DRAINAGE ANALYSIS
for
THE WINDSOR AT MILLBROOK VILLAGE
Railroad Avenue
Duxbury, MA

Report prepared for

50 RR AVE DUX LLC
272 St. George Street
Duxbury, MA 02332
781-934-8502

by

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Plymouth, MA 02360
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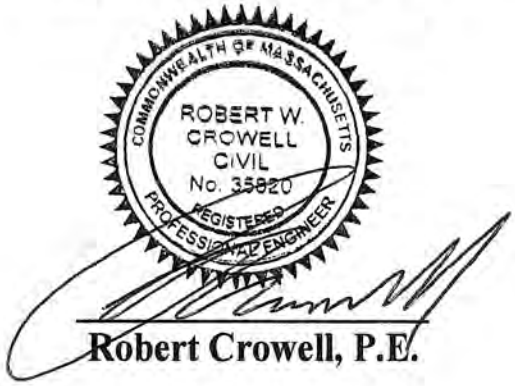


Robert Crowell, P.E.

DRAINAGE ANALYSIS NARRATIVE

THE WINSOR AT MILLBROOK VILLAGE
Railroad Avenue
Duxbury, MA

Existing Soils Description

The 2021 Plymouth County soil maps classify the soil types as Map Symbol 256B - Deerfield loamy fine sand, 0 to 8% slopes that is categorized as hydrologic soil group "A", Map Symbol 602B – Urban land, 0 to 8 % slopes that is unclassified (hydrologic soil group "A" used for calculations), Map Symbol 37A, Massasoit-Mashpee complex, 0-3% slopes that is categorized as hydrological soil group "C" and Map Symbol 701A, Rainberry coarse sand, 0-3% slopes, sanded surface, inactive that is categorized as hydrological soil group "A/D" (hydrological soil group "D" used for calculations.

Methodology

Pre- and post-development stormwater runoff calculations were performed using U.S. Soils Conservation Drainage Method (SCS TR-55), utilizing the HydroCAD computer program, Verson 10. Both conditions were analyzed for the 2, 10, 25 and 100-year, 24-hour duration Type III design storms. In addition, the HydroCAD computer model was utilized to route hydrographs through the proposed Inground Infiltration System.

Proposed Hydrologic Conditions

The pre-development hydrologic conditions will be affected by the construction of four residential buildings (12 units), removal of some existing driveway pavement, removal of a shed and construction of the driveways and parking areas. The proposed inground infiltration system will collect runoff from part of the proposed driveway/parking areas and part of the building roof areas and infiltrate the runoff into the ground. The proposed detention basin 1 will collect runoff from part of the building roof areas, from part of the proposed driveway/parking areas and from runoff on Railroad Avenue. Detention basin 2 will collect runoff from part of the building areas and from the grass/landscape areas.

The following are summary tables of the pre- and post-development peak runoff rates and of the total runoff volumes from the site.

TABLE 1: **Total Peak Flows From Site**

DESIGN STORM (YEAR)	TOTAL PEAK RUNOFF FROM SITE		
	PRE DEVELOP. (CFS)	POST DEVELOP. (CFS)	NET CHANGE (CFS)
2	0.65	0.62	-0.03
10	1.54	1.07	-0.47
25	2.29	1.43	-0.86
100	3.52	1.98	-1.54

TABLE 2: **Total Runoff Volumes From Site**

DESIGN STORM (YEAR)	TOTAL RUNOFF VOLUME		
	PRE DEVELOP. (Ac Ft)	POST DEVELOP. (Ac Ft)	NET CHANGE (Ac Ft)
2	0.082	0.157	+0.075
			(+91.5 %)
10	0.181	0.271	+0.090
			(+49.7 %)
25	0.258	0.360	+0.102
			(+39.5 %)
100	0.381	0.512	+0.131
			(+34.4 %)

TABLE 3: **Total Peak Flows From Site At Wetlands**

DESIGN STORM (YEAR)	TOTAL PEAK RUNOFF FROM SITE		
	PRE DEVELOP. (CFS)	POST DEVELOP. (CFS)	NET CHANGE (CFS)
2	0.64	0.62	-0.02
10	1.38	1.03	-0.35
25	1.90	1.29	-0.61
100	2.70	1.66	-1.04

TABLE 4: **Total Runoff Volumes From Site At Wetlands**

DESIGN STORM (YEAR)	TOTAL RUNOFF VOLUME		
	PRE DEVELOP. (Ac Ft)	POST DEVELOP. (Ac Ft)	NET CHANGE (Ac Ft)
2	0.071	0.155	+0.084
			(+118.3%)
10	0.142	0.259	+0.117
			(+82.4 %)
25	0.192	0.340	+0.148
			(+77.1 %)
100	0.271	0.477	+0.206
			(+76.0 %)

TABLE 5: **Total Peak Flows To Railroad Avenue & Alden Street**

DESIGN STORM (YEAR)	TOTAL PEAK RUNOFF FROM SITE		
	PRE DEVELOP. (CFS)	POST DEVELOP. (CFS)	NET CHANGE (CFS)
2	0.03	0.004	-0.026
10	0.21	0.06	-0.15
25	0.40	0.11	-0.29
100	0.74	0.31	-0.43

TABLE 6: **Total Runoff Volumes To Railroad Avenue & Alden Street**

DESIGN STORM (YEAR)	TOTAL RUNOFF VOLUME		
	PRE DEVELOP. (Ac Ft)	POST DEVELOP. (Ac Ft)	NET CHANGE (Ac Ft)
2	0.010	0.002	-0.008
			(-80.0%)
10	0.035	0.011	-0.024
			(-68.6%)
25	0.056	0.019	-0.037
			(-66.1%)
100	0.092	0.033	-0.059
			(-64.1%)

TABLE 7: Total Peak Flows To 114 Alden Street

DESIGN STORM (YEAR)	TOTAL PEAK RUNOFF FROM SITE		
	PRE DEVELOP. (CFS)	POST DEVELOP. (CFS)	NET CHANGE (CFS)
2	0	0	0
10	0.02	0.003	-0.017
25	0.05	0.01	-0.04
100	0.14	0.02	-0.12

TABLE 8: Total Runoff Volumes To 114 Alden Street

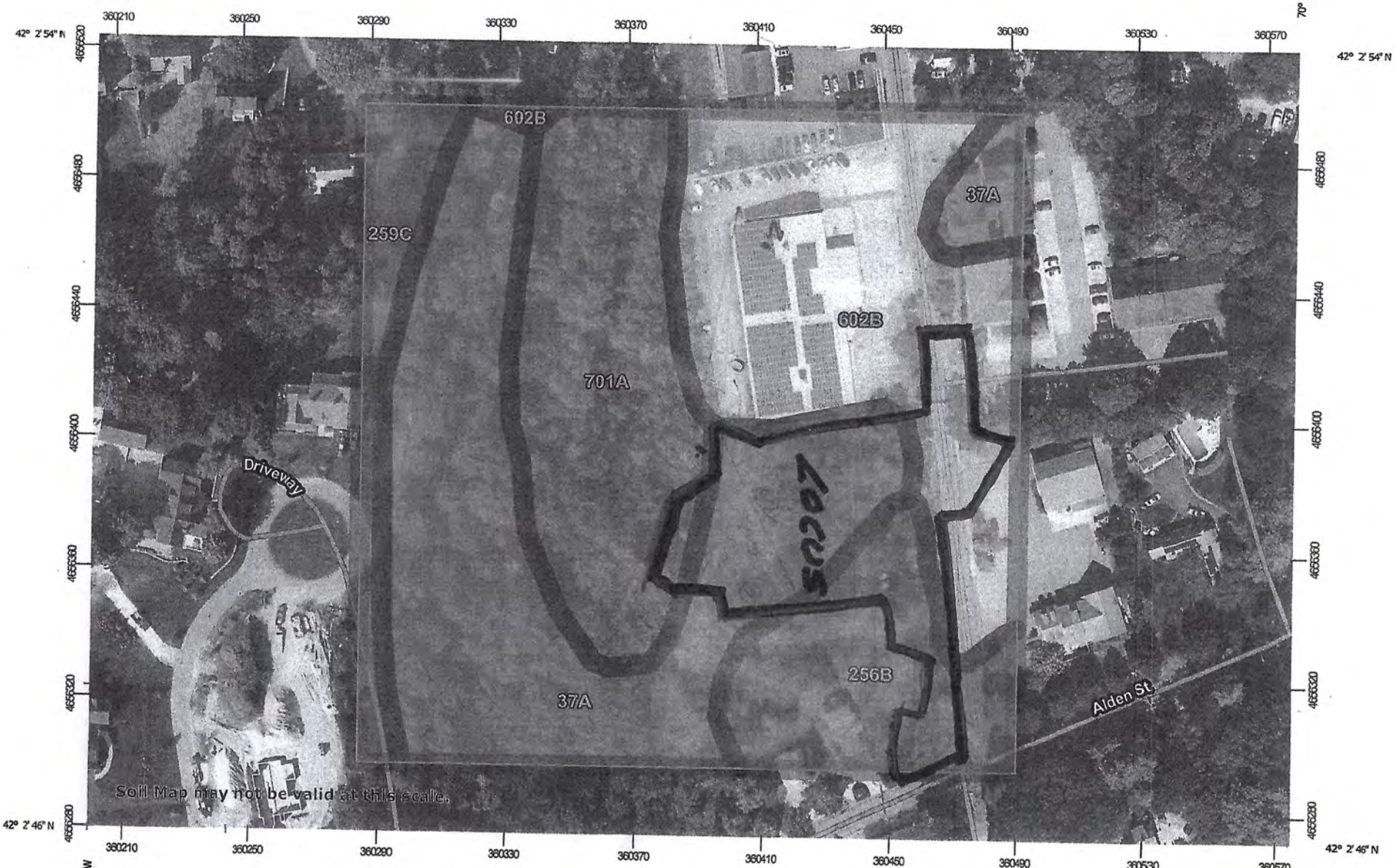
DESIGN STORM (YEAR)	TOTAL RUNOFF VOLUME		
	PRE DEVELOP. (Ac Ft)	POST DEVELOP. (Ac Ft)	NET CHANGE (Ac Ft)
2	0	0	0
			(0%)
10	0.005	0.001	-0.002
			(-40.0%)
25	0.010	0.001	-0.009
			(-90.0%)
100	0.018	0.002	-0.016
			(-88.9 %)

Supporting Information for Drainage Calculations

The Winsor At Millbrook Village
Railroad Avenue
Duxbury, MA

Plymouth County 2021 Soil Survey
Hydraulic Soil Groups
Soil Observation Holes
Soil Group Infiltration Rates

Hydrologic Soil Group—Plymouth County, Massachusetts
(50 Railroad Ave Duxbury)



USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
37A	Massasoit - Mashpee complex, 0 to 3 percent slopes	D (C) (*)	3.6	34.9%
256B	Deerfield loamy fine sand, 3 to 8 percent slopes	A (*)	1.2	11.9%
259C	Carver loamy coarse sand, 8 to 15 percent slopes	A	0.6	5.8%
602B	Urban land, 0 to 8 percent slopes	(*)	2.9	27.7%
701A	Rainberry coarse sand, 0 to 3 percent slope, sanded surface, inactive	A/D (D) (*)	2.0	19.7%
Totals for Area of Interest			10.4	**100.0%**

Massasoit and Mashpee Soils: Very deep, nearly level, somewhat poorly to poorly drained map unit complex formed in sandy outwash material. Massasoit and Mashpee soils are in depressions, at the base of swales and in low areas which border streams, ponds and swamps.

NOTE: Massasoit soils were formerly classified as Saugatuck soils, Mashpee soils were formerly classified as Pipestone soils

Click here to see Mashpee and Massasoit soil profiles

Link to Official Series Description Mashpee | Link to Official Series Description Massasoit
Pipestone Pedon Description 2326801 | Massasoit Pedon Description 2326803 | Massasoit Pedon Description 2303704 | Mashpee Pedon Description 2303705 | Mashpee Pedon and Lab Data S07MA023004 | Water Table Data

Map Unit (s): 037/ 038
Map Phases: 37A Massasoit - Mashpee complex.
Taxonomic Classification: **Massasoit** soils: Sandy, mixed, mesic, Ortstein Aeric Haplaquods.
Mashpee soils: Sandy, mixed, mesic, Typic Endoaquods.
Drainage Class: Poorly drained.
Parent Material: Glacial fluvial deposits.
Permeability: Rapid in loose sandy horizons, slow in cemented layers.
Available Water Holding Capacity: Low.
Soil Reaction: Very strongly acid to neutral.
Depth to Bedrock: Greater than 65 inches.
Seasonal High Watertable: **Depth**: +0.5 to 1.5 feet below the surface. **Type**: Apparent. **Months**: November to June.
Hydrologic Group: C.
Hydric Soil: Yes.
Flooding/Ponding Potential: **Frequency and Type**: Commonly ponded. **Duration and Months**: Brief to long, November to May.
Potential Inclusions: Walpole and Wareham soils are similar inclusions. Very poorly drained Scarboro and Berryland soils are on lower elevations. Moderately well drained Deerfield and Eldridge soils are on higher elevations.

Soil Suitability:

Agriculture: Poorly suited for most agricultural uses mainly due to wetness.

Woodland: Poorly suited due to wetness.

Development: Poorly suited due to seasonal high watertables at or near the surface for prolong periods of time.

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DRAINAGE
TEST HOLES
50 RR AVE

INFILTRATION SYS

DTP-1 9-8-22 16.6

0-42"	FILL	SL	10YR3/3
42-44"	A	SL	10YR6/8
44-55"	B	SL	2.5Y6/4
55-78"	C	L	2.5Y5/6

WEEPING @ 65"(11.2)
ADJ GND WTR ELEV=13.25

BASIN 2

DTP-2 9-8-22 16.1

0-3"	FILL	SL	10YR3/3
3-32"	A	SL	10YR6/8
32-50"	B	SL	2.5Y6/4
50-63"	C1	SiL	2.5Y5/3
63-74"	C2	SL	2.5Y5/6

MOTTLING @ 34" (ELEV=13.25)

DEEP HOLES

TEST PIT #	PERFORMED BY: / WITNESSED BY:	DATE
1-3	S.R.PHINNEY ROBERT CROWELL	9-8-22

USE ELEV=13.25 FOR GND WTR
FOR BASIN 2 & INFILTRATION SYS

BASIN 1

DTP-3 9-8-22 15.5

0-36"	A	SL	10YR6/8
36-52"	B	SL	2.5Y6/4
50-63"	C1	SiL	2.5Y5/6
63-74"	C2	SL	2.5Y5/6

WEEPING @ 37" (12.41)
MOTTLING @ 34" (ELEV=12.66)

Depth to Seasonally High Water Table

A minimum of two to four feet of clearance is needed from the bottom of the stone reservoir to the seasonally high water table. This is readily determined by soil borings taken during a wet period.

Proximity of Wells and Foundations

Trenches in commercial and industrial areas should be located at least 100 feet away from a drinking water well to minimize the possibility of groundwater contamination, and should be situated at least 10 feet down-gradient and 100 feet up-gradient from building foundations.

Maximum Depth of Reservoir

To insure that the stone reservoir completely drains in 72 hours, it may be necessary to limit the depth of the stone reservoir when underlying soils have relatively low exfiltration rates. These limits are shown for various soil textures in Table 5.3. If necessary, the dimensions of an infiltration trench would have to be modified in order to accommodate the necessary volume without exceeding the maximum depth limits.

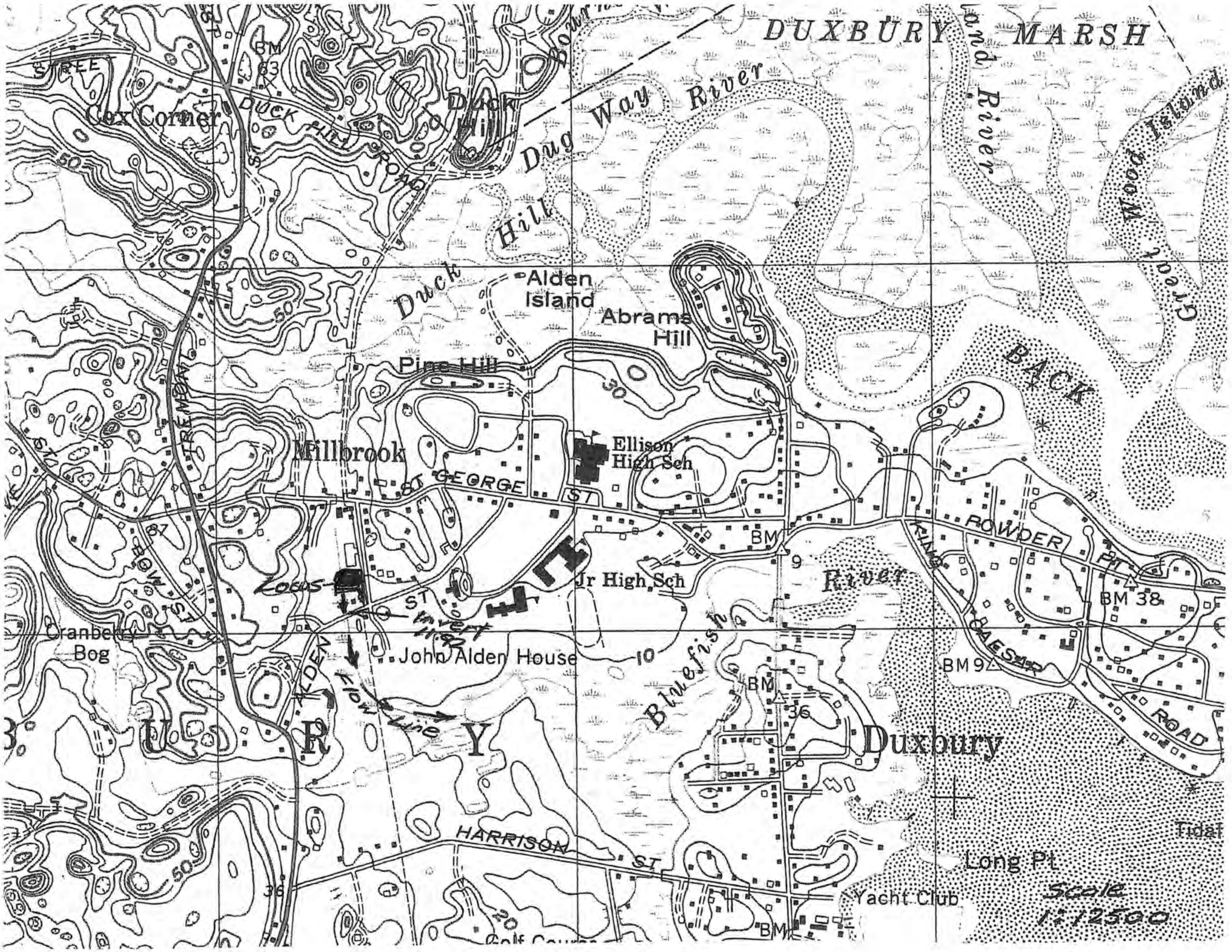
Table 5.3: Soil Limitations For Infiltration Trenches

SOIL TEXTURE	MINIMUM INFILTRATION RATE (fc-inches/hour)	SCS SOIL GROUP	MAXIMUM DEPTH OF TRENCH (in) 48 hours	72 hours
Sand	8.27	A	992	1489
Loamy Sand	2.41	A	290	434
Sandy Loam	1.02	B	122	183
* Loam	0.52	B	62	93
Silt Loam	0.27	C	32	49
Sandy Clay Loam	0.17	C	20	31
Clay Loam	0.09	D	11	16
Silty Clay Loam	0.06	D	7	11
Sandy Clay	0.05	D	6	9
Silty Clay	0.04	D	6	7
Clay	0.02	D	2	4

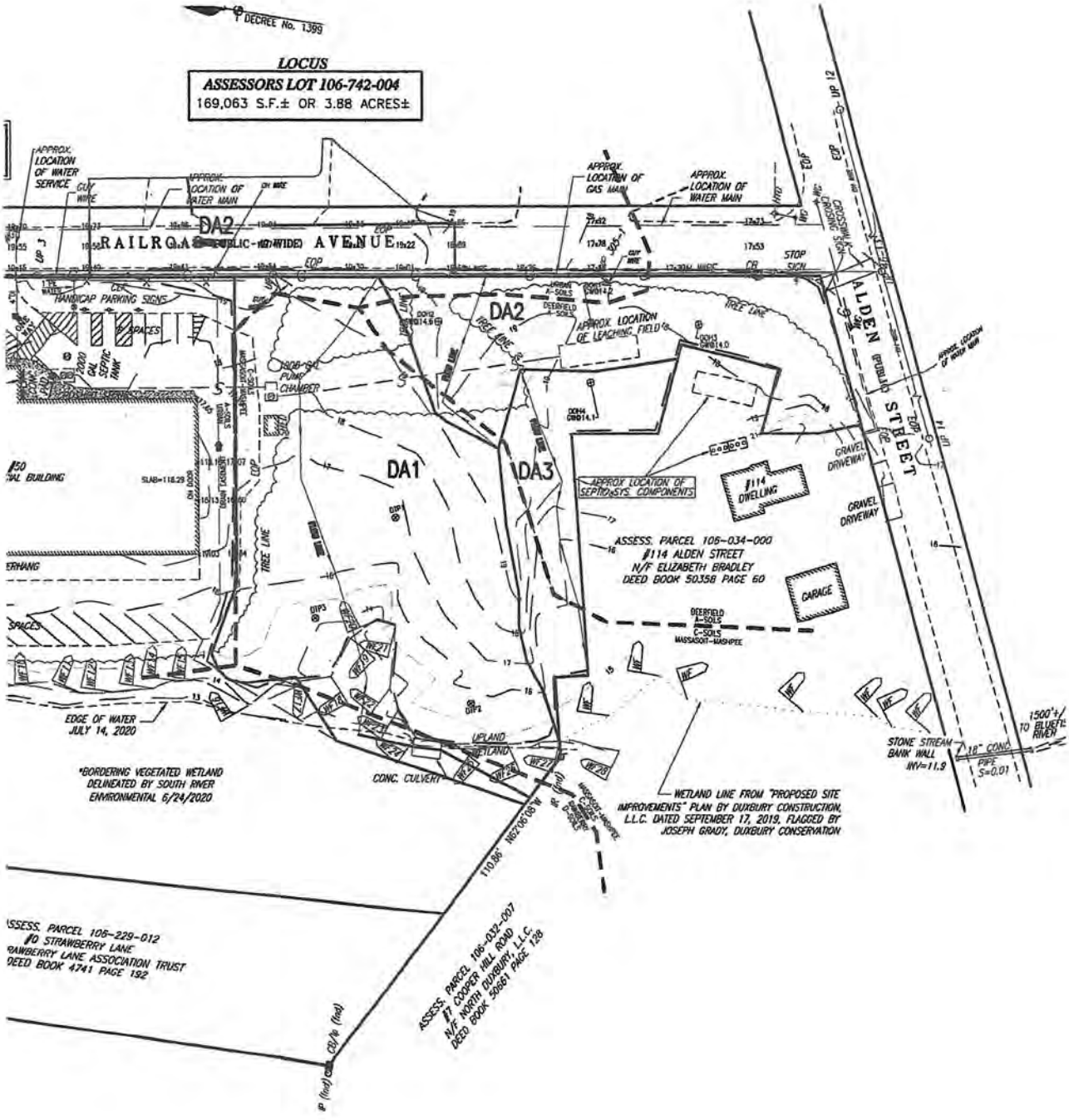
* infiltration System

Sources: Maryland WRA (1984) and Shaver (1986).

