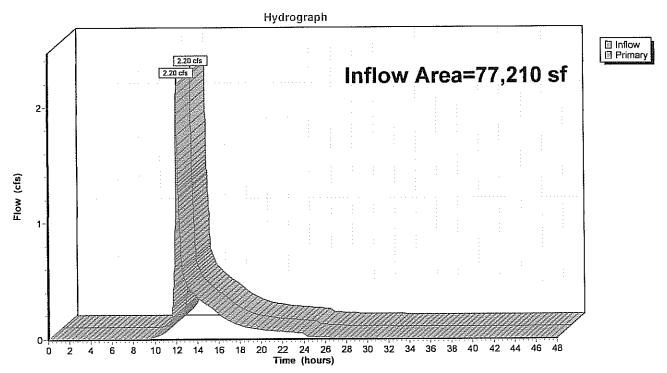
Inflow Area = 77,210 sf, 45.86% Impervious, Inflow Depth > 1.76" for 2 YR event

Inflow = 2.20 cfs @ 12.09 hrs, Volume= 11,324 cf

Primary = 2.20 cfs @ 12.09 hrs, Volume= 11,324 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-4: WET-2



Type III 24-hr 2 YR Rainfall=3.50" Printed 5/21/2014

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Summary for Pond AP-5: WET-3

[40] Hint: Not Described (Outflow=Inflow)

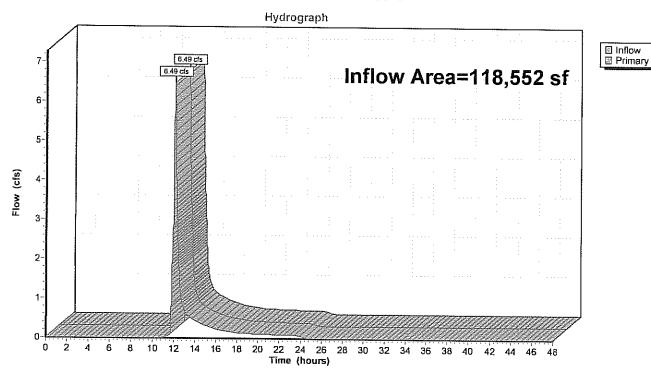
Inflow Area = 118,552 sf, 62.79% Impervious, Inflow Depth = 1.95" for 2 YR event

Inflow = 6.49 cfs @ 12.12 hrs, Volume= 19,286 cf

Primary = 6.49 cfs @ 12.12 hrs, Volume= 19,286 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-5: WET-3



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Summary for Pond BASIN-1: BioRetention Area 1

Inflow Area = 81,936 sf, 4.31% Impervious, Inflow Depth = 1.37" for 2 YR event

Inflow = 3.93 cfs @ 12.13 hrs, Volume= 9,328 cf

Outflow = 0.08 cfs @ 19.73 hrs, Volume= 1,684 cf, Atten= 98%, Lag= 456.0 min

Primary = 0.08 cfs @ 19.73 hrs, Volume= 1,684 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.53' @ 19.73 hrs Surf.Area= 5,834 sf Storage= 7,831 cf

Flood Elev= 80.00' Surf.Area= 7,310 sf Storage= 17,464 cf

Plug-Flow detention time= 567.1 min calculated for 1,684 cf (18% of inflow)

Center-of-Mass det. time= 424.4 min (1,294.5 - 870.1)

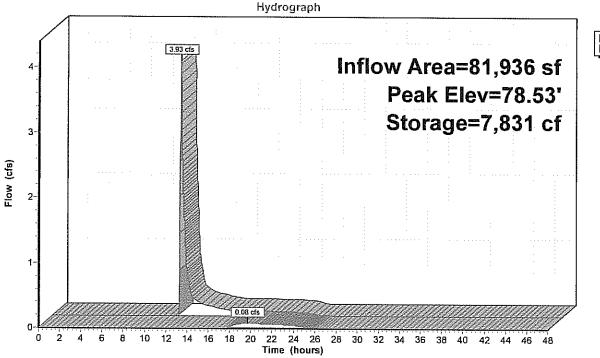
Volume	Inv	vert Ava	il.Storage	Storage	Description	
#1	77.	.00'	17,464 cf	Custom	ı Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio		Surf.Area (sq-ft)		c.Store c-feet)	Cum.Store (cubic-feet)	
77.0	00	4,407		0	0	
78.0	00	5,319		4,863	4,863	
79.0	00	6,286		5,803	10,666	
80.0	00	7,310		6,798	17,464	
Device	Routing	j Ir	vert Out	let Device	es	
#1	Primary	, 78	Hea	ad (feet) (0.20 0.40 0.60	oad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 .70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.08 cfs @ 19.73 hrs HW=78.53' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.08 cfs @ 0.48 fps)

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Pond BASIN-1: BioRetention Area 1





Type III 24-hr 2 YR Rainfall=3.50"

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Summary for Pond BASIN-2: Subsurface Detention System

Inflow Area = 56,802 sf, 85.28% Impervious, Inflow Depth = 2.94" for 2 YR event
Inflow = 4.22 cfs @ 12.08 hrs, Volume= 13,912 cf
Outflow = 2.90 cfs @ 12.20 hrs, Volume= 12,804 cf, Atten= 31%, Lag= 6.8 min
Primary = 1.42 cfs @ 12.21 hrs, Volume= 7,558 cf
Secondary = 1.49 cfs @ 12.18 hrs, Volume= 5,247 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 76.63' @ 12.17 hrs Surf.Area= 5,296 sf Storage= 4,187 cf Flood Elev= 78.10' Surf.Area= 5,296 sf Storage= 6,011 cf

Plug-Flow detention time= 120.4 min calculated for 12,804 cf (92% of inflow) Center-of-Mass det. time= 79.1 min (857.4 - 778.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	75.37'	3,201 cf	68.33'W x 77.50'L x 2.04'H Field A
			10,812 cf Overall - 2,811 cf Embedded = 8,001 cf x 40.0% Voids
#2A	75.87'	2,811 cf	Cultec C-100HD x 200 Inside #1
			Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
			Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
			Row Length Adjustment= +0.50' x 1.86 sf x 20 rows
		6.011 cf	Total Available Storage

Storage Group A created with Chamber Wizard

<u>Device</u>	Routing	Invert	Outlet Devices	
#1	Primary	75.87'	12.0" Round Culvert	
			L= 50.0' CPP, square edge headwall, Ke= 0.500	
			Inlet / Outlet Invert= 75.87' / 75.42' S= 0.0090 '/' Cc= 0.900	
			n= 0.011, Flow Area= 0.79 sf	
#2	Secondary	75.87'	18.0" Round Culvert	
			L= 24.0' CPP, square edge headwall, Ke= 0.500	
			Inlet / Outlet Invert= 75.87' / 75.87' S= 0.0000 '/' Cc= 0.900	
			n= 0.011, Flow Area= 1.77 sf	

Primary OutFlow Max=1.42 cfs @ 12.21 hrs HW=76.61' TW=76.22' (Dynamic Tailwater) 1=Culvert (Outlet Controls 1.42 cfs @ 3.16 fps)

Secondary OutFlow Max=1.50 cfs @ 12.18 hrs HW=76.62' TW=76.44' (Dynamic Tailwater) 2=Culvert (Outlet Controls 1.50 cfs @ 2.46 fps)

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Pond BASIN-2: Subsurface Detention System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 20 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

10 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 75.50' Row Length +12.0" End Stone x 2 = 77.50' Base Length

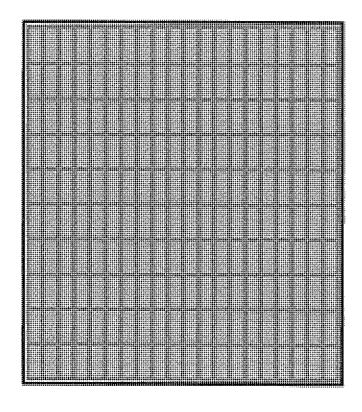
20 Rows x 36.0" Wide + 4.0" Spacing x 19 + 12.0" Side Stone x 2 = 68.33' Base Width 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

200 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 20 Rows = 2,810.9 cf Chamber Storage

10,812.3 cf Field - 2,810.9 cf Chambers = 8,001.5 cf Stone x 40.0% Voids = 3,200.6 cf Stone Storage

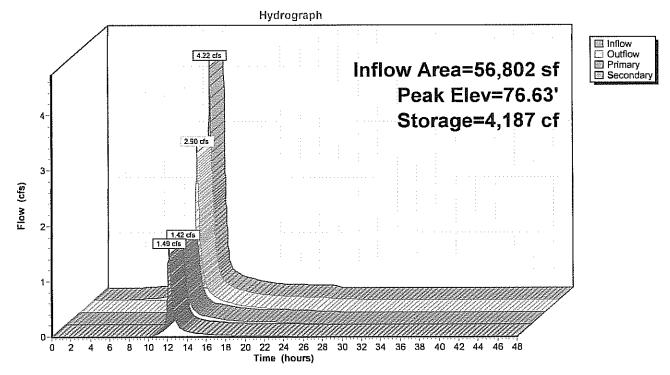
Chamber Storage + Stone Storage = 6,011.4 cf = 0.138 af Overall Storage Efficiency = 55.6%

200 Chambers 400.5 cy Field 296.4 cy Stone



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Pond BASIN-2: Subsurface Detention System



Type III 24-hr 2 YR Rainfall=3.50" Printed 5/21/2014

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Summary for Pond BASIN-3: BioRetention Area 3

29,735 sf, 63.13% Impervious, Inflow Depth = 1.98" for 2 YR event Inflow Area =

Inflow 1.83 cfs @ 12.10 hrs, Volume= 4,902 cf

Outflow = 0.26 cfs @ 12.66 hrs, Volume= 4,850 cf, Atten= 86%, Lag= 33.3 min

Primary 0.26 cfs @ 12.66 hrs, Volume= 4.850 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.55' @ 12.66 hrs Surf.Area= 4,030 sf Storage= 2,089 cf

Flood Elev= 78.00' Surf.Area= 5,167 sf Storage= 8,763 cf

Plug-Flow detention time= 154.7 min calculated for 4,849 cf (99% of inflow)

Center-of-Mass det. time= 148.6 min (992.4 - 843.7)

<u>Volume</u>	Inv	ert Avail.Sto	rage Storage D	escription	
#1	76.0	00' 8,76	33 cf Custom S	tage Data (Pri	smatic) Listed below (Recalc)
Elevation (fee	et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
76.0		3,624	0	0	
77.0		4,367	3,996	3,996	
78.0	טט	5,167	4,767	8,763	
Device	Routing	Invert	Outlet Devices		
#1	Primary	75.00'	12.0" Round 1	2" HDPE	
	·		L= 30.0' CPP, inlet / Outlet inv	square edge h ert= 75.00' / 74	eadwall, Ke= 0.500 4.80' S= 0.0067 '/' Cc= 0.900 ght & clean, Flow Area= 0.79 sf
#2	Device 1	76.00'	4.0" Vert. 4" Or	ifice C= 0.60	00
#3	Device 1	76.60'		rise Sharp-C	rested Rectangular Weir

Primary OutFlow Max=0.26 cfs @ 12.66 hrs HW=76.55' TW=0.00' (Dynamic Tailwater)

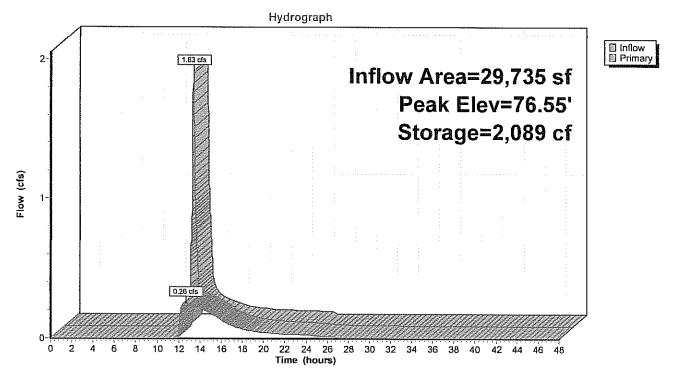
-1=12" HDPE (Passes 0.26 cfs of 3.69 cfs potential flow)

-2=4" Orifice (Orifice Controls 0.26 cfs @ 2.96 fps)

-3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

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Pond BASIN-3: BioRetention Area 3



Type III 24-hr 2 YR Rainfall=3.50"

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Summary for Pond BASIN-4: BioRetention Area 4

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 2.75" for 2 YR event

Inflow = 6.06 cfs @ 12.09 hrs, Volume= 19,003 cf

Outflow = 5.48 cfs @ 12.13 hrs, Volume= 15,770 cf, Atten= 10%, Lag= 2.4 min

Primary = 5.48 cfs @ 12.13 hrs, Volume= 15,770 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.36' @ 12.13 hrs Surf.Area= 3,877 sf Storage= 4,584 cf

Flood Elev= 79.00' Surf.Area= 4,374 sf Storage= 7,218 cf

Plug-Flow detention time= 107.4 min calculated for 15,770 cf (83% of inflow)

Center-of-Mass det. time= 40.1 min (841.5 - 801.4)

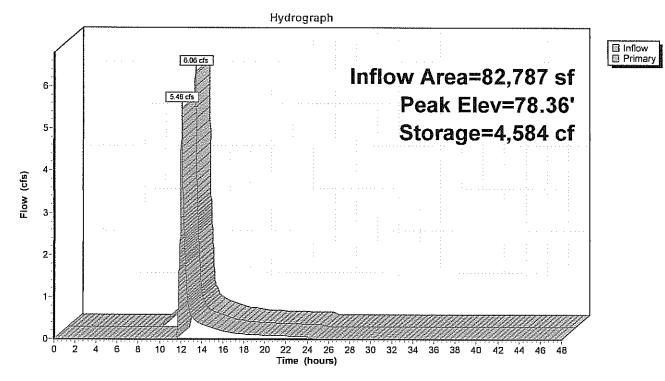
Volume	<u> </u>	ert Avail.Sto	rage Storage	Description	
#1	77.	00' 7,2	18 cf Custom	Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio (feet		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
77.0 78.0 79.0	0	2,871 3,595 4,374	0 3,233 3,985	0 3,233 7,218	
Device	Routing	Invert	Outlet Device	s	
#1	Primary	78.00'	Head (feet) 0 2.50 3.00 3.5 Coef. (English).20 0.40 0.60 50 4.00 4.50 5	70 2.69 2.68 2.68 2.66 2.64 2.64

Primary OutFlow Max=5.48 cfs @ 12.13 hrs HW=78.36' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 5.48 cfs @ 1.51 fps)

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Pond BASIN-4: BioRetention Area 4



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Summary for Pond DMH-1: DMH-1

Inflow Area =

134,220 sf, 93.77% Impervious, Inflow Depth = 2.56" for 2 YR event

Inflow = Outflow = 6.70 cfs @ 12.09 hrs, Volume=

28,631 cf 28,631 cf, Atten= 0%, Lag= 0.0 min

Primary =

6.70 cfs @ 12.09 hrs, Volume= 6.70 cfs @ 12.09 hrs, Volume=

28,631 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 76.41' @ 12.09 hrs

Flood Elev= 79.80'

Device Routing #1 Primary Invert Outlet Devices

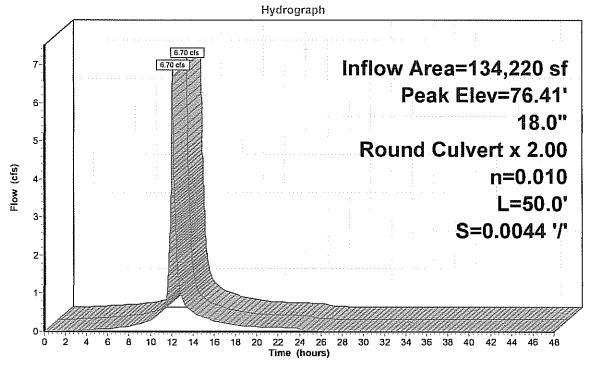
75.42' 18.0" Round Cuivert X 2.00

L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.42' / 75.20' S= 0.0044 '/' Cc= 0.900

n= 0.010 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=6.69 cfs @ 12.09 hrs HW=76.41' TW=0.00' (Dynamic Tailwater) 1=Culvert (Barrel Controls 6.69 cfs @ 3.84 fps)

Pond DMH-1: DMH-1





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Summary for Pond DMH-2: DMH-2

Inflow = 1.49 cfs @ 12.18 hrs, Volume= 5,247 cf

Outflow = 1.49 cfs @ 12.18 hrs, Volume= 5,247 cf, Atten= 0%, Lag= 0.0 min

Primary = 1.49 cfs @ 12.18 hrs, Volume= 5,247 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

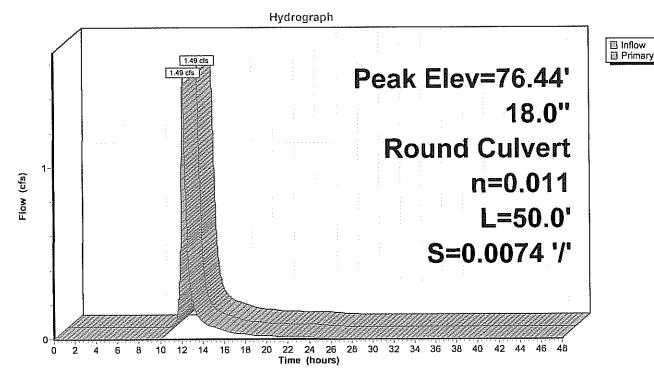
Peak Elev= 76.44' @ 12.18 hrs

Flood Elev= 79.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.87'	18.0" Round Culvert
	•		L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 75.87' / 75.50' S= 0.0074 '/' Cc= 0.900
			n= 0.011 Flow Area= 1.77 sf

Primary OutFlow Max=1.49 cfs @ 12.18 hrs HW=76.44' TW=0.00' (Dynamic Tailwater) 1=Culvert (Barrel Controls 1.49 cfs @ 3.54 fps)

Pond DMH-2: DMH-2



Type III 24-hr 2 YR Rainfall=3.50"

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Summary for Pond DMH-3:

Inflow Area = 77,418 sf,100.00% Impervious, Inflow Depth = 3.27" for 2 YR event

Inflow = 6.05 cfs @ 12.08 hrs, Volume= 21,074 cf

Outflow = 6.05 cfs @ 12.08 hrs, Volume= 21,074 cf, Atten= 0%, Lag= 0.0 min

Primary = 6.05 cfs @ 12.08 hrs, Volume= 21,074 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

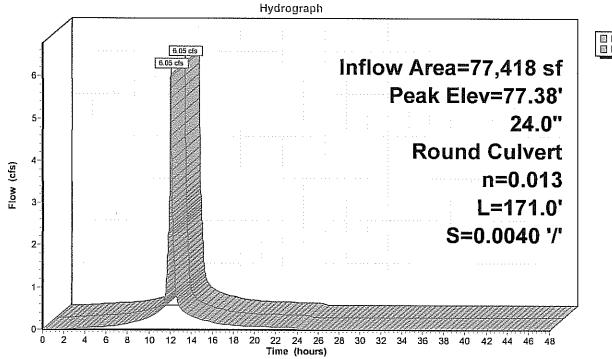
Peak Elev= 77.38' @ 12.09 hrs

Flood Elev= 79.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	76.14'	24.0" Round Culvert
			L= 171.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 76.14' / 75.45' S= 0.0040 '/' Cc= 0.900
			n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=6.04 cfs @ 12.08 hrs HW=77.38' TW=76.41' (Dynamic Tailwater) 1=Culvert (Outlet Controls 6.04 cfs @ 4.24 fps)

Pond DMH-3:





Type III 24-hr 2 YR Rainfall=3.50" Printed 5/21/2014

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Summary for Pond FB-1: Forebay

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow Area = 81,936 sf, 4.31% Impervious, Inflow Depth = 2.02" for 2 YR event

4.45 cfs @ 12.09 hrs, Volume= Inflow 13,768 cf

Outflow = 3.93 cfs @ 12.13 hrs, Volume= 9,328 cf, Atten= 12%, Lag= 2.6 min

Primary = 3.93 cfs @ 12.13 hrs, Volume= 9.328 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 78.53' @ 19.73 hrs Surf.Area= 2,627 sf Storage= 4,523 cf

Flood Elev= 79.00' Surf.Area= 2,991 sf Storage= 5,837 cf

Plug-Flow detention time= 146.9 min calculated for 9,328 cf (68% of inflow)

Center-of-Mass det. time= 48.0 min (870.1 - 822.2)