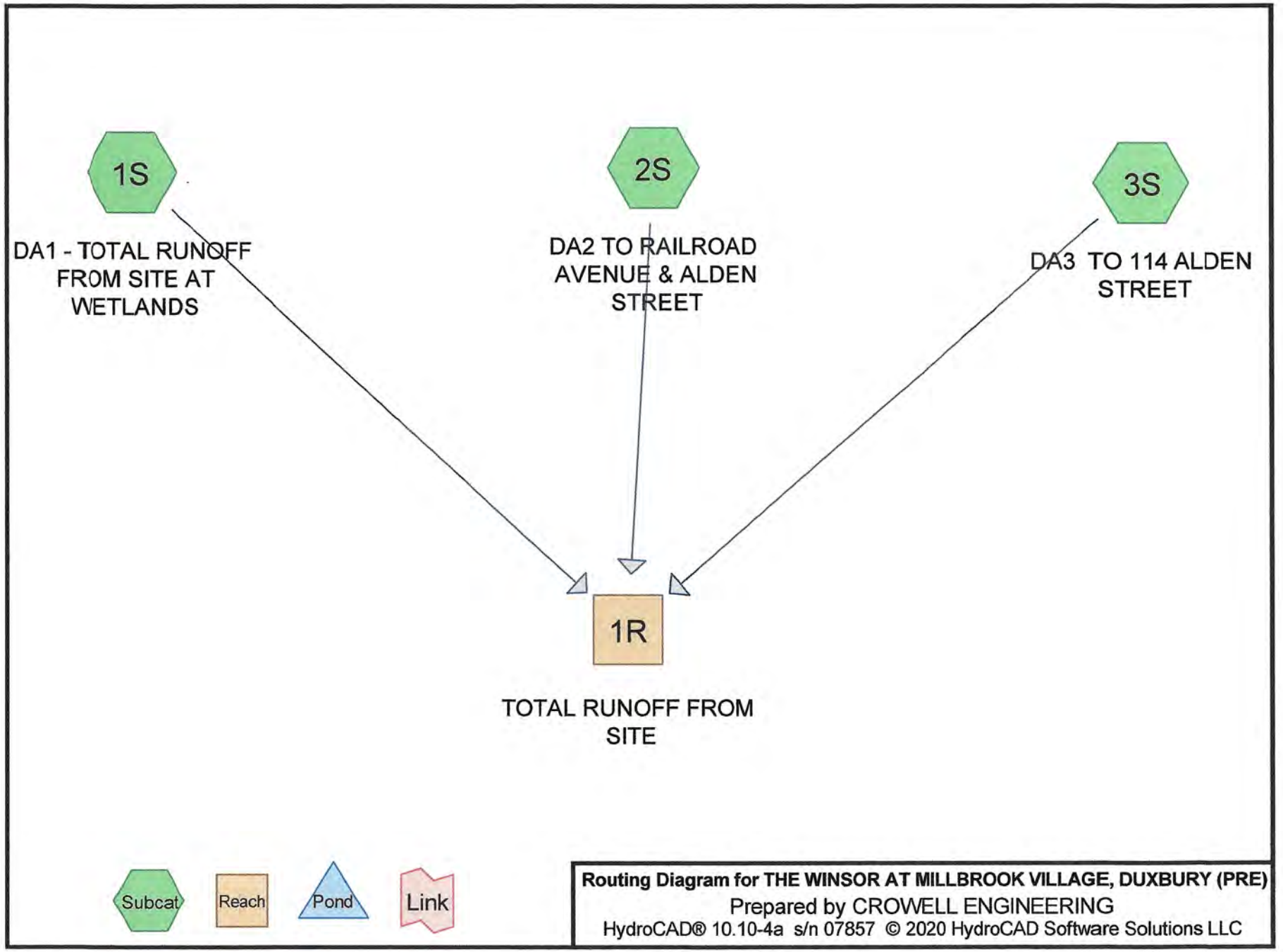
Site Watershed Analysis


DUXBURY MARSH
Cox Corner
DUCK HILL ROAD
Duck Hill
Dug Way River
Duck Hill
Alden Island
Abrams Hill
Pine Hill
River
Great Wood Island
BACK
Millbrook
Ellison High Sch
ST GEORGE ST
TREMONT
BOW ST
POWDER PT
KING
Jr High Sch
Locus
Invert 11.40
River
Cranberry Bog
John Alden House
ALDEN
Flow Line
Bluefish
BM 38
CAESAR
BM 9
ROAD
Duxbury
HARRISON ST
Tidal
Long Pt
Yacht Club
Scale 1:12500

Pre-Development Drainage Analysis
(Existing Conditions)



Predevelopment Watershed Plan


1S
DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS
2S
DA2 TO RAILROAD AVENUE & ALDEN STREET
3S
DA3 TO 114 ALDEN STREET
1R
TOTAL RUNOFF FROM SITE
Subcat
Reach
Pond
Link
Routing Diagram for THE WINSOR AT MILLBROOK VILLAGE, DUXBURY (PRE)
Prepared by CROWELL ENGINEERING
HydroCAD® 10.10-4a s/n 07857 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year Storm	Type III 24-hr		Default	24.00	1	3.40	2
2	10 Year Storm	Type III 24-hr		Default	24.00	1	4.80	2
3	25 Year Storm	Type III 24-hr		Default	24.00	1	5.70	2
4	100 Year Storm	Type III 24-hr		Default	24.00	1	7.00	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.201	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
0.115	74	>75% Grass cover, Good, HSG C (1S, 2S)
0.004	98	Conc Culvert, HSG D (1S)
0.166	98	Paved parking, HSG A (2S)
0.029	98	Paved parking, HSG C (1S)
0.002	98	Roofs, HSG C (1S)
0.439	30	Woods, Good, HSG A (1S, 2S, 3S)
0.668	70	Woods, Good, HSG C (1S, 2S, 3S)
0.108	77	Woods-wetlands Good, HSG D (1S)
1.731	**60**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.805	HSG A	1S, 2S, 3S
0.000	HSG B	
0.814	HSG C	1S, 2S, 3S
0.112	HSG D	1S
0.000	Other	
1.731		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.201	0.000	0.115	0.000	0.000	0.315	>75% Grass cover, Good	1S, 2S, 3S
0.000	0.000	0.000	0.004	0.000	0.004	Conc Culvert	1S
0.166	0.000	0.029	0.000	0.000	0.195	Paved parking	1S, 2S
0.000	0.000	0.002	0.000	0.000	0.002	Roofs	1S
0.439	0.000	0.668	0.000	0.000	1.107	Woods, Good	1S, 2S, 3S
0.000	0.000	0.000	0.108	0.000	0.108	Woods-wetlands Good	1S
0.805	**0.000**	**0.814**	**0.112**	**0.000**	**1.731**	**TOTAL AREA**	

Time span=0.00-26.00 hrs, dt=0.05 hrs, 521 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM Runoff Area=39,154 sf 3.91% Impervious Runoff Depth=0.95"
Flow Length=268' Tc=17.5 min CN=70 Runoff=0.64 cfs 0.071 af

Subcatchment 2S: DA2 TO RAILROAD Runoff Area=27,287 sf 26.50% Impervious Runoff Depth=0.20"
Flow Length=120' Slope=0.0050 '/' Tc=21.3 min CN=51 Runoff=0.03 cfs 0.010 af

Subcatchment 3S: DA3 TO 114 ALDEN STREET Runoff Area=8,967 sf 0.00% Impervious Runoff Depth=0.04"
Flow Length=115' Tc=12.9 min CN=43 Runoff=0.00 cfs 0.001 af

Reach 1R: TOTAL RUNOFF FROM SITE Inflow=0.65 cfs 0.082 af
Outflow=0.65 cfs 0.082 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.082 af Average Runoff Depth = 0.57"
88.38% Pervious = 1.530 ac 11.62% Impervious = 0.201 ac

Summary for Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS

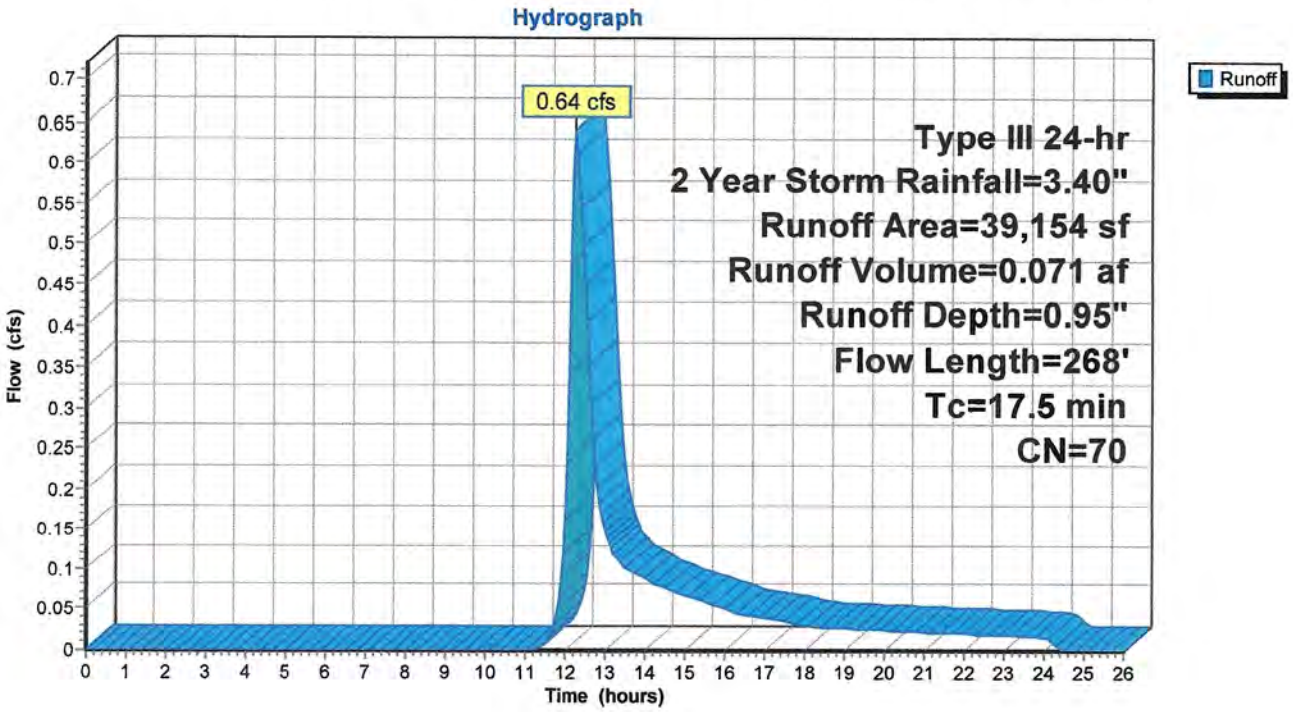
Runoff = 0.64 cfs @ 12.27 hrs, Volume= 0.071 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	1,091	30	Woods, Good, HSG A
	25,974	70	Woods, Good, HSG C
*	4,694	77	Woods-wetlands Good, HSG D
	1,059	39	>75% Grass cover, Good, HSG A
	4,807	74	>75% Grass cover, Good, HSG C
	1,268	98	Paved parking, HSG C
*	164	98	Conc Culvert, HSG D
	97	98	Roofs, HSG C
	39,154	70	Weighted Average
	37,625		96.09% Pervious Area
	1,529		3.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS**
					Woods: Light underbrush n= 0.400 P2= 3.40"
3.1	168	0.0330	0.91		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
2.4	50	0.0050	0.35		**Shallow Concentrated Flow, WOODS/WETLANDS**
					Woodland Kv= 5.0 fps
17.5	268	Total			

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS



Summary for Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET

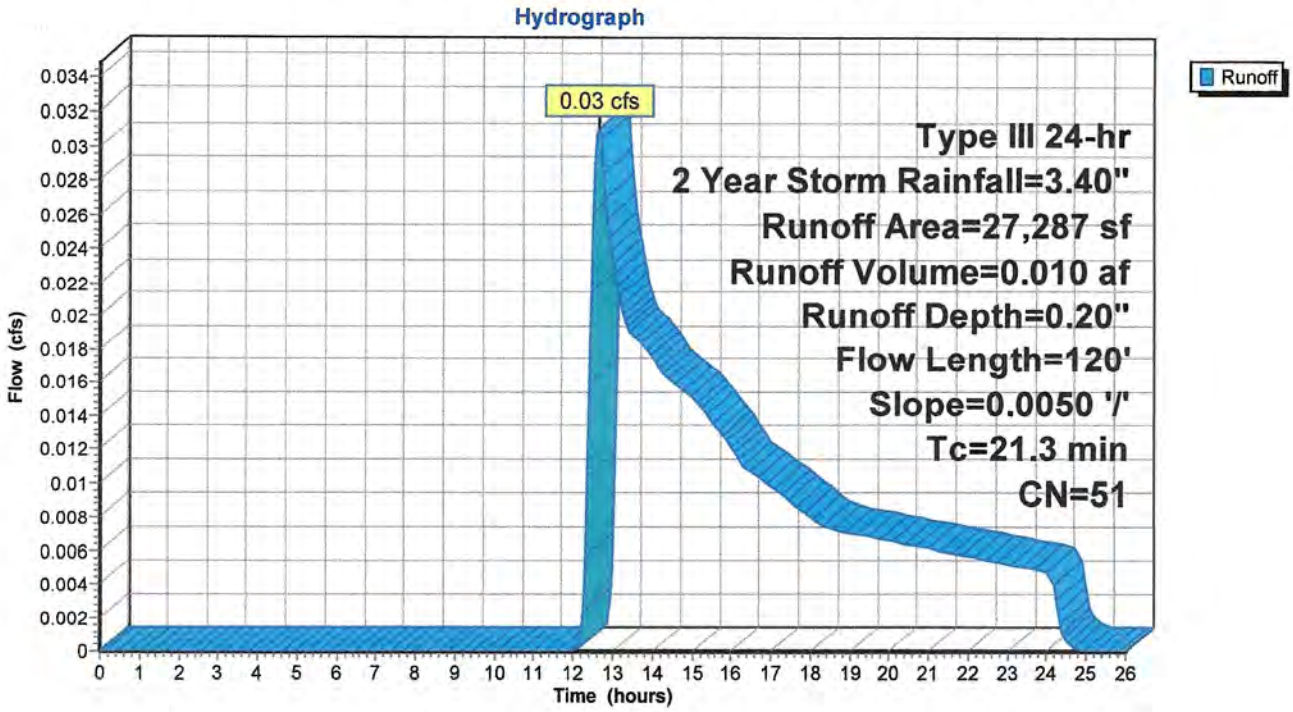
Runoff = 0.03 cfs @ 12.63 hrs, Volume= 0.010 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

Area (sf)	CN	Description
12,076	30	Woods, Good, HSG A
263	70	Woods, Good, HSG C
7,532	39	>75% Grass cover, Good, HSG A
185	74	>75% Grass cover, Good, HSG C
7,231	98	Paved parking, HSG A
27,287	51	Weighted Average
20,056		73.50% Pervious Area
7,231		26.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	30	0.0050	0.04		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
4.6	20	0.0050	0.07		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 3.40"
1.0	30	0.0050	0.49		**Shallow Concentrated Flow, GRASS** Short Grass Pasture Kv= 7.0 fps
1.9	40	0.0050	0.35		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
21.3	120	Total			

Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 3S: DA3 TO 114 ALDEN STREET

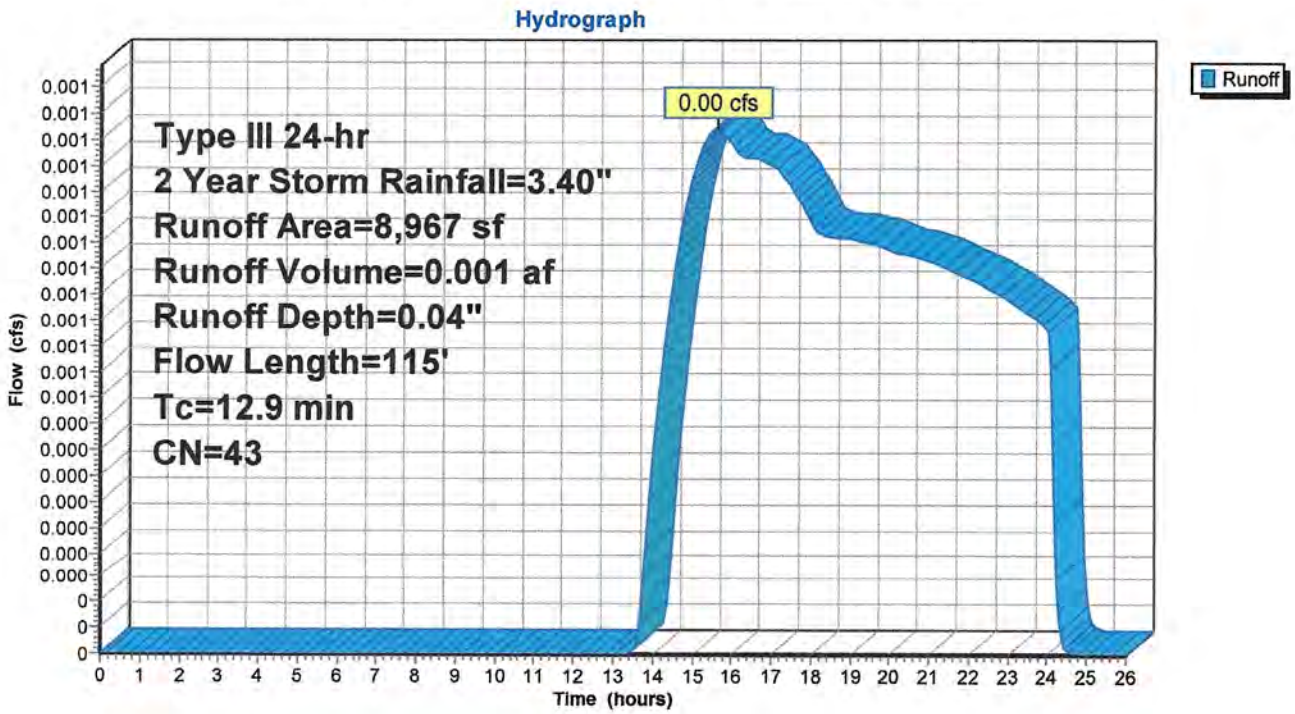
Runoff = 0.00 cfs @ 15.63 hrs, Volume= 0.001 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

Area (sf)	CN	Description
5,939	30	Woods, Good, HSG A
2,878	70	Woods, Good, HSG C
150	39	>75% Grass cover, Good, HSG A
8,967	43	Weighted Average
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	65	0.0540	1.16		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
12.9	115	Total			

Subcatchment 3S: DA3 TO 114 ALDEN STREET



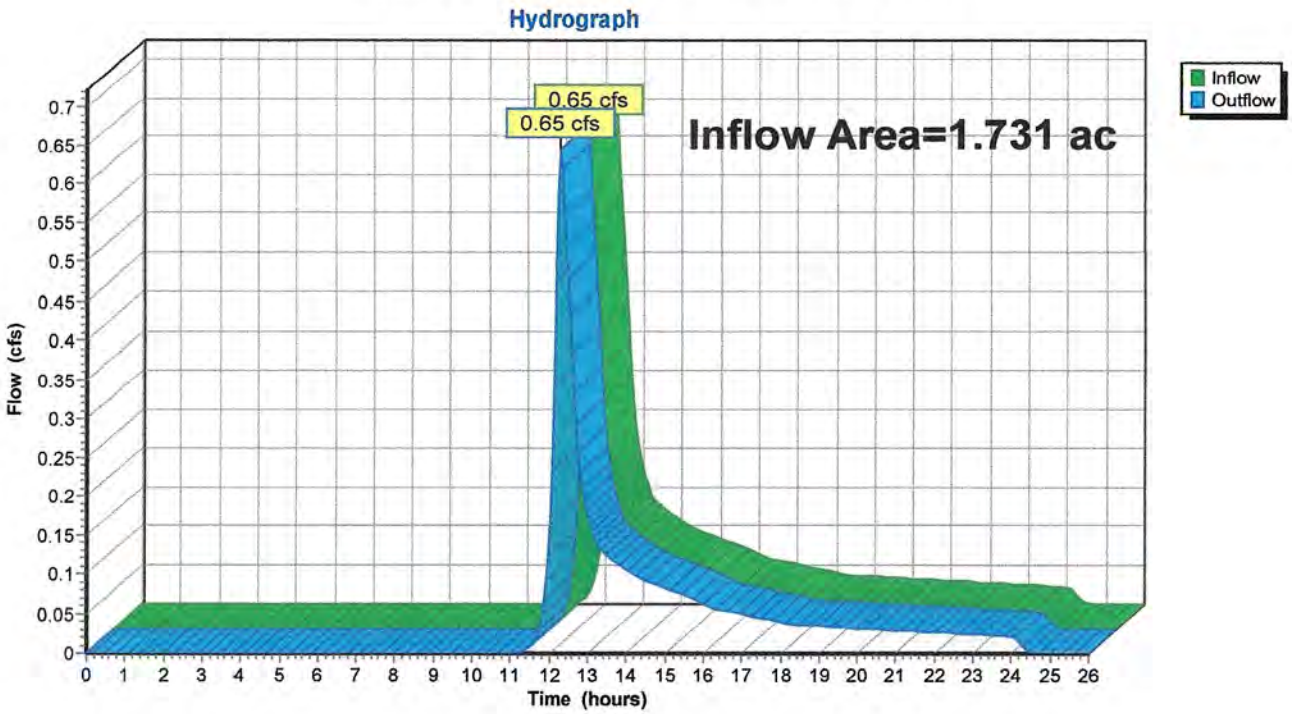
Summary for Reach 1R: TOTAL RUNOFF FROM SITE

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

Inflow Area = 1.731 ac, 11.62% Impervious, Inflow Depth = 0.57" for 2 Year Storm event
Inflow = 0.65 cfs @ 12.27 hrs, Volume= 0.082 af
Outflow = 0.65 cfs @ 12.27 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE



Time span=0.00-26.00 hrs, dt=0.05 hrs, 521 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM Runoff Area=39,154 sf 3.91% Impervious Runoff Depth=1.89"
Flow Length=268' Tc=17.5 min CN=70 Runoff=1.38 cfs 0.142 af

Subcatchment 2S: DA2 TO RAILROAD Runoff Area=27,287 sf 26.50% Impervious Runoff Depth=0.66"
Flow Length=120' Slope=0.0050 '/' Tc=21.3 min CN=51 Runoff=0.21 cfs 0.035 af

Subcatchment 3S: DA3 TO 114 ALDEN STREET Runoff Area=8,967 sf 0.00% Impervious Runoff Depth=0.30"
Flow Length=115' Tc=12.9 min CN=43 Runoff=0.02 cfs 0.005 af

Reach 1R: TOTAL RUNOFF FROM SITE Inflow=1.54 cfs 0.181 af
Outflow=1.54 cfs 0.181 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.181 af Average Runoff Depth = 1.26"
88.38% Pervious = 1.530 ac 11.62% Impervious = 0.201 ac

Summary for Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS

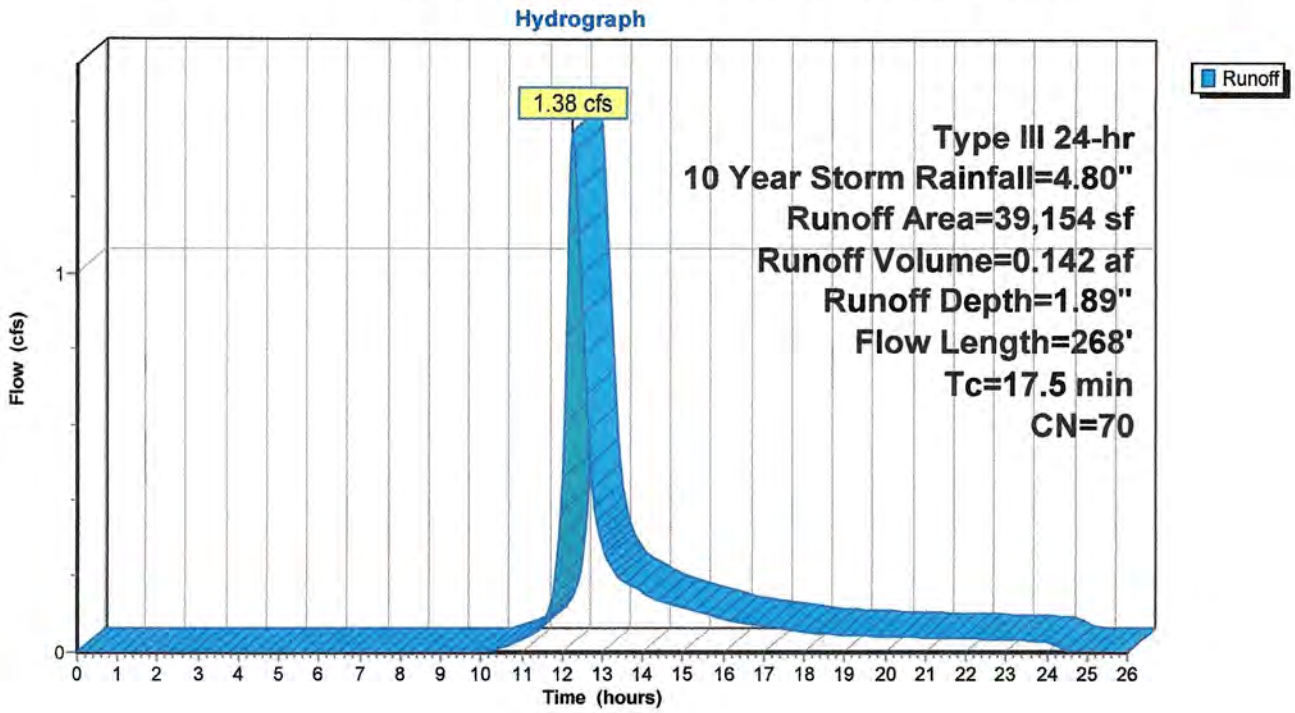
Runoff = 1.38 cfs @ 12.26 hrs, Volume= 0.142 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	1,091	30	Woods, Good, HSG A
	25,974	70	Woods, Good, HSG C
*	4,694	77	Woods-wetlands Good, HSG D
	1,059	39	>75% Grass cover, Good, HSG A
	4,807	74	>75% Grass cover, Good, HSG C
	1,268	98	Paved parking, HSG C
*	164	98	Conc Culvert, HSG D
	97	98	Roofs, HSG C
	39,154	70	Weighted Average
	37,625		96.09% Pervious Area
	1,529		3.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
3.1	168	0.0330	0.91		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.4	50	0.0050	0.35		**Shallow Concentrated Flow, WOODS/WETLANDS** Woodland Kv= 5.0 fps
17.5	268	Total			

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS



Summary for Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET

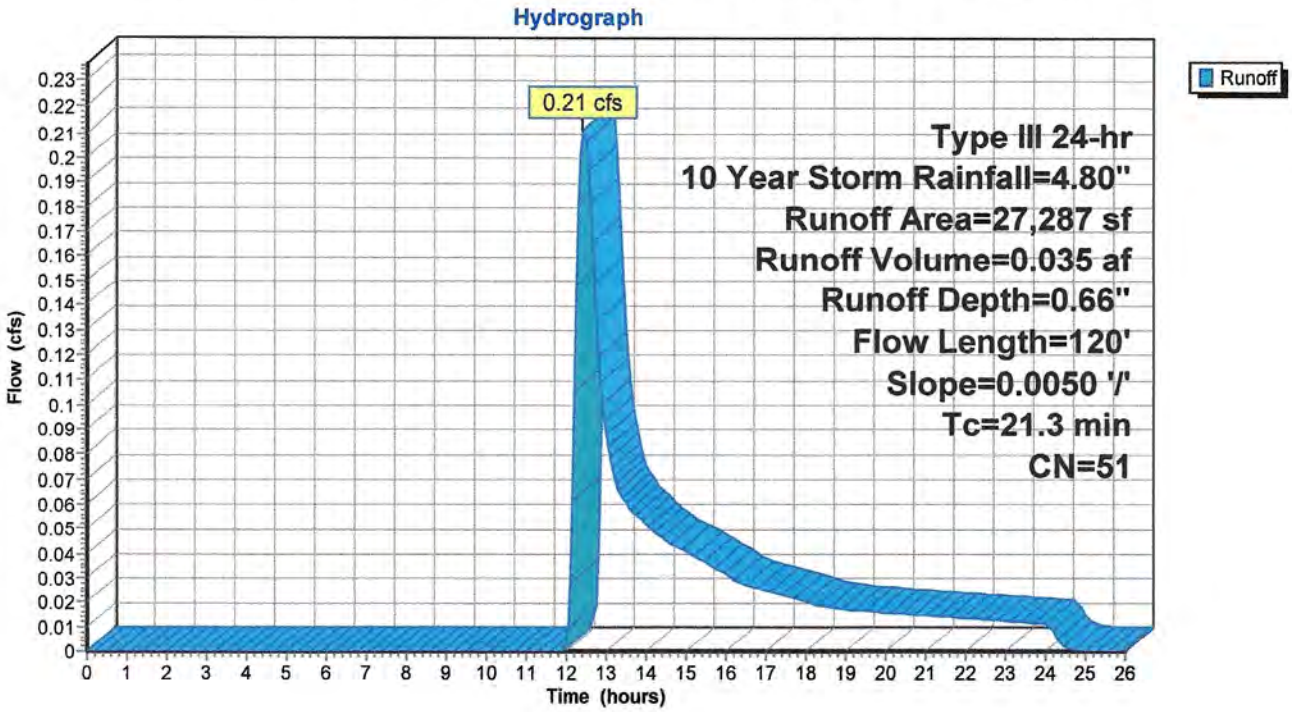
Runoff = 0.21 cfs @ 12.42 hrs, Volume= 0.035 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