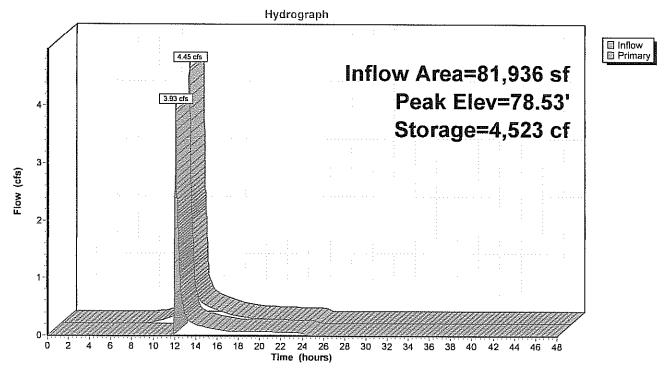
Volume	lnv	ert Avai	l.Storage	Storage D	escription	
#1	76.	00'	5,837 cf	Custom S	tage Data (Pr	ismatic) Listed below (Recalc)
Elevatio		Surf.Area (sq-ft)		c.Store c-feet)	Cum.Store (cubic-feet)	
76.0	0	1,200		0	Ó	
77.00 1,		1,518		1,359	1,359	
78.0		2,227		1,873	3,232	
78.5	50	2,602		1,207	4,439	
79.0	0	2,991		1,398	5,837	
Device	Routing	lnv	vert Outl	et Devices		
#1	Primary	78.	Hea	d (feet) 0.2	0.40 0.60	road-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.92 cfs @ 12.13 hrs HW=78.29' TW=77.21' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 3.92 cfs @ 1.36 fps)

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Pond FB-1: Forebay



Type III 24-hr 2 YR Rainfall=3.50"

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Summary for Pond FB-2: Forebay

Inflow Area = 29,735 sf, 63.13% Impervious, Inflow Depth = 2.36" for 2 YR event

Inflow = 1.87 cfs @ 12.09 hrs, Volume= 5,841 cf

Outflow = 1.83 cfs @ 12.10 hrs, Volume= 4,902 cf, Atten= 2%, Lag= 1.0 min

Primary = 1.83 cfs @ 12.10 hrs, Volume= 4,902 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.78' @ 12.10 hrs Surf.Area= 907 sf Storage= 1,099 cf

Flood Elev= 77.00' Surf.Area= 982 sf Storage= 1,304 cf

Plug-Flow detention time= 103.2 min calculated for 4,902 cf (84% of inflow)

Center-of-Mass det. time= 36.2 min (843.7 - 807.6)

Volume	lnv	ert Avail.Sto	rage Storage	Description	
#1	75.	00' 1,3	04 cf Custom	Stage Data (Prismatic) Listed below (Recalc)	
Elevation (fee		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
75.0 76.0 77.0	00	350 638 982	0 494 810	0 494 1,304	
Device	Routing	Invert	Outlet Device	, -	
#1	Primary	76.60'	Head (feet) 0 2.50 3.00 3. Coef. (English	5.0' breadth Broad-Crested Rectangular Weir 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 50 4.00 4.50 5.00 5.50 h) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 66 2.68 2.70 2.74 2.79 2.88	

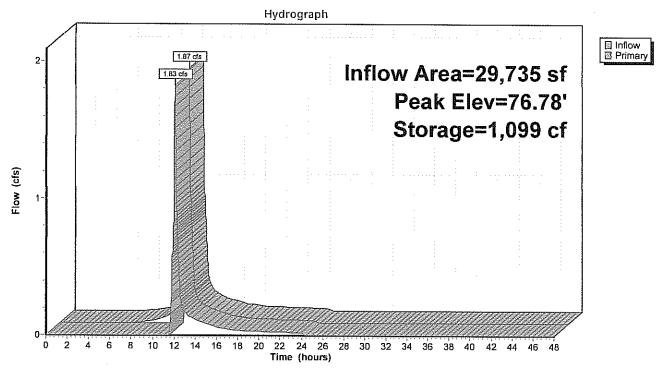
Primary OutFlow Max=1.83 cfs @ 12.10 hrs HW=76.78' TW=76.27' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 1.83 cfs @ 1.00 fps)

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Pond FB-2: Forebay



Type III 24-hr 2 YR Rainfall=3.50"

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Summary for Pond FB-3: Forebay

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 2.94" for 2 YR event

Inflow = 6.16 cfs @ 12.08 hrs, Volume= 20,276 cf

Outflow = 6.06 cfs @ 12.09 hrs, Volume= 19,003 cf, Atten= 2%, Lag= 0.4 min

Primary = 6.06 cfs @ 12.09 hrs, Volume= 19,003 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.46' @ 12.10 hrs Surf.Area= 1,296 sf Storage= 1,475 cf

Flood Elev= 78.80' Surf.Area= 1,439 sf Storage= 1,941 cf

Plug-Flow detention time= 57.4 min calculated for 18,999 cf (94% of inflow)

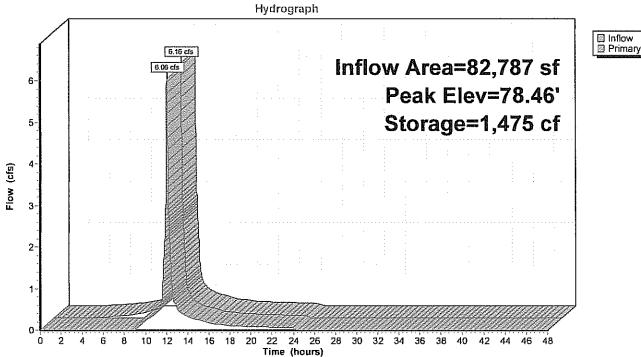
Center-of-Mass det. time= 23.2 min (801.4 - 778.3)

<u>Volume</u>	Inv	ert Avail.Sto	orage Storage	Description	
#1	77.	00' 1,9	41 cf Custom	Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
77.0	00	743	0	0	
78.0	0	1,104	924	924	
78.8	80	1,439	1,017	1,941	
Device	Routing	Invert	Outlet Device	s	
#1	Primary	78.30'	Head (feet) 0 2.50 3.00	0.20 0.40 0.60 (n) 2.69 2.72 2.7	ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 75 2.85 2.98 3.08 3.20 3.28 3.31

Primary OutFlow Max=6.06 cfs @ 12.09 hrs HW=78.46' TW=78.34' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 6.06 cfs @ 1.01 fps)

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Pond FB-3: Forebay





Type III 24-hr 10 YR Rainfall=4.80"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 4
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 POST 1: Post Development Runoff Area=81,936 sf 4.31% Impervious Runoff Depth=3.18"

Tc=6.0 min CN=85 Runoff=6.96 cfs 21,738 cf

Subcatchment POST 1A: Post Development Runoff Area=47,737 sf 0.00% Impervious Runoff Depth=1.89"

Tc=6.0 min CN=70 Runoff=2.38 cfs 7,516 cf

Subcatchment POST 2: Post Development Runoff Area=56,802 sf 85.28% Impervious Runoff Depth=4.22"

Tc=6.0 min CN=95 Runoff=5.94 cfs 19,982 cf

Subcatchment POST 3: Post Development Runoff Area=29,735 sf 63.13% Impervious Runoff Depth=3.58"

Tc=6.0 min CN=89 Runoff=2.79 cfs 8,873 cf

Subcatchment POST 3A: Post Runoff Area=47,475 sf 35.05% Impervious Runoff Depth=2.72"

Tc=6.0 min CN=80 Runoff=3.48 cfs 10,758 cf

Subcatchment POST 4: Post Development Runoff Area=82,787 sf 85.50% Impervious Runoff Depth=4.22"

Tc=6.0 min CN=95 Runoff=8.66 cfs 29,124 cf

Subcatchment POST 4A: Post Runoff Area=35,765 sf 10.20% Impervious Runoff Depth=2.12"

Tc=6.0 min CN=73 Runoff=2,03 cfs 6,333 cf

Subcatchment POST-2A: Post Runoff Area=77,418 sf 100.00% Impervious Runoff Depth=4.56"

Tc=6.0 min CN=98 Runoff=8.34 cfs 29,441 cf

Pond 3P: DCB-1 Peak Elev=77.20' Inflow=5.94 cfs 19,982 cf

12.0" Round Culvert x 2.00 n=0.013 L=6.0' S=0.0133 '/' Outflow=5.94 cfs 19,982 cf

Pond AP-1: WET-8 (No Flow)

Primary=0.00 cfs 0 cf

Pond AP-2: WET-1 Inflow=2.38 cfs 17.170 cf

Primary=2.38 cfs 17,170 cf

Pond AP-3: OFFSITE SWALE Inflow=11.64 cfs 48,316 cf

Primary=11.64 cfs 48,316 cf

Pond AP-4: WET-2 Inflow=3.73 cfs 18,638 cf

Primary=3.73 cfs 18,638 cf

Pond AP-5: WET-3 Inflow=9.70 cfs 30,950 cf

Primary=9.70 cfs 30,950 cf

Pond BASIN-1: BioRetention Area 1 Peak Elev=78.63' Storage=8,423 cf Inflow=6.62 cfs 17,299 cf

Outflow=0.65 cfs 9,654 cf

Pond BASIN-2: Subsurface Detention Peak Elev=76.90' Storage=4,938 cf Inflow=5.94 cfs 19.982 cf

Primary=2.13 cfs 10,718 cf Secondary=2.53 cfs 8,156 cf Outflow=4.66 cfs 18,874 cf

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Pond BASIN-3: BioRetention Area 3 Peak Elev=76.75' Storage=2,911 cf Inflow=2.75 cfs 7,934 cf

Outflow=1.05 cfs 7,880 cf

Pond BASIN-4: BioRetention Area 4 Peak Elev=78.45' Storage=4,932 cf Inflow=8.46 cfs 27,850 cf

Outflow=7.80 cfs 24,617 cf

Pond DMH-1: DMH-1 Peak Elev=76.64' Inflow=9.42 cfs 40,160 cf

18.0" Round Culvert x 2.00 n=0.010 L=50.0' S=0.0044 '/' Outflow=9.42 cfs 40,160 cf

Pond DMH-2: DMH-2 Peak Elev=76.65' Inflow=2.53 cfs 8,156 cf

18.0" Round Culvert n=0.011 L=50.0' S=0.0074 '/' Outflow=2.53 cfs 8,156 cf

Pond DMH-3: Peak Elev=77.65' inflow=8.34 cfs 29,441 cf

24.0" Round Culvert n=0.013 L=171.0' S=0.0040 '/' Outflow=8.34 cfs 29,441 cf

Pond FB-1: Forebay Peak Elev=78.63' Storage=4,792 cf Inflow=6.96 cfs 21,738 cf

Outflow=6.62 cfs 17,299 cf

Pond FB-2: Forebay Peak Elev=76.84' Storage=1,149 cf Inflow=2.79 cfs 8,873 cf

Outflow=2.75 cfs 7,934 cf

Pond FB-3: Forebay Peak Elev=78.53' Storage=1,562 cf Inflow=8.66 cfs 29,124 cf

Outflow=8.46 cfs 27,850 cf

Total Runoff Area = 459,655 sf Runoff Volume = 133,764 cf Average Runoff Depth = 3.49" 47.95% Pervious = 220,424 sf 52.05% Impervious = 239,231 sf Prepared by Field Engineering Co. Inc. HydroCAD® 10.00-12 s/n 01897 © 2014 HydroCAD Software Solutions LLC

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Summary for Subcatchment POST 1: Post Development Area 1

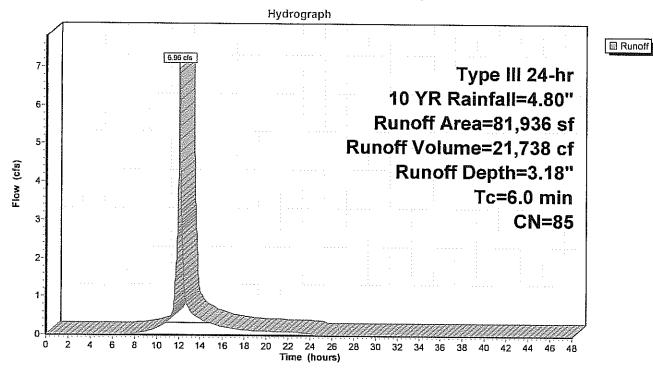
Runoff = 6.96 cfs @ 12.09 hrs, Volume=

21,738 cf, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

	Area (sf)	CN	Description	Description						
	51,749	89	Gravel road	Gravel roads, HSG C						
	3,528	98	Paved park	Paved parking, HSG C						
···········	26,659			75% Grass cover, Good, HSG C						
	81,936 78,408 3,528	85								
T <u>(min</u>		Slope (ft/ft	,	Capacity (cfs)	Description					
6.0	0				Direct Entry.					

Subcatchment POST 1: Post Development Area 1



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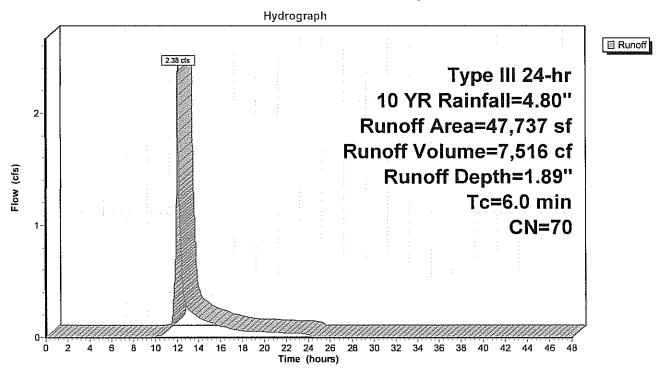
Summary for Subcatchment POST 1A: Post Development Area 1A

Runoff = 2.38 cfs @ 12.09 hrs, Volume= 7,516 cf, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

Α	rea (sf)	CN	Description		
	942	89	Gravel road	s, HSG C	
	46,795	70	Woods, Go	od, HSG C)
47,737 70 Weighted Average					
	47,737		100.00% Pe	ervious Are	ea ea
T -	1 41-	01		0	Description
Tc	Length	Slope	•	Capacity	•
<u>(min)</u>	(feet)	(ft/ft) (ft/sec)	(cfs)	
6.0					Direct Entry,

Subcatchment POST 1A: Post Development Area 1A



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Summary for Subcatchment POST 2: Post Development Area 2

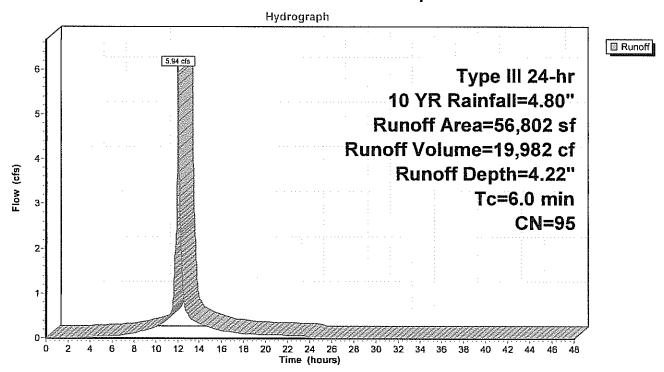
Runoff = 5.94 cfs @ 12.08 hrs, Volume= 1

19,982 cf, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

A	rea (sf)	CN	Description						
	48,439	98	Paved park	ing, HSG C					
	2,831	89	Gravel road	Gravel roads, HSG C					
	5,532	74	75% Grass cover, Good, HSG C						
	56,802	95	95 Weighted Average						
	8,363		14.72% Pervious Area						
	48,439		85.28% Imp	ervious Are	ea				
_ _	1	01	V (. 1 . 2)		5				
Tc		Slope	-	Capacity	Description				
<u>(min)</u>	(feet)	(ft/ft) (ft/sec)	(cfs)					
6.0					Direct Entry.				

Subcatchment POST 2: Post Development Area 2



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Summary for Subcatchment POST 3: Post Development Area 3

Runoff

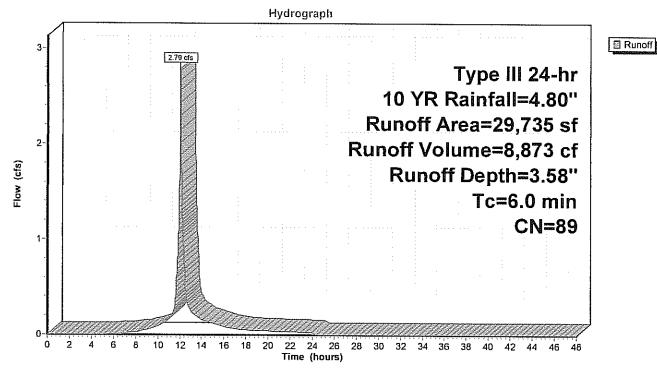
2.79 cfs @ 12.09 hrs, Volume=

8,873 cf, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

A	rea (sf)	CN	Description						
	18,773	98	Paved parking, HSG C						
	10,962	74	>75% Grass cover, Good, HSG C						
	29,735	89	Weighted A	verage					
10,962 36.87% Pervious 7				vious Area					
	18,773		63.13% lmp	pervious Are	э а				
Tc	Length	Slope	,	Capacity	Description				
<u>(min)</u>	(feet)	(ft/ft)	(ft/sec)	(cfs)					
6.0					Direct Entry,				

Subcatchment POST 3: Post Development Area 3



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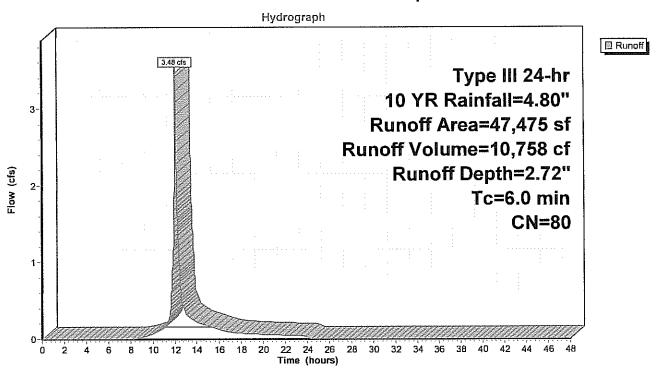
Summary for Subcatchment POST 3A: Post Development Area 3A

Runoff = 3.48 cfs @ 12.09 hrs, Volume= 10,758 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

_	Area (s	f) Cl	<u>N D</u>	escription						
	14,95	0 9	8 R	oofs, HSG C						
	1,68	9 9	8 P	Paved parking, HSG C						
	30,83	36 7	0 V	oods, Good, HSG C						
	47,47	75 8	0 V	Weighted Average						
	30,83	36	64	64.95% Pervious Area						
	16,63	39	3	5.05% lmp	ervious Are	ea				
						-				
	Tc Leng	~	Slope	Velocity	Capacity	Description				
	(min) (fe	et)	(ft/ft)	(ft/sec)	(cfs)		· · · · · · · · · · · · · · · · · · ·			
	6.0					Direct Entry,				

Subcatchment POST 3A: Post Development Area 3A



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Summary for Subcatchment POST 4: Post Development Area 4

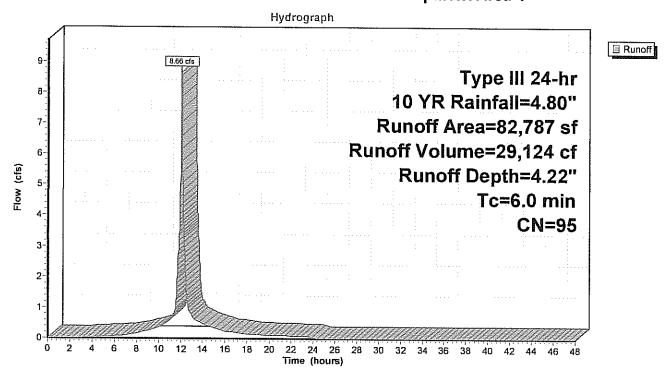
Runoff = 8.66 cfs @ 12.08 hrs, Volume=

29,124 cf, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

A	rea (sf)	CN	Description	Description				
	70,785	98	Paved park	Paved parking, HSG C				
	12,002	74	>75% Gras	75% Grass cover, Good, HSG C				
	82,787	95	Weighted A	Veighted Average				
	12,002		14.50% Pervious Area					
	70,785		85.50% Imp	ervious Are	ea			
Tc (min)	Length (feet)	Slope (ft/ft	-	Capacity (cfs)	Description			
6.0					Direct Entry,			

Subcatchment POST 4: Post Development Area 4



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Summary for Subcatchment POST 4A: Post Development Area 4A

Runoff

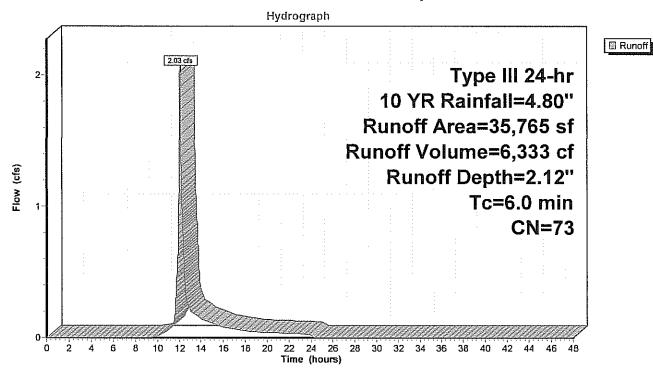
2.03 cfs @ 12.09 hrs, Volume=

6,333 cf, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

	A	rea (sf)	CN	Description				
		32,116	70	Woods, Good, HSG C				
		3,649	98	Paved parking, HSG C				
•		35,765	55 73 Weighted Average					
	32,116 89.80% Pervious Area							
		3,649		10.20% Imp	pervious Ar	ea		
	_		01			.		
	Tc	Length	Slope	,	Capacity	Description		
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
	6.0					Direct Entry.		

Subcatchment POST 4A: Post Development Area 4A



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Summary for Subcatchment POST-2A: Post Development Area 2A

Runoff

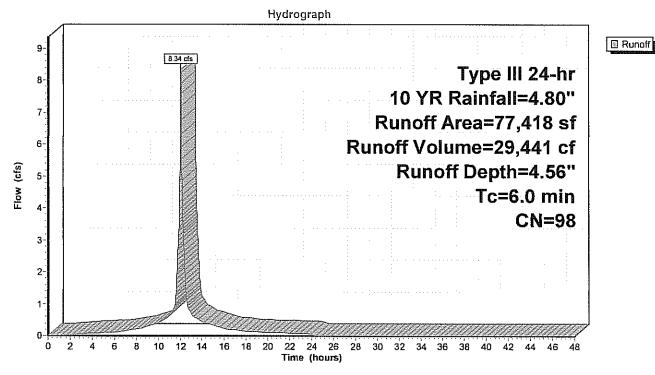
8.34 cfs @ 12.08 hrs, Volume=

29,441 cf, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 10 YR Rainfall=4.80"

_	A	rea (sf)	CN [Description					
		77,418	98 F	Roofs, HSG C					
_		77,418		100.00% Im	pervious A	Area			
			Slope	,		Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	6.0					Direct Entry.			

Subcatchment POST-2A: Post Development Area 2A



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Summary for Pond 3P: DCB-1

56,802 sf, 85.28% Impervious, Inflow Depth = 4.22" for 10 YR event Inflow Area =

Inflow 19,982 cf

5.94 cfs @ 12.08 hrs, Volume= 5.94 cfs @ 12.08 hrs, Volume= Outflow 19,982 cf, Atten= 0%, Lag= 0.0 min

5.94 cfs @ 12.08 hrs, Volume= Primary 19,982 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

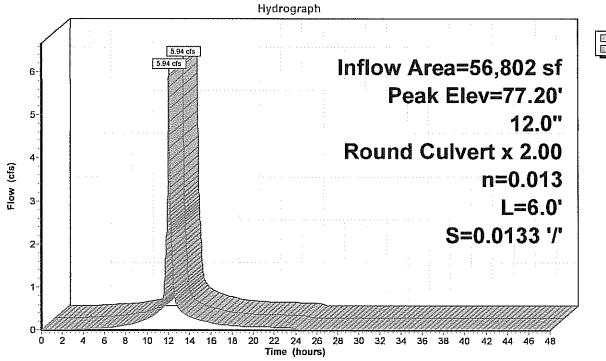
Peak Elev= 77.20' @ 12.11 hrs

Flood Elev= 78.40'

Device	Routing	Invert	Outlet Devices			
#1	Primary	76.00'	12.0" Round Culvert X 2.00			
			L= 6.0' RCP, groove end projecting, Ke= 0.200			
			Inlet / Outlet Invert= 76.00' / 75.92' S= 0.0133 '/' Cc= 0.900			
			n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf			

Primary OutFlow Max=5.96 cfs @ 12.08 hrs HW=77.14' TW=76.75' (Dynamic Tailwater) -1=Culvert (Inlet Controls 5.96 cfs @ 3.80 fps)

Pond 3P: DCB-1





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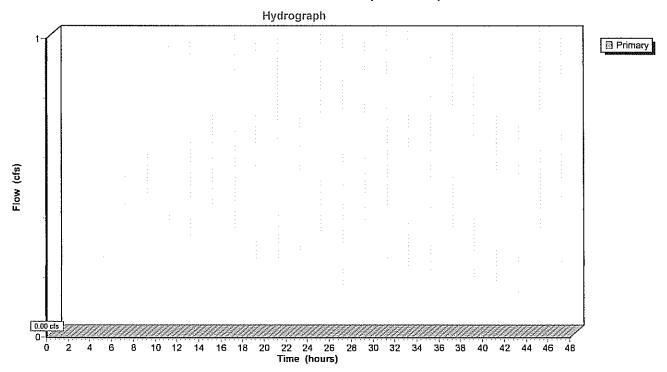
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Summary for Pond AP-1: WET-8 (No Flow)

[40] Hint: Not Described (Outflow=Inflow)

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

Pond AP-1: WET-8 (No Flow)



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Summary for Pond AP-2: WET-1

[40] Hint: Not Described (Outflow=Inflow)

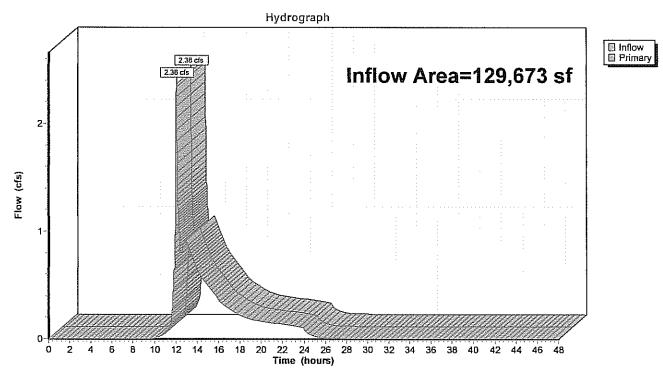
Inflow Area = 129,673 sf, 2.72% Impervious, Inflow Depth = 1.59" for 10 YR event

Inflow = 2.38 cfs @ 12.09 hrs, Volume= 17,170 cf

Primary = 2.38 cfs @ 12.09 hrs, Volume= 17,170 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-2: WET-1



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Summary for Pond AP-3: OFFSITE SWALE

[40] Hint: Not Described (Outflow=Inflow)

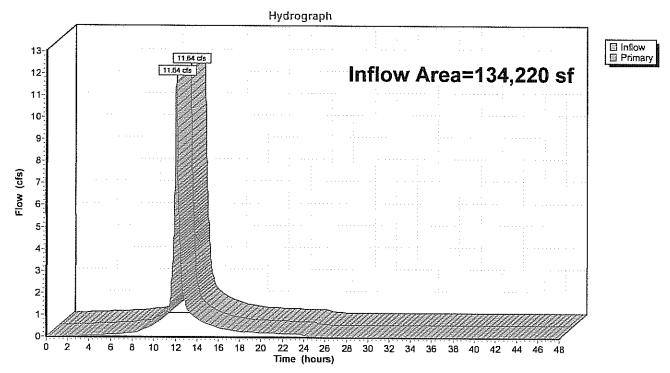
Inflow Area = 134,220 sf, 93.77% Impervious, Inflow Depth = 4.32" for 10 YR event

Inflow = 11.64 cfs @ 12.11 hrs, Volume= 48,316 cf

Primary = 11.64 cfs @ 12.11 hrs, Volume= 48,316 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-3: OFFSITE SWALE



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Summary for Pond AP-4: WET-2

[40] Hint: Not Described (Outflow=Inflow)

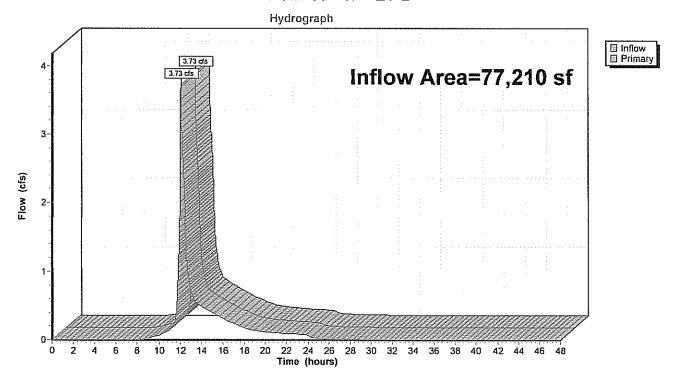
Inflow Area = 77,210 sf, 45.86% Impervious, Inflow Depth > 2.90" for 10 YR event

Inflow = 3.73 cfs @ 12.09 hrs, Volume= 18,638 cf

Primary = 3.73 cfs @ 12.09 hrs, Volume= 18,638 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-4: WET-2



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Summary for Pond AP-5: WET-3

[40] Hint: Not Described (Outflow=Inflow)

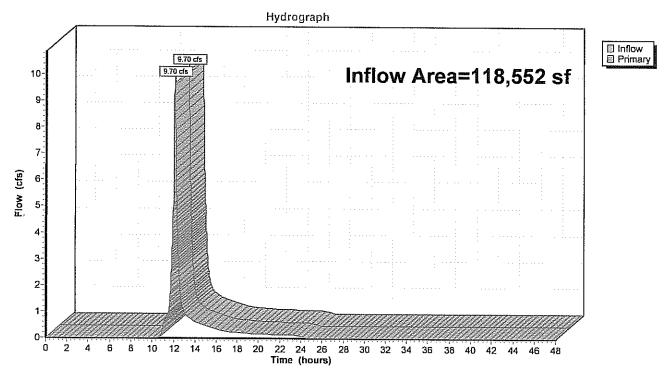
Inflow Area = 118,552 sf, 62.79% Impervious, Inflow Depth = 3.13" for 10 YR event

inflow = 9.70 cfs @ 12.12 hrs, Volume= 30,950 cf

Primary = 9.70 cfs @ 12.12 hrs, Volume= 30,950 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-5: WET-3



Type III 24-hr 10 YR Rainfall=4.80"

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Summary for Pond BASIN-1: BioRetention Area 1

Inflow Area = 81,936 sf, 4.31% Impervious, Inflow Depth = 2.53" for 10 YR event

Inflow = 6.62 cfs @ 12.11 hrs, Volume= 17,299 cf

Outflow = 0.65 cfs @ 13.00 hrs, Volume= 9,654 cf, Atten= 90%, Lag= 53.3 min

Primary = 0.65 cfs @ 13.00 hrs, Volume= 9.654 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 78.63' @ 13.00 hrs Surf.Area= 5,931 sf Storage= 8,423 cf

Flood Elev= 80.00' Surf.Area= 7,310 sf Storage= 17,464 cf

Plug-Flow detention time= 251.0 min calculated for 9,652 cf (56% of inflow)

Center-of-Mass det. time= 130.2 min (985.6 - 855.3)

<u>Volume</u>	<u>ln\</u>	<u>/ert Avai</u>	I.Storage	Storage	Description		
#1	77.	00'	17,464 cf	Custom	Stage Data (Pr	ismatic) Listed below (R	ecalc)
Elevation (fee		Surf.Area (sq-ft)		:.Store c-feet)	Cum.Store (cubic-feet)		
77.0 78.0 79.0 80.0	00 00	4,407 5,319 6,286 7,310		0 4,863 5,803 6,798	0 4,863 10,666 17,464		
Device	Routing	<u>In</u>	vert Out	et Device	es		
#1	Primary	78	Hea	0' 5.0' long x 25.0' breadth Broad-0 Head (feet) 0.20 0.40 0.60 0.80 Coef. (English) 2.68 2.70 2.70 2		0.80 1.00 1.20 1.40 1.	60

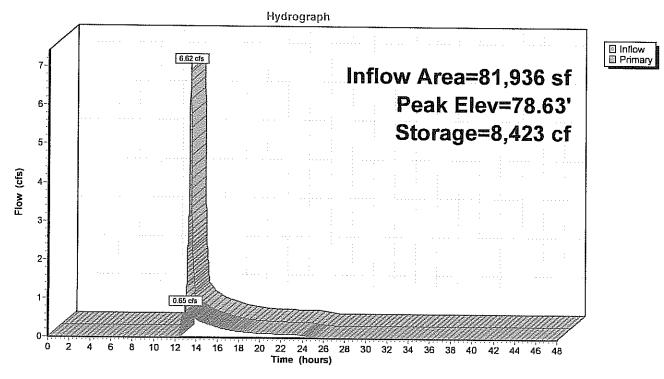
Primary OutFlow Max=0.65 cfs @ 13.00 hrs HW=78.63' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 0.65 cfs @ 0.98 fps)

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Pond BASIN-1: BioRetention Area 1



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Summary for Pond BASIN-2: Subsurface Detention System

Inflow Area = 56,802 sf, 85.28% Impervious, Inflow Depth = 4.22" for 10 YR event Inflow = 5.94 cfs @ 12.08 hrs, Volume= 19,982 cf Outflow = 4.66 cfs @ 12.18 hrs, Volume= 18,874 cf, Atten= 22%, Lag= 5.5 min Primary = 2.13 cfs @ 12.18 hrs, Volume= 10,718 cf Secondary = 2.53 cfs @ 12.17 hrs, Volume= 8,156 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 76.90' @ 12.15 hrs Surf.Area= 5,296 sf Storage= 4,938 cf Flood Elev= 78.10' Surf.Area= 5,296 sf Storage= 6,011 cf

Plug-Flow detention time= 97.6 min calculated for 18,870 cf (94% of inflow) Center-of-Mass det. time= 66.7 min (836.0 - 769.3)

<u>Volume</u>	Invert	Avail.Storage	Storage Description
#1A	75.37'	3,201 cf	68.33'W x 77.50'L x 2.04'H Field A
			10,812 cf Overall - 2,811 cf Embedded = 8,001 cf x 40.0% Voids
#2A	75.87'	2,811 cf	
			Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
			Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
			Row Length Adjustment= +0.50' x 1.86 sf x 20 rows
		6,011 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	75.87'	12.0" Round Culvert
			L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 75.87' / 75.42' S= 0.0090 '/' Cc= 0.900
			n= 0.011, Flow Area= 0.79 sf
#2	Secondary	75.87'	18.0" Round Culvert
			L= 24.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 75.87' / 75.87' S= 0.0000 '/' Cc= 0.900
			n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=2.13 cfs @ 12.18 hrs HW=76.88' TW=76.47' (Dynamic Tailwater) 1=Culvert (Outlet Controls 2.13 cfs @ 3.34 fps)

Secondary OutFlow Max=2.66 cfs @ 12.17 hrs HW=76.89' TW=76.65' (Dynamic Tailwater) —2=Culvert (Outlet Controls 2.66 cfs @ 2.93 fps)

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Pond BASIN-2: Subsurface Detention System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 20 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

10 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 75.50' Row Length +12.0" End Stone x 2 = 77.50' Base Length

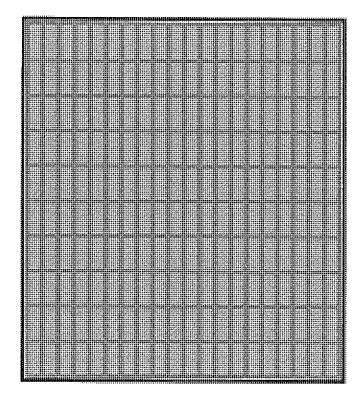
20 Rows x 36.0" Wide + 4.0" Spacing x 19 + 12.0" Side Stone x 2 = 68.33' Base Width 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

200 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 20 Rows = 2,810.9 cf Chamber Storage

10,812.3 cf Field - 2,810.9 cf Chambers = 8,001.5 cf Stone x 40.0% Voids = 3,200.6 cf Stone Storage

Chamber Storage + Stone Storage = 6,011.4 cf = 0.138 af Overall Storage Efficiency = 55.6%

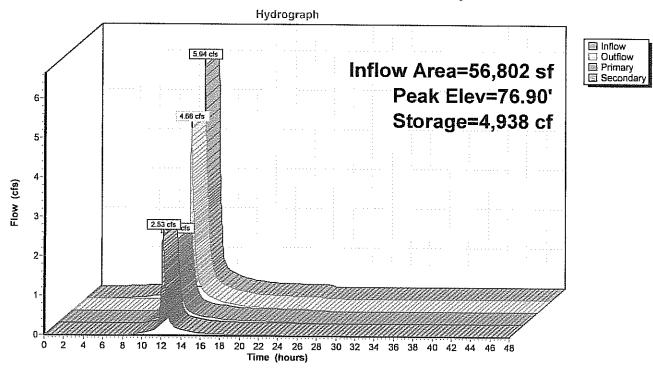
200 Chambers 400.5 cy Field 296.4 cy Stone



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Pond BASIN-2: Subsurface Detention System



Type III 24-hr 10 YR Rainfall=4.80"

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Summary for Pond BASIN-3: BioRetention Area 3

Inflow Area = 29,735 sf, 63.13% Impervious, Inflow Depth = 3.20" for 10 YR event

Inflow 2.75 cfs @ 12.10 hrs. Volume= 7,934 cf

Outflow = 1.05 cfs @ 12.34 hrs, Volume= 7,880 cf, Atten= 62%, Lag= 14.6 min

Primary = 1.05 cfs @ 12.34 hrs, Volume= 7.880 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.75' @ 12.34 hrs Surf.Area= 4,178 sf Storage= 2,911 cf

Flood Elev= 78.00' Surf.Area= 5,167 sf Storage= 8,763 cf

Plug-Flow detention time= 124.7 min calculated for 7,879 cf (99% of inflow)

Center-of-Mass det. time= 120.8 min (946.6 - 825.8)

<u>Volume</u>	Inv	ert Avail.Sto	rage Storage	Description	
#1	76.	00' 8,7	63 cf Custom	Stage Data (Prisi	matic) Listed below (Recalc)
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
76.0	_	3,624	0	0	
77.0	_	4,367	3,996	3,996	
78.0	00	5,167	4,767	8,763	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	75.00'	12.0" Round	12" HDPE	
#2	Device 1	J 76.00'	Inlet / Outlet I n= 0.011 Cor	nvert= 75.00' / 74.	adwall, Ke= 0.500 80' S= 0.0067 '/' Cc= 0.900 at & clean, Flow Area= 0.79 sf
#3	Device 1		4.0' long x 1.		sted Rectangular Weir

Primary OutFlow Max=1.05 cfs @ 12.34 hrs HW=76.75' TW=0.00' (Dynamic Tailwater)

-1=12" HDPE (Passes 1.05 cfs of 4.16 cfs potential flow)

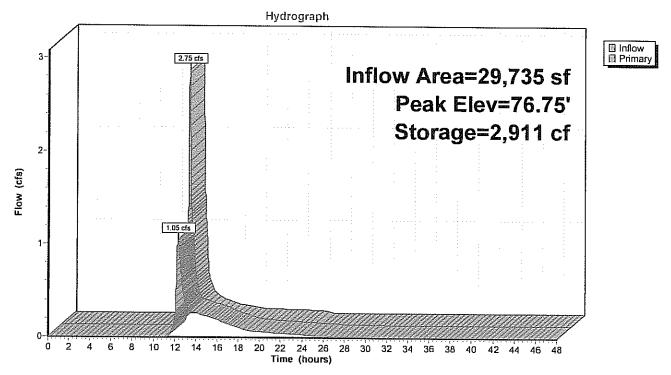
-2=4" Orifice (Orifice Controls 0.32 cfs @ 3.67 fps)

-3=Sharp-Crested Rectangular Weir (Weir Controls 0.73 cfs @ 1.27 fps)

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Pond BASIN-3: BioRetention Area 3



Type III 24-hr 10 YR Rainfall=4.80" Printed 5/21/2014

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Summary for Pond BASIN-4: BioRetention Area 4

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 4.04" for 10 YR event

Inflow = 8.46 cfs @ 12.09 hrs, Volume= 27,850 cf

Outflow = 7.80 cfs @ 12.13 hrs, Volume= 24,617 cf, Atten= 8%, Lag= 2.1 min

Primary = 7.80 cfs @ 12.13 hrs, Volume= 24,617 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 78.45' @ 12.13 hrs Surf.Area= 3,946 sf Storage= 4,932 cf

Flood Elev= 79.00' Surf.Area= 4,374 sf Storage= 7,218 cf

Plug-Flow detention time= 88.1 min calculated for 24,612 cf (88% of inflow)

Center-of-Mass det. time= 35.0 min (823.6 - 788.6)

Volume	lnν	<u>rert Avail.Sto</u>	orage Storage	Description	
#1	7 7.	00' 7,2	18 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
77.0 78.0 79.0	0	2,871 3,595 4,374	0 3,233 3,985	0 3,233 7,218	
Device	Routing	Invert	Outlet Device	s	
#1	Primary	78.00'	Head (feet) 0 2.50 3.00 3.0 Coef. (English).20	70 2.69 2.68 2.68 2.66 2.64 2.64

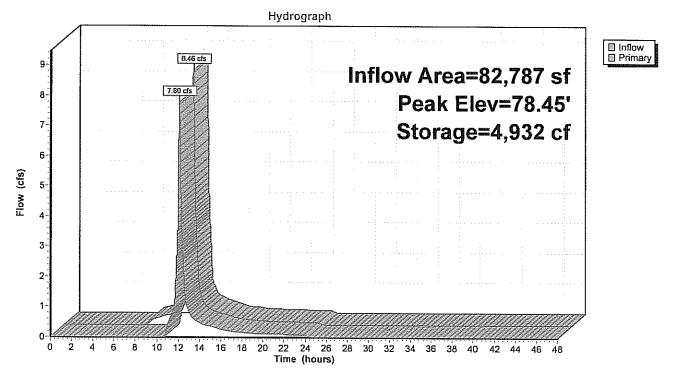
Primary OutFlow Max=7.79 cfs @ 12.13 hrs HW=78.45' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 7.79 cfs @ 1.73 fps)

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Pond BASIN-4: BioRetention Area 4



Type III 24-hr 10 YR Rainfall=4.80"

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Summary for Pond DMH-1: DMH-1

Inflow Area = 134,220 sf, 93.77% Impervious, Inflow Depth = 3.59" for 10 YR event

Inflow = 9.42 cfs @ 12.10 hrs, Volume= 40,160 cf

Outflow = 9.42 cfs @ 12.10 hrs, Volume= 40,160 cf, Atten= 0%, Lag= 0.0 min

Primary = 9.42 cfs @ 12.10 hrs, Volume= 40,160 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