Area (sf)	CN	Description
12,076	30	Woods, Good, HSG A
263	70	Woods, Good, HSG C
7,532	39	>75% Grass cover, Good, HSG A
185	74	>75% Grass cover, Good, HSG C
7,231	98	Paved parking, HSG A
27,287	51	Weighted Average
20,056		73.50% Pervious Area
7,231		26.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	30	0.0050	0.04		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
4.6	20	0.0050	0.07		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 3.40"
1.0	30	0.0050	0.49		**Shallow Concentrated Flow, GRASS** Short Grass Pasture Kv= 7.0 fps
1.9	40	0.0050	0.35		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
21.3	120	Total			

Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 3S: DA3 TO 114 ALDEN STREET

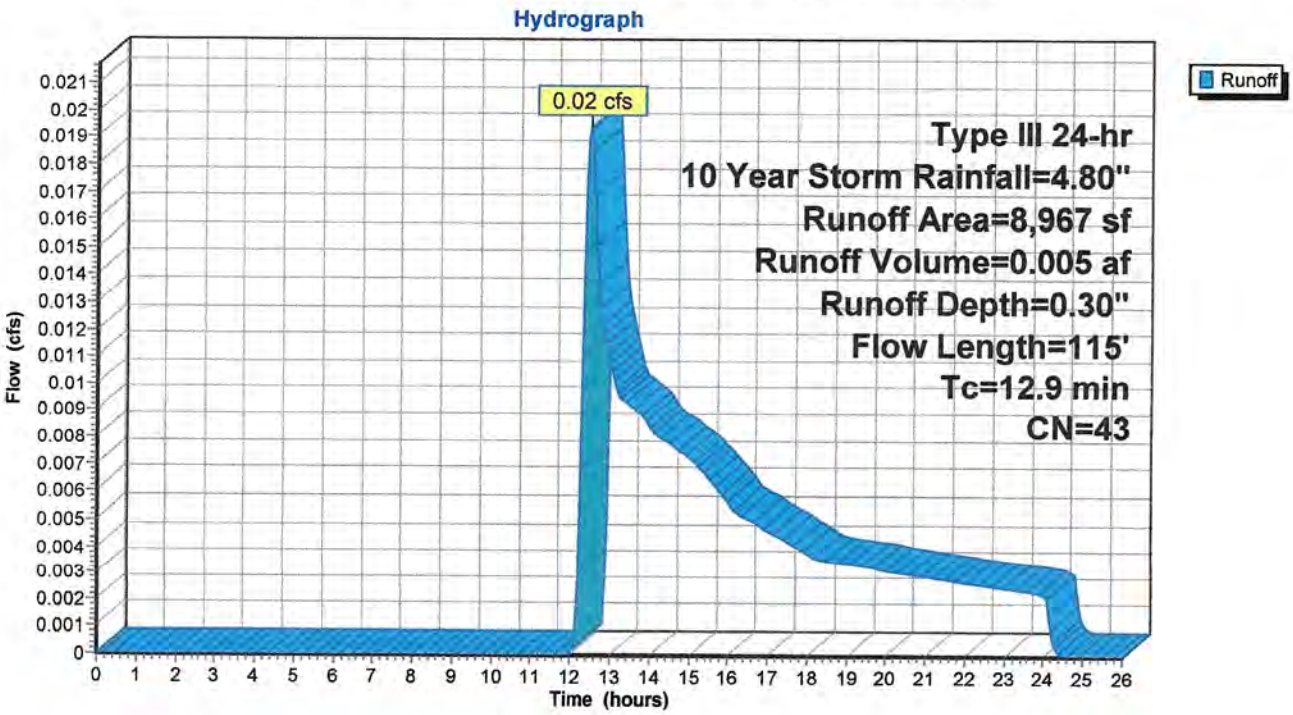
Runoff = 0.02 cfs @ 12.49 hrs, Volume= 0.005 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

Area (sf)	CN	Description
5,939	30	Woods, Good, HSG A
2,878	70	Woods, Good, HSG C
150	39	>75% Grass cover, Good, HSG A
8,967	43	Weighted Average
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	65	0.0540	1.16		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
12.9	115	Total			

Subcatchment 3S: DA3 TO 114 ALDEN STREET



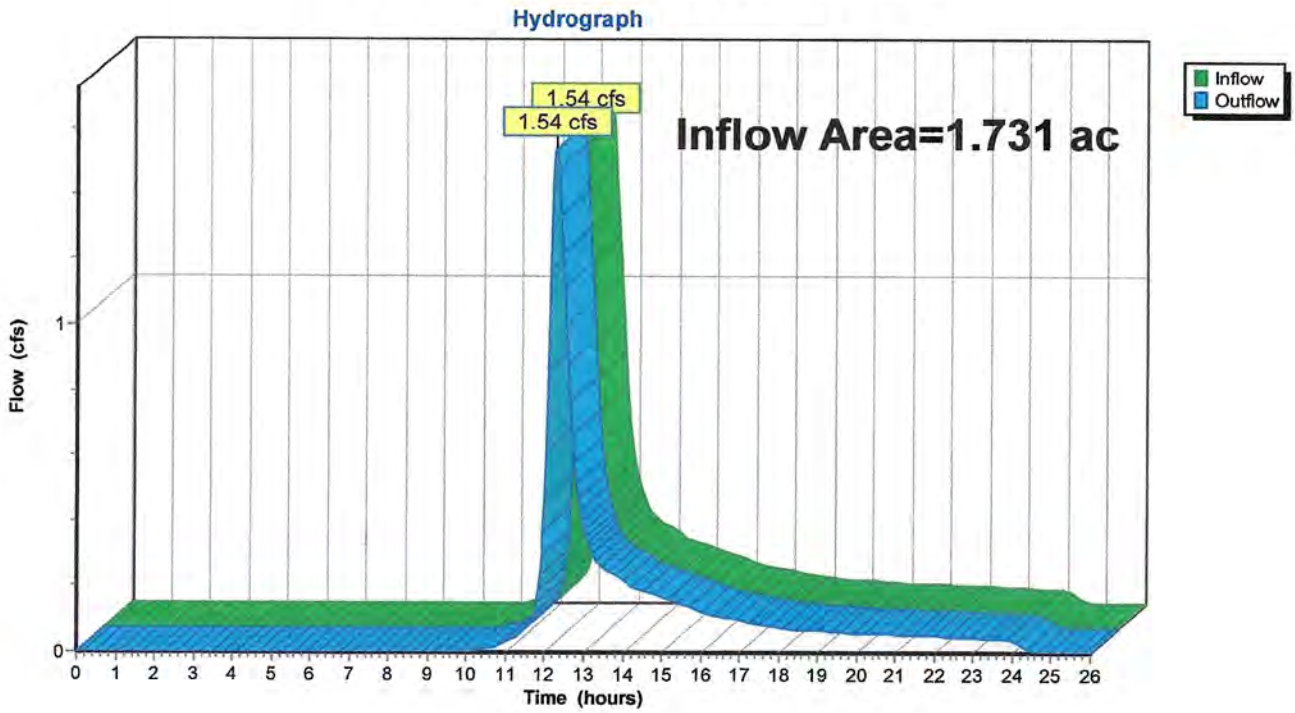
Summary for Reach 1R: TOTAL RUNOFF FROM SITE

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

Inflow Area = 1.731 ac, 11.62% Impervious, Inflow Depth = 1.26" for 10 Year Storm event
Inflow = 1.54 cfs @ 12.27 hrs, Volume= 0.181 af
Outflow = 1.54 cfs @ 12.27 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE



Time span=0.00-26.00 hrs, dt=0.05 hrs, 521 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM Runoff Area=39,154 sf 3.91% Impervious Runoff Depth=2.57"
Flow Length=268' Tc=17.5 min CN=70 Runoff=1.90 cfs 0.192 af

Subcatchment 2S: DA2 TO RAILROAD Runoff Area=27,287 sf 26.50% Impervious Runoff Depth=1.07"
Flow Length=120' Slope=0.0050 '/' Tc=21.3 min CN=51 Runoff=0.40 cfs 0.056 af

Subcatchment 3S: DA3 TO 114 ALDEN STREET Runoff Area=8,967 sf 0.00% Impervious Runoff Depth=0.57"
Flow Length=115' Tc=12.9 min CN=43 Runoff=0.05 cfs 0.010 af

Reach 1R: TOTAL RUNOFF FROM SITE Inflow=2.29 cfs 0.258 af
Outflow=2.29 cfs 0.258 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.258 af Average Runoff Depth = 1.79"
88.38% Pervious = 1.530 ac 11.62% Impervious = 0.201 ac

Summary for Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS

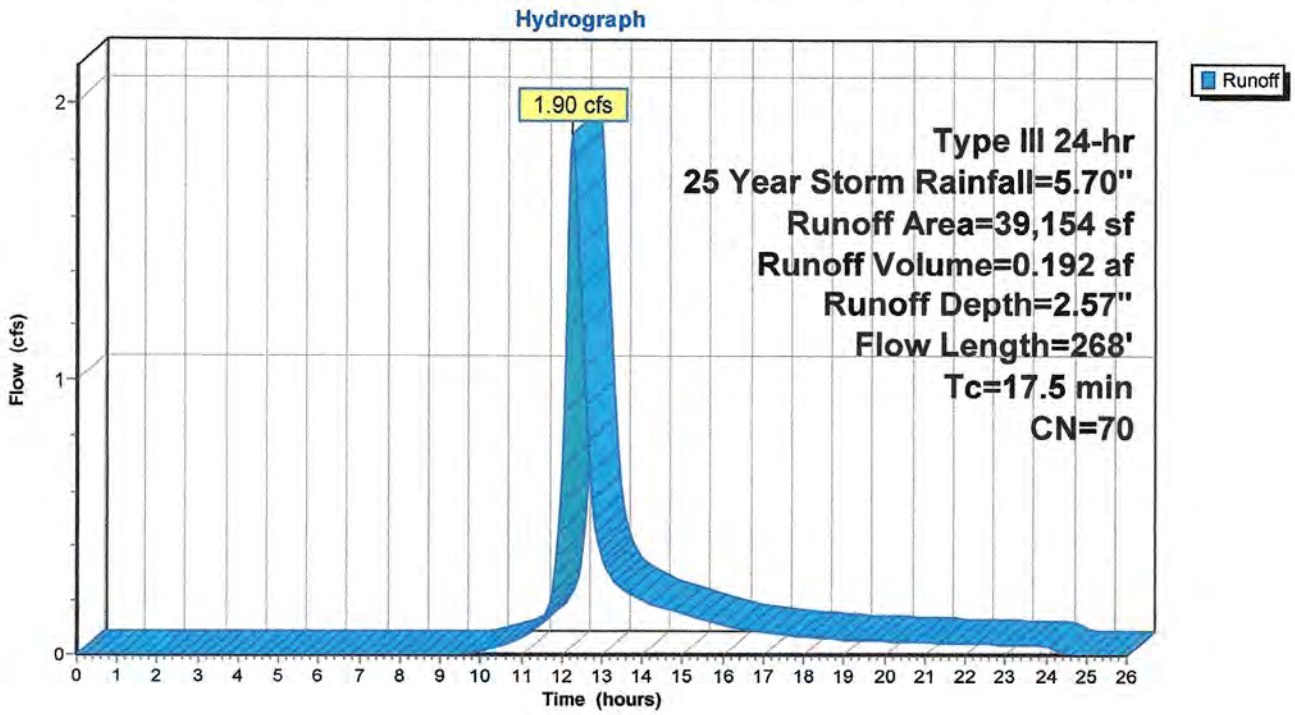
Runoff = 1.90 cfs @ 12.25 hrs, Volume= 0.192 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	1,091	30	Woods, Good, HSG A
	25,974	70	Woods, Good, HSG C
*	4,694	77	Woods-wetlands Good, HSG D
	1,059	39	>75% Grass cover, Good, HSG A
	4,807	74	>75% Grass cover, Good, HSG C
	1,268	98	Paved parking, HSG C
*	164	98	Conc Culvert, HSG D
	97	98	Roofs, HSG C
	39,154	70	Weighted Average
	37,625		96.09% Pervious Area
	1,529		3.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS**
					Woods: Light underbrush n= 0.400 P2= 3.40"
3.1	168	0.0330	0.91		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
2.4	50	0.0050	0.35		**Shallow Concentrated Flow, WOODS/WETLANDS**
					Woodland Kv= 5.0 fps
17.5	268	Total			

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS



Summary for Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET

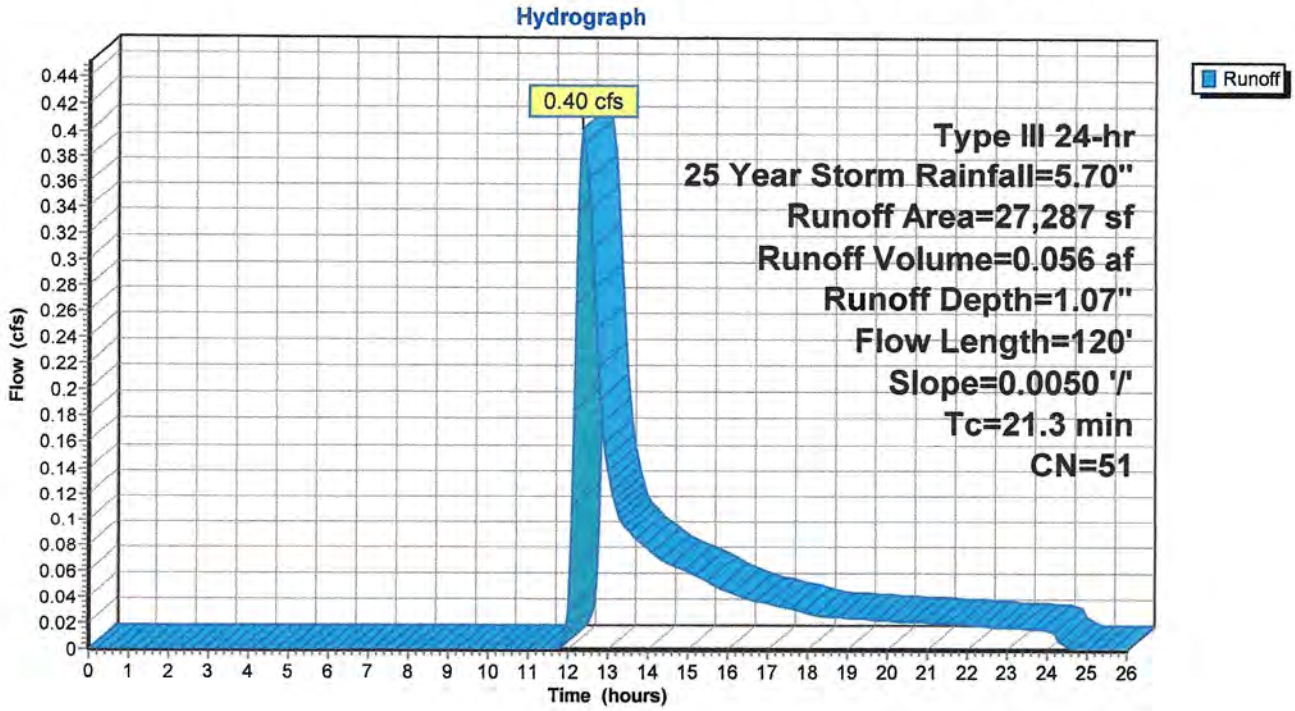
Runoff = 0.40 cfs @ 12.37 hrs, Volume= 0.056 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

Area (sf)	CN	Description
12,076	30	Woods, Good, HSG A
263	70	Woods, Good, HSG C
7,532	39	>75% Grass cover, Good, HSG A
185	74	>75% Grass cover, Good, HSG C
7,231	98	Paved parking, HSG A
27,287	51	Weighted Average
20,056		73.50% Pervious Area
7,231		26.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	30	0.0050	0.04		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
4.6	20	0.0050	0.07		**Sheet Flow, GRASS** Grass: Short n= 0.150 P2= 3.40"
1.0	30	0.0050	0.49		**Shallow Concentrated Flow, GRASS** Short Grass Pasture Kv= 7.0 fps
1.9	40	0.0050	0.35		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
21.3	120	Total			

Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 3S: DA3 TO 114 ALDEN STREET

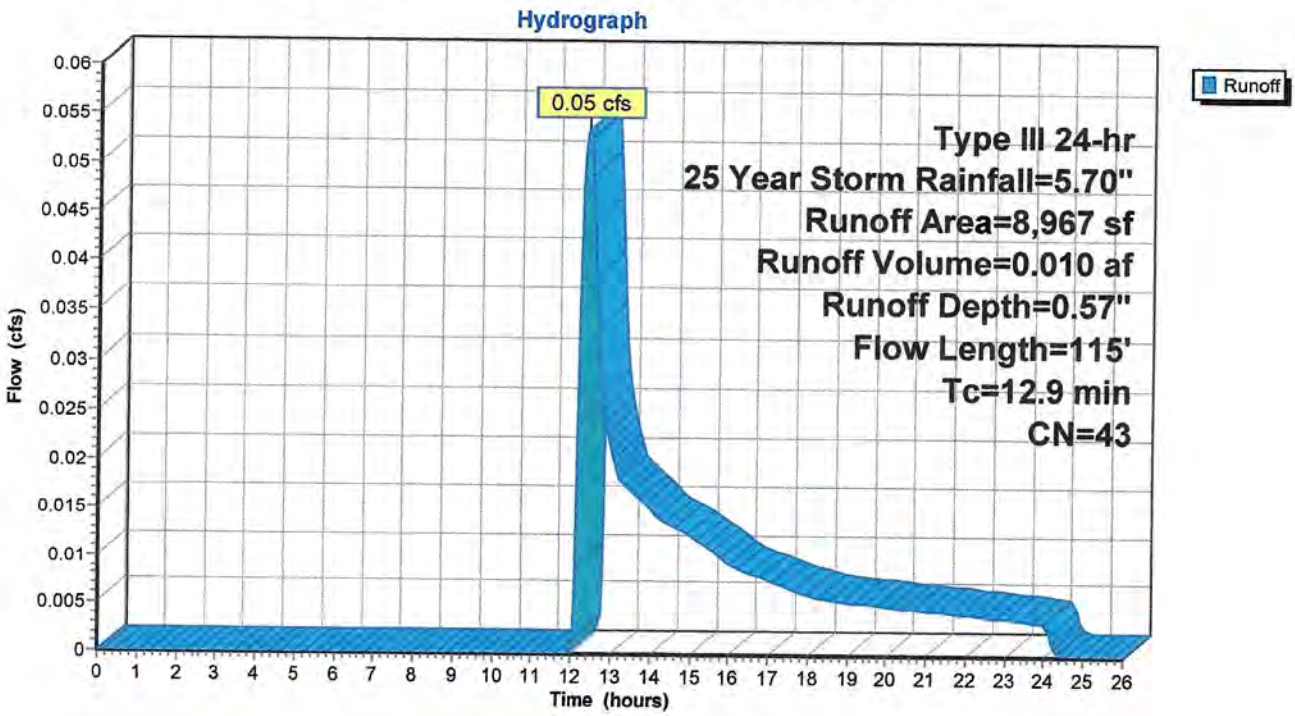
Runoff = 0.05 cfs @ 12.38 hrs, Volume= 0.010 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

Area (sf)	CN	Description
5,939	30	Woods, Good, HSG A
2,878	70	Woods, Good, HSG C
150	39	>75% Grass cover, Good, HSG A
8,967	43	Weighted Average
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	65	0.0540	1.16		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
12.9	115	Total			

Subcatchment 3S: DA3 TO 114 ALDEN STREET



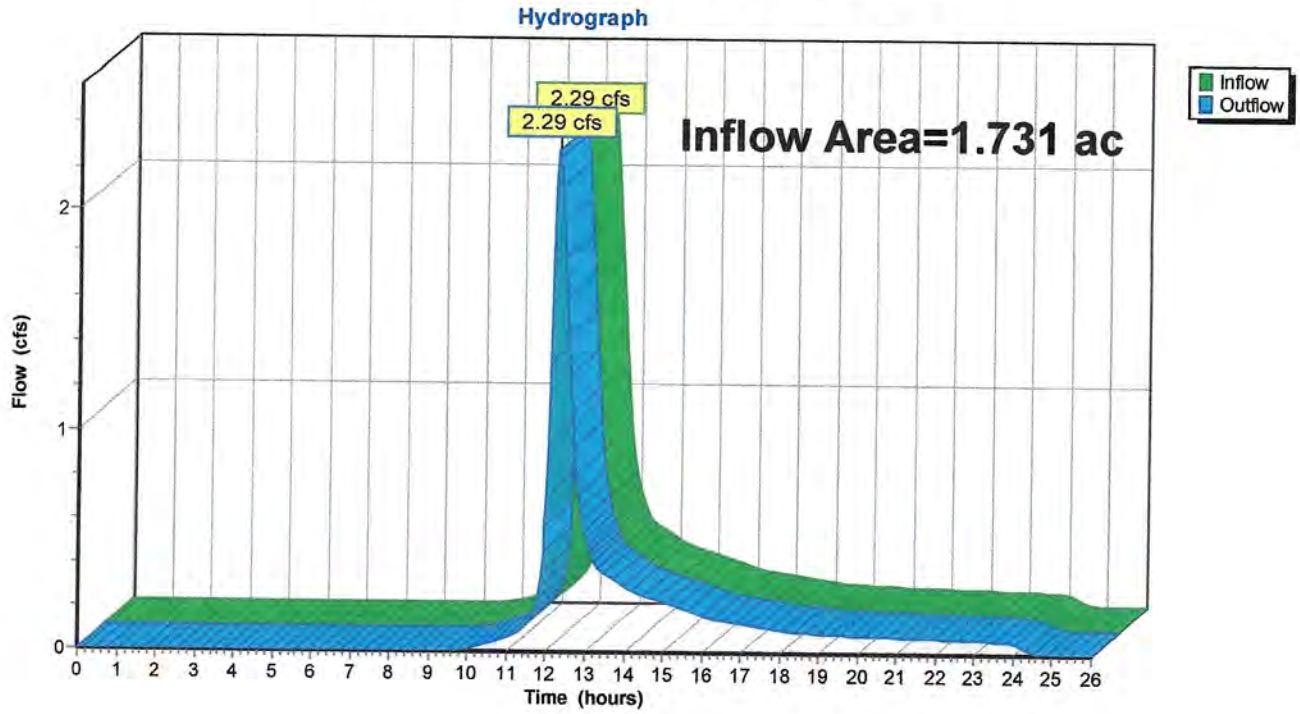
Summary for Reach 1R: TOTAL RUNOFF FROM SITE

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

Inflow Area = 1.731 ac, 11.62% Impervious, Inflow Depth = 1.79" for 25 Year Storm event
Inflow = 2.29 cfs @ 12.27 hrs, Volume= 0.258 af
Outflow = 2.29 cfs @ 12.27 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE



Time span=0.00-26.00 hrs, dt=0.05 hrs, 521 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM Runoff Area=39,154 sf 3.91% Impervious Runoff Depth=3.62"
Flow Length=268' Tc=17.5 min CN=70 Runoff=2.70 cfs 0.271 af

Subcatchment 2S: DA2 TO RAILROAD Runoff Area=27,287 sf 26.50% Impervious Runoff Depth=1.76"
Flow Length=120' Slope=0.0050 '/' Tc=21.3 min CN=51 Runoff=0.74 cfs 0.092 af

Subcatchment 3S: DA3 TO 114 ALDEN STREET Runoff Area=8,967 sf 0.00% Impervious Runoff Depth=1.07"
Flow Length=115' Tc=12.9 min CN=43 Runoff=0.14 cfs 0.018 af

Reach 1R: TOTAL RUNOFF FROM SITE Inflow=3.52 cfs 0.381 af
Outflow=3.52 cfs 0.381 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.381 af Average Runoff Depth = 2.64"
88.38% Pervious = 1.530 ac 11.62% Impervious = 0.201 ac

Summary for Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS

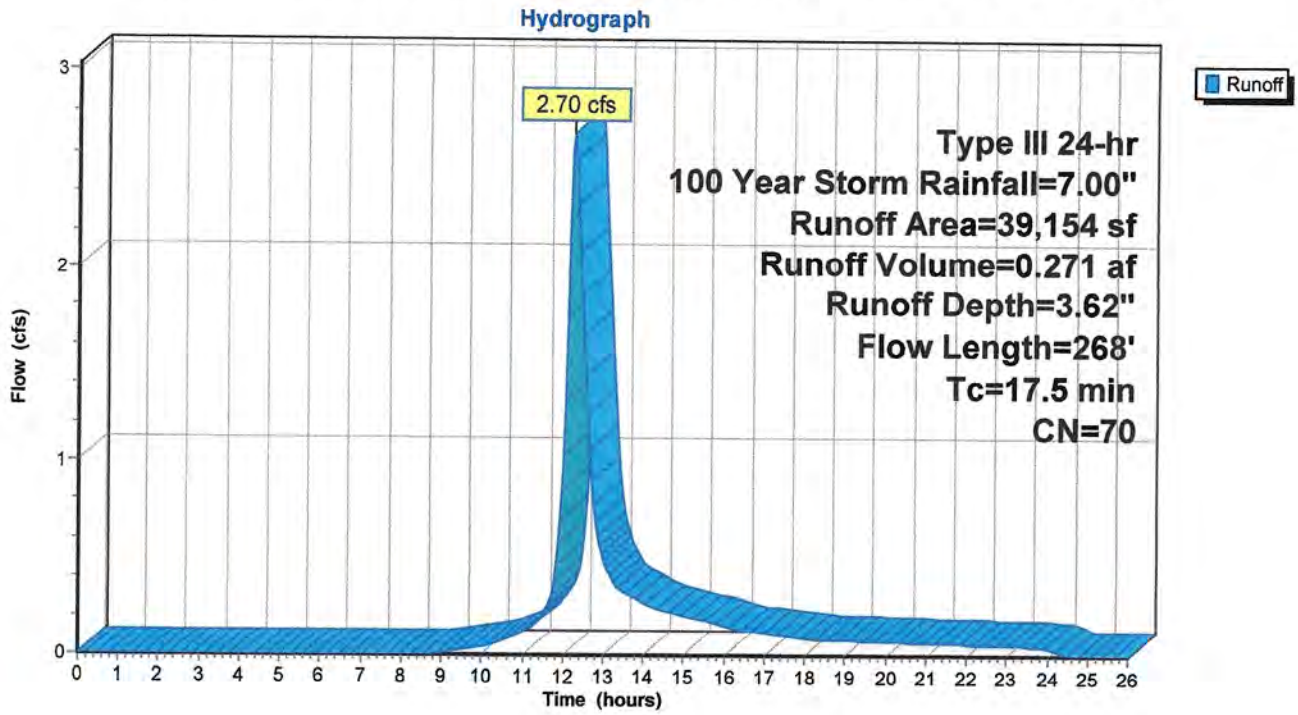
Runoff = 2.70 cfs @ 12.25 hrs, Volume= 0.271 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	1,091	30	Woods, Good, HSG A
	25,974	70	Woods, Good, HSG C
*	4,694	77	Woods-wetlands Good, HSG D
	1,059	39	>75% Grass cover, Good, HSG A
	4,807	74	>75% Grass cover, Good, HSG C
	1,268	98	Paved parking, HSG C
*	164	98	Conc Culvert, HSG D
	97	98	Roofs, HSG C
	39,154	70	Weighted Average
	37,625		96.09% Pervious Area
	1,529		3.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
3.1	168	0.0330	0.91		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.4	50	0.0050	0.35		**Shallow Concentrated Flow, WOODS/WETLANDS** Woodland Kv= 5.0 fps
17.5	268	Total			

Subcatchment 1S: DA1 - TOTAL RUNOFF FROM SITE AT WETLANDS



Summary for Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET

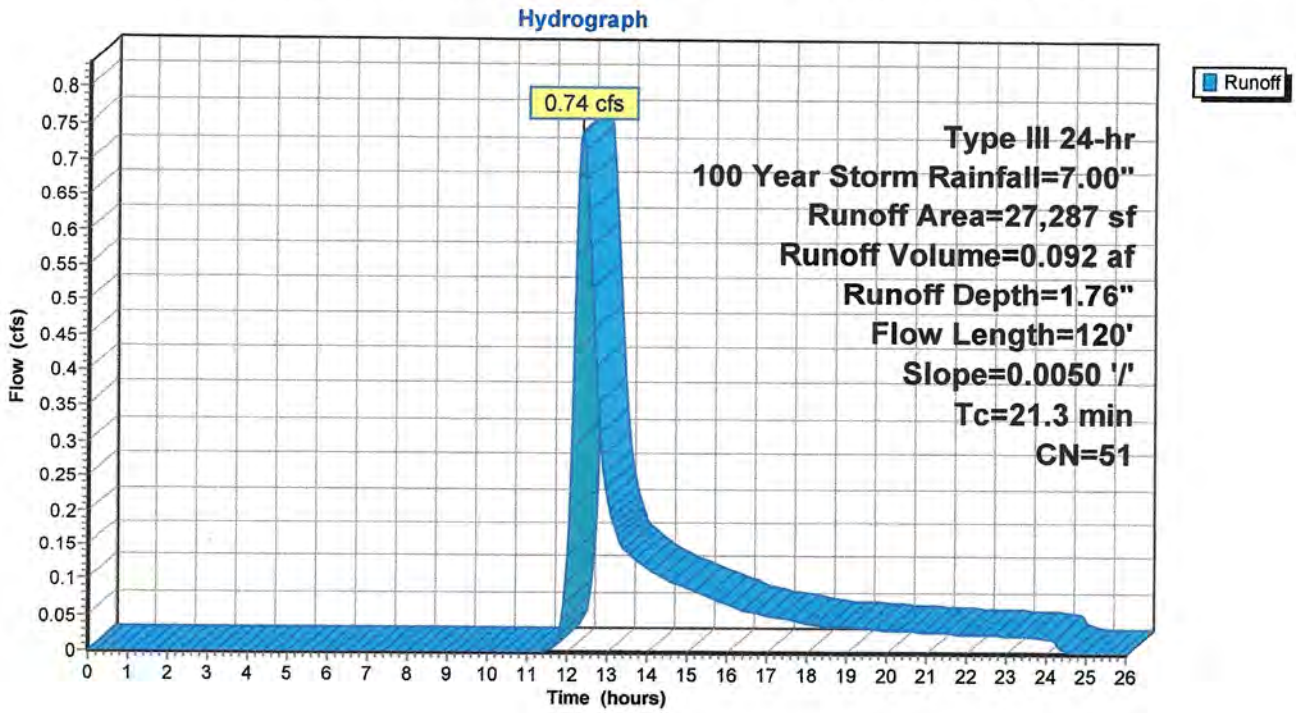
Runoff = 0.74 cfs @ 12.34 hrs, Volume= 0.092 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

Area (sf)	CN	Description
12,076	30	Woods, Good, HSG A
263	70	Woods, Good, HSG C
7,532	39	>75% Grass cover, Good, HSG A
185	74	>75% Grass cover, Good, HSG C
7,231	98	Paved parking, HSG A
27,287	51	Weighted Average
20,056		73.50% Pervious Area
7,231		26.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	30	0.0050	0.04		**Sheet Flow, WOODS**
					Woods: Light underbrush n= 0.400 P2= 3.40"
4.6	20	0.0050	0.07		**Sheet Flow, GRASS**
					Grass: Short n= 0.150 P2= 3.40"
1.0	30	0.0050	0.49		**Shallow Concentrated Flow, GRASS**
					Short Grass Pasture Kv= 7.0 fps
1.9	40	0.0050	0.35		**Shallow Concentrated Flow, WOODS**
					Woodland Kv= 5.0 fps
21.3	120	Total			

Subcatchment 2S: DA2 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 3S: DA3 TO 114 ALDEN STREET

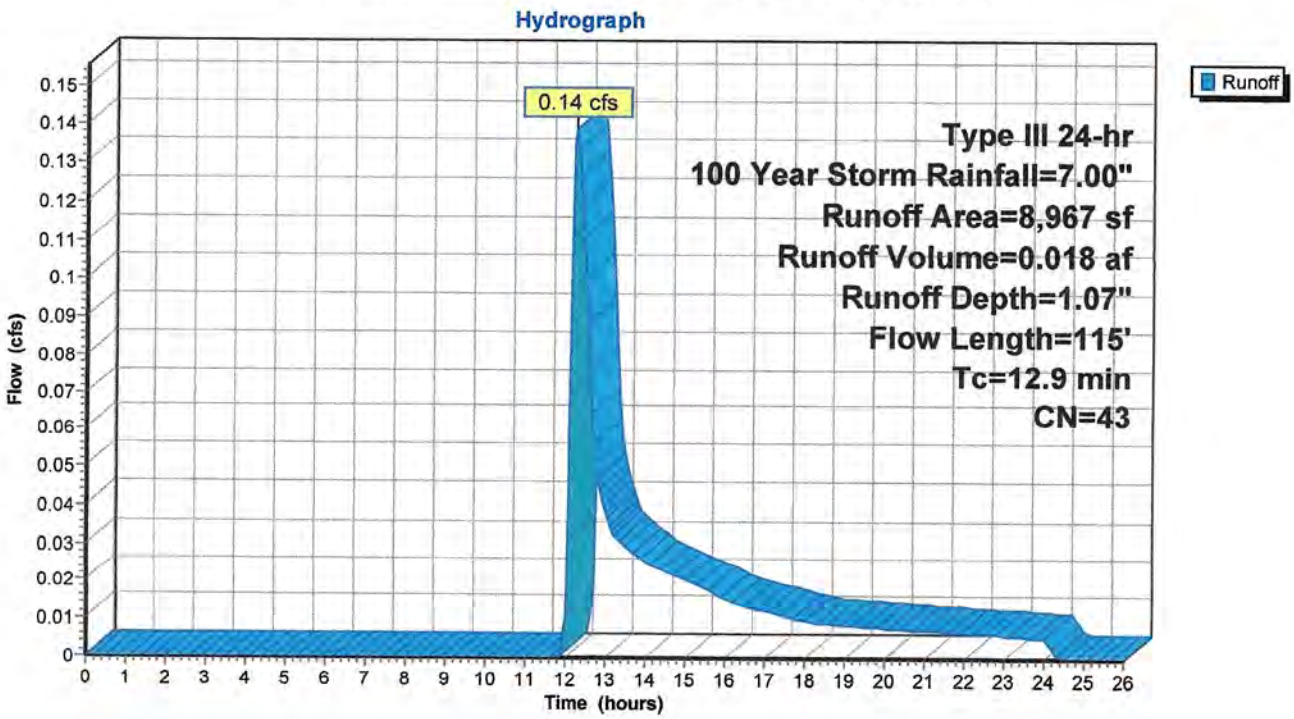
Runoff = 0.14 cfs @ 12.25 hrs, Volume= 0.018 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

Area (sf)	CN	Description
5,939	30	Woods, Good, HSG A
2,878	70	Woods, Good, HSG C
150	39	>75% Grass cover, Good, HSG A
8,967	43	Weighted Average
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, WOODS** Woods: Light underbrush n= 0.400 P2= 3.40"
0.9	65	0.0540	1.16		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
12.9	115	Total			

Subcatchment 3S: DA3 TO 114 ALDEN STREET



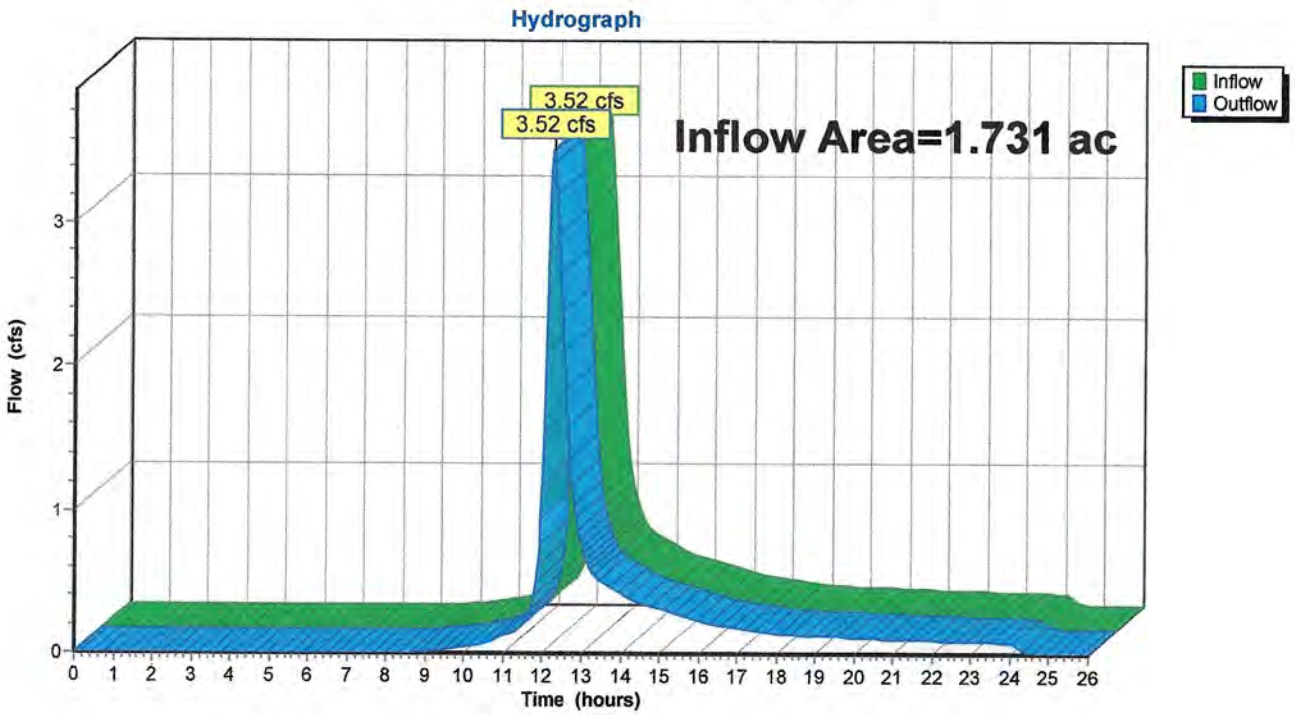
Summary for Reach 1R: TOTAL RUNOFF FROM SITE

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

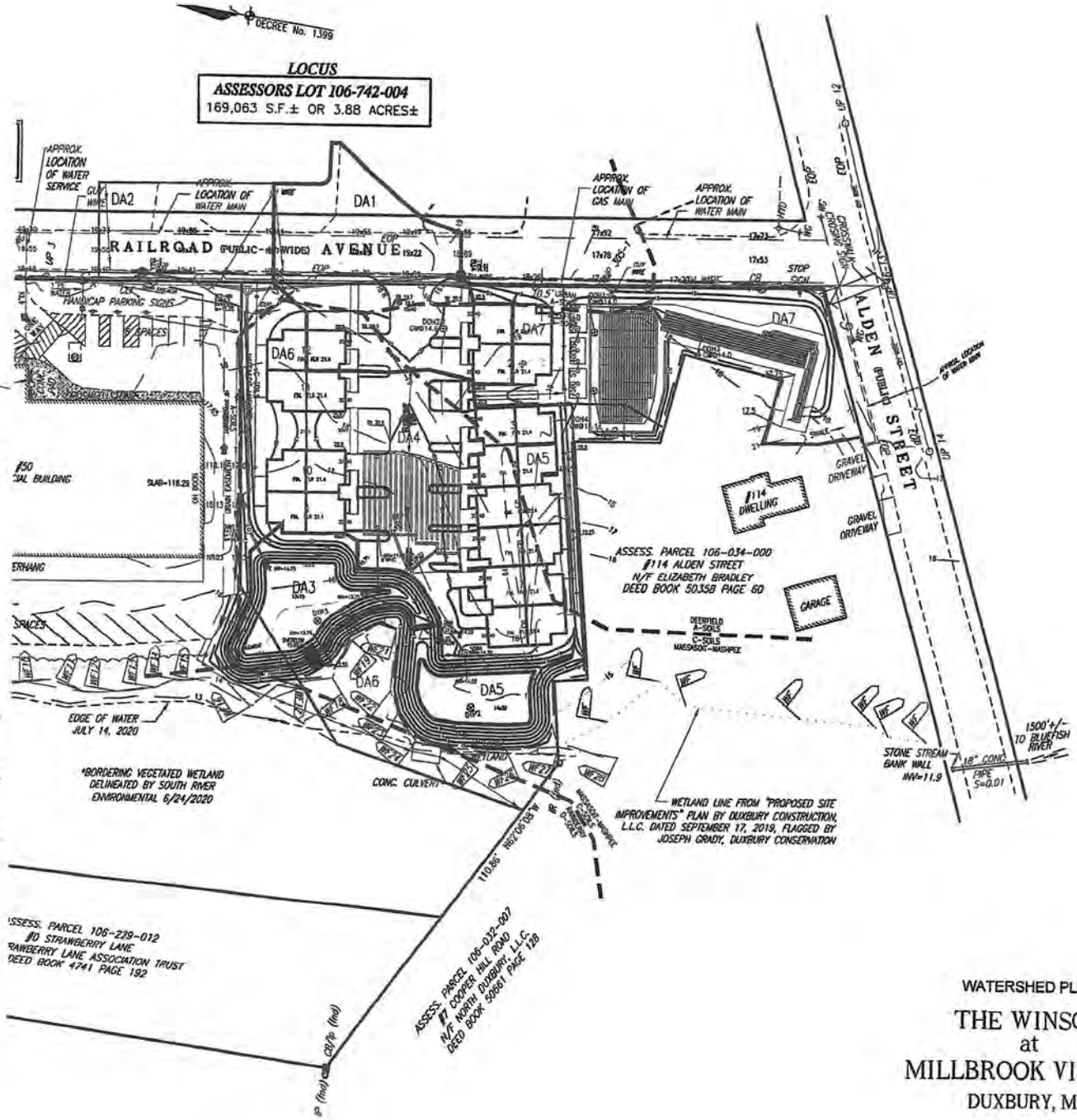
Inflow Area = 1.731 ac, 11.62% Impervious, Inflow Depth = 2.64" for 100 Year Storm event
Inflow = 3.52 cfs @ 12.26 hrs, Volume= 0.381 af
Outflow = 3.52 cfs @ 12.26 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-26.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE



Post-Development Drainage Analysis
(Proposed Conditions)



Postdevelopment Watershed Plan

WATERSHED PLAN

THE WINSOR
at
MILLBROOK VILLAGE
DUXBURY, MA

PREPARED FOR

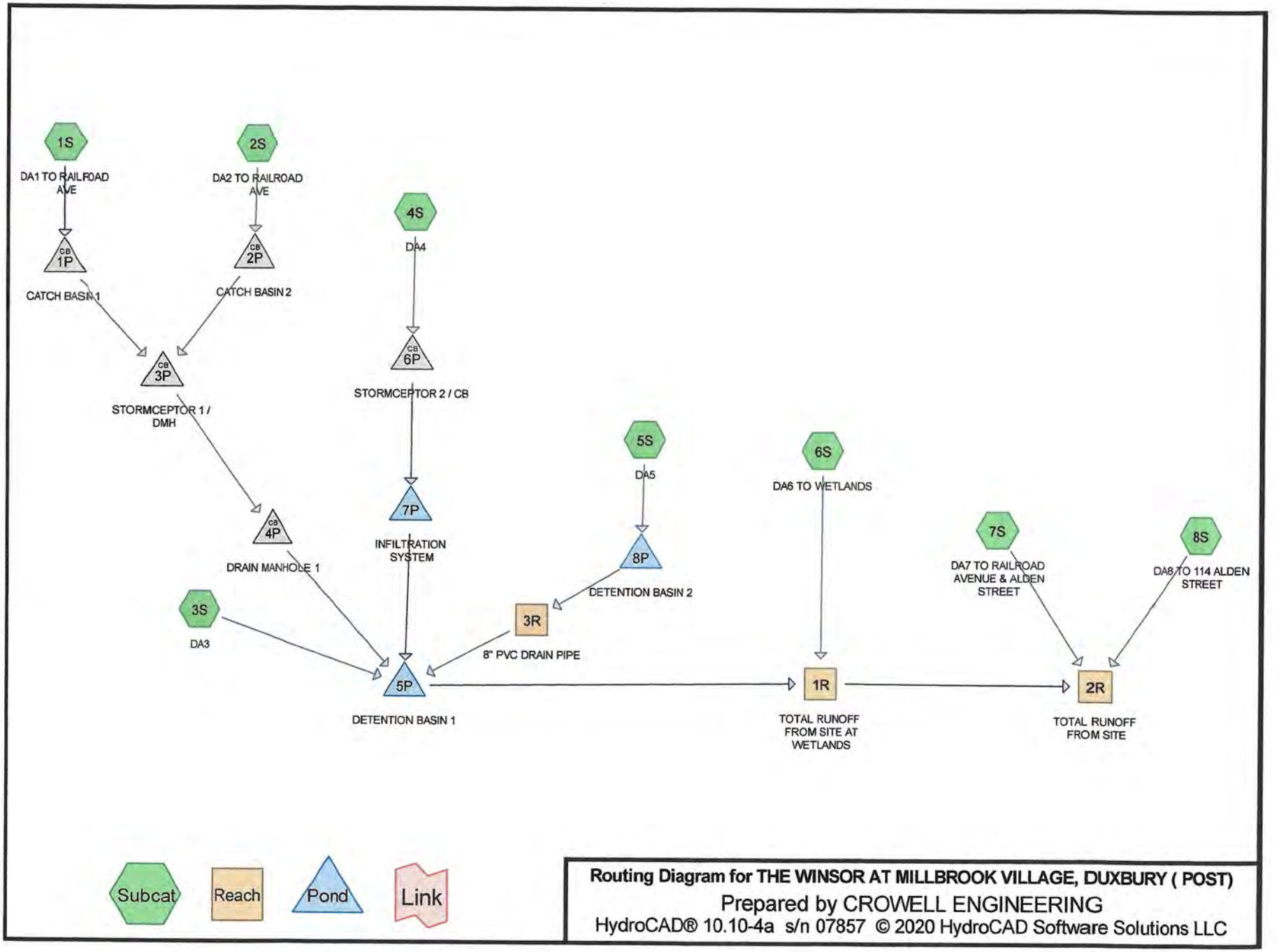
THE WINSOR
at
MILLBROOK VILLAGE LLC

CROWELL ENGINEERING
981 LONG POND ROAD
PLYMOUTH, MA 02360
774-283-0443

△#	REVISIONS PER:	DATE:
1	SUBMIT TO ZBA	6-15-23
2	REVIEW ENGINEER	7-5-23
3	REVIEW ENGINEER	8-31-23

DATE ISSUED:	7/18/22
DWG. SCALE:	1"=40'
DRAWN BY:	BC
REVIEWED BY:	
PROJECT NO:	

DRAWING NAME:
WATERSHED PLANS



Routing Diagram for THE WINSOR AT MILLBROOK VILLAGE, DUXBURY (POST)

Prepared by CROWELL ENGINEERING

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year Storm	Type III 24-hr		Default	24.00	1	3.40	2
2	10 Year Storm	Type III 24-hr		Default	24.00	1	4.80	2
3	25 Year Storm	Type III 24-hr		Default	24.00	1	5.70	2
4	100 Year Storm	Type III 24-hr		Default	24.00	1	7.00	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.422	39	>75% Grass cover, Good, HSG A (1S, 2S, 4S, 5S, 6S, 7S, 8S)
0.330	74	>75% Grass cover, Good, HSG C (1S, 3S, 4S, 5S, 6S)
0.004	98	Conc Culvert, HSG D (6S)
0.060	98	Detention Basin 1, Water Surface, HSG C (3S)
0.046	98	Detention Basin 2, Water Surface, HSG C (5S)
0.010	98	Paved parking, HSG C (1S)
0.003	98	Paved parking, dwy, curbs, HSG A (4S)
0.158	98	Paved parking, dwy, curbs, HSG C (4S)
0.071	98	Paved sreet, driveway, HSG A (2S)
0.179	98	Paved street, dwys, parking, curbs HSG A (1S)
0.098	98	Roofs, HSG A (1S, 4S, 5S, 7S)
0.176	98	Roofs, HSG C (1S, 4S, 5S, 6S)
0.009	98	Sidewalks, HSG A (1S, 4S)
0.026	98	Sidewalks, HSG C (1S, 4S)
0.004	98	Walks, HSG A (7S)
0.019	98	Walls, HSG A (5S, 7S, 8S)
0.001	98	Walls, HSG C (5S)
0.008	70	Woods, Good, HSG C (6S)
0.108	77	Woods-wetland, Good, HSG D (6S)
1.731	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.805	HSG A	1S, 2S, 4S, 5S, 6S, 7S, 8S
0.000	HSG B	
0.814	HSG C	1S, 3S, 4S, 5S, 6S
0.112	HSG D	6S
0.000	Other	
1.731		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.422	0.000	0.330	0.000	0.000	0.752	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.000	0.000	0.000	0.004	0.000	0.004	Conc Culvert	6S
0.000	0.000	0.060	0.000	0.000	0.060	Detention Basin 1, Water Surface	3S
0.000	0.000	0.046	0.000	0.000	0.046	Detention Basin 2, Water Surface	5S
0.000	0.000	0.010	0.000	0.000	0.010	Paved parking	1S
0.003	0.000	0.158	0.000	0.000	0.161	Paved parking, dwy, curbs	4S
0.071	0.000	0.000	0.000	0.000	0.071	Paved sreet, driveway	2S
0.179	0.000	0.000	0.000	0.000	0.179	Paved street, dwys, parking, curbs	1S
0.098	0.000	0.176	0.000	0.000	0.274	Roofs	1S, 4S, 5S, 6S, 7S
0.009	0.000	0.026	0.000	0.000	0.035	Sidewalks	1S, 4S
0.004	0.000	0.000	0.000	0.000	0.004	Walks	7S
0.019	0.000	0.001	0.000	0.000	0.020	Walls	5S, 7S, 8S
0.000	0.000	0.008	0.000	0.000	0.008	Woods, Good	6S
0.000	0.000	0.000	0.108	0.000	0.108	Woods-wetland, Good	6S
0.805	**0.000**	**0.814**	**0.112**	**0.000**	**1.731**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3R	14.38	13.75	68.0	0.0093	0.010	8.0	0.0	0.0
2	1P	16.12	15.53	118.0	0.0050	0.012	12.0	0.0	0.0
3	2P	16.65	15.53	56.0	0.0200	0.012	12.0	0.0	0.0
4	3P	15.28	14.81	133.0	0.0035	0.012	15.0	0.0	0.0
5	4P	14.81	14.75	17.0	0.0035	0.012	15.0	0.0	0.0
6	5P	13.75	13.55	20.0	0.0100	0.010	4.0	0.0	0.0
7	6P	17.02	16.75	18.0	0.0150	0.010	12.0	0.0	0.0
8	7P	17.68	15.95	30.0	0.0577	0.012	6.0	0.0	0.0
9	8P	14.50	14.38	12.0	0.0100	0.010	4.0	0.0	0.0

Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 TO RAILROAD AVE Runoff Area=12,039 sf 84.98% Impervious Runoff Depth=2.45"
Flow Length=157' Tc=7.0 min CN=91 Runoff=0.74 cfs 0.056 af

Subcatchment 2S: DA2 TO RAILROAD AVE Runoff Area=5,729 sf 53.83% Impervious Runoff Depth=1.00"
Flow Length=100' Tc=5.7 min CN=71 Runoff=0.14 cfs 0.011 af

Subcatchment 3S: DA3 Runoff Area=5,613 sf 46.59% Impervious Runoff Depth=1.93"
Tc=5.0 min CN=85 Runoff=0.29 cfs 0.021 af