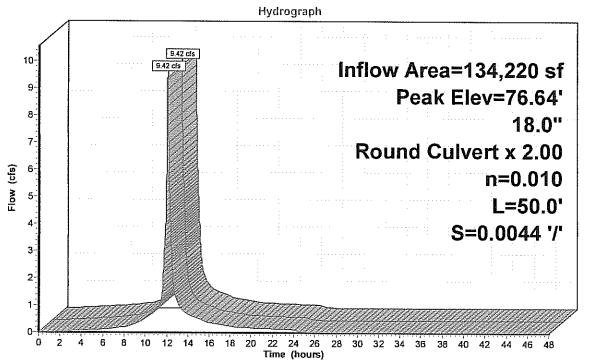
Peak Elev= 76.64' @ 12.10 hrs

Flood Elev= 79.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.42'	18.0" Round Culvert X 2.00
			L= 50.0' RCP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 75.42' / 75.20' S= 0.0044 '/' Cc= 0.900
			n= 0.010 Cast iron, coated. Flow Area= 1.77 sf

Primary OutFlow Max=9.42 cfs @ 12.10 hrs HW=76.64' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 9.42 cfs @ 4.15 fps)

Pond DMH-1: DMH-1





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Type III 24-hr 10 YR Rainfall=4.80" Printed 5/21/2014

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Summary for Pond DMH-2: DMH-2

Inflow = 2.53 cfs @ 12.17 hrs, Volume= 8,156 cf

Outflow = 2.53 cfs @ 12.17 hrs, Volume= 8,156 cf, Atten= 0%, Lag= 0.0 min

Primary = 2.53 cfs @ 12.17 hrs, Volume= 8.156 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

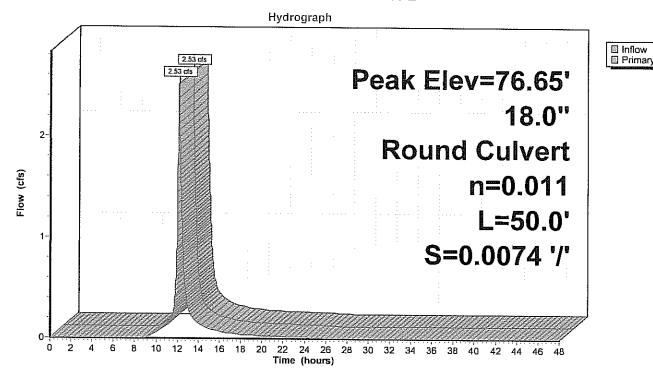
Peak Elev= 76.65' @ 12.17 hrs

Flood Elev= 79.20'

Device	Routing	Invert	Outlet Devices
#1	Primary		18.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet invert= 75.87' / 75.50' S= 0.0074 '/' Cc= 0.900 n= 0.011. Flow Area= 1.77 sf

Primary OutFlow Max=2.53 cfs @ 12.17 hrs HW=76.65' TW=0.00' (Dynamic Tailwater) 1=Culvert (Barrel Controls 2.53 cfs @ 3.96 fps)

Pond DMH-2: DMH-2



Type III 24-hr 10 YR Rainfall=4.80" Printed 5/21/2014

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Summary for Pond DMH-3:

Inflow Area = 77,418 sf,100.00% Impervious, Inflow Depth = 4.56" for 10 YR event

Inflow = 8.34 cfs @ 12.08 hrs, Volume= 29,441 cf

Outflow = 8.34 cfs @ 12.08 hrs, Volume= 29,441 cf, Atten= 0%, Lag= 0.0 min

Primary = 8.34 cfs @ 12.08 hrs, Volume= 29,441 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

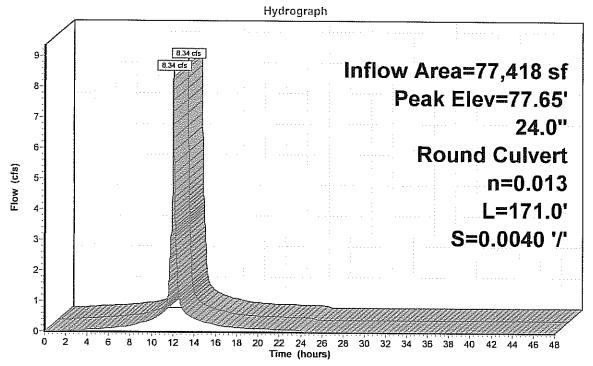
Peak Elev= 77.65' @ 12.09 hrs

Flood Elev= 79.80'

<u>Device</u>	Routing	Invert	Outlet Devices
#1	Primary		24.0" Round Culvert L= 171.0' RCP, groove end projecting, Ke= 0.200
			Inlet / Outlet Invert= 76.14' / 75.45' S= 0.0040 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections Flow Area= 3.14 sf

Primary OutFlow Max=8.33 cfs @ 12.08 hrs HW=77.64' TW=76.63' (Dynamic Tailwater) 1=Culvert (Outlet Controls 8.33 cfs @ 4.56 fps)

Pond DMH-3:





Type III 24-hr 10 YR Rainfall=4.80" Printed 5/21/2014

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Summary for Pond FB-1: Forebay

Inflow Area = 81,936 sf, 4.31% Impervious, Inflow Depth = 3.18" for 10 YR event

Inflow = 6.96 cfs @ 12.09 hrs, Volume= 21,738 cf

Outflow = 6.62 cfs @ 12.11 hrs, Volume= 17,299 cf, Atten= 5%, Lag= 1.6 min

Primary = 6.62 cfs @ 12.11 hrs, Volume= 17,299 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 78.63' @ 13.00 hrs Surf.Area= 2,705 sf Storage= 4,792 cf

Flood Elev= 79.00' Surf.Area= 2,991 sf Storage= 5,837 cf

Plug-Flow detention time= 123.2 min calculated for 17,295 cf (80% of inflow)

Center-of-Mass det. time= 46.2 min (855.3 - 809.1)

Volume	ln∨	<u>ert Avail.S</u>	torage Stor	age Description	
#1	76.	00' 5	,837 cf Cus	tom Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation (fee		Surf.Area (sq-ft)	Inc.Store (cubic-feet		
76.00 77.00		1,200 1,518	1,35	0 9 1,359	
78.00 78.50		2,227 2,602	1,87; 1,20	3 3,232	
79.0		2,991	1,398	,	
Device	Routing	Inve	rt Outlet De	vices	
#1	Primary	78.00	Head (fee	et) 0.20 0.40 0.60	road-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 .70 2.69 2.68 2.69 2.67 2.64

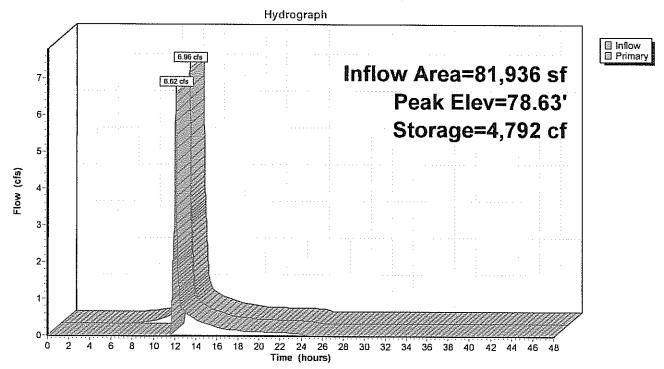
Primary OutFlow Max=6.61 cfs @ 12.11 hrs HW=78.41' TW=77.81' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 6.61 cfs @ 1.63 fps)

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Pond FB-1: Forebay



Type III 24-hr 10 YR Rainfall=4.80"

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Summary for Pond FB-2: Forebay

Inflow Area = 29,735 sf, 63.13% Impervious, Inflow Depth = 3.58" for 10 YR event

Inflow = 2.79 cfs @ 12.09 hrs, Volume= 8,873 cf

Outflow = 2.75 cfs @ 12.10 hrs, Volume= 7,934 cf, Atten= 2%, Lag= 0.9 min

Primary = 2.75 cfs @ 12.10 hrs, Volume= 7,934 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.84' @ 12.10 hrs Surf.Area= 926 sf Storage= 1,149 cf

Flood Elev= 77.00' Surf.Area= 982 sf Storage= 1,304 cf

Plug-Flow detention time= 80.5 min calculated for 7,932 cf (89% of inflow)

Center-of-Mass det. time= 30.0 min (825.8 - 795.8)

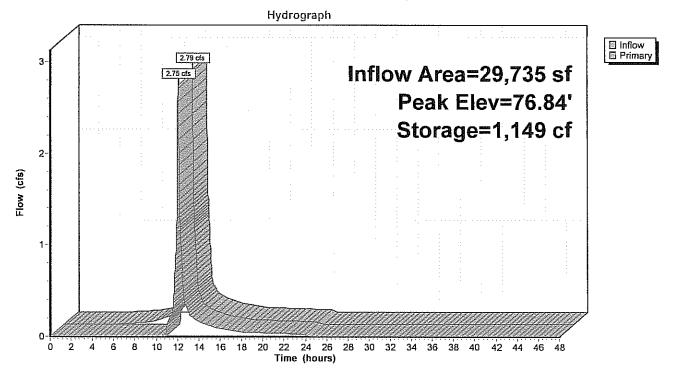
<u>Volume</u>	<u>ln</u> v	vert Avail.St	orage Storag	ge Description
#1	75	.00' 1,	304 cf Custo	m Stage Data (Prismatic) Listed below (Recalc)
Elevation (fee		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
75. 76. 77.	00	350 638 982	0 494 810	0 494 1,304
Device	Routing	ı İnver	t Outlet Device	ces
#1	Primary	76.60	Head (feet) 2.50 3.00 3 Coef. (Englis	x 5.0' breadth Broad-Crested Rectangular Weir 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 3.50 4.00 4.50 5.00 5.50 (sh) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.75 cfs @ 12.10 hrs HW=76.84' TW=76.55' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 2.75 cfs @ 1.16 fps)

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Pond FB-2: Forebay



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Summary for Pond FB-3: Forebay

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 4.22" for 10 YR event

Inflow = 8.66 cfs @ 12.08 hrs, Volume= 29,124 cf

Outflow = 8.46 cfs @ 12.09 hrs, Volume= 27,850 cf, Atten= 2%, Lag= 0.4 min

Primary = 8.46 cfs @ 12.09 hrs, Volume= 27,850 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 78.53' @ 12.11 hrs Surf.Area= 1,324 sf Storage= 1,562 cf

Flood Elev= 78.80' Surf.Area= 1,439 sf Storage= 1,941 cf

Plug-Flow detention time= 44.8 min calculated for 27,850 cf (96% of inflow)

Center-of-Mass det. time= 19.3 min (788.6 - 769.3)

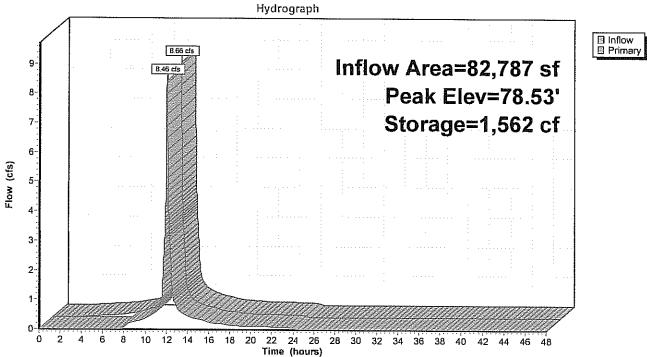
Volume	Inv	ert Avail.Sto	rage Storage D	Description		
#1	77.	00' 1,9	41 cf Custom S	Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
77.0	_	743	0	0		
78.0	00	1,104	924	924		
78.8	30	1,439	1,017	1,941		
Device	Routing	Invert	Outlet Devices			
#1	Primary	78.30'	38.0' long x 1.	0' breadth Bro	oad-Crested Rectangular Weir	
	,				0.80 1.00 1.20 1.40 1.60 1.80 2.00	
			2.50 3.00			
			Coef. (English) 3.30 3.31 3.32		.75 2.85 2.98 3.08 3.20 3.28 3.31	

Primary OutFlow Max=8.46 cfs @ 12.09 hrs HW=78.52' TW=78.43' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 8.46 cfs @ 1.01 fps)

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Pond FB-3: Forebay





Type III 24-hr 25 YR Rainfall=5.50"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 4
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 POST 1: Post Development Runoff Area=81,936 sf 4.31% Impervious Runoff Depth=3.83"

Tc=6.0 min CN=85 Runoff=8.33 cfs 26,171 cf

Subcatchment POST 1A: Post Development Runoff Area=47,737 sf 0.00% Impervious Runoff Depth=2.41"

Tc=6.0 min CN=70 Runoff=3.07 cfs 9.604 cf

Subcatchment POST 2: Post Development Runoff Area=56,802 sf 85.28% Impervious Runoff Depth=4.92"

Tc=6.0 min CN=95 Runoff=6.86 cfs 23,266 cf

Subcatchment POST 3: Post Development Runoff Area=29,735 sf 63.13% Impervious Runoff Depth=4.25"

Tc=6.0 min CN=89 Runoff=3.29 cfs 10,537 cf

Subcatchment POST 3A: Post Runoff Area=47,475 sf 35.05% Impervious Runoff Depth=3.33"

Tc=6.0 min CN=80 Runoff=4.25 cfs 13,188 cf

Subcatchment POST 4: Post Development Runoff Area=82,787 sf 85.50% Impervious Runoff Depth=4.92"

Tc=6.0 min CN=95 Runoff=10.00 cfs 33,910 cf

TC-6.0 min CN=95 Runom=10.00 cts 33,910 ct

Subcatchment POST 4A: Post Runoff Area=35,765 sf 10.20% Impervious Runoff Depth=2.68" Tc=6.0 min CN=73 Runoff=2.57 cfs 7,984 cf

Subcatchment POST-2A: Post Runoff Area=77,418 sf 100.00% Impervious Runoff Depth=5.26"

Tc=6.0 min CN=98 Runoff=9.57 cfs 33,951 cf

Pond 3P: DCB-1 Peak Elev=77.48' Inflow=6.86 cfs 23,266 cf

12.0" Round Culvert x 2.00 n=0.013 L=6.0' S=0.0133 '/' Outflow=6.86 cfs 23,266 cf

Pond AP-1: WET-8 (No Flow)

Primary=0.00 cfs 0 cf

Pond AP-2: WET-1 Inflow=3.07 cfs 23,691 cf Primary=3.07 cfs 23,691 cf

Pond AP-3: OFFSiTE SWALE Inflow=13.85 cfs 56,109 cf

Primary=13.85 cfs 56,109 cf

Pond AP-4: WET-2 Inflow=4.85 cfs 22,731 cf

Primary=4.85 cfs 22,731 cf

Pond AP-5: WET-3 Inflow=11.47 cfs 37,387 cf Primary=11.47 cfs 37,387 cf

Pond BASIN-1: BioRetention Area 1 Peak Elev=78.76' Storage=9,156 cf inflow=7.67 cfs 21,732 cf Outflow=1.73 cfs 14.087 cf

Pond BASIN-2: Subsurface Detention Peak Elev=77.06' Storage=5,262 cf Inflow=6.86 cfs 23,266 cf

Primary=2.51 cfs 12,366 cf Secondary=3.13 cfs 9,792 cf Outflow=5.61 cfs 22,158 cf

4000 DOOT	FIMO TEOT	CLIDOLIDE	A OF BOND A
1998-PUS I	-VV5- E5	-SUBSURF	ACE POND 2

Type III 24-hr 25 YR Rainfall=5.50"

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Pond BASIN-3: BioRetention Area 3 Peak Elev=76.81' Storage=3,180 cf Inflow=3.15 cfs 9,598 cf

Outflow=1.61 cfs 9,544 cf

Pond BASIN-4: BioRetention Area 4 Peak Elev=78.49' Storage=5,101 cf Inflow=9.75 cfs 32,636 cf

Outflow=9.06 cfs 29,403 cf

Pond DMH-1: DMH-1 Peak Elev=76.78' Inflow=11.00 cfs 46,316 cf

18.0" Round Culvert x 2.00 n=0.010 L=50.0' S=0.0044 '/' Outflow=11.00 cfs 46,316 cf

Pond DMH-2: DMH-2 Peak Elev=76.76' Inflow=3.13 cfs 9,792 cf

18.0" Round Culvert n=0.011 L=50.0' S=0.0074 '/' Outflow=3.13 cfs 9,792 cf

Pond DMH-3: Peak Elev=77.79' Inflow=9.57 cfs 33,951 cf

24.0" Round Culvert n=0.013 L=171.0' S=0.0040 '/' Outflow=9.57 cfs 33,951 cf

Pond FB-1: Forebay Peak Elev=78.76' Storage=5,132 cf Inflow=8.33 cfs 26,171 cf

Outflow=7.67 cfs 21,732 cf

Pond FB-2: Forebay Peak Elev=76.87' Storage=1,184 cf Inflow=3.29 cfs 10,537 cf

Outflow=3.15 cfs 9,598 cf

Pond FB-3: Forebay Peak Elev=78.56' Storage=1,610 cf Inflow=10.00 cfs 33,910 cf

Outflow=9.75 cfs 32,636 cf

Total Runoff Area = 459,655 sf Runoff Volume = 158,610 cf Average Runoff Depth = 4.14" 47.95% Pervious = 220,424 sf 52.05% Impervious = 239,231 sf

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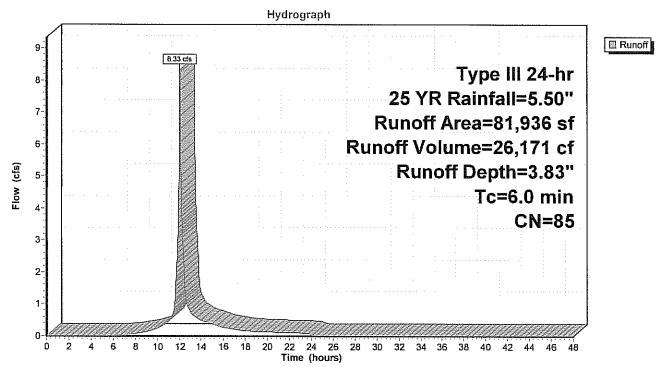
Summary for Subcatchment POST 1: Post Development Area 1

Runoff 8.33 cfs @ 12.09 hrs, Volume= 26,171 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

Are	a (sf) C	CN Description							
5	1,749 8	39	Gravel roads, HSG C						
3	3,528	98	Paved parki	ng, HSG C					
26	3,659 T	74 :	>75% Gras:	s cover, Go	od, HSG C				
8-	1,936 8	85 Weighted Average							
78	3,408	95.69% Pervious Area							
3	3,528	4.31% Impervious Area							
	_	Slope		Capacity	Description				
<u>(min)</u>	(feet)	(ft/ft)	(ft/sec)	(cfs)					
6.0					Direct Entry.				

Subcatchment POST 1: Post Development Area 1



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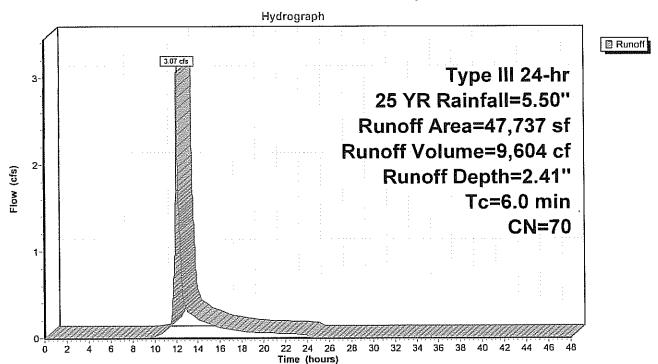
Summary for Subcatchment POST 1A: Post Development Area 1A

Runoff = 3.07 cfs @ 12.09 hrs, Volume= 9,604 cf, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

	Area (sf)	CN	Description				
	942	89	Gravel road	ls, HSG C			
	46,795	70	Woods, Good, HSG C				
	47,737	70	Weighted A	verage			
	47,737		100.00% Pe	ervious Are	ea		
To (min)		Slope (ft/ft	•	Capacity (cfs)	Description		
6.0		(101)	(10000)	(5,5)	Direct Entry,		

Subcatchment POST 1A: Post Development Area 1A



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1998-POST-WS-TEST-SUBSURFACE POND 2

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Summary for Subcatchment POST 2: Post Development Area 2

Runoff

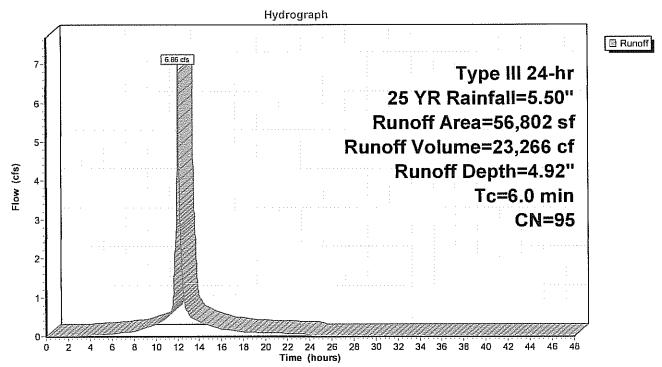
6.86 cfs @ 12.08 hrs, Volume=

23,266 cf, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

	Ar	ea (sf)	CN [Description						
		48,439	98 F	Paved parking, HSG C						
		2,831	89 (Gravel roads, HSG C						
		5,532	74	>75% Grass cover, Good, HSG C						
		56,802	95 \	95 Weighted Average						
		8,363		14.72% Pervious Area						
	•	48,439	3	85.28% Impervious Area						
	Тс	Length	Slope	Velocity	Capacity	Description				
1-	nin)	(feet)	(ft/ft)	(ft/sec)	(cfs)	Description				
		(ieet)	(IIIII)	(IRSEC)	(013)					
	6.0					Direct Entry,				

Subcatchment POST 2: Post Development Area 2



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Summary for Subcatchment POST 3: Post Development Area 3

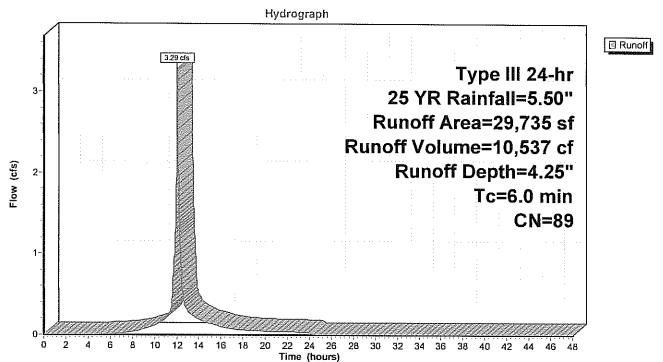
Runoff = 3.29 cfs @ 12.09 hrs, Volume=

10,537 cf, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

	Area (sf)	CN	Description						
	18,773		Paved parking, HSG C						
	10,962	74	>75% Gras	75% Grass cover, Good, HSG C					
	29,735 10,962 18,773	735 89 Weighted Average 962 36.87% Pervious Area							
Tc (min)		Slope (ft/ft)	,	Capacity (cfs)	Description				
6.0					Direct Entry.				