Subcatchment 4S: DA4 Runoff Area=15,291 sf 83.57% Impervious Runoff Depth=2.64"
Flow Length=225' Slope=0.0050 '/' Tc=5.0 min CN=93 Runoff=1.05 cfs 0.077 af

Subcatchment 5S: DA5 Runoff Area=8,903 sf 57.97% Impervious Runoff Depth=1.85"
Flow Length=151' Tc=10.6 min CN=84 Runoff=0.38 cfs 0.032 af

Subcatchment 6S: DA6 TO WETLANDS Runoff Area=13,540 sf 15.41% Impervious Runoff Depth=1.36"
Flow Length=440' Tc=14.6 min CN=77 Runoff=0.37 cfs 0.035 af

Subcatchment 7S: DA7 TO RAILROAD Runoff Area=13,232 sf 11.99% Impervious Runoff Depth=0.09"
Flow Length=105' Tc=10.7 min CN=46 Runoff=0.00 cfs 0.002 af

Subcatchment 8S: DA8 TO 114 ALDEN STREET Runoff Area=1,061 sf 6.79% Impervious Runoff Depth=0.04"
Flow Length=22' Slope=0.0200 '/' Tc=5.0 min CN=43 Runoff=0.00 cfs 0.000 af

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS Inflow=0.62 cfs 0.155 af
Outflow=0.62 cfs 0.155 af

Reach 2R: TOTAL RUNOFF FROM SITE Inflow=0.62 cfs 0.157 af
Outflow=0.62 cfs 0.157 af

Reach 3R: 8" PVC DRAIN PIPE Avg. Flow Depth=0.13' Max Vel=2.66 fps Inflow=0.13 cfs 0.032 af
8.0" Round Pipe n=0.010 L=68.0' S=0.0093 '/' Capacity=1.51 cfs Outflow=0.13 cfs 0.032 af

Pond 1P: CATCH BASIN 1 Peak Elev=16.61' Inflow=0.74 cfs 0.056 af
12.0" Round Culvert n=0.012 L=118.0' S=0.0050 '/' Outflow=0.74 cfs 0.056 af

Pond 2P: CATCH BASIN 2 Peak Elev=16.83' Inflow=0.14 cfs 0.011 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0200 '/' Outflow=0.14 cfs 0.011 af

Pond 3P: STORMCEPTOR 1 / DMH Peak Elev=15.81' Inflow=0.88 cfs 0.067 af
15.0" Round Culvert n=0.012 L=133.0' S=0.0035 '/' Outflow=0.88 cfs 0.067 af

Pond 4P: DRAIN MANHOLE 1 Peak Elev=15.37' Inflow=0.88 cfs 0.067 af
15.0" Round Culvert n=0.012 L=17.0' S=0.0035 '/' Outflow=0.88 cfs 0.067 af

Pond 5P: DETENTION BASIN 1 Peak Elev=14.43' Storage=1,654 cf Inflow=1.22 cfs 0.120 af
Outflow=0.29 cfs 0.120 af

Pond 6P: STORMCEPTOR 2 / CB Peak Elev=17.55' Inflow=1.05 cfs 0.077 af
12.0" Round Culvert n=0.010 L=18.0' S=0.0150 '/' Outflow=1.05 cfs 0.077 af

Pond 7P: INFILTRATION SYSTEM Peak Elev=16.73' Storage=1,939 cf Inflow=1.05 cfs 0.077 af
Discarded=0.03 cfs 0.077 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.077 af

Pond 8P: DETENTION BASIN 2 Peak Elev=14.78' Storage=492 cf Inflow=0.38 cfs 0.032 af
Outflow=0.13 cfs 0.032 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.234 af Average Runoff Depth = 1.62"
50.12% Pervious = 0.868 ac 49.88% Impervious = 0.864 ac

Summary for Subcatchment 1S: DA1 TO RAILROAD AVE

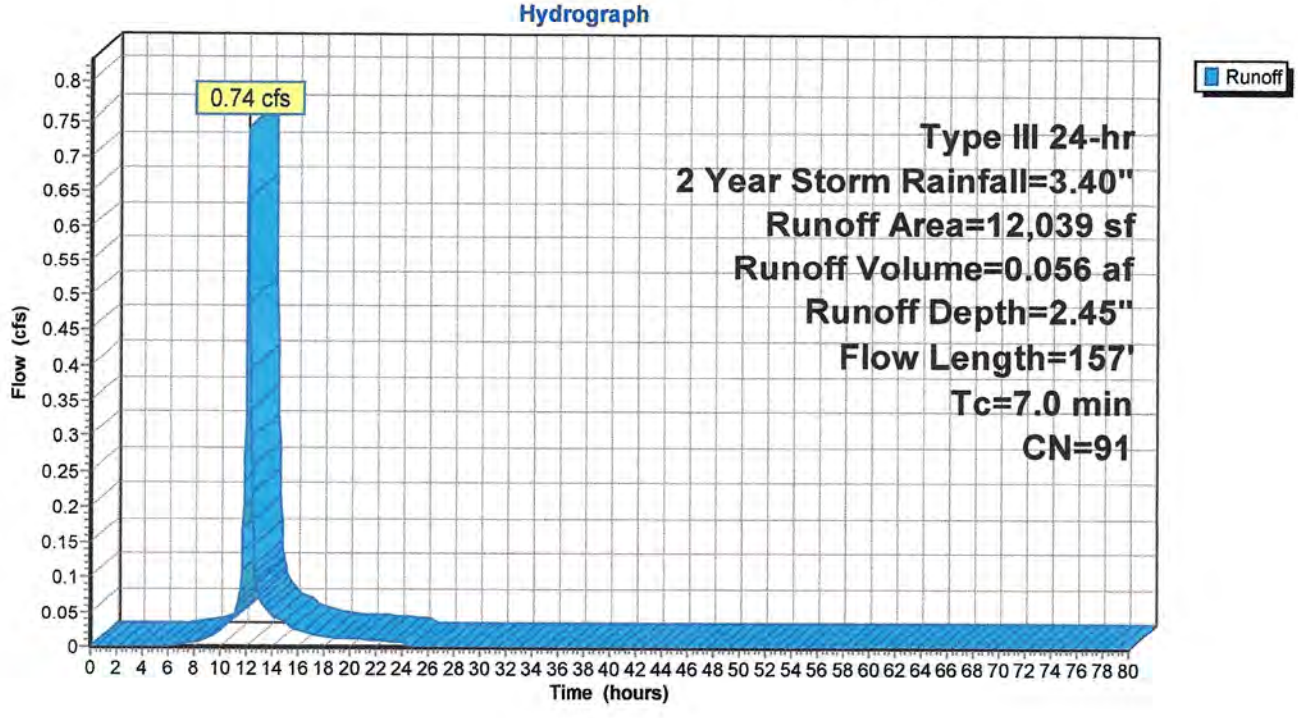
Runoff = 0.74 cfs @ 12.10 hrs, Volume= 0.056 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	1,270	39	>75% Grass cover, Good, HSG A
	538	74	>75% Grass cover, Good, HSG C
*	7,805	98	Paved street, dwys, parking, curbs HSG A
	449	98	Paved parking, HSG C
*	292	98	Sidewalks, HSG A
*	146	98	Sidewalks, HSG C
	1,028	98	Roofs, HSG A
	511	98	Roofs, HSG C
	12,039	91	Weighted Average
	1,808		15.02% Pervious Area
	10,231		84.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	28	0.0150	0.08		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
0.5	24	0.0100	0.81		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
0.9	105	0.0090	1.93		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
7.0	157	Total			

Subcatchment 1S: DA1 TO RAILROAD AVE



Summary for Subcatchment 2S: DA2 TO RAILROAD AVE

[49] Hint: Tc<2dt may require smaller dt

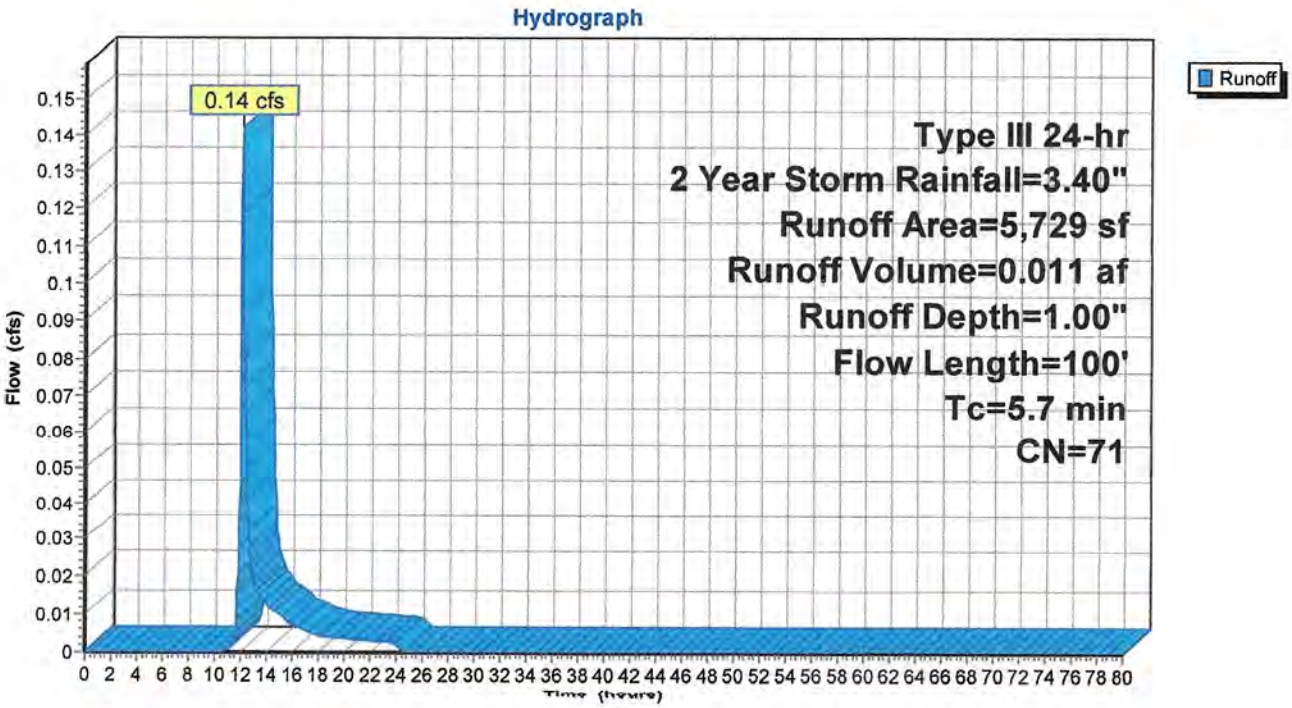
Runoff = 0.14 cfs @ 12.10 hrs, Volume= 0.011 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	2,645	39	>75% Grass cover, Good, HSG A
*	3,084	98	Paved sreet, driveway, HSG A
	5,729	71	Weighted Average
	2,645		46.17% Pervious Area
	3,084		53.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	28	0.0250	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
0.5	22	0.0100	0.79		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
0.6	50	0.0050	1.44		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
5.7	100	Total			

Subcatchment 2S: DA2 TO RAILROAD AVE



Summary for Subcatchment 3S: DA3

[49] Hint: Tc<2dt may require smaller dt

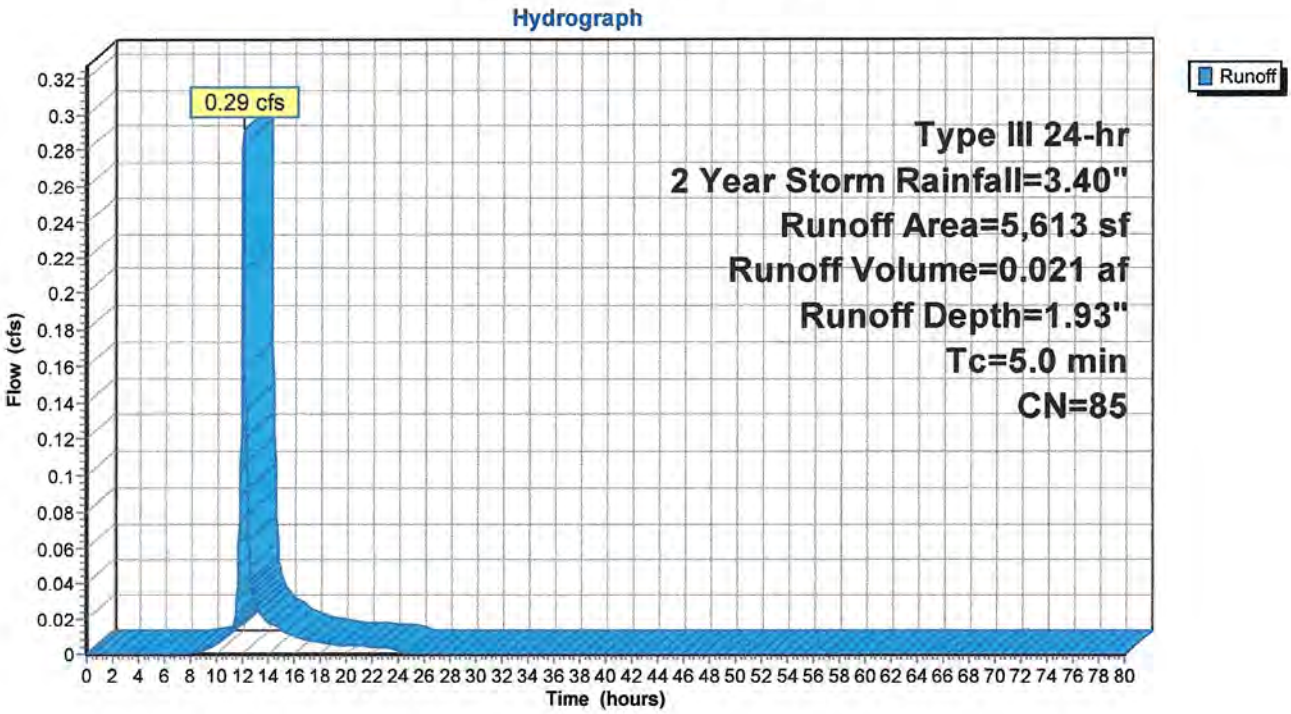
Runoff = 0.29 cfs @ 12.08 hrs, Volume= 0.021 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	2,998	74	>75% Grass cover, Good, HSG C
*	2,615	98	Detention Basin 1, Water Surface, HSG C
	5,613	85	Weighted Average
	2,998		53.41% Pervious Area
	2,615		46.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DETENTION BASIN 1**

Subcatchment 3S: DA3



Summary for Subcatchment 4S: DA4

[49] Hint: Tc<2dt may require smaller dt

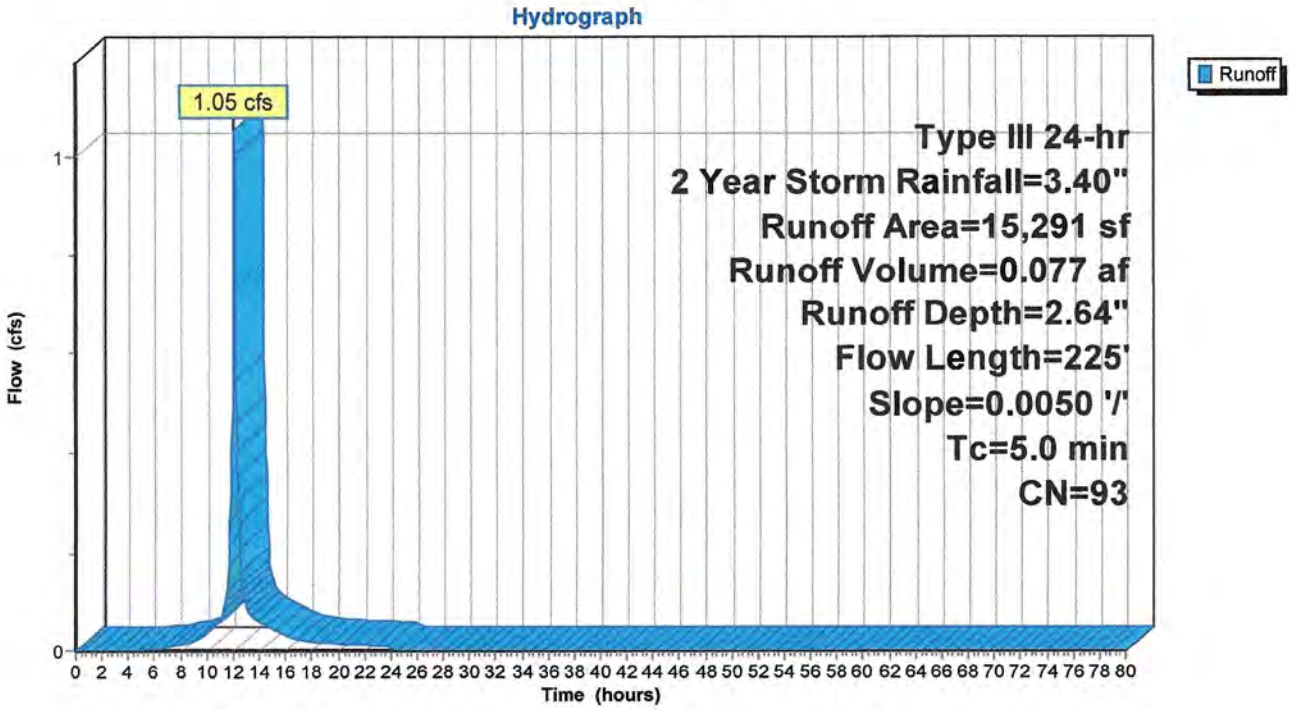
Runoff = 1.05 cfs @ 12.07 hrs, Volume= 0.077 af, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	250	39	>75% Grass cover, Good, HSG A
	2,262	74	>75% Grass cover, Good, HSG C
	490	98	Roofs, HSG A
	4,174	98	Roofs, HSG C
*	149	98	Paved parking, dwy, curbs, HSG A
*	6,878	98	Paved parking, dwy, curbs, HSG C
*	97	98	Sidewalks, HSG A
*	991	98	Sidewalks, HSG C
	15,291	93	Weighted Average
	2,512		16.43% Pervious Area
	12,779		83.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.71		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
2.0	175	0.0050	1.44		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
3.2	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: DA4



Summary for Subcatchment 5S: DA5

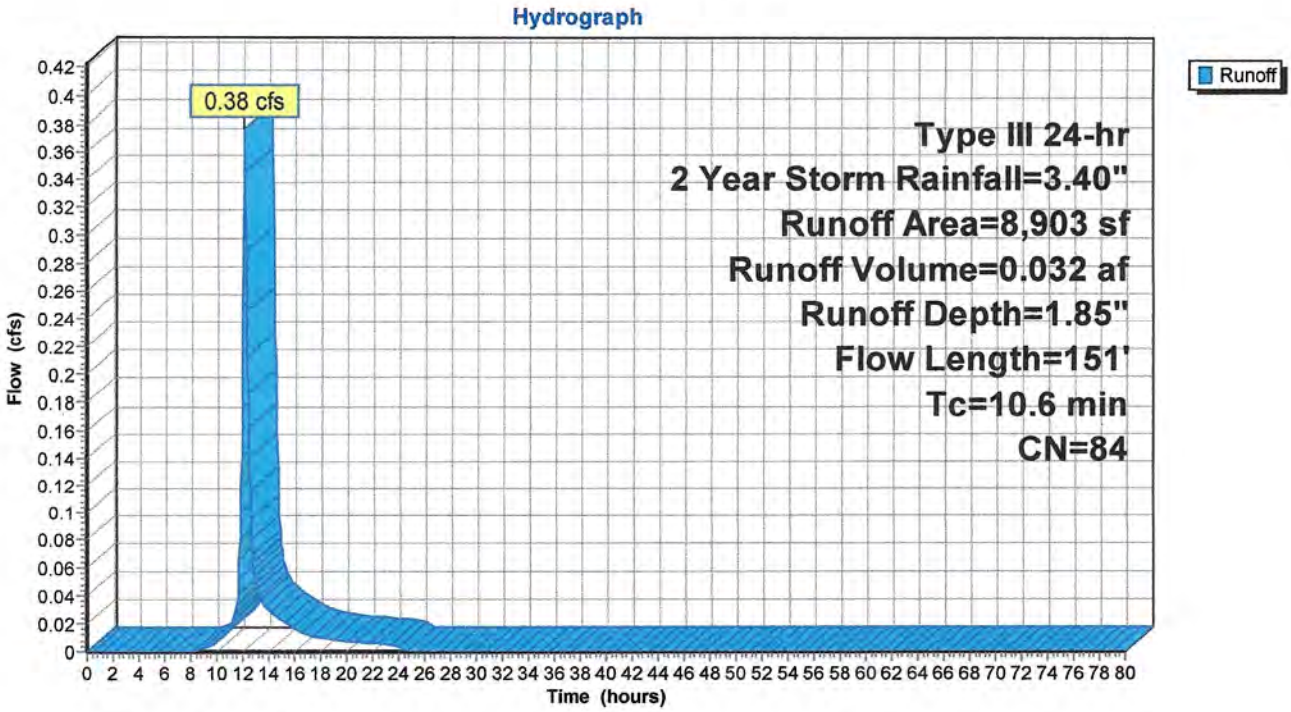
Runoff = 0.38 cfs @ 12.15 hrs, Volume= 0.032 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	1,113	39	>75% Grass cover, Good, HSG A
	2,629	74	>75% Grass cover, Good, HSG C
*	1,982	98	Detention Basin 2, Water Surface, HSG C
	1,807	98	Roofs, HSG A
	1,050	98	Roofs, HSG C
*	292	98	Walls, HSG A
*	30	98	Walls, HSG C
	8,903	84	Weighted Average
	3,742		42.03% Pervious Area
	5,161		57.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0050	0.09		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.40"
1.0	65	0.0050	1.14		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1	36	0.1400	6.02		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
10.6	151	Total			

Subcatchment 5S: DA5



Summary for Subcatchment 6S: DA6 TO WETLANDS

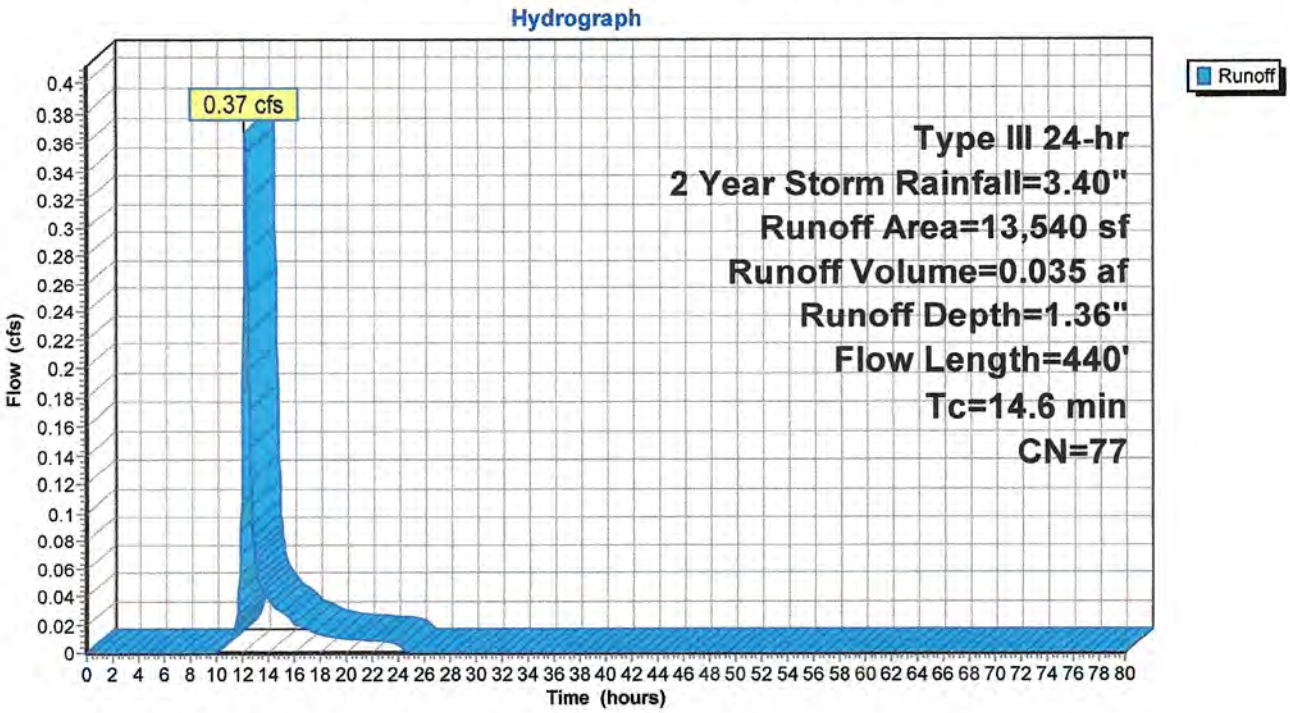
Runoff = 0.37 cfs @ 12.21 hrs, Volume= 0.035 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	353	70	Woods, Good, HSG C
*	4,694	77	Woods-wetland, Good, HSG D
	463	39	>75% Grass cover, Good, HSG A
	5,944	74	>75% Grass cover, Good, HSG C
	1,922	98	Roofs, HSG C
*	164	98	Conc Culvert, HSG D
	13,540	77	Weighted Average
	11,454		84.59% Pervious Area
	2,086		15.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	30	0.0200	0.09		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.40"
0.6	100	0.0180	2.72		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
0.5	90	0.0220	3.01		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
8.2	220	0.0080	0.45		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
14.6	440	Total			