Subcatchment POST 3: Post Development Area 3



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Summary for Subcatchment POST 3A: Post Development Area 3A

Runoff

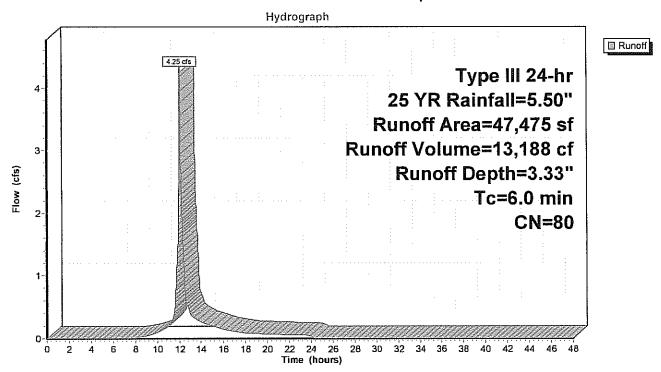
4.25 cfs @ 12.09 hrs, Volume=

13,188 cf, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

_	Α	rea (sf)	CN I	N Description						
		14,950	98 I	Roofs, HSG C						
		1,689	98 I	Paved parking, HSG C						
_		30,836	70 Y	Woods, Good, HSG C						
		47,475	80 \	80 Weighted Average						
		30,836	64.95% Pervious Area							
		16,639	•							
	Tc	Length	Slope	*	Capacity	Description				
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
	6.0					Direct Entry,				

Subcatchment POST 3A: Post Development Area 3A



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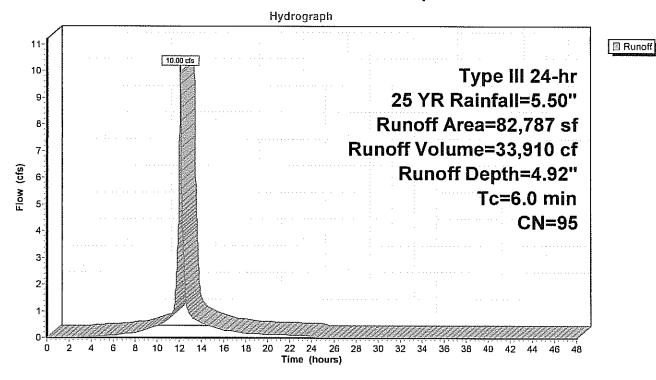
Summary for Subcatchment POST 4: Post Development Area 4

Runoff = 10.00 cfs @ 12.08 hrs, Volume= 33,910 cf, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

<i>F</i>	Area (sf)	CN	Description					
	70,785	98	Paved park	ing, HSG C				
	12,002	74	>75% Grass cover, Good, HSG C					
	82,787	95	Weighted A	verage				
	12,002 14.50% Pervious Area							
	70,785		85.50% lmp	pervious Ar	ea			
Tc (min)	Length (feet)	Slope (ft/ft)	,	Capacity (cfs)	Description			
6.0		· · · · · · · · · · · · · · · · · · ·			Direct Entry.			

Subcatchment POST 4: Post Development Area 4



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Summary for Subcatchment POST 4A: Post Development Area 4A

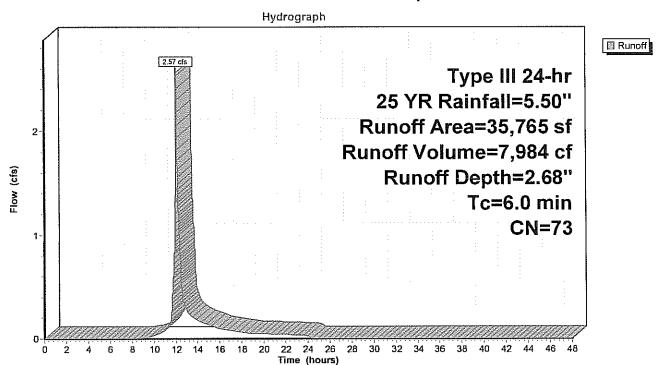
Runoff = 2.57 cfs @ 12.09 hrs, Volume= 7

7,984 cf, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

_	Α	rea (sf)	CN	Description					
-		32,116	70	Woods, Good, HSG C					
		3,649	98	Paved parking, HSG C					
		35,765 73 Weighted Average							
	32,116 89.80% Pervious Area								
		3,649		10.20% lmp	pervious Ar	ea			
	Tc (min)	Length (feet)	Slope (ft/ft)	•	Capacity (cfs)	Description			
•	6.0			\	()	Direct Entry.			

Subcatchment POST 4A: Post Development Area 4A



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Summary for Subcatchment POST-2A: Post Development Area 2A

Runoff

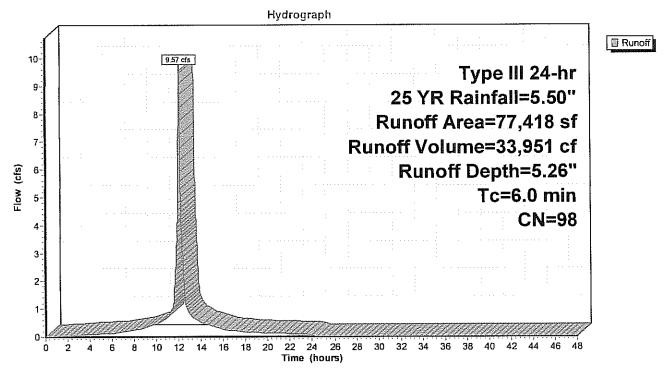
9.57 cfs @ 12.08 hrs, Volume=

33,951 cf, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 25 YR Rainfall=5.50"

	Α	rea (sf)	CN E	Description		
		77,418	98 F	Roofs, HSC	C C	
		77,418	1	00.00% lm	ipervious A	Area
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
-	6.0					Direct Entry.

Subcatchment POST-2A: Post Development Area 2A



Type III 24-hr 25 YR Rainfall=5.50"

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Summary for Pond 3P: DCB-1

Inflow Area = 56,802 sf, 85.28% Impervious, Inflow Depth = 4.92" for 25 YR event

Inflow = 6.86 cfs @ 12.08 hrs, Volume= 23,266 cf

Outflow = 6.86 cfs @ 12.08 hrs, Volume= 23,266 cf, Atten= 0%, Lag= 0.0 min

Primary = 6.86 cfs @ 12.08 hrs, Volume= 23,266 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

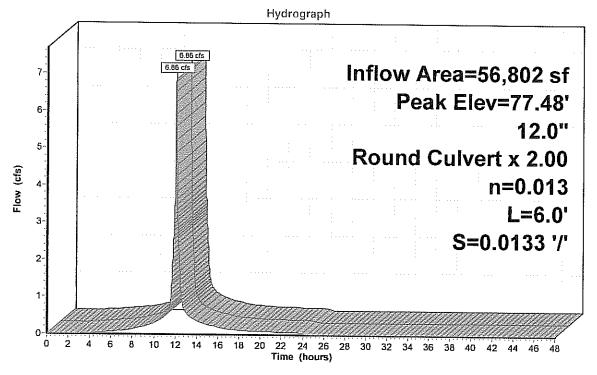
Peak Elev= 77.48' @ 12.11 hrs

Flood Elev= 78.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	76.00'	12.0" Round Culvert X 2.00 L= 6.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 76.00' / 75.92' S= 0.0133 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections. Flow Area= 0.79 sf

Primary OutFlow Max=6.83 cfs @ 12.08 hrs HW=77.42' TW=76.90' (Dynamic Tailwater) 1=Culvert (Inlet Controls 6.83 cfs @ 4.35 fps)

Pond 3P: DCB-1





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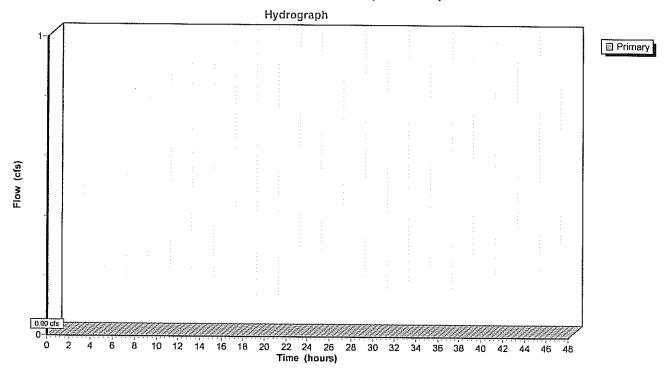
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Summary for Pond AP-1: WET-8 (No Flow)

[40] Hint: Not Described (Outflow=Inflow)

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

Pond AP-1: WET-8 (No Flow)



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Summary for Pond AP-2: WET-1

[40] Hint: Not Described (Outflow=Inflow)

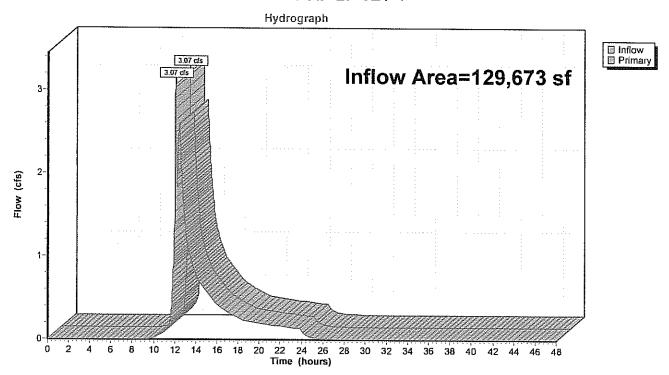
Inflow Area = 129,673 sf, 2.72% Impervious, Inflow Depth = 2.19" for 25 YR event

Inflow 23,691 cf

3.07 cfs @ 12.09 hrs, Volume= 3.07 cfs @ 12.09 hrs, Volume= Primary 23,691 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-2: WET-1



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Summary for Pond AP-3: OFFSITE SWALE

[40] Hint: Not Described (Outflow=Inflow)

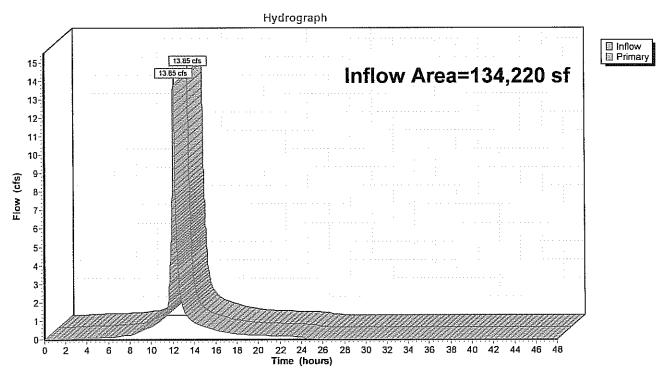
Inflow Area = 134,220 sf, 93.77% Impervious, Inflow Depth = 5.02" for 25 YR event

Inflow = 13.85 cfs @ 12.11 hrs, Volume= 56,109 cf

Primary = 13.85 cfs @ 12.11 hrs, Volume= 56,109 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-3: OFFSITE SWALE



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Summary for Pond AP-4: WET-2

[40] Hint: Not Described (Outflow=Inflow)

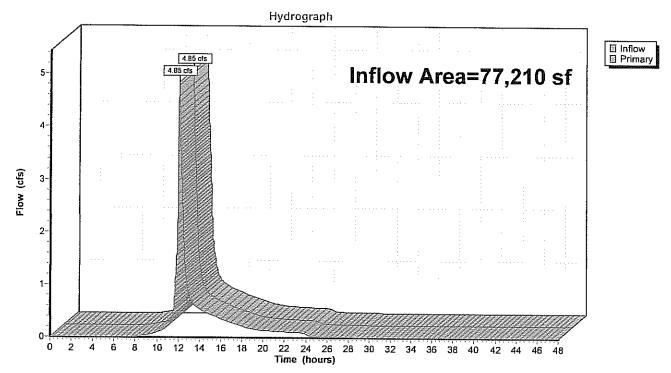
Inflow Area = 77,210 sf, 45.86% Impervious, Inflow Depth > 3.53" for 25 YR event

Inflow = 4.85 cfs @ 12.11 hrs, Volume= 22,731 cf

Primary = 4.85 cfs @ 12.11 hrs, Volume= 22,731 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-4: WET-2



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Summary for Pond AP-5: WET-3

[40] Hint: Not Described (Outflow=Inflow)

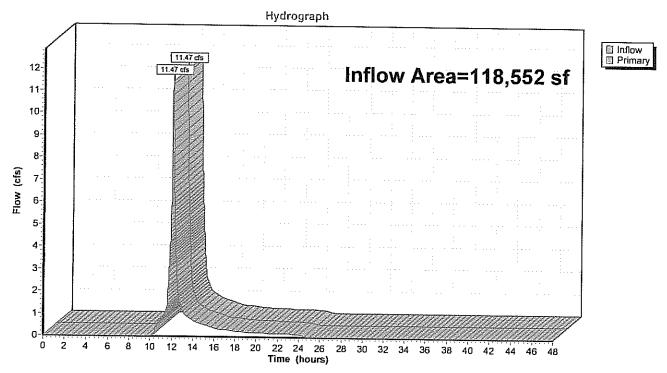
Inflow Area = 118,552 sf, 62.79% Impervious, Inflow Depth = 3.78" for 25 YR event

Inflow 37,387 cf

11.47 cfs @ 12.12 hrs, Volume= 11.47 cfs @ 12.12 hrs, Volume= Primary 37,387 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-5: WET-3



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Summary for Pond BASIN-1: BioRetention Area 1

81,936 sf, 4.31% Impervious, Inflow Depth = 3.18" for 25 YR event Inflow Area =

7.67 cfs @ 12.10 hrs, Volume= 21,732 cf Inflow

14,087 cf, Atten= 77%, Lag= 25.1 min 1.73 cfs @ 12.52 hrs, Volume= Outflow =

1.73 cfs @ 12.52 hrs, Volume= 14,087 cf Primary =

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.76' @ 12.52 hrs Surf Area= 6,049 sf Storage= 9,156 cf

Flood Elev= 80.00' Surf.Area= 7,310 sf Storage= 17,464 cf

Plug-Flow detention time= 198.7 min calculated for 14,084 cf (65% of inflow)

Center-of-Mass det. time= 92.7 min (938.5 - 845.7)

Volume	inve	ert Avail	.Storage_		Description	
#1	77.C	0' 1	7,464 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation (feet)	-	Surf.Area (sq-ft)		:.Store c-feet)	Cum.Store (cubic-feet)	
77.00 78.00 79.00 80.00)	4,407 5,319 6,286 7,310		0 4,863 5,803 6,798	0 4,863 10,666 17,464	
Device	Routing	lnv		let Device		
#1	Primary	78	Hea	d (feet)	0.20 0.40 0.60	oad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 .70 2.64 2.63 2.64 2.64 2.63

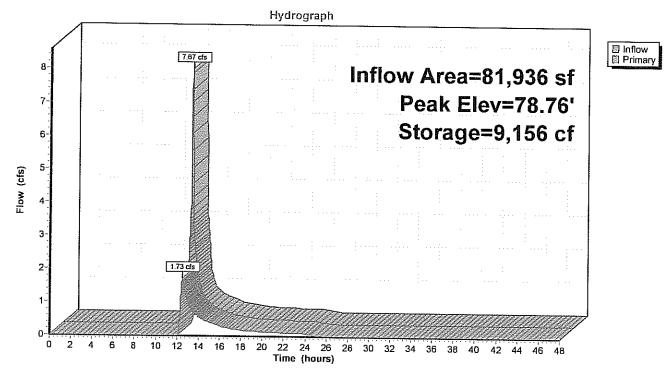
Coet. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.73 cfs @ 12.52 hrs HW=78.76' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 1.73 cfs @ 1.36 fps)

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Pond BASIN-1: BioRetention Area 1



Type III 24-hr 25 YR Rainfall=5.50"

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Summary for Pond BASIN-2: Subsurface Detention System

Inflow Area = 56,802 sf, 85.28% Impervious, Inflow Depth = 4.92" for 25 YR event lnflow = 6.86 cfs @ 12.08 hrs, Volume= 23,266 cf Outflow = 5.61 cfs @ 12.17 hrs, Volume= 22,158 cf, Atten= 18%, Lag= 5.4 min Primary = 2.51 cfs @ 12.18 hrs, Volume= 12,366 cf Secondary = 3.13 cfs @ 12.14 hrs, Volume= 9,792 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 77.06' @ 12.14 hrs Surf.Area= 5,296 sf Storage= 5,262 cf Flood Elev= 78.10' Surf.Area= 5,296 sf Storage= 6,011 cf

Plug-Flow detention time= 89.2 min calculated for 22,153 cf (95% of inflow) Center-of-Mass det. time= 62.0 min (827.8 - 765.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	75.37'	3,201 cf	68.33'W x 77.50'L x 2.04'H Field A
			10,812 cf Overall - 2,811 cf Embedded = 8,001 cf x 40.0% Voids
#2A	75.87'	2,811 cf	Cultec C-100HD x 200 Inside #1
			Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
			Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
			Row Length Adjustment= +0.50' x 1.86 sf x 20 rows
		6.011 cf	Total Available Storage

Storage Group A created with Chamber Wizard

<u>Device</u>	Routing	Invert	Outlet Devices
#1	Primary	75.87'	12.0" Round Culvert
			L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 75.87' / 75.42' S= 0.0090 '/' Cc= 0.900
			n= 0.011, Flow Area= 0.79 sf
#2	Secondary	75.87'	18.0" Round Culvert
			L= 24.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 75.87' / 75.87' S= 0.0000 '/' Cc= 0.900
			n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=2.51 cfs @ 12.18 hrs HW=77.02' TW=76.57' (Dynamic Tailwater) 1=Culvert (Outlet Controls 2.51 cfs @ 3.48 fps)

Secondary OutFlow Max=3.58 cfs @ 12.14 hrs HW=77.06' TW=76.76' (Dynamic Tailwater)

—2=Culvert (Barrel Controls 3.58 cfs @ 3.28 fps)

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Pond BASIN-2: Subsurface Detention System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 20 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

10 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 75.50' Row Length +12.0" End Stone x 2 = 77.50' Base Length

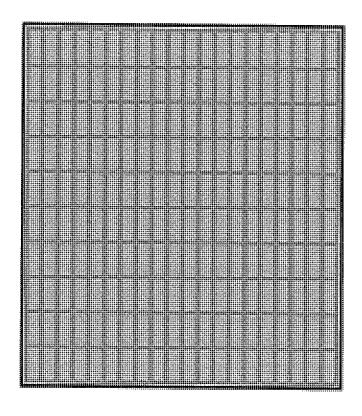
20 Rows x 36.0" Wide + 4.0" Spacing x 19 + 12.0" Side Stone x 2 = 68.33' Base Width 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

200 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 20 Rows = 2,810.9 cf Chamber Storage

10,812.3 cf Field - 2,810.9 cf Chambers = 8,001.5 cf Stone x 40.0% Voids = 3,200.6 cf Stone Storage

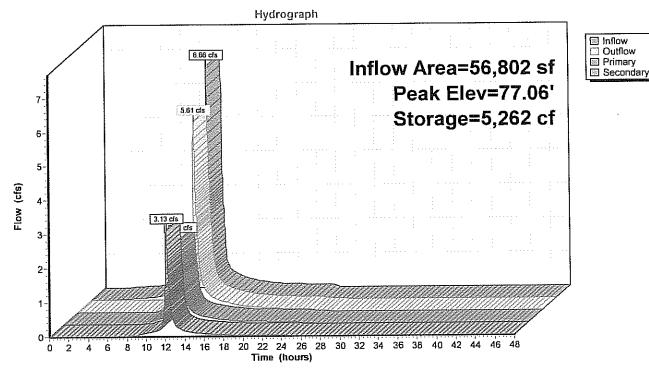
Chamber Storage + Stone Storage = 6,011.4 cf = 0.138 af Overall Storage Efficiency = 55.6%

200 Chambers 400.5 cy Field 296.4 cy Stone



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Pond BASIN-2: Subsurface Detention System



Type III 24-hr 25 YR Rainfall=5.50"

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Summary for Pond BASIN-3: BioRetention Area 3

Inflow Area = 29,735 sf, 63.13% Impervious, Inflow Depth = 3.87" for 25 YR event

Inflow = 3.15 cfs @ 12.09 hrs, Volume= 9,598 cf

Outflow = 1.61 cfs @ 12.25 hrs, Volume= 9,544 cf, Atten= 49%, Lag= 9.2 min

Primary = 1.61 cfs @ 12.25 hrs, Volume= 9,544 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.81 @ 12.25 hrs Surf.Area= 4,226 sf Storage= 3,180 cf

Flood Elev= 78.00' Surf.Area= 5,167 sf Storage= 8,763 cf

Plug-Flow detention time= 112.8 min calculated for 9,544 cf (99% of inflow)

Center-of-Mass det. time= 109.3 min (928.3 - 819.0)

Income A 11 Oc

Valuese

Volume	Inve	<u>ert Avail.Sto</u>	rage Storage	Description			
#1	76.0	0' 8,76		********	ismatic) Listed below (Recalc)		
Elevation (fee	et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)			
76.0 77.0 78.0	00	3,624 4,367 5,167	0 3,996 4,767	0 3,996 8,763			
Device	Routing	Invert	Outlet Device	S			
#1	Primary	75.00'	iniet / Outlet I	ɔ, square edge h nvert= 75.00' / 7	neadwall, Ke= 0.500 4.80' S= 0.0067 '/' Cc= 0.900 ght & clean, Flow Area= 0.79 sf		
#2 #3	Device 1 Device 1	76.00' 76.60'	4.0" Vert. 4" Orifice C= 0.600 4.0' long x 1.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.5' Crest Height				

Primary OutFlow Max=1.61 cfs @ 12.25 hrs HW=76.81' TW=0.00' (Dynamic Tailwater)

-1=12" HDPE (Passes 1.61 cfs of 4.30 cfs potential flow)

2=4" Orifice (Orifice Controls 0.34 cfs @ 3.86 fps)

─3=Sharp-Crested Rectangular Weir (Weir Controls 1.27 cfs @ 1.53 fps)

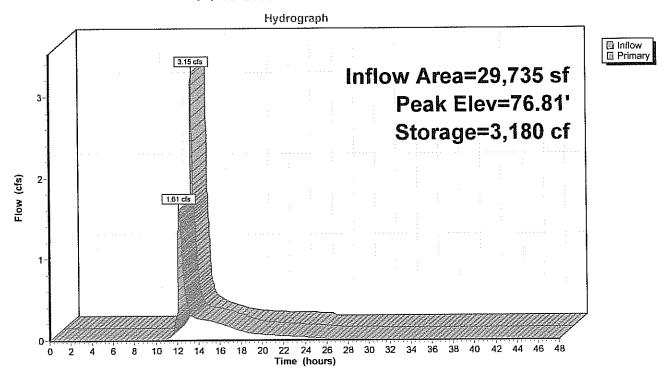
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1998-POST-WS-TEST-SUBSURFACE POND 2

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Pond BASIN-3: BioRetention Area 3



Type III 24-hr 25 YR Rainfall=5.50"

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Summary for Pond BASIN-4: BioRetention Area 4

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 4.73" for 25 YR event

Inflow = 9.75 cfs @ 12.09 hrs, Volume= 32,636 cf

Outflow = 9.06 cfs @ 12.12 hrs, Volume= 29,403 cf, Atten= 7%, Lag= 2.0 min

Primary = 9.06 cfs @ 12.12 hrs, Volume= 29,403 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.49' @ 12.12 hrs Surf.Area= 3,979 sf Storage= 5,101 cf

Flood Elev= 79.00' Surf.Area= 4,374 sf Storage= 7,218 cf

Plug-Flow detention time= 80.9 min calculated for 29,397 cf (90% of inflow)

Center-of-Mass det. time= 33.2 min (816.7 - 783.5)

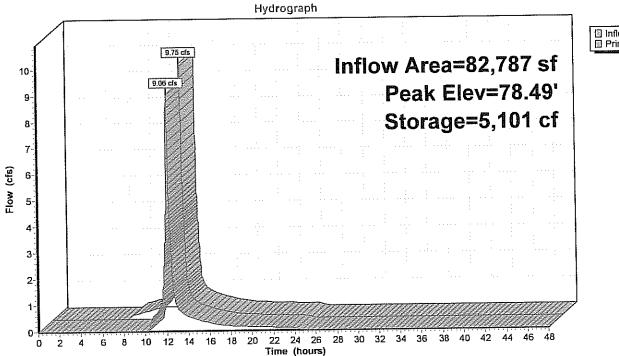
Volume	lnv	ert Avail.Sto	orage Storage D	Description	
#1	77.	00' 7,2	18 cf Custom §	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation (feet		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
77.00 78.00 79.00	0	2,871 3,595 4,374	0 3,233 3,985	0 3,233 7,218	
Device	Routing	Invert	Outlet Devices		
#1	Primary	78.00'	Head (feet) 0.2 2.50 3.00 3.50	20 0.40 0.60 0 4.00 4.50 5 2.43 2.54 2.	70 2.69 2.68 2.68 2.66 2.64 2.64

Primary OutFlow Max=9.04 cfs @ 12.12 hrs HW=78.49' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 9.04 cfs @ 1.84 fps)

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Pond BASIN-4: BioRetention Area 4





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Summary for Pond DMH-1: DMH-1

Inflow Area =

134,220 sf, 93.77% Impervious, Inflow Depth = 4.14" for 25 YR event

Inflow

11.00 cfs @ 12.10 hrs, Volume=

46,316 cf

Outflow

11.00 cfs @ 12.10 hrs, Volume=

46,316 cf, Atten= 0%, Lag= 0.0 min

Primary

11.00 cfs @ 12.10 hrs, Volume=

46,316 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

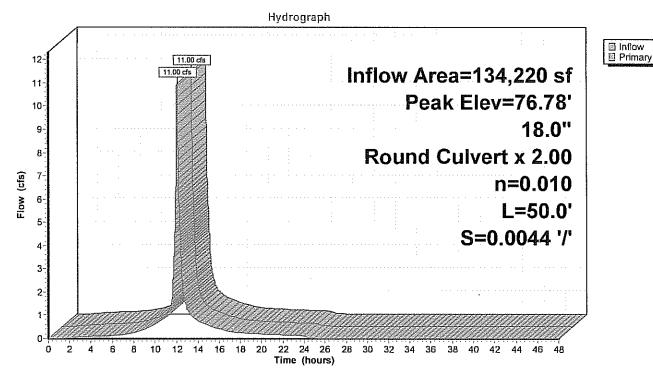
Peak Elev= 76.78' @ 12.10 hrs

Flood Elev= 79.80'

Device	Routing	Invert	Outlet Devices					
#1	Primary	75.42'	18.0" Round Culvert X 2.00					
			L= 50.0' RCP, square edge headwall, Ke= 0.500					
			Inlet / Outlet Invert= 75.42' / 75.20' S= 0.0044 '/' Cc= 0.900					
			n= 0.010 Cast iron, coated, Flow Area= 1.77 sf					

Primary OutFlow Max=10.99 cfs @ 12.10 hrs HW=76.78' TW=0.00' (Dynamic Tailwater) 1=Cuivert (Barrel Controls 10.99 cfs @ 4.31 fps)

Pond DMH-1: DMH-1



Type III 24-hr 25 YR Rainfall=5.50" Printed 5/21/2014

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Summary for Pond DMH-2: DMH-2

Inflow 3.13 cfs @ 12.14 hrs, Volume= 9.792 cf

Outflow 3.13 cfs @ 12.14 hrs, Volume= 9,792 cf, Atten= 0%, Lag= 0.0 min

Primary 3.13 cfs @ 12.14 hrs, Volume= 9,792 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

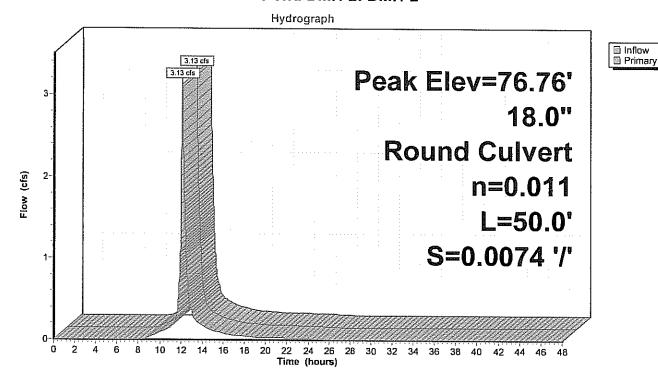
Peak Elev= 76.76' @ 12.14 hrs

Flood Elev= 79.20'

<u>Device</u>	Routing	Invert	Outlet Devices
#1	Primary	75.87'	18.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.87' / 75.50' S= 0.0074 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=3.13 cfs @ 12.14 hrs HW=76.76' TW=0.00' (Dynamic Tailwater) 1=Culvert (Barrel Controls 3.13 cfs @ 4.14 fps)

Pond DMH-2: DMH-2



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Summary for Pond DMH-3:

77,418 sf,100.00% Impervious, Inflow Depth = 5.26" for 25 YR event Inflow Area =

9.57 cfs @ 12.08 hrs, Volume= 33,951 cf Inflow

33,951 cf, Atten= 0%, Lag= 0.0 min 9.57 cfs @ 12.08 hrs, Volume= Outflow

33,951 cf 9.57 cfs @ 12.08 hrs, Volume= Primary

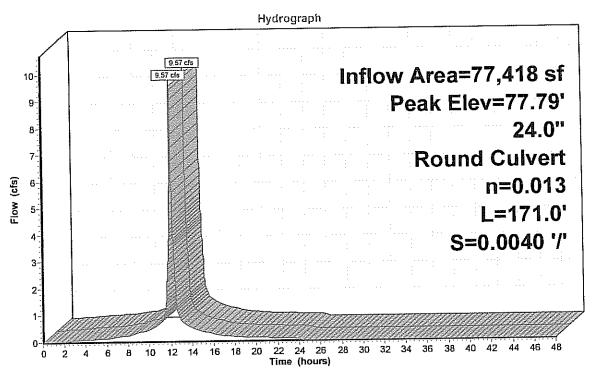
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 77.79' @ 12.09 hrs

Flood Elev= 79.80'

Device	Routing	Invert	Outlet Devices
#1	Primary		24.0" Round Culvert L= 171.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 76.14' / 75.45' S= 0.0040 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=9.56 cfs @ 12.08 hrs HW=77.79' TW=76.76' (Dynamic Tailwater) -1=Culvert (Outlet Controls 9.56 cfs @ 4.69 fps)

Pond DMH-3:





Type III 24-hr 25 YR Rainfall=5.50"

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Summary for Pond FB-1: Forebay

Inflow Area = 81,936 sf, 4.31% Impervious, Inflow Depth = 3.83" for 25 YR event

Inflow = 8.33 cfs @ 12.09 hrs, Volume= 26,171 cf

Outflow = 7.67 cfs @ 12.10 hrs, Volume= 21,732 cf, Atten= 8%, Lag= 0.7 min

Primary = 7.67 cfs @ 12.10 hrs, Volume= 21,732 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.76' @ 12.51 hrs Surf.Area= 2,801 sf Storage= 5,132 cf

Flood Elev= 79.00' Surf.Area= 2,991 sf Storage= 5,837 cf

Plug-Flow detention time= 110.9 min calculated for 21,732 cf (83% of inflow)

Center-of-Mass det. time= 41.8 min (845.7 - 803.9)

Volume	Inv	<u>rert Avail.S</u>	torage S	Storage D	escription	
#1	76.	.00¹ 5,	837 cf C	Custom S	stage Data (Pr	ismatic) Listed below (Recalc)
Classatia		Court Anna	l== 0	4	O 04	
Elevation		Surf.Area	Inc.S		Cum.Store	
(fee	et)	(sq-ft)	(cubic-1	eet)	(cubic-feet)	
76.0	00	1,200		0	0	
77.0	00	1,518	1,	,359	1,359	
78.0	00	2,227	1,	,873	3,232	
78.5	50	2,602	1,	,207	4,439	
79.0	00	2,991	1.	,398	5,837	
Device	Routing	Inver	t Outlet	Devices		
#1	Primary	78.00)' 10.0' le	ong x 10	.0' breadth B	road-Crested Rectangular Weir
	J			-		0.80 1.00 1.20 1.40 1.60
				` '		.70 2.69 2.68 2.69 2.67 2.64

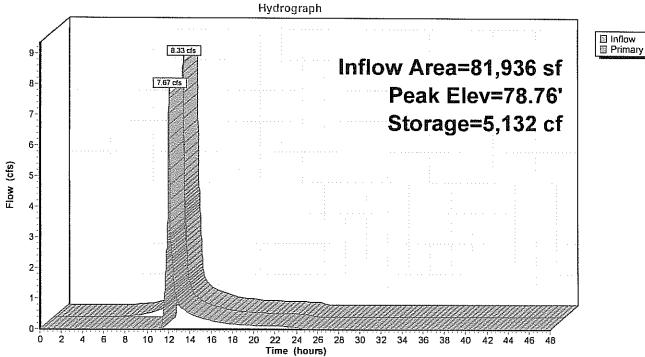
Primary OutFlow Max=7.66 cfs @ 12.10 hrs HW=78.45' TW=78.09' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 7.66 cfs @ 1.69 fps)

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Pond FB-1: Forebay





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Summary for Pond FB-2: Forebay

Inflow Area = 29,735 sf, 63.13% Impervious, Inflow Depth = 4.25" for 25 YR event

Inflow = 3.29 cfs @ 12.09 hrs, Volume= 10,537 cf

Outflow = 3.15 cfs @ 12.09 hrs, Volume= 9,598 cf, Atten= 4%, Lag= 0.5 min

Primary = 3.15 cfs @ 12.09 hrs, Volume= 9,598 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.87 @ 12.12 hrs Surf.Area= 939 sf Storage= 1.184 cf

Flood Elev= 77.00' Surf.Area= 982 sf Storage= 1,304 cf

Plug-Flow detention time= 72.5 min calculated for 9,596 cf (91% of inflow)

Center-of-Mass det. time= 27.9 min (819.0 - 791.1)

Volume	Inve	ert Avail.Sto		Description	
#1	75.0	00' 1,30	04 cf Custom S	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
75.0	=	350	0	0	
76.0	_	638	494	494 1,304	
77.0	iU	982	810	1,304	
Device	Routing	Invert	Outlet Devices		
#1	Primary	76.60'	Head (feet) 0. 2.50 3.00 3.5 Coef. (English)	20 0.40 0.60 0 4.00 4.50 5) 2.34 2.50 2	Dad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 5.00 5.50 .70 2.68 2.68 2.66 2.65 2.65 2.65 2.74 2.79 2.88

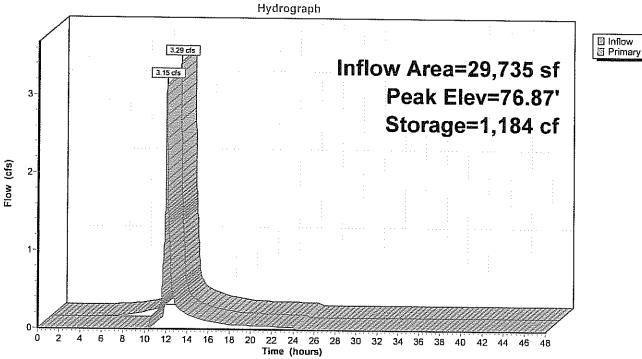
Primary OutFlow Max=3.15 cfs @ 12.09 hrs HW=76.87' TW=76.67' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 3.15 cfs @ 1.18 fps)

Type III 24-hr 25 YR Rainfall=5.50" Printed 5/21/2014

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Pond FB-2: Forebay





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Summary for Pond FB-3: Forebay

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 4.92" for 25 YR event

Inflow = 10.00 cfs @ 12.08 hrs, Volume= 33,910 cf

Outflow = 9.75 cfs @ 12.09 hrs, Volume= 32,636 cf, Atten= 2%, Lag= 0.4 min

Primary = 9.75 cfs @ 12.09 hrs, Volume= 32,636 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 78.56' @ 12.11 hrs Surf.Area= 1,339 sf Storage= 1,610 cf Flood Elev= 78.80' Surf.Area= 1,439 sf Storage= 1,941 cf

Plug-Flow detention time= 40.2 min calculated for 32,636 cf (96% of inflow)

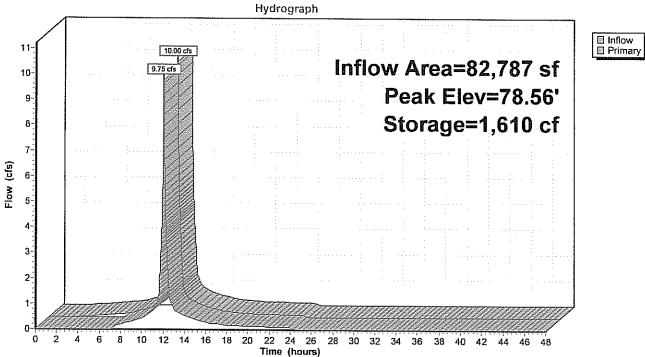
Center-of-Mass det. time= 17.7 min (783.5 - 765.8)

Volume	Inv	ert Avail.Sto		Description			
#1	77.0	00' 1,9	41 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)		
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)			
77.00 78.00 78.8	0	743 1,104 1,439	0 924 1,017	0 924 1,941			
Device	Routing	Invert	Outlet Device	es			
#1	Primary		38.0' 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				

Primary OutFlow Max=9.75 cfs @ 12.09 hrs HW=78.56' TW=78.47' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 9.75 cfs @ 1.00 fps)

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Pond FB-3: Forebay





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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 4
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 POST 1: Post Development Runoff Area=81,936 sf 4.31% Impervious Runoff Depth=5.25"

Tc=6.0 min CN=85 Runoff=11.26 cfs 35,865 cf

Subcatchment POST 1A: Post Development Runoff Area=47,737 sf 0.00% Impervious Runoff Depth=3.62"

Tc=6.0 min CN=70 Runoff=4.65 cfs 14,394 cf

Subcatchment POST 2: Post Development Runoff Area=56,802 sf 85.28% Impervious Runoff Depth=6.41"

Tc=6.0 min CN=95 Runoff=8.82 cfs 30,322 cf

Subcatchment POST 3: Post Development Runoff Area=29,735 sf 63.13% Impervious Runoff Depth=5.71"

Tc=6.0 min CN=89 Runoff=4.34 cfs 14,144 cf

Subcatchment POST 3A: Post Runoff Area=47,475 sf 35.05% Impervious Runoff Depth=4.69"

Tc=6.0 min CN=80 Runoff=5.94 cfs 18,572 cf

Subcatchment POST 4: Post Development Runoff Area=82,787 sf 85.50% Impervious Runoff Depth=6.41"

Tc=6.0 min CN=95 Runoff=12.85 cfs 44,193 cf

Subcatchment POST 4A: Post Runoff Area=35,765 sf 10.20% Impervious Runoff Depth=3.94"

Tc=6.0 min CN=73 Runoff=3.79 cfs 11.729 cf

Subcatchment POST-2A: Post Runoff Area=77,418 sf 100.00% Impervious Runoff Depth=6.76"

Tc=6.0 min CN=98 Runoff=12.21 cfs 43,618 cf

Pond 3P: DCB-1 Peak Elev=78.12' Inflow=8.82 cfs 30,322 cf

12.0" Round Culvert x 2.00 n=0.013 L=6.0' S=0.0133 '/' Outflow=8.82 cfs 30.322 cf

Pond AP-1: WET-8 (No Flow)

Primary=0.00 cfs 0 cf

Pond AP-2: WET-1 Inflow=6.96 cfs 38,175 cf

Primary=6.96 cfs 38,175 cf

Pond AP-3: OFFSITE SWALE Inflow=18.06 cfs 72,831 cf

Primary=18.06 cfs 72,831 cf

Pond AP-4: WET-2 Inflow=8.03 cfs 31,723 cf

Primary=8.03 cfs 31,723 cf

Pond AP-5: WET-3 Inflow=15.33 cfs 51,415 cf

Primary=15.33 cfs 51,415 cf

Peak Elev=78.99' Storage=10,616 cf Inflow=8,46 cfs 31,425 cf

Outflow=4.66 cfs 23,781 cf

Pond BASIN-2: Subsurface Detention Peak Elev=77.38' Storage=5,948 cf Inflow=8.82 cfs 30,322 cf