Subcatchment 6S: DA6 TO WETLANDS



Summary for Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET

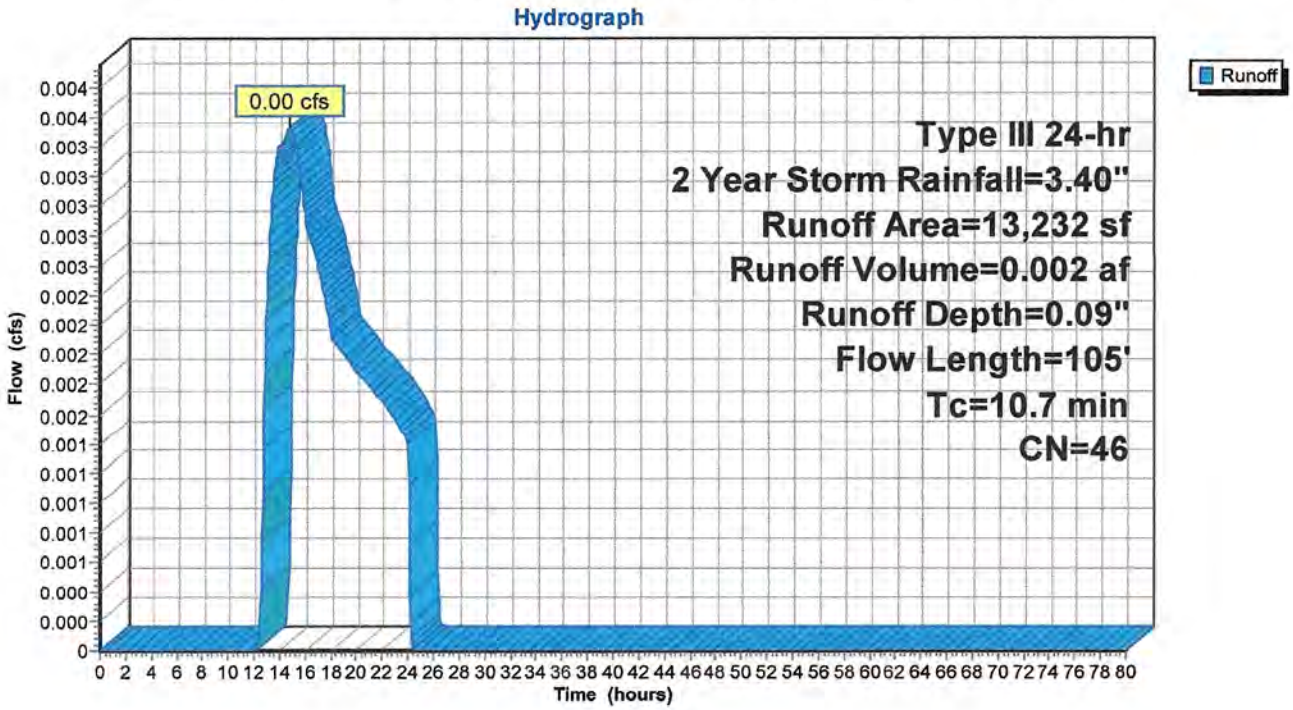
Runoff = 0.00 cfs @ 14.74 hrs, Volume= 0.002 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	11,645	39	>75% Grass cover, Good, HSG A
	959	98	Roofs, HSG A
*	165	98	Walks, HSG A
*	463	98	Walls, HSG A
	13,232	46	Weighted Average
	11,645		88.01% Pervious Area
	1,587		11.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	35	0.0200	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
3.6	15	0.0130	0.07		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
1.1	55	0.0130	0.80		**Shallow Concentrated Flow, GRASS** Short Grass Pasture Kv= 7.0 fps
10.7	105	Total			

Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 8S: DA8 TO 114 ALDEN STREET

[49] Hint: Tc<2dt may require smaller dt

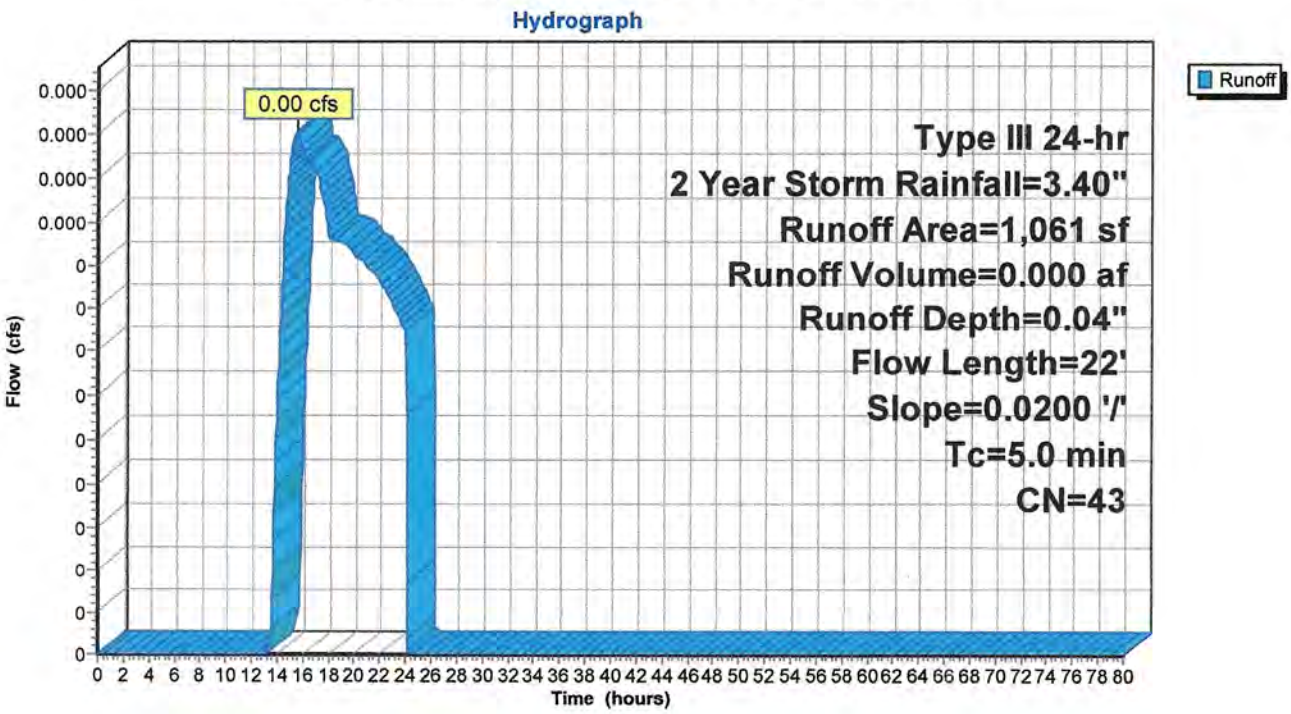
Runoff = 0.00 cfs @ 15.50 hrs, Volume= 0.000 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Storm Rainfall=3.40"

	Area (sf)	CN	Description
	989	39	>75% Grass cover, Good, HSG A
*	72	98	Walls, HSG A
	1,061	43	Weighted Average
	989		93.21% Pervious Area
	72		6.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	22	0.0200	0.09		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
4.1	22	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 8S: DA8 TO 114 ALDEN STREET



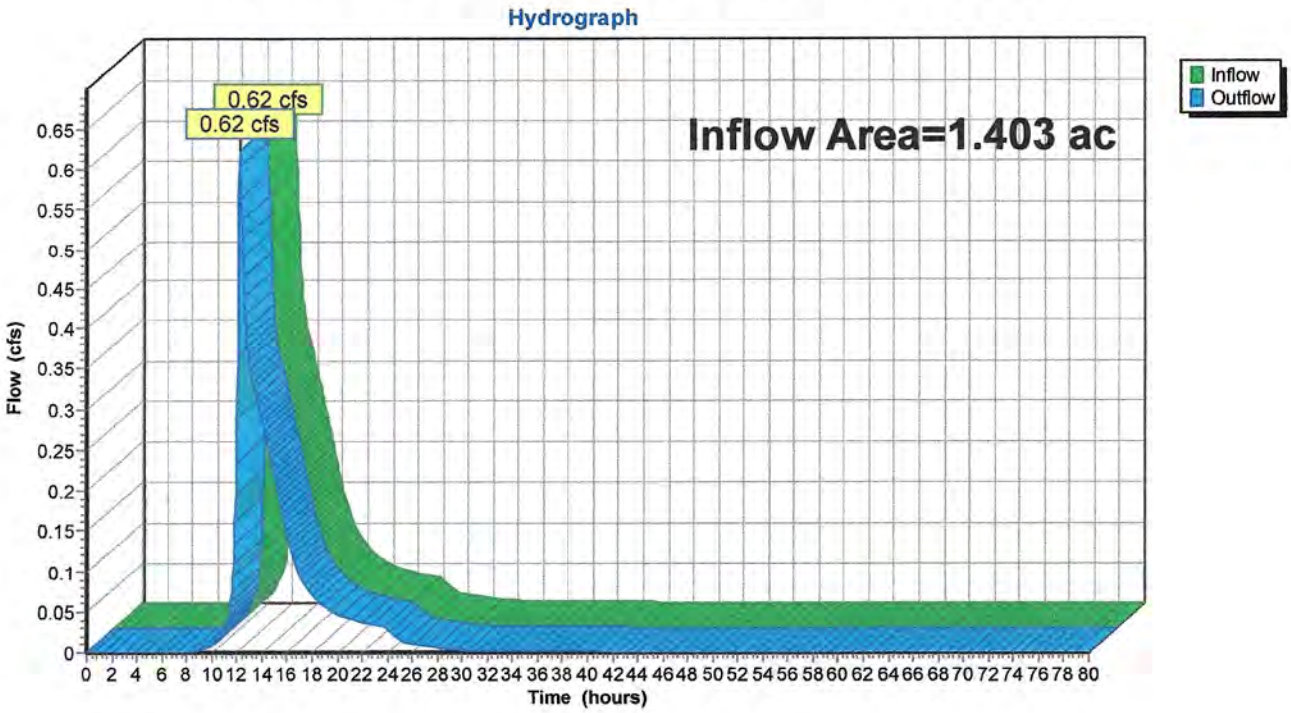
Summary for Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS

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

Inflow Area = 1.403 ac, 58.83% Impervious, Inflow Depth = 1.32" for 2 Year Storm event
Inflow = 0.62 cfs @ 12.22 hrs, Volume= 0.155 af
Outflow = 0.62 cfs @ 12.22 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS



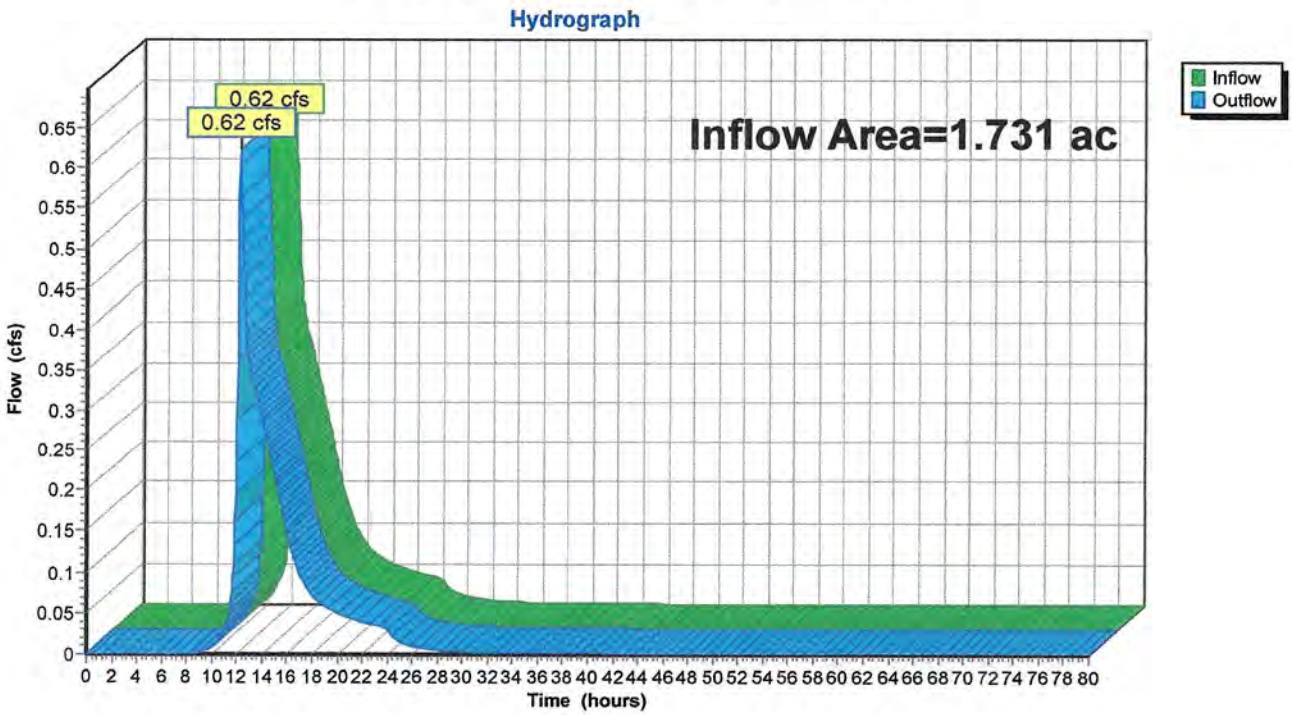
Summary for Reach 2R: TOTAL RUNOFF FROM SITE

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

Inflow Area = 1.731 ac, 49.88% Impervious, Inflow Depth = 1.09" for 2 Year Storm event
Inflow = 0.62 cfs @ 12.22 hrs, Volume= 0.157 af
Outflow = 0.62 cfs @ 12.22 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 2R: TOTAL RUNOFF FROM SITE



Summary for Reach 3R: 8" PVC DRAIN PIPE

[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 8P Primary device # 1 INLET by 0.01'

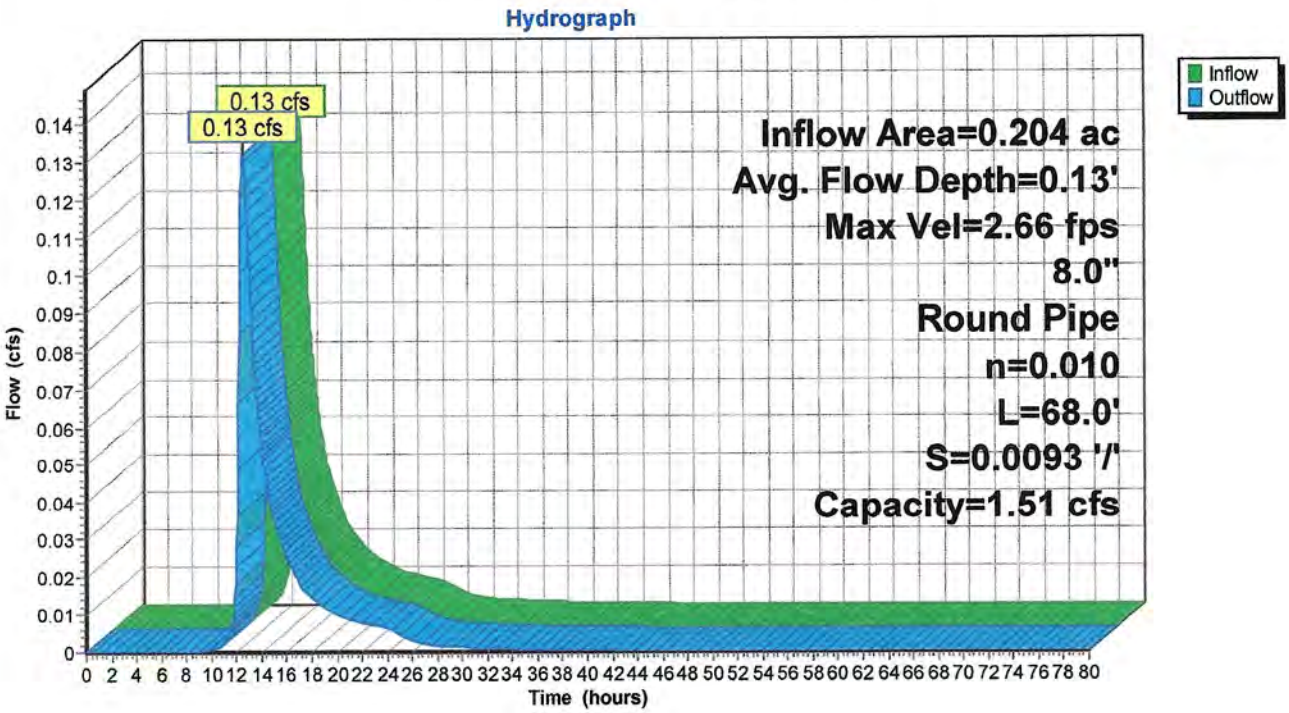
Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 1.85" for 2 Year Storm event
Inflow = 0.13 cfs @ 12.52 hrs, Volume= 0.032 af
Outflow = 0.13 cfs @ 12.53 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.66 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 1.4 min

Peak Storage= 3 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 0.53'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 68.0' Slope= 0.0093 '/'
Inlet Invert= 14.38', Outlet Invert= 13.75'

Reach 3R: 8" PVC DRAIN PIPE



Summary for Pond 1P: CATCH BASIN 1

[57] Hint: Peaked at 16.61' (Flood elevation advised)

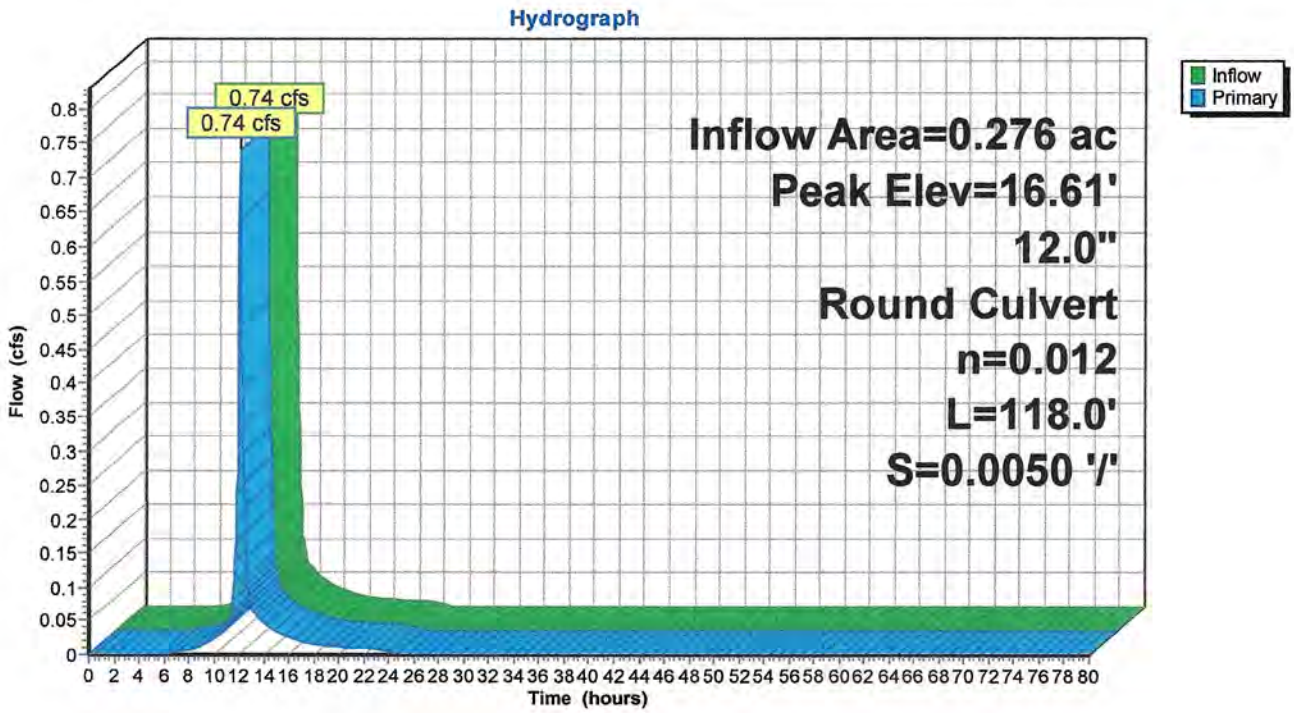
Inflow Area = 0.276 ac, 84.98% Impervious, Inflow Depth = 2.45" for 2 Year Storm event
Inflow = 0.74 cfs @ 12.10 hrs, Volume= 0.056 af
Outflow = 0.74 cfs @ 12.10 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.10 hrs, Volume= 0.056 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.61' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.12'	**12.0" Round CPP_Round 12"** L= 118.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.12' / 15.53' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.10 hrs HW=16.61' (Free Discharge)
↑—**1=CPP_Round 12"** (Barrel Controls 0.74 cfs @ 2.83 fps)

Pond 1P: CATCH BASIN 1



Summary for Pond 2P: CATCH BASIN 2

[57] Hint: Peaked at 16.83' (Flood elevation advised)

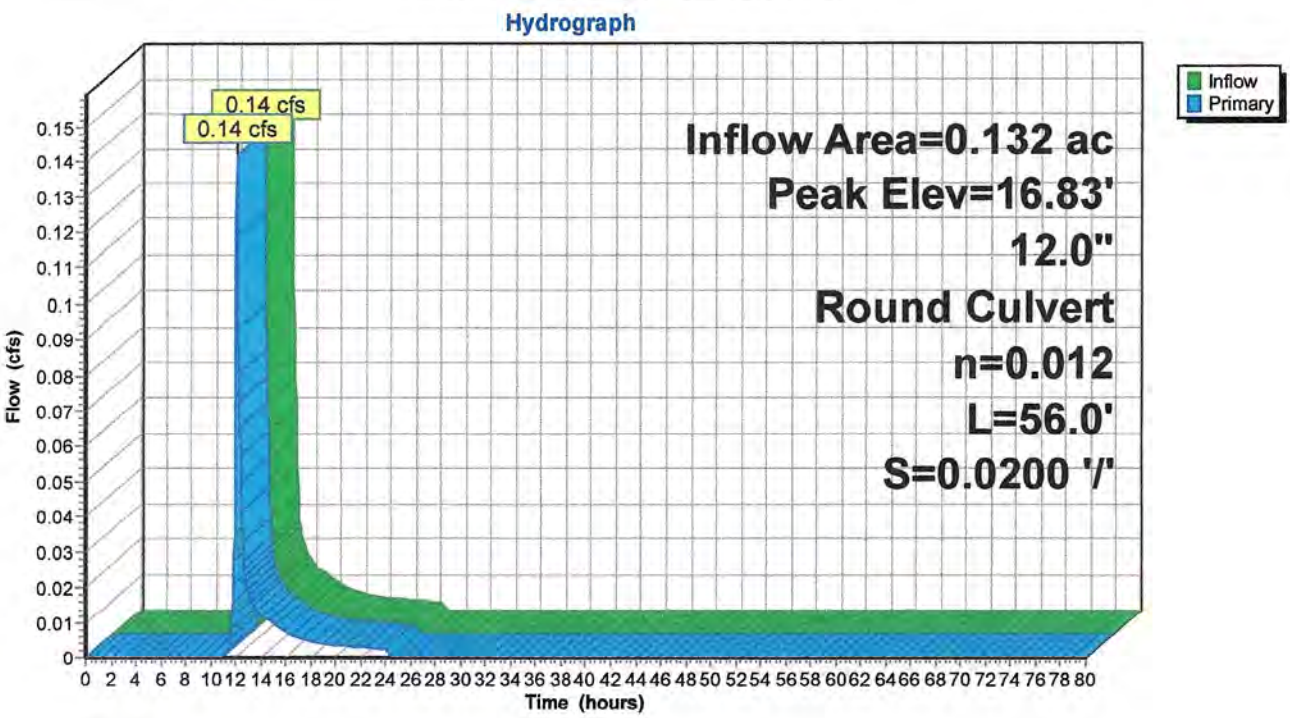
Inflow Area = 0.132 ac, 53.83% Impervious, Inflow Depth = 1.00" for 2 Year Storm event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.011 af
Outflow = 0.14 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.14 cfs @ 12.10 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.83' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.65'	**12.0" Round CPP_Round 12"** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.65' / 15.53' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.14 cfs @ 12.10 hrs HW=16.83' (Free Discharge)
↑—**1=CPP_Round 12"** (Inlet Controls 0.14 cfs @ 1.45 fps)

Pond 2P: CATCH BASIN 2



Summary for Pond 3P: STORMCEPTOR 1 / DMH

[57] Hint: Peaked at 15.81' (Flood elevation advised)
[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.28'
[79] Warning: Submerged Pond 2P Primary device # 1 OUTLET by 0.28'

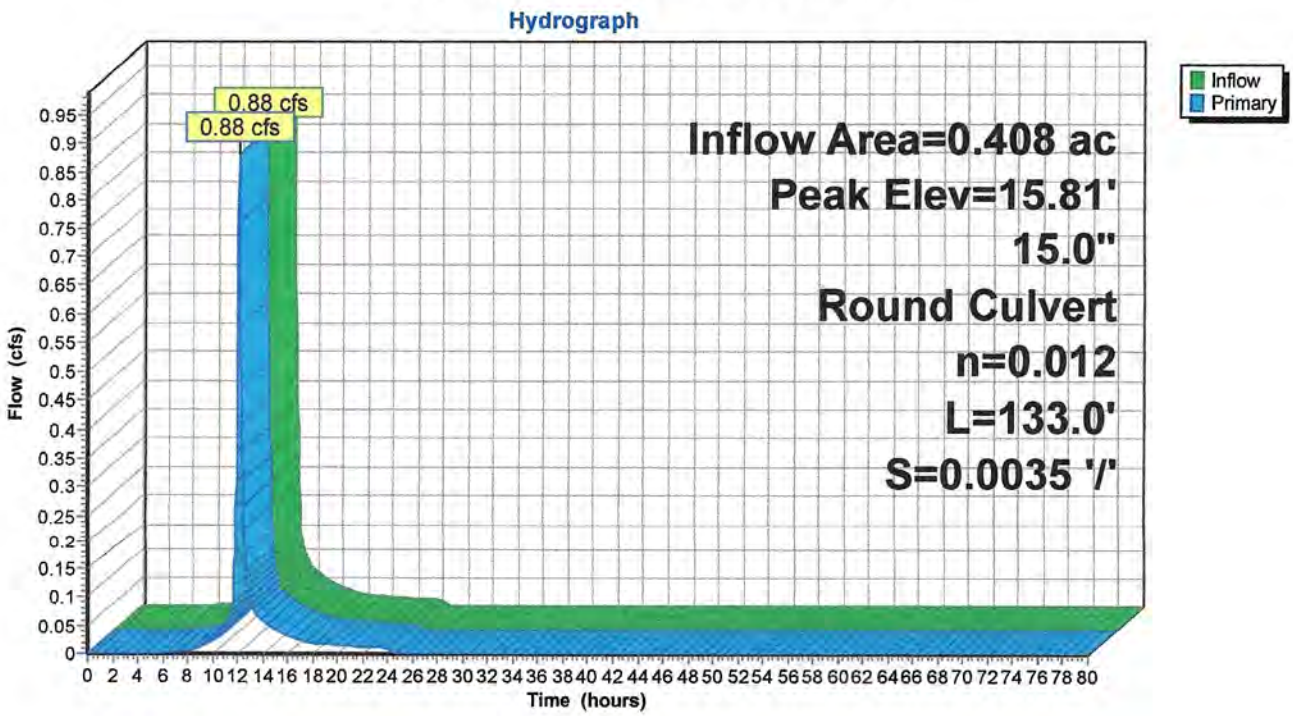
Inflow Area = 0.408 ac, 74.94% Impervious, Inflow Depth = 1.98" for 2 Year Storm event
Inflow = 0.88 cfs @ 12.10 hrs, Volume= 0.067 af
Outflow = 0.88 cfs @ 12.10 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 12.10 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.81' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.28'	**15.0" Round CPP_Round 15"** L= 133.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.28' / 14.81' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.88 cfs @ 12.10 hrs HW=15.81' (Free Discharge)
1=CPP_Round 15" (Barrel Controls 0.88 cfs @ 2.63 fps)