Primary=2.92 cfs 15,704 cf Secondary=4.43 cfs 13,509 cf Outflow=7.24 cfs 29,213 cf

1008	POST		TEST.	SHR	SHEE	ACE	PONE	12
1330.	·rua	-VV-3-	I E O I	-oub	SURI	'AUE	FUNL	JZ

Type III 24-hr 100 YR Rainfall=7.00"

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Pond BASIN-3: BioRetention Area 3 Peak Elev=76.93' Storage=3,682 cf Inflow=4.09 cfs 13,205 cf

Outflow=2.85 cfs 13,150 cf

Pond BASIN-4: BioRetention Area 4 Peak Elev=78.58' Storage=5,437 cf Inflow=12.52 cfs 42,919 cf

Outflow=11.75 cfs 39,686 cf

Pond DMH-1: DMH-1 Peak Elev=77.03' Inflow=13.94 cfs 59,322 cf

18.0" Round Culvert x 2.00 n=0.010 L=50.0' S=0.0044 '/' Outflow=13.94 cfs 59,322 cf

Pond DMH-2: DMH-2 Peak Elev=76.97' Inflow=4.43 cfs 13,509 cf

18.0" Round Culvert n=0.011 L=50.0' S=0.0074 '/' Outflow=4.43 cfs 13,509 cf

Pond DMH-3: Peak Elev=78.10' Inflow=12.21 cfs 43,618 cf

24.0" Round Culvert n=0.013 L=171.0' S=0.0040 '/' Outflow=12.21 cfs 43,618 cf

Pond FB-1: Forebay Peak Elev=79.00' Storage=5,835 cf Inflow=11.26 cfs 35,865 cf

Outflow=8.46 cfs 31,425 cf

Pond FB-2: Forebay Peak Elev=76.99' Storage=1,291 cf Inflow=4.34 cfs 14,144 cf

Outflow=4.09 cfs 13,205 cf

Pond FB-3: Forebay Peak Elev=78.64' Storage=1,713 cf Inflow=12.85 cfs 44,193 cf

Outflow=12.52 cfs 42,919 cf

Total Runoff Area = 459,655 sf Runoff Volume = 212,836 cf Average Runoff Depth = 5.56" 47.95% Pervious = 220,424 sf 52.05% Impervious = 239,231 sf

1998-POST-WS-TEST-SUBSURFACE POND 2

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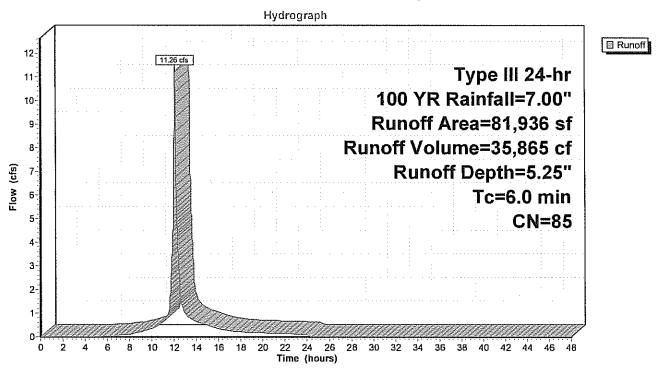
Summary for Subcatchment POST 1: Post Development Area 1

Runoff = 11.26 cfs @ 12.09 hrs, Volume= 35,865 cf, Depth= 5.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

	Aı	rea (sf)	CN	Description							
		51,749	89	Gravel roads, HSG C							
		3,528	98	Paved parking, HSG C							
		26,659	74	>75% Grass cover, Good, HSG C							
		81,936	85	85 Weighted Average							
		78,408		95.69% Pervious Area							
		3,528		4.31% Impe	ervious Area	a					
	Tc	Length	Slope	Velocity	Capacity	Description					
<u>(n</u>	nin)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
	6.0					Direct Entry.					

Subcatchment POST 1: Post Development Area 1



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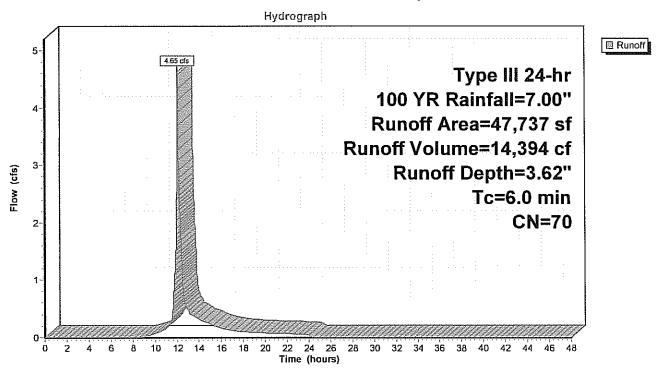
Summary for Subcatchment POST 1A: Post Development Area 1A

Runoff = 4.65 cfs @ 12.09 hrs, Volume= 14,394 cf, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

	Α	rea (sf)	CN	Description					
		942	89	Gravel road	ls, HSG C				
		46,795	70	Woods, Good, HSG C					
47,737 70 Weighted Average					verage				
		47,737		100.00% Pe	ervious Are	ea			
	Тс	Length	Slope	Velocity	Capacity	Description			
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	6.0					Direct Entry.			

Subcatchment POST 1A: Post Development Area 1A



1998-POST-WS-TEST-SUBSURFACE POND 2

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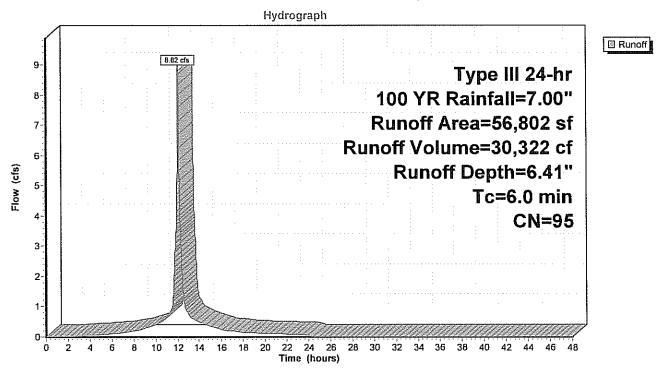
Summary for Subcatchment POST 2: Post Development Area 2

Runoff = 8.82 cfs @ 12.08 hrs, Volume= 30,322 cf, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

_	A	rea (sf)	CN I	Description								
_		48,439	98	Paved parking, HSG C								
		2,831	89 (Gravel roads, HSG C								
		5,532	74 :	>75% Grass cover, Good, HSG C								
		56,802	95 \	95 Weighted Average								
		8,363		14.72% Pervious Area								
		48,439	1	35.28% lmp	ervious Ar	ea						
	Tc	Length	Slope	Velocity	Capacity	Description						
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)							
	6.0					Direct Entry						

Subcatchment POST 2: Post Development Area 2



1998-POST-WS-TEST-SUBSURFACE POND 2

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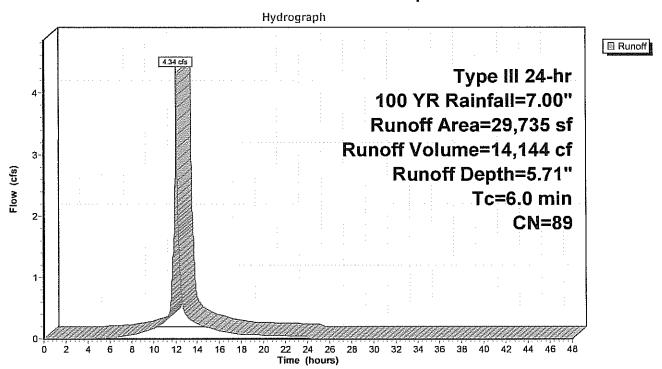
Summary for Subcatchment POST 3: Post Development Area 3

Runoff = 4.34 cfs @ 12.08 hrs, Volume= 14,144 cf, Depth= 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

A	rea (sf)	CN I	Description							
	18,773	98 I	Paved parking, HSG C							
	10,962	74 :	>75% Grass cover, Good, HSG C							
	29,735	89 \	9 Weighted Average							
	10,962 36.87% Pervious Area									
	18,773	(3.13% lmp	ervious Ar	ea					
Tc (min)	Length (feet)	Slope (ft/ft)	-	Capacity (cfs)	Description					
6.0	1,000		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(0.0)	Direct Entry,					

Subcatchment POST 3: Post Development Area 3



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Summary for Subcatchment POST 3A: Post Development Area 3A

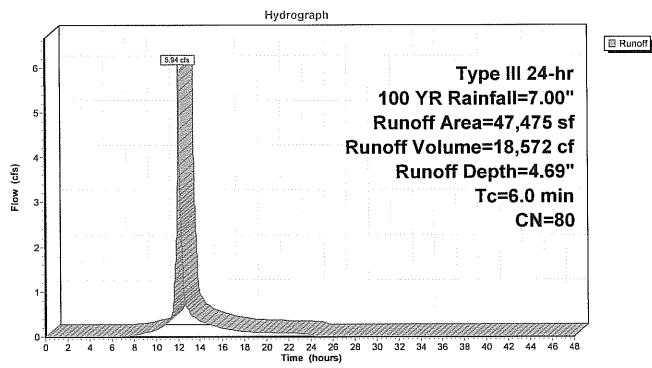
Runoff = 5.94 cfs @ 12.09 hrs, Volume=

18,572 cf, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

	Area (sf)	CN I	Description							
	14,950	98	Roofs, HSG	loofs, HSG C						
	1,689	98 I	Paved parking, HSG C							
	30,836	70 [\]	Noods, Go	/oods, Good, HSG C						
	47,475	80 '	Weighted Average							
	30,836	(64.95% Pervious Area							
	16,639	,	35.05% lmp	pervious Ar	ea					
Т		Slope	Velocity	Capacity	Description					
(min) (feet)	(ft/ft)	(ft/sec)	(cfs)						
6.	0				Direct Entry,					

Subcatchment POST 3A: Post Development Area 3A



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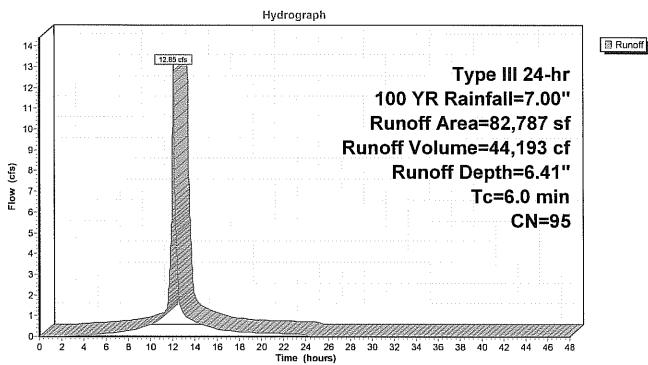
Summary for Subcatchment POST 4: Post Development Area 4

Runoff = 12.85 cfs @ 12.08 hrs, Volume= 44,193 cf, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

A	rea (sf)	CN	Description							
	70,785	98	Paved parking, HSG C							
	12,002	74	>75% Grass cover, Good, HSG C							
	82,787	95	95 Weighted Average							
	12,002 14.50% Pervious Area									
	70,785		85.50% lmp	pervious Ar	ea					
Τ-	141-	O1	N / - 1 20	0	D : ::					
Тс	Length	Slope	,	Capacity	Description					
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
6.0					Direct Entry					

Subcatchment POST 4: Post Development Area 4



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Summary for Subcatchment POST 4A: Post Development Area 4A

Runoff

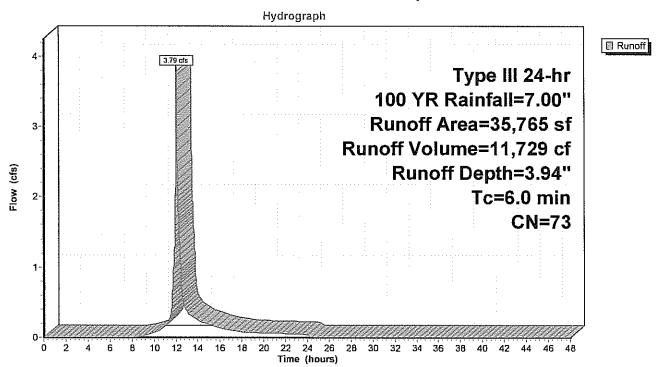
3.79 cfs @ 12.09 hrs, Volume=

11,729 cf, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

Area ((sf)	CN [Description						
32,1	116	70 \	Noods, Good, HSG C						
3,6	349	98 F	Paved parking, HSG C						
35,7	765	73 ١	Neighted A	verage					
32,1	116	8	39.80% Per	vious Area					
3,6	649	•	10.20% lmp	ervious Are	∍a				
	ngth feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
6.0					Direct Entry.				

Subcatchment POST 4A: Post Development Area 4A



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Summary for Subcatchment POST-2A: Post Development Area 2A

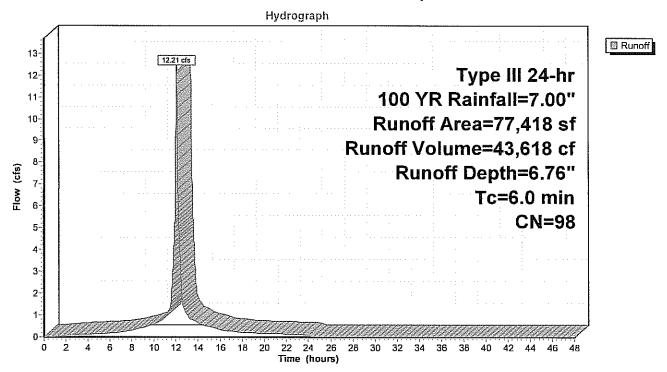
Runoff = 12.21 cfs @ 12.08 hrs, Volume=

43,618 cf, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs Type III 24-hr 100 YR Rainfall=7.00"

	A	rea (sf)	CN [Description		
		77,418	98 F	Roofs, HSC	G C	
		77,418	•	100.00% In	npervious A	Area
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
-	6.0					Direct Entry

Subcatchment POST-2A: Post Development Area 2A



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Summary for Pond 3P: DCB-1

Inflow Area = 56,802 sf, 85.28% Impervious, Inflow Depth = 6.41" for 100 YR event

Inflow = 8.82 cfs @ 12.08 hrs, Volume= 30,322 cf

Outflow = 8.82 cfs @ 12.08 hrs, Volume= 30,322 cf, Atten= 0%, Lag= 0.0 min

Primary = 8.82 cfs @ 12.08 hrs, Volume= 30,322 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

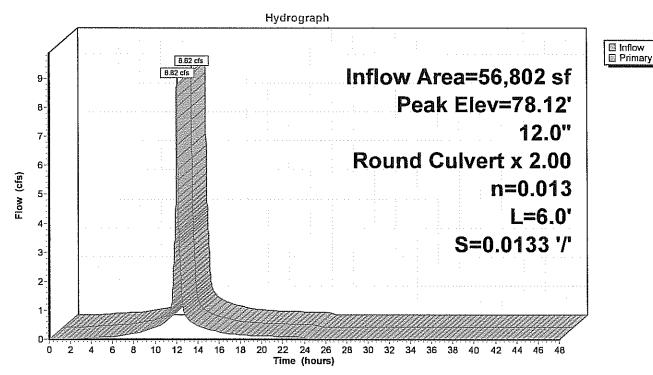
Peak Elev= 78.12' @ 12.10 hrs

Flood Elev= 78.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	76.00'	12.0" Round Culvert X 2.00
	_		L= 6.0' RCP, groove end projecting, Ke= 0.200
			Inlet / Outlet Invert= 76.00' / 75.92' S= 0.0133 '/' Cc= 0.900
			n= 0.013 Concrete pipe, bends & connections. Flow Area= 0.79 sf

Primary OutFlow Max=8.78 cfs @ 12.08 hrs HW=78.07' TW=77.21' (Dynamic Tailwater) 1=Culvert (Inlet Controls 8.78 cfs @ 5.59 fps)

Pond 3P: DCB-1



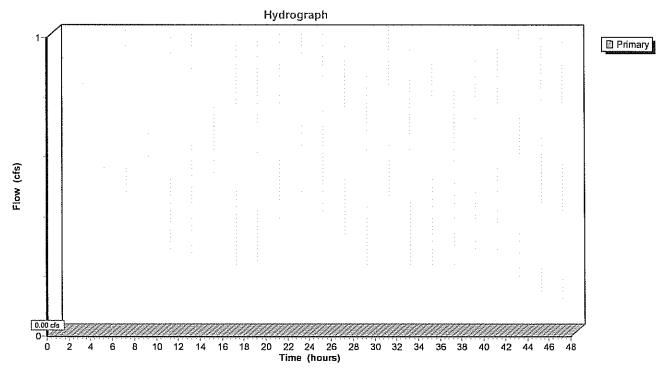
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Summary for Pond AP-1: WET-8 (No Flow)

[40] Hint: Not Described (Outflow=Inflow)

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

Pond AP-1: WET-8 (No Flow)



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Summary for Pond AP-2: WET-1

[40] Hint: Not Described (Outflow=Inflow)

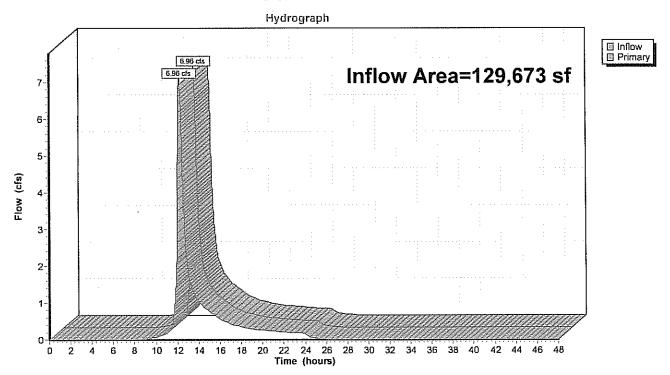
Inflow Area = 129,673 sf, 2.72% Impervious, Inflow Depth = 3.53" for 100 YR event

Inflow = 6.96 cfs @ 12.20 hrs, Volume= 38,175 cf

Primary = 6.96 cfs @ 12.20 hrs, Volume= 38,175 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-2: WET-1



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Summary for Pond AP-3: OFFSITE SWALE

[40] Hint: Not Described (Outflow=Inflow)

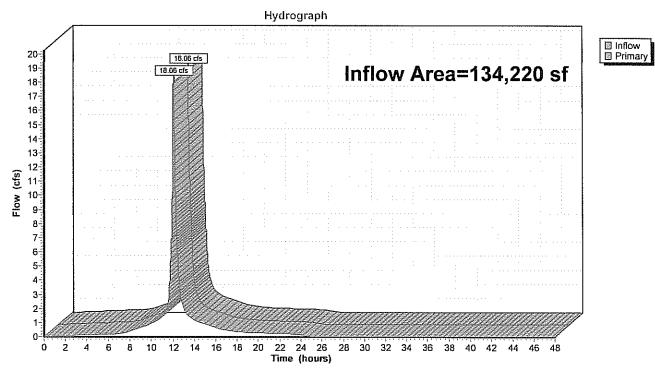
Inflow Area = 134,220 sf, 93.77% Impervious, Inflow Depth = 6.51" for 100 YR event

Inflow = 18.06 cfs @ 12.10 hrs, Volume= 72,831 cf

Primary = 18.06 cfs @ 12.10 hrs, Volume= 72,831 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-3: OFFSITE SWALE



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Summary for Pond AP-4: WET-2

[40] Hint: Not Described (Outflow=Inflow)

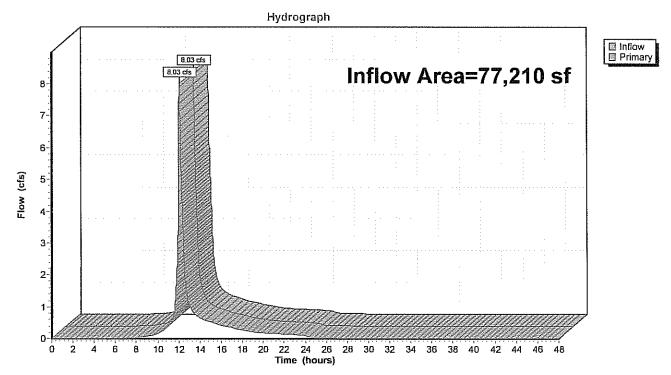
Inflow Area = 77,210 sf, 45.86% Impervious, Inflow Depth = 4.93" for 100 YR event

Inflow = 8.03 cfs @ 12.11 hrs, Volume= 31,723 cf

Primary = 8.03 cfs @ 12.11 hrs, Volume= 31,723 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-4: WET-2



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Summary for Pond AP-5: WET-3

[40] Hint: Not Described (Outflow=Inflow)

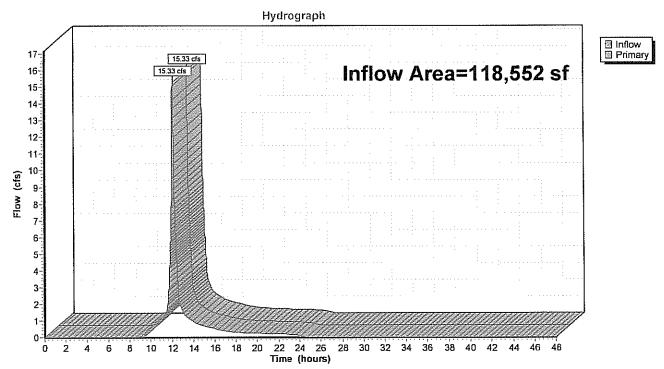
Inflow Area = 118,552 sf, 62.79% Impervious, Inflow Depth = 5.20" for 100 YR event