Pond 3P: STORMCEPTOR 1 / DMH



Summary for Pond 4P: DRAIN MANHOLE 1

[57] Hint: Peaked at 15.37' (Flood elevation advised)
[79] Warning: Submerged Pond 3P Primary device # 1 INLET by 0.09'

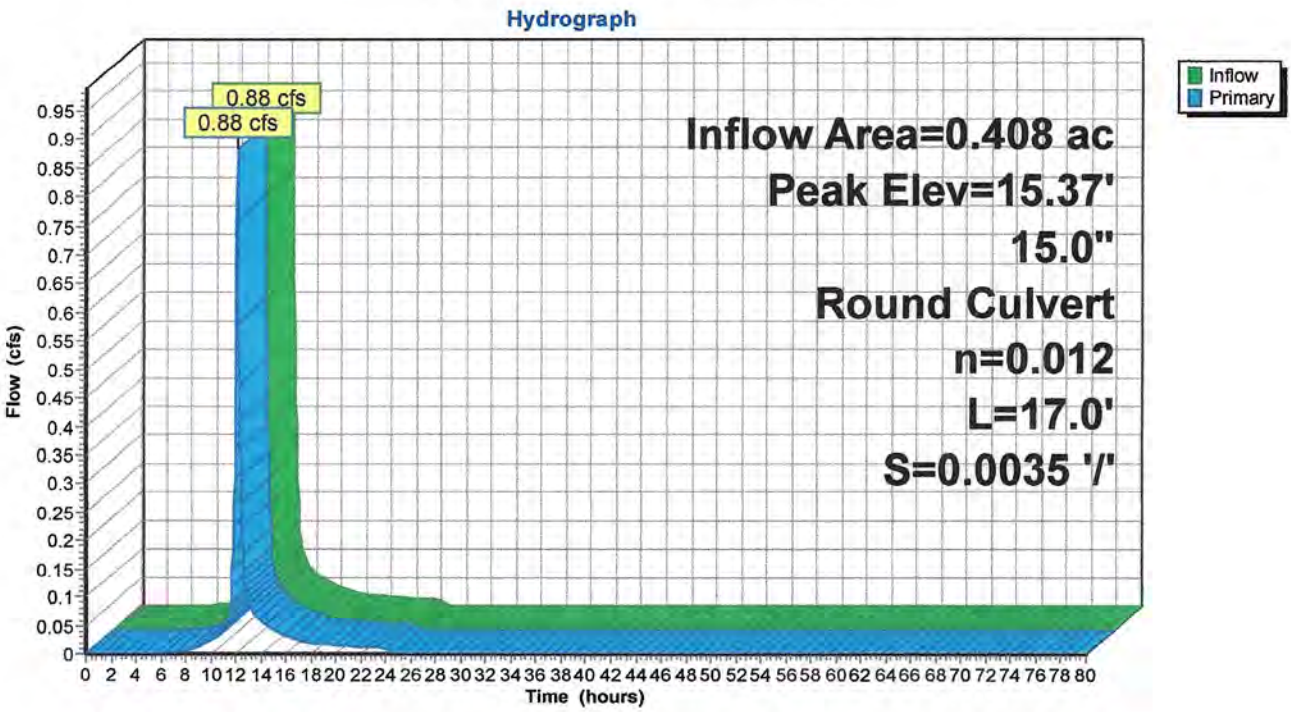
Inflow Area = 0.408 ac, 74.94% Impervious, Inflow Depth = 1.98" for 2 Year Storm event
Inflow = 0.88 cfs @ 12.10 hrs, Volume= 0.067 af
Outflow = 0.88 cfs @ 12.10 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 12.10 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.37' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.81'	**15.0" Round CPP_Round 15"** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 14.81' / 14.75' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.88 cfs @ 12.10 hrs HW=15.37' (Free Discharge)
↑—**1=CPP_Round 15"** (Barrel Controls 0.88 cfs @ 2.42 fps)

Pond 4P: DRAIN MANHOLE 1



Summary for Pond 5P: DETENTION BASIN 1

[62] Hint: Exceeded Reach 3R OUTLET depth by 0.56' @ 12.80 hrs

Inflow Area = 1.092 ac, 71.19% Impervious, Inflow Depth = 1.31" for 2 Year Storm event
Inflow = 1.22 cfs @ 12.10 hrs, Volume= 0.120 af
Outflow = 0.29 cfs @ 12.66 hrs, Volume= 0.120 af, Atten= 76%, Lag= 33.9 min
Primary = 0.29 cfs @ 12.66 hrs, Volume= 0.120 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 14.43' @ 12.66 hrs Surf.Area= 2,591 sf Storage= 1,654 cf

Plug-Flow detention time= 108.7 min calculated for 0.119 af (100% of inflow)
Center-of-Mass det. time= 109.1 min (960.7 - 851.6)

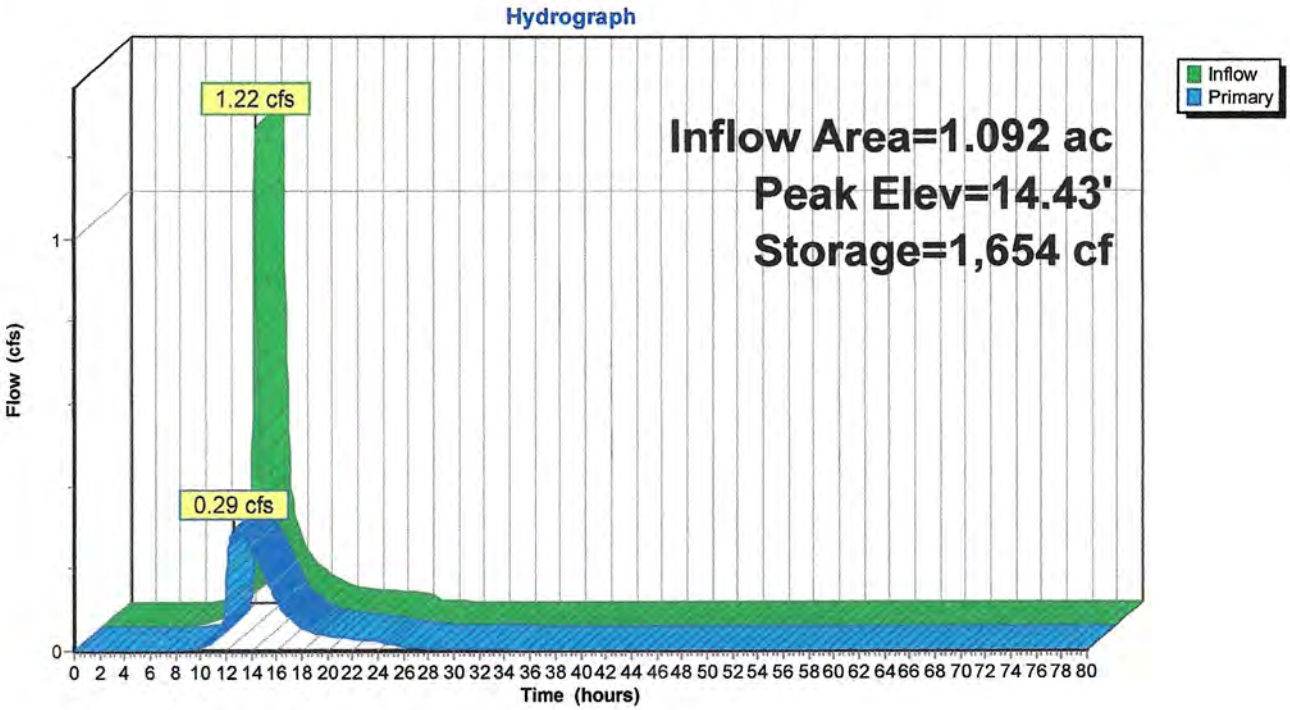
Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	11,218 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
13.75	2,256	0	0	2,256
14.00	2,367	578	578	2,375
15.00	2,897	2,628	3,205	2,935
16.00	3,450	3,169	6,375	3,523
17.00	4,137	3,788	10,163	4,244
17.25	4,302	1,055	11,218	4,419

Device	Routing	Invert	Outlet Devices
#1	Primary	13.75'	**4.0" Round 4" PVC Culvert** L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 13.75' / 13.55' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	15.95'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.29 cfs @ 12.66 hrs HW=14.43' (Free Discharge)
↑—**1=4" PVC Culvert** (Barrel Controls 0.29 cfs @ 3.38 fps)
└—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: DETENTION BASIN 1



Summary for Pond 6P: STORMCEPTOR 2 / CB

[57] Hint: Peaked at 17.55' (Flood elevation advised)

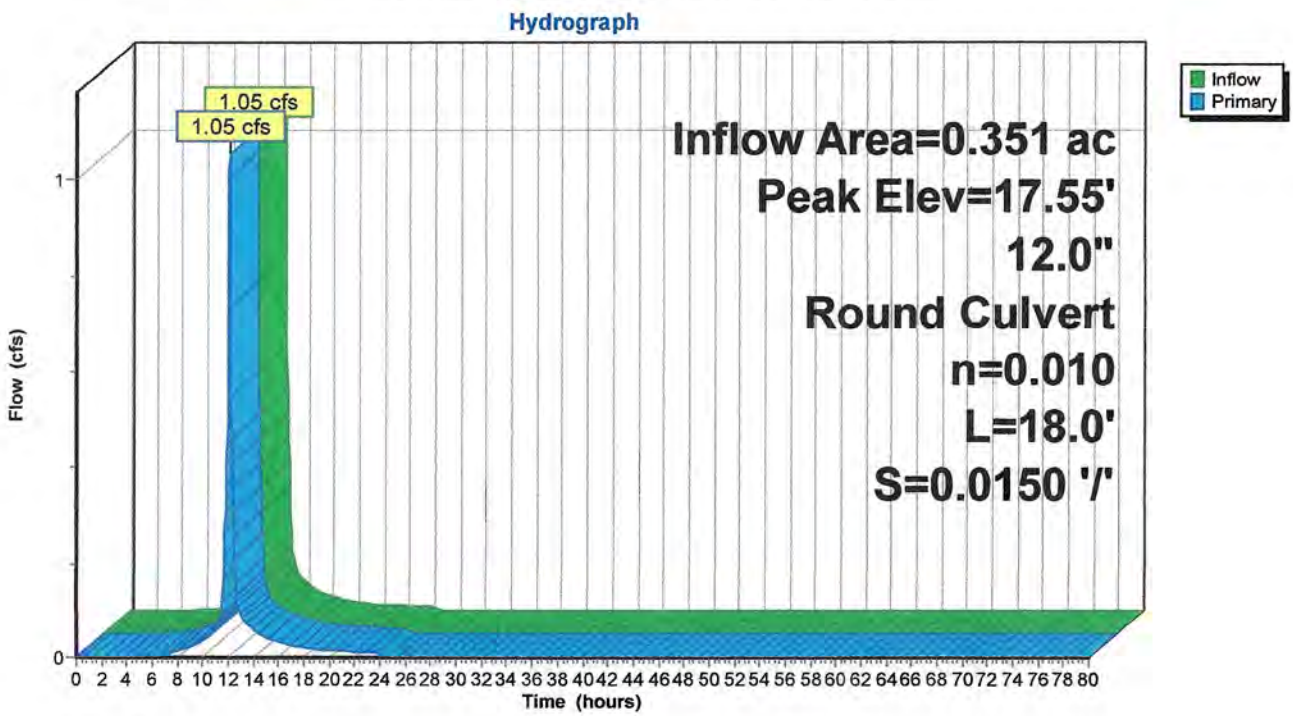
Inflow Area = 0.351 ac, 83.57% Impervious, Inflow Depth = 2.64" for 2 Year Storm event
Inflow = 1.05 cfs @ 12.07 hrs, Volume= 0.077 af
Outflow = 1.05 cfs @ 12.07 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min
Primary = 1.05 cfs @ 12.07 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 17.55' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.02'	**12.0" Round CMP_Round 12"** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.02' / 16.75' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.01 cfs @ 12.07 hrs HW=17.54' (Free Discharge)
↑—1=CMP_Round 12" (Inlet Controls 1.01 cfs @ 2.46 fps)

Pond 6P: STORMCEPTOR 2 / CB



Summary for Pond 7P: INFILTRATION SYSTEM

Inflow Area = 0.351 ac, 83.57% Impervious, Inflow Depth = 2.64" for 2 Year Storm event
Inflow = 1.05 cfs @ 12.07 hrs, Volume= 0.077 af
Outflow = 0.03 cfs @ 15.70 hrs, Volume= 0.077 af, Atten= 97%, Lag= 217.6 min
Discarded = 0.03 cfs @ 15.70 hrs, Volume= 0.077 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.73' @ 15.70 hrs Surf.Area= 2,673 sf Storage= 1,939 cf

Plug-Flow detention time= 526.4 min calculated for 0.077 af (100% of inflow)
Center-of-Mass det. time= 526.6 min (1,316.2 - 789.7)

Volume	Invert	Avail.Storage	Storage Description
#1	15.50'	1,595 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 7,137 cf Overall - 3,149 cf Embedded = 3,988 cf x 40.0% Voids
#2	15.83'	2,683 cf	**24.0" Round CMP_Round 24"** Inside #1 L= 854.0' 3,149 cf Overall - 1.0" Wall Thickness = 2,683 cf
		4,278 cf	Total Available Storage

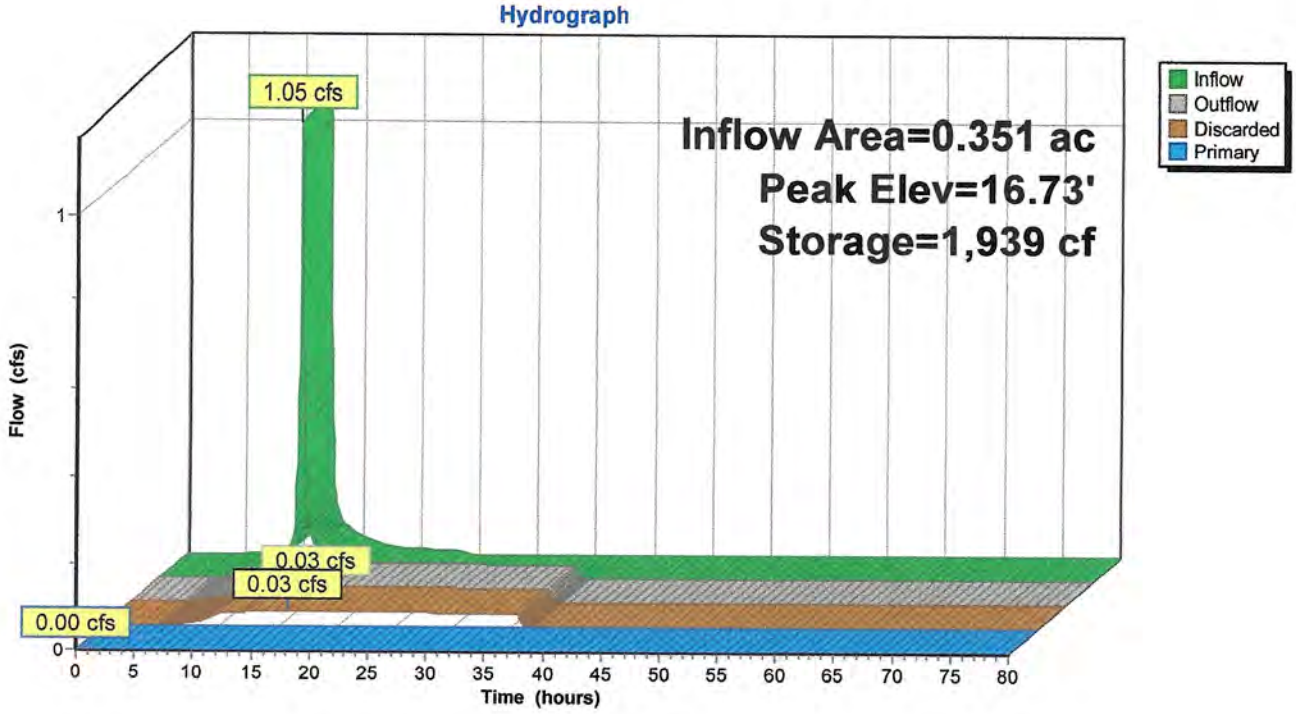
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
15.50	2,673	0	0	2,673
15.83	2,673	882	882	2,733
16.00	2,673	454	1,337	2,765
17.00	2,673	2,673	4,010	2,948
17.83	2,673	2,219	6,228	3,100
18.00	2,673	454	6,683	3,131
18.17	2,673	454	7,137	3,162

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.50'	**0.520 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	17.68'	**6.0" Round PVC_Round 6"** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.68' / 15.95' S= 0.0577 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.03 cfs @ 15.70 hrs HW=16.73' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.50' (Free Discharge)
↑—**2=PVC_Round 6"** (Controls 0.00 cfs)

Pond 7P: INFILTRATION SYSTEM



Summary for Pond 8P: DETENTION BASIN 2

Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 1.85" for 2 Year Storm event
Inflow = 0.38 cfs @ 12.15 hrs, Volume= 0.032 af
Outflow = 0.13 cfs @ 12.52 hrs, Volume= 0.032 af, Atten= 65%, Lag= 21.8 min
Primary = 0.13 cfs @ 12.52 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 14.78' @ 12.52 hrs Surf.Area= 1,818 sf Storage= 492 cf

Plug-Flow detention time= 123.2 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 123.0 min (954.0 - 831.1)

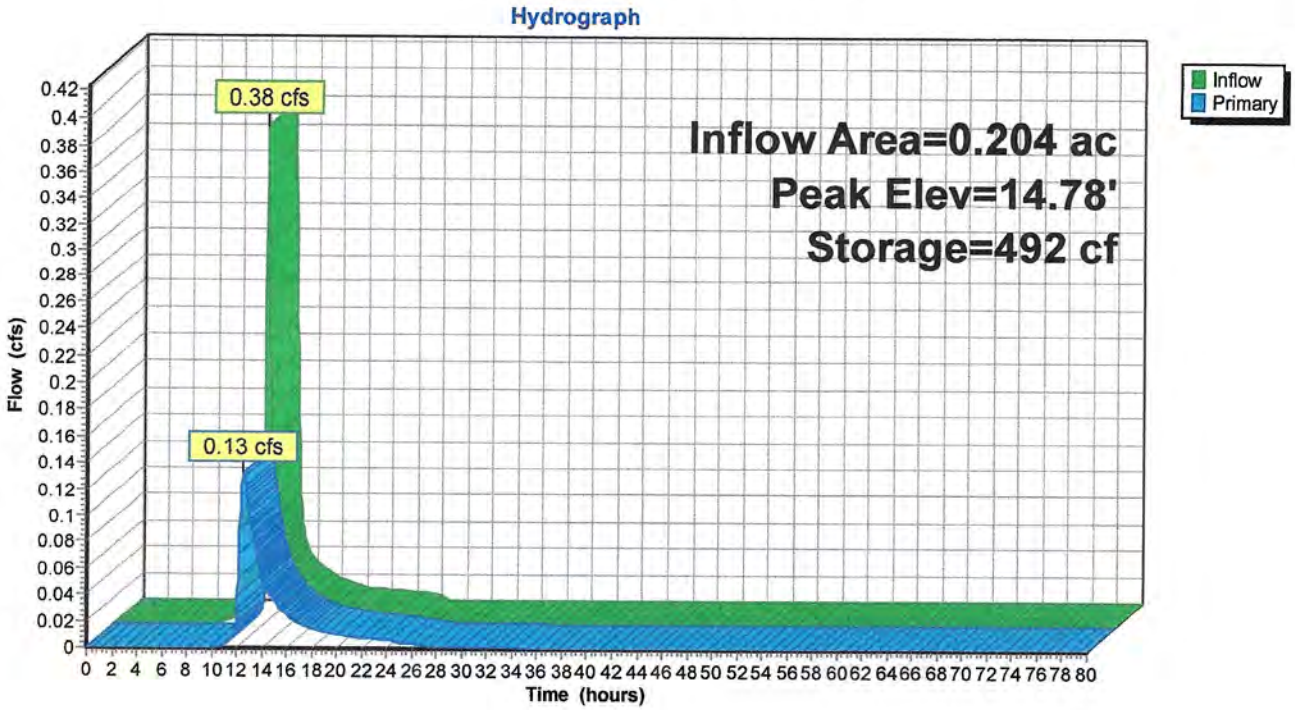
Volume	Invert	Avail.Storage	Storage Description
#1	14.50'	6,448 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
14.50	1,712	0	0	1,712
15.00	1,904	904	904	1,918
16.00	2,370	2,133	3,036	2,412
17.00	2,952	2,656	5,692	3,022
17.25	3,098	756	6,448	3,176

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**4.0" Round 4" PVC Culvert** L= 12.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 14.38' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	16.25'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.13 cfs @ 12.52 hrs HW=14.78' (Free Discharge)
↑—**1=4" PVC Culvert** (Barrel Controls 0.13 cfs @ 2.30 fps)
└—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: DETENTION BASIN 2



Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 TO RAILROAD AVE Runoff Area=12,039 sf 84.98% Impervious Runoff Depth=3.79"
Flow Length=157' Tc=7.0 min CN=91 Runoff=1.12 cfs 0.087 af

Subcatchment 2S: DA2 TO RAILROAD AVE Runoff Area=5,729 sf 53.83% Impervious Runoff Depth=1.97"
Flow Length=100' Tc=5.7 min CN=71 Runoff=0.29 cfs 0.022 af

Subcatchment 3S: DA3 Runoff Area=5,613 sf 46.59% Impervious Runoff Depth=3.18"
Tc=5.0 min CN=85 Runoff=0.48 cfs 0.034 af

Subcatchment 4S: DA4 Runoff Area=15,291 sf 83.57% Impervious Runoff Depth=4.00"
Flow Length=225' Slope=0.0050 '/' Tc=5.0 min CN=93 Runoff=1.56 cfs 0.117 af

Subcatchment 5S: DA5 Runoff Area=8,903 sf 57.97% Impervious Runoff Depth=3.09"
Flow Length=151' Tc=10.6 min CN=84 Runoff=0.63 cfs 0.053 af

Subcatchment 6S: DA6 TO WETLANDS Runoff Area=13,540 sf 15.41% Impervious Runoff Depth=2.46"
Flow Length=440' Tc=14.6 min CN=77 Runoff=0.68 cfs 0.064 af

Subcatchment 7S: DA7 TO RAILROAD Runoff Area=13,232 sf 11.99% Impervious Runoff Depth=0.42"
Flow Length=105' Tc=10.7 min CN=46 Runoff=0.06 cfs 0.011 af

Subcatchment 8S: DA8 TO 114 ALDEN STREET Runoff Area=1,061 sf 6.79% Impervious Runoff Depth=0.30"
Flow Length=22' Slope=0.0200 '/' Tc=5.0 min CN=43 Runoff=0.00 cfs 0.001 af

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS Inflow=1.03 cfs 0.259 af
Outflow=1.03 cfs 0.259 af

Reach 2R: TOTAL RUNOFF FROM SITE Inflow=1.07 cfs 0.271 af
Outflow=1.07 cfs 0.271 af

Reach 3R: 8" PVC DRAIN PIPE Avg. Flow Depth=0.17' Max Vel=3.08 fps Inflow=0.22 cfs 0.053 af
8.0" Round Pipe n=0.010 L=68.0' S=0.0093 '/' Capacity=1.51 cfs Outflow=0.22 cfs 0.053 af

Pond 1P: CATCH BASIN 1 Peak Elev=16.74' Inflow=1.12 cfs 0.087 af
12.0" Round Culvert n=0.012 L=118.0' S=0.0050 '/' Outflow=1.12 cfs 0.087 af

Pond 2P: CATCH BASIN 2 Peak Elev=16.92' Inflow=0.29 cfs 0.022 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0200 '/' Outflow=0.29 cfs 0.022 af

Pond 3P: STORMCEPTOR 1 / DMH Peak Elev=15.97' Inflow=1.42 cfs 0.109 af
15.0" Round Culvert n=0.012 L=133.0' S=0.0035 '/' Outflow=1.42 cfs 0.109 af

Pond 4P: DRAIN MANHOLE 1 Peak Elev=15.54' Inflow=1.42 cfs 0.109 af
15.0" Round Culvert n=0.012 L=17.0' S=0.0035 '/' Outflow=1.42 cfs 0.109 af

Pond 5P: DETENTION BASIN 1 Peak Elev=14.90' Storage=2,917 cf Inflow=2.00 cfs 0.196 af
Outflow=0.40 cfs 0.196 af

Pond 6P: STORMCEPTOR 2 / CB Peak Elev=17.69' Inflow=1.56 cfs 0.117 af
12.0" Round Culvert n=0.010 L=18.0' S=0.0150 '/' Outflow=1.56 cfs 0.117 af

Pond 7P: INFILTRATION SYSTEM Peak Elev=17.42' Storage=3,296 cf Inflow=1.56 cfs 0.117 af
Discarded=0.04 cfs 0.117 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.117 af