Inflow = 15.33 cfs @ 12.11 hrs, Volume= 51,415 cf

Primary = 15.33 cfs @ 12.11 hrs, Volume= 51,415 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Pond AP-5: WET-3



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Summary for Pond BASIN-1: BioRetention Area 1

Inflow Area = 81,936 sf, 4.31% Impervious, Inflow Depth = 4.60" for 100 YR event

Inflow = 8.46 cfs @ 12.10 hrs, Volume= 31,425 cf

Outflow = 4.66 cfs @ 12.30 hrs, Volume= 23,781 cf, Atten= 45%, Lag= 12.1 min

Primary = 4.66 cfs @ 12.30 hrs, Volume= 23,781 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.99' @ 12.30 hrs Surf.Area= 6,278 sf Storage= 10,616 cf

Flood Elev= 80.00' Surf.Area= 7,310 sf Storage= 17,464 cf

Plug-Flow detention time= 147.0 min calculated for 23,781 cf (76% of inflow)

Center-of-Mass det. time= 60.9 min (891.6 - 830.7)

Volume	<u>In</u>	vert Ava	il.Storage	Storage	Description	
#1	77	.00'	17,464 cf	Custom	Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio		Surf.Area (sq-ft)		c.Store ic-feet)	Cum.Store (cubic-feet)	
77.0	00	4,407		0	0	
78.0	00	5,319		4,863	4,863	
79.0	00	6,286		5,803	10,666	
80.0	00	7,310		6,798	17,464	
Device	Routing	g lı	nvert Ou	tlet Device	es	
#1	Primar	y 7	He	ad (feet) (0.20 0.40 0.60	oad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.66 cfs @ 12.30 hrs HW=78.99' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 4.66 cfs @ 1.89 fps)

1998-POST-WS-TEST-SUBSURFACE POND 2

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Pond BASIN-2: Subsurface Detention System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 20 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

10 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 75.50' Row Length +12.0" End Stone x 2 = 77.50' Base Length

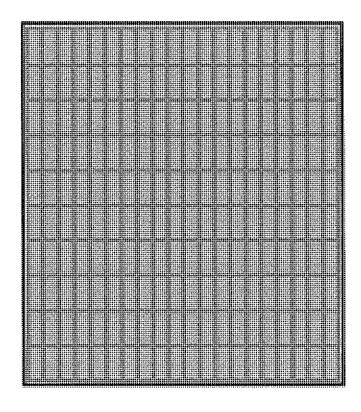
20 Rows x 36.0" Wide + 4.0" Spacing x 19 + 12.0" Side Stone x 2 = 68.33' Base Width 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

200 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 20 Rows = 2,810.9 cf Chamber Storage

10,812.3 cf Field - 2,810.9 cf Chambers = 8,001.5 cf Stone x 40.0% Voids = 3,200.6 cf Stone Storage

Chamber Storage + Stone Storage = 6,011.4 cf = 0.138 af Overall Storage Efficiency = 55.6%

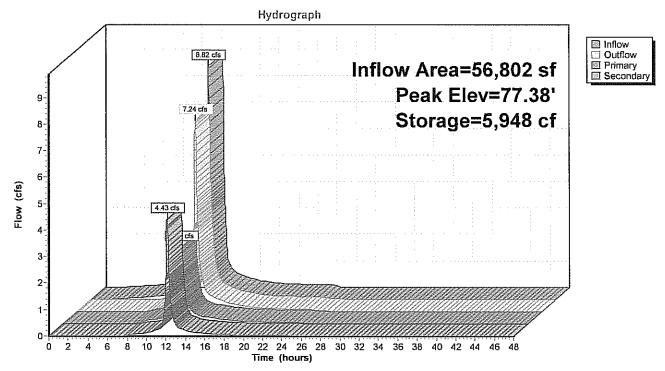
200 Chambers 400.5 cy Field 296.4 cy Stone



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Pond BASIN-2: Subsurface Detention System



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Summary for Pond BASIN-3: BioRetention Area 3

Inflow Area = 29,735 sf, 63.13% Impervious, Inflow Depth = 5.33" for 100 YR event

Inflow = 4.09 cfs @ 12.10 hrs, Volume= 13,205 cf

Outflow = 2.85 cfs @ 12.18 hrs, Volume= 13,150 cf, Atten= 30%, Lag= 5.2 min

Primary = 2.85 cfs @ 12.18 hrs, Volume= 13,150 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 76.93' @ 12.18 hrs Surf.Area= 4,313 sf Storage= 3,682 cf

Flood Elev= 78.00' Surf.Area= 5,167 sf Storage= 8,763 cf

Plug-Flow detention time= 96.2 min calculated for 13,148 cf (100% of inflow)

Center-of-Mass det. time= 93.8 min (901.5 - 807.7)

Volume	Inver	t Avail.Sto	rage Storage	Description	
#1	76.00	' 8,76	33 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
76.0	00	3,624	0	0	
77.0	00	4,367	3,996	3,996	
78.0	00	5,167	4,767	8,763	
Device	Routing	Invert	Outlet Devices	S	
#1	Primary	75.00'	12.0" Round	12" HDPE	
			L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet invert= 75.00' / 74.80' S= 0.0067 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf		
#2 #3	Device 1 Device 1	76.00' 76.60'	 4.0" Vert. 4" Orifice C= 0.600 4.0' long x 1.50' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.5' Crest Height 		

Primary OutFlow Max=2.85 cfs @ 12.18 hrs HW=76.93' TW=0.00' (Dynamic Tailwater)

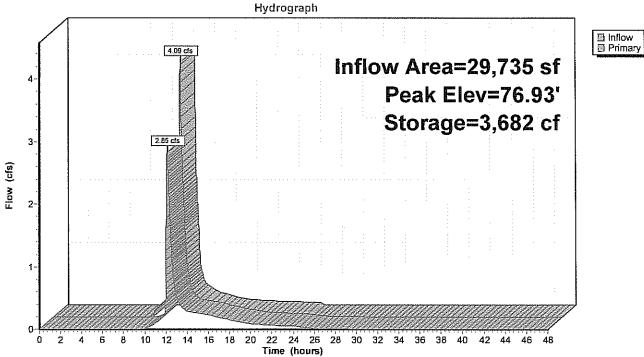
1=12" HDPE (Passes 2.85 cfs of 4.52 cfs potential flow)

2=4" Orifice (Orifice Controls 0.37 cfs @ 4.20 fps)

☐3=Sharp-Crested Rectangular Weir (Weir Controls 2.48 cfs @ 1.92 fps)

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Pond BASIN-3: BioRetention Area 3





Type III 24-hr 100 YR Rainfall=7.00"

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Summary for Pond BASIN-4: BioRetention Area 4

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 6.22" for 100 YR event

Inflow = 12.52 cfs @ 12.09 hrs, Volume= 42,919 cf

Outflow = 11.75 cfs @ 12.12 hrs, Volume= 39,686 cf, Atten= 6%, Lag= 1.9 min

Primary = 11.75 cfs @ 12.12 hrs, Volume= 39,686 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.58' @ 12.12 hrs Surf.Area= 4,044 sf Storage= 5,437 cf

Flood Elev= 79.00' Surf.Area= 4,374 sf Storage= 7,218 cf

Plug-Flow detention time= 69.4 min calculated for 39,678 cf (92% of inflow)

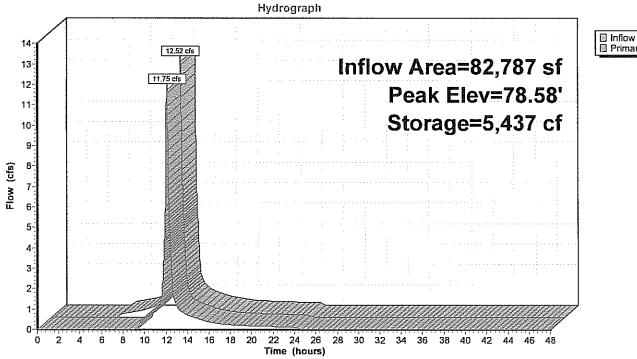
Center-of-Mass det. time= 30.1 min (805.2 - 775.1)

Volume	Inv	<u>ert Avail.Sto</u>	<u>rage Storage</u>	Description	
#1	77.0	00' 7,2	18 cf Custom	n Stage Data (Prismatic) Listed below (Recalc)	
Elevatior (feet		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
77.00 78.00 79.00	Ö	2,871 3,595 4,374	0 3,233 3,985	0 3,233 7,218	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	78.00'	Head (feet) (2.50 3.00 3. Coef. (Englis	8.0' breadth Broad-Crested Rectangular Weir 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .50 4.00 4.50 5.00 5.50 h) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 .65 2.66 2.66 2.68 2.70 2.74	

Primary OutFlow Max=11.74 cfs @ 12.12 hrs HW=78.58' TW=0.00' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 11.74 cfs @ 2.04 fps)

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Pond BASIN-4: BioRetention Area 4





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Summary for Pond DMH-1: DMH-1

Inflow Area = 134,220 sf, 93.77% Impervious, Inflow Depth = 5.30" for 100 YR event

Inflow = 13.94 cfs @ 12.09 hrs, Volume= 59,322 cf

Outflow = 13.94 cfs @ 12.09 hrs, Volume= 59,322 cf, Atten= 0%, Lag= 0.0 min

Primary = 13.94 cfs @ 12.09 hrs, Volume= 59,322 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 77.03' @ 12.09 hrs Flood Elev= 79.80'

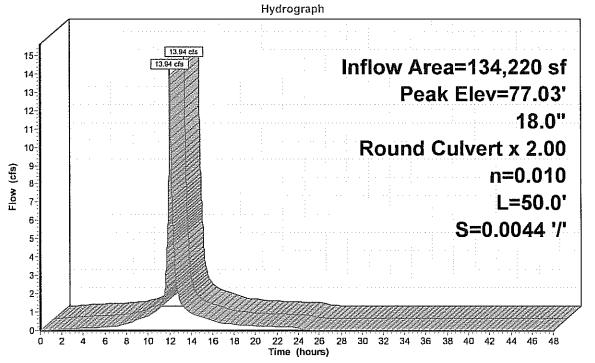
Device Routing Invert Outlet Devices

#1 Primary 75.42' **18.0" Round Culvert X 2.00**L= 50.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 75.42' / 75.20' S= 0.0044 '/' Cc= 0.900

Primary OutFlow Max=13.92 cfs @ 12.09 hrs HW=77.03' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 13.92 cfs @ 4.57 fps)

Pond DMH-1: DMH-1

n= 0.010 Cast iron, coated, Flow Area= 1.77 sf





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Summary for Pond DMH-2: DMH-2

Inflow = 4.43 cfs @ 12.14 hrs, Volume= 13,509 cf

Outflow = 4.43 cfs @ 12.14 hrs, Volume= 13,509 cf, Atten= 0%, Lag= 0.0 min

Primary = 4.43 cfs @ 12.14 hrs, Volume= 13,509 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

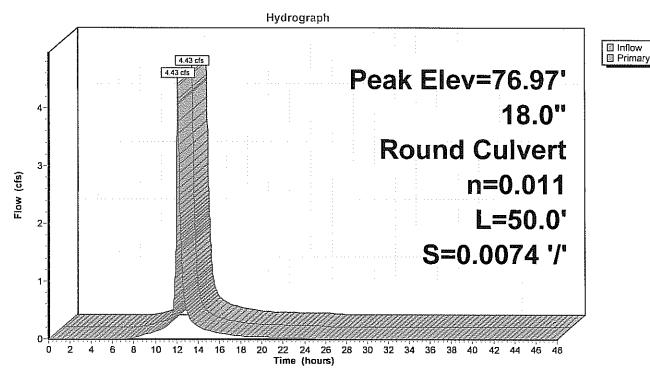
Peak Elev= 76.97' @ 12.14 hrs

Flood Elev= 79.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	75.87'	18.0" Round Culvert
			L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 75.87' / 75.50' S= 0.0074 '/' Cc= 0.900
			n= 0 011 Flow Area= 1 77 sf

Primary OutFlow Max=4.43 cfs @ 12.14 hrs HW=76.97' TW=0.00' (Dynamic Tailwater) 1=Culvert (Barrel Controls 4.43 cfs @ 4.44 fps)

Pond DMH-2: DMH-2



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Summary for Pond DMH-3:

Inflow Area = 77,418 sf,100.00% Impervious, Inflow Depth = 6.76" for 100 YR event

Inflow = 12.21 cfs @ 12.08 hrs, Volume= 43,618 cf

Outflow = 12.21 cfs @ 12.08 hrs, Volume= 43,618 cf, Atten= 0%, Lag= 0.0 min

Primary = 12.21 cfs @ 12.08 hrs, Volume= 43,618 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 78.10' @ 12.09 hrs

Flood Elev= 79.80'

Device Routing Invert Outlet Devices

#1 Primary

76.14'

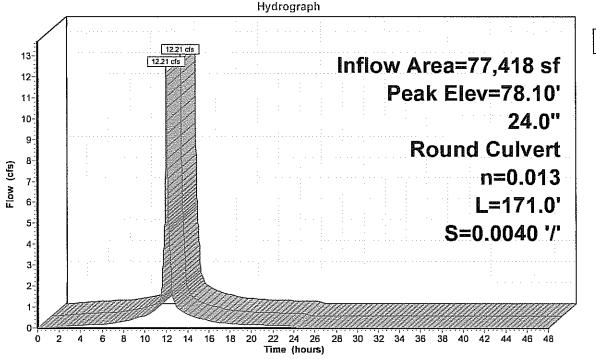
24.0" Round Culvert

L= 171.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 76.14' / 75.45' S= 0.0040 '/' Cc= 0.900

n= 0.013 Concrete pipe, bends & connections, Flow Area= 3.14 sf

Primary OutFlow Max=12.18 cfs @ 12.08 hrs HW=78.10' TW=77.02' (Dynamic Tailwater)
1=Culvert (Outlet Controls 12.18 cfs @ 4.92 fps)

Pond DMH-3:





Type III 24-hr 100 YR Rainfall=7.00"

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Summary for Pond FB-1: Forebay

Inflow Area = 81,936 sf, 4.31% Impervious, Inflow Depth = 5.25" for 100 YR event

Inflow = 11.26 cfs @ 12.09 hrs, Volume= 35,865 cf

Outflow = 8.46 cfs @ 12.10 hrs, Volume= 31,425 cf, Atten= 25%, Lag= 0.7 min

Primary = 8.46 cfs @ 12.10 hrs, Volume= 31,425 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4 Peak Elev= 79.00' @ 12.29 hrs Surf.Area= 2,990 sf Storage= 5,835 cf

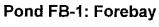
Flood Elev= 79.00' Surf.Area= 2,991 sf Storage= 5,837 cf

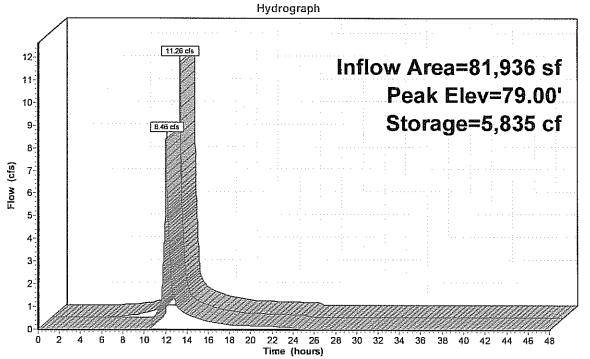
Plug-Flow detention time= 92.0 min calculated for 31,425 cf (88% of inflow) Center-of-Mass det. time= 35.6 min (830.7 - 795.1)

<u>Volume</u>	Inv	vert Avail.Sto	orage Storage	Description	
#1	76.	00' 5,8	37 cf Custom	Stage Data (Pri	smatic) Listed below (Recalc)
Elevation (fee		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
76.0	00	1,200	0	0	
77.00		1,518	1,359	1,359	
78.00		2,227	1,873	3,232	
78.50		2,602	1,207	4,439	
79.00		2,991	1,398	5,837	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	78.00'	Head (feet) (0.20 0.40 0.60 0	oad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.46 cfs @ 12.10 hrs HW=78.77' TW=78.70' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 8.46 cfs @ 1.10 fps)

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Type III 24-hr 100 YR Rainfall=7.00"

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Summary for Pond FB-2: Forebay

Inflow Area = 29,735 sf, 63.13% Impervious, Inflow Depth = 5.71" for 100 YR event

Inflow = 4.34 cfs @ 12.08 hrs, Volume= 14,144 cf

Outflow = 4.09 cfs @ 12.10 hrs, Volume= 13,205 cf, Atten= 6%, Lag= 0.6 min

Primary = 4.09 cfs @ 12.10 hrs, Volume= 13,205 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 76.99' @ 12.13 hrs Surf.Area= 977 sf Storage= 1,291 cf

Flood Elev= 77.00' Surf.Area= 982 sf Storage= 1,304 cf

Plug-Flow detention time= 60.2 min calculated for 13,203 cf (93% of inflow)

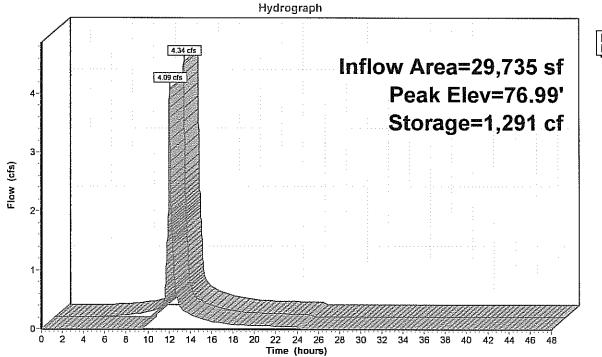
Center-of-Mass det. time= 24.5 min (807.7 - 783.2)

<u>Volume</u>	Inv	ert Avail.Sto	rage Storage	Description	
#1	75.0	00' 1,30	04 cf Custom	n Stage Data (Prismatic) Listed below (Recalc)	
Elevatio (fee		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
75.0	_	350	0	0	
76.0	0	638	494	494	
77.0	0	982	810	1,304	
Device	Routing	Invert	Outlet Device	98	
#1	Primary	76.60'	Head (feet) 0 2.50 3.00 3. Coef. (English	5.0' breadth Broad-Crested Rectangular Weir 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .50 4.00 4.50 5.00 5.50 h) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 .66 2.68 2.70 2.74 2.79 2.88	

Primary OutFlow Max=4.08 cfs @ 12.10 hrs HW=76.97' TW=76.86' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 4.08 cfs @ 1.09 fps)

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Pond FB-2: Forebay





Type III 24-hr 100 YR Rainfall=7.00"

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Summary for Pond FB-3: Forebay

Inflow Area = 82,787 sf, 85.50% Impervious, Inflow Depth = 6.41" for 100 YR event

Inflow = 12.85 cfs @ 12.08 hrs, Volume= 44,193 cf

Outflow = 12.52 cfs @ 12.09 hrs, Volume= 42,919 cf, Atten= 3%, Lag= 0.4 min

Primary = 12.52 cfs @ 12.09 hrs, Volume= 42,919 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 78.64' @ 12.11 hrs Surf.Area= 1,371 sf Storage= 1,713 cf

Flood Elev= 78.80' Surf.Area= 1,439 sf Storage= 1,941 cf

Plug-Flow detention time= 33.0 min calculated for 42,919 cf (97% of inflow)

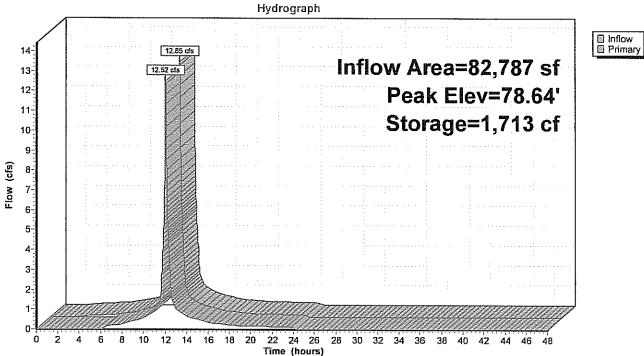
Center-of-Mass det. time= 15.1 min (775.1 - 760.0)

Volume	Inv	<u>/ert</u> Avail.Sto	rage Storage Description				
#1	77.	.00' 1,9	41 cf Custom	Stage Data (Pri	smatic) Listed below (Recalc)		
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)			
77.0 78.0 78.8	00	743 1,104 1,439	0 924 1,017	0 924 1,941			
Device	Routing	ı Invert	Outlet Devices	i			
#1	Primary	78.30'	Head (feet) 0. 2.50 3.00	20 0.40 0.60 () 2.69 2.72 2. ⁻	75 2.85 2.98 3.08 3.20 3.28 3.31		

Primary OutFlow Max=12.51 cfs @ 12.09 hrs HW=78.63' TW=78.56' (Dynamic Tailwater) 1=Broad-Crested Rectangular Weir (Weir Controls 12.51 cfs @ 1.00 fps)

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Pond FB-3: Forebay





Appendix A

Updated Post Development Watershed Plan