Pond 8P: DETENTION BASIN 2 Peak Elev=14.94' Storage=794 cf Inflow=0.63 cfs 0.053 af
Outflow=0.22 cfs 0.053 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.388 af Average Runoff Depth = 2.69"
50.12% Pervious = 0.868 ac 49.88% Impervious = 0.864 ac

Summary for Subcatchment 1S: DA1 TO RAILROAD AVE

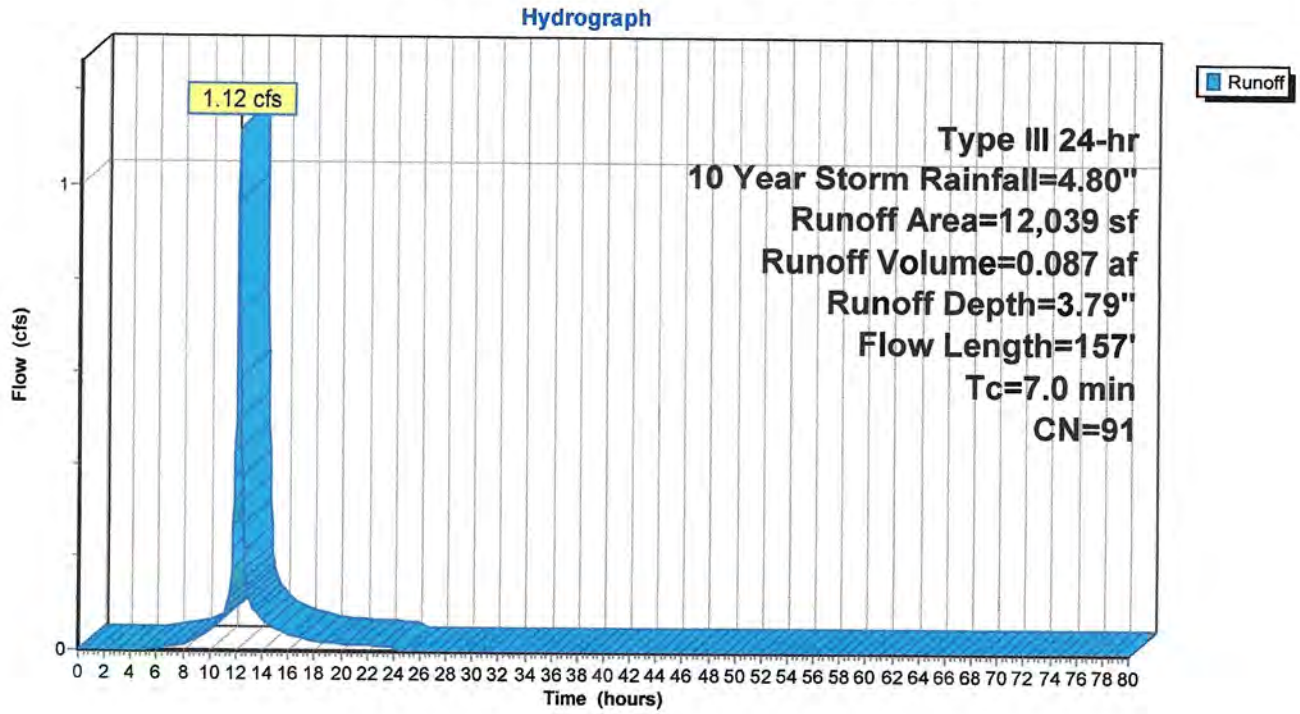
Runoff = 1.12 cfs @ 12.10 hrs, Volume= 0.087 af, Depth= 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	1,270	39	>75% Grass cover, Good, HSG A
	538	74	>75% Grass cover, Good, HSG C
*	7,805	98	Paved street, dwys, parking, curbs HSG A
	449	98	Paved parking, HSG C
*	292	98	Sidewalks, HSG A
*	146	98	Sidewalks, HSG C
	1,028	98	Roofs, HSG A
	511	98	Roofs, HSG C
	12,039	91	Weighted Average
	1,808		15.02% Pervious Area
	10,231		84.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	28	0.0150	0.08		**Sheet Flow, GRASS**
					Grass: Dense n= 0.240 P2= 3.40"
0.5	24	0.0100	0.81		**Sheet Flow, PAVED**
					Smooth surfaces n= 0.011 P2= 3.40"
0.9	105	0.0090	1.93		**Shallow Concentrated Flow, PAVED**
					Paved Kv= 20.3 fps
7.0	157	Total			

Subcatchment 1S: DA1 TO RAILROAD AVE



Summary for Subcatchment 2S: DA2 TO RAILROAD AVE

[49] Hint: Tc<2dt may require smaller dt

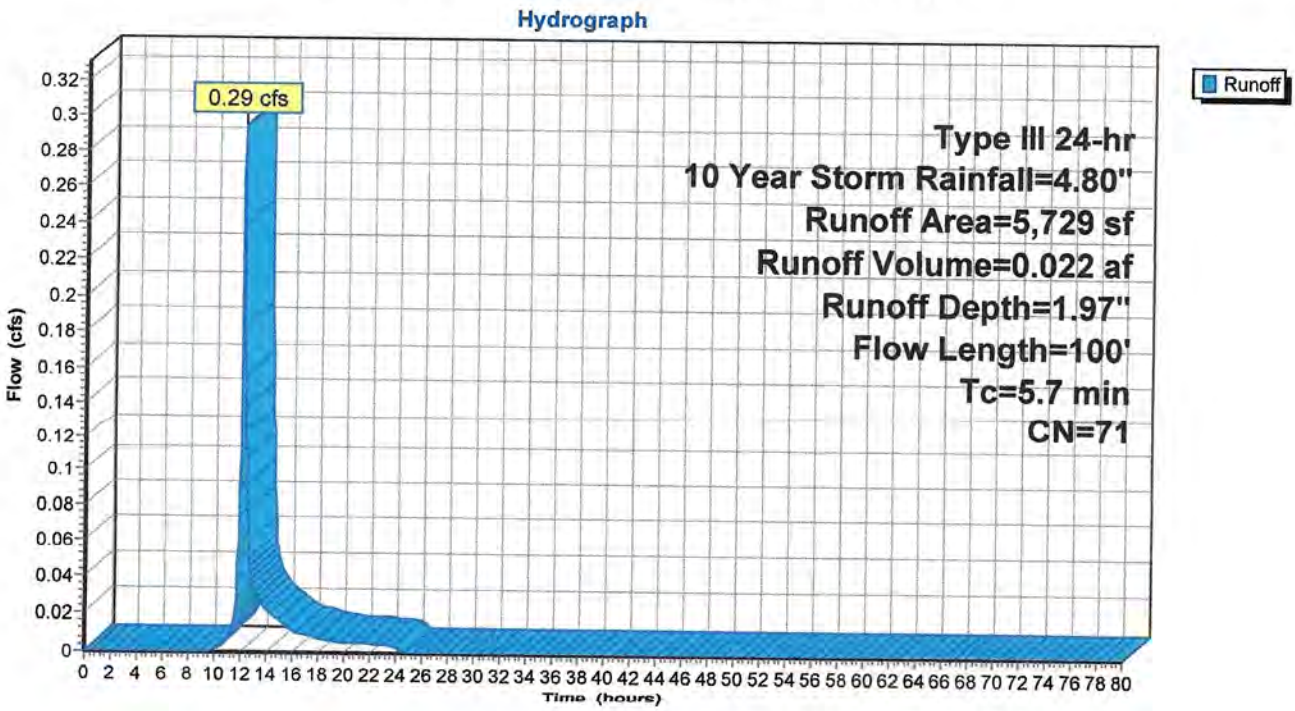
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.022 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	2,645	39	>75% Grass cover, Good, HSG A
*	3,084	98	Paved sreet, driveway, HSG A
	5,729	71	Weighted Average
	2,645		46.17% Pervious Area
	3,084		53.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	28	0.0250	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
0.5	22	0.0100	0.79		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
0.6	50	0.0050	1.44		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
5.7	100	Total			

Subcatchment 2S: DA2 TO RAILROAD AVE



Summary for Subcatchment 3S: DA3

[49] Hint: Tc<2dt may require smaller dt

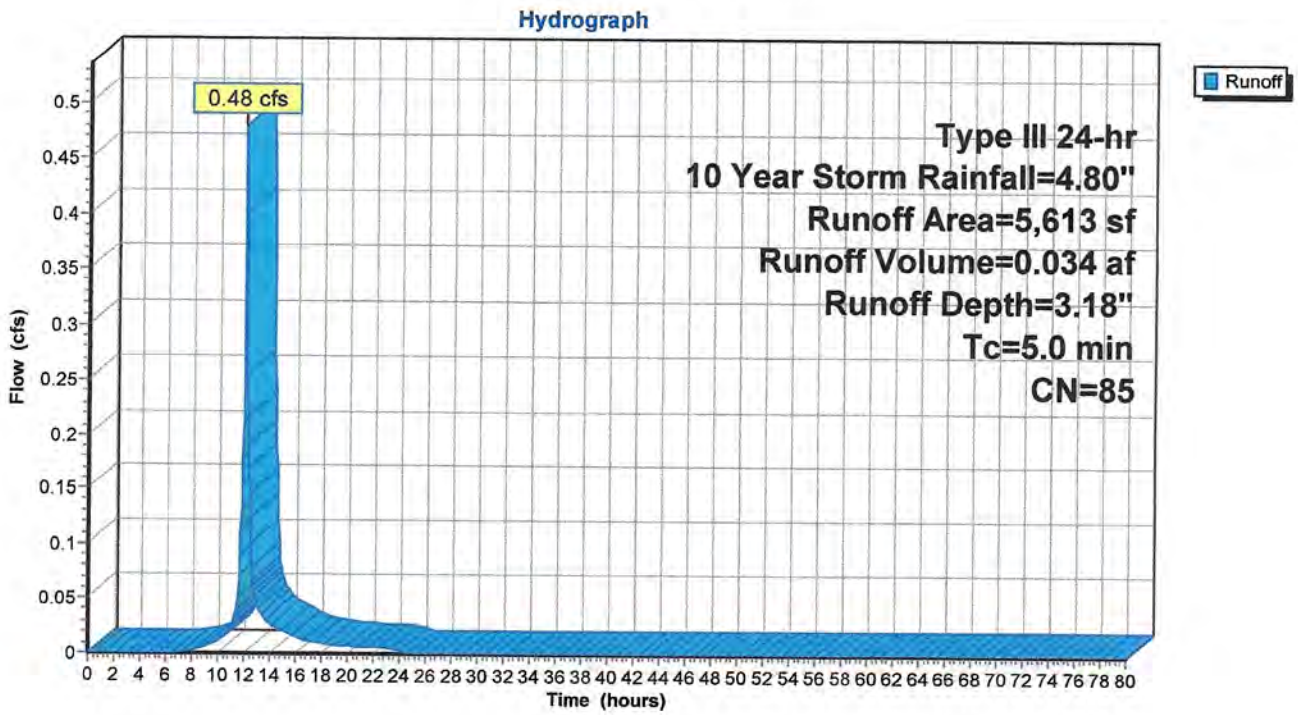
Runoff = 0.48 cfs @ 12.07 hrs, Volume= 0.034 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	2,998	74	>75% Grass cover, Good, HSG C
*	2,615	98	Detention Basin 1, Water Surface, HSG C
	5,613	85	Weighted Average
	2,998		53.41% Pervious Area
	2,615		46.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DETENTION BASIN 1**

Subcatchment 3S: DA3



Summary for Subcatchment 4S: DA4

[49] Hint: Tc<2dt may require smaller dt

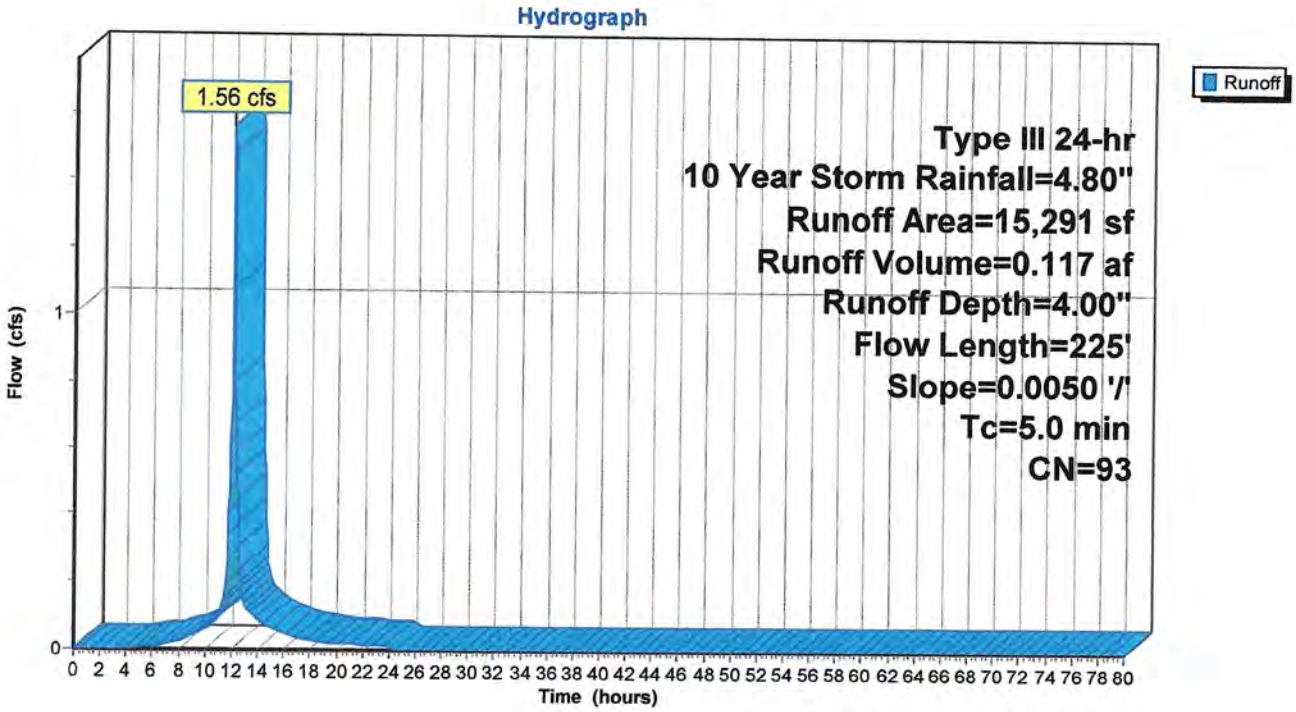
Runoff = 1.56 cfs @ 12.07 hrs, Volume= 0.117 af, Depth= 4.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	250	39	>75% Grass cover, Good, HSG A
	2,262	74	>75% Grass cover, Good, HSG C
	490	98	Roofs, HSG A
	4,174	98	Roofs, HSG C
*	149	98	Paved parking, dwy, curbs, HSG A
*	6,878	98	Paved parking, dwy, curbs, HSG C
*	97	98	Sidewalks, HSG A
*	991	98	Sidewalks, HSG C
	15,291	93	Weighted Average
	2,512		16.43% Pervious Area
	12,779		83.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.71		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
2.0	175	0.0050	1.44		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
3.2	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: DA4



Summary for Subcatchment 5S: DA5

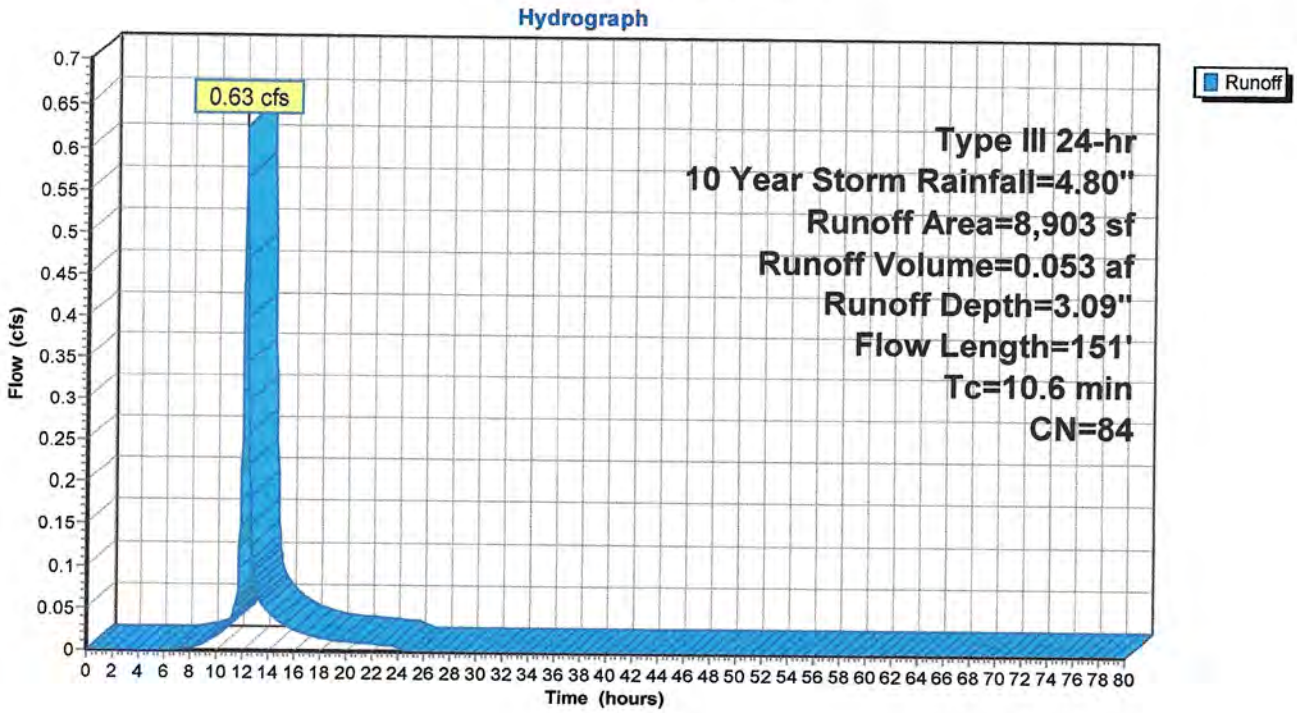
Runoff = 0.63 cfs @ 12.15 hrs, Volume= 0.053 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	1,113	39	>75% Grass cover, Good, HSG A
	2,629	74	>75% Grass cover, Good, HSG C
*	1,982	98	Detention Basin 2, Water Surface, HSG C
	1,807	98	Roofs, HSG A
	1,050	98	Roofs, HSG C
*	292	98	Walls, HSG A
*	30	98	Walls, HSG C
	8,903	84	Weighted Average
	3,742		42.03% Pervious Area
	5,161		57.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0050	0.09		**Sheet Flow, grass**
					Grass: Short n= 0.150 P2= 3.40"
1.0	65	0.0050	1.14		**Shallow Concentrated Flow, Grass**
					Unpaved Kv= 16.1 fps
0.1	36	0.1400	6.02		**Shallow Concentrated Flow, Grass**
					Unpaved Kv= 16.1 fps
10.6	151	Total			

Subcatchment 5S: DA5



Summary for Subcatchment 6S: DA6 TO WETLANDS

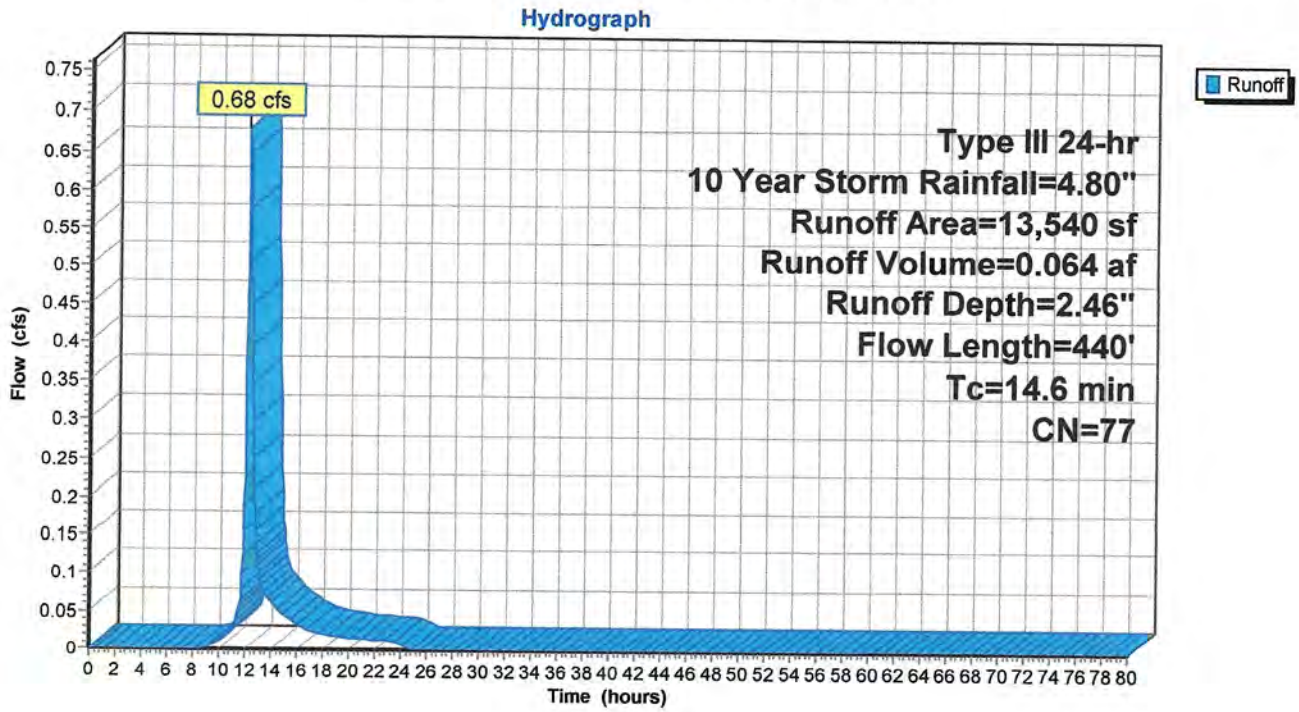
Runoff = 0.68 cfs @ 12.21 hrs, Volume= 0.064 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	353	70	Woods, Good, HSG C
*	4,694	77	Woods-wetland, Good, HSG D
	463	39	>75% Grass cover, Good, HSG A
	5,944	74	>75% Grass cover, Good, HSG C
	1,922	98	Roofs, HSG C
*	164	98	Conc Culvert, HSG D
	13,540	77	Weighted Average
	11,454		84.59% Pervious Area
	2,086		15.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	30	0.0200	0.09		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.40"
0.6	100	0.0180	2.72		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
0.5	90	0.0220	3.01		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
8.2	220	0.0080	0.45		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
14.6	440	Total			

Subcatchment 6S: DA6 TO WETLANDS



Summary for Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET

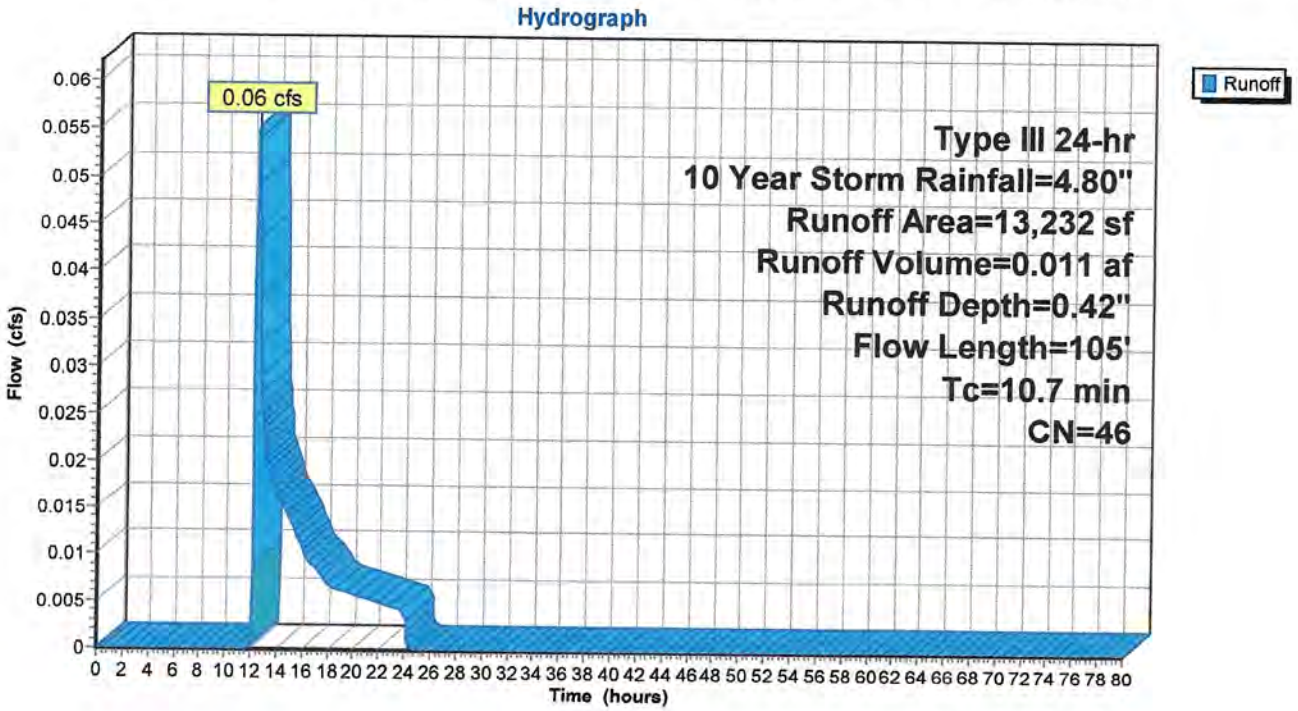
Runoff = 0.06 cfs @ 12.38 hrs, Volume= 0.011 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	11,645	39	>75% Grass cover, Good, HSG A
	959	98	Roofs, HSG A
*	165	98	Walks, HSG A
*	463	98	Walls, HSG A
	13,232	46	Weighted Average
	11,645		88.01% Pervious Area
	1,587		11.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	35	0.0200	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
3.6	15	0.0130	0.07		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
1.1	55	0.0130	0.80		**Shallow Concentrated Flow, GRASS** Short Grass Pasture Kv= 7.0 fps
10.7	105	Total			

Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 8S: DA8 TO 114 ALDEN STREET

[49] Hint: Tc<2dt may require smaller dt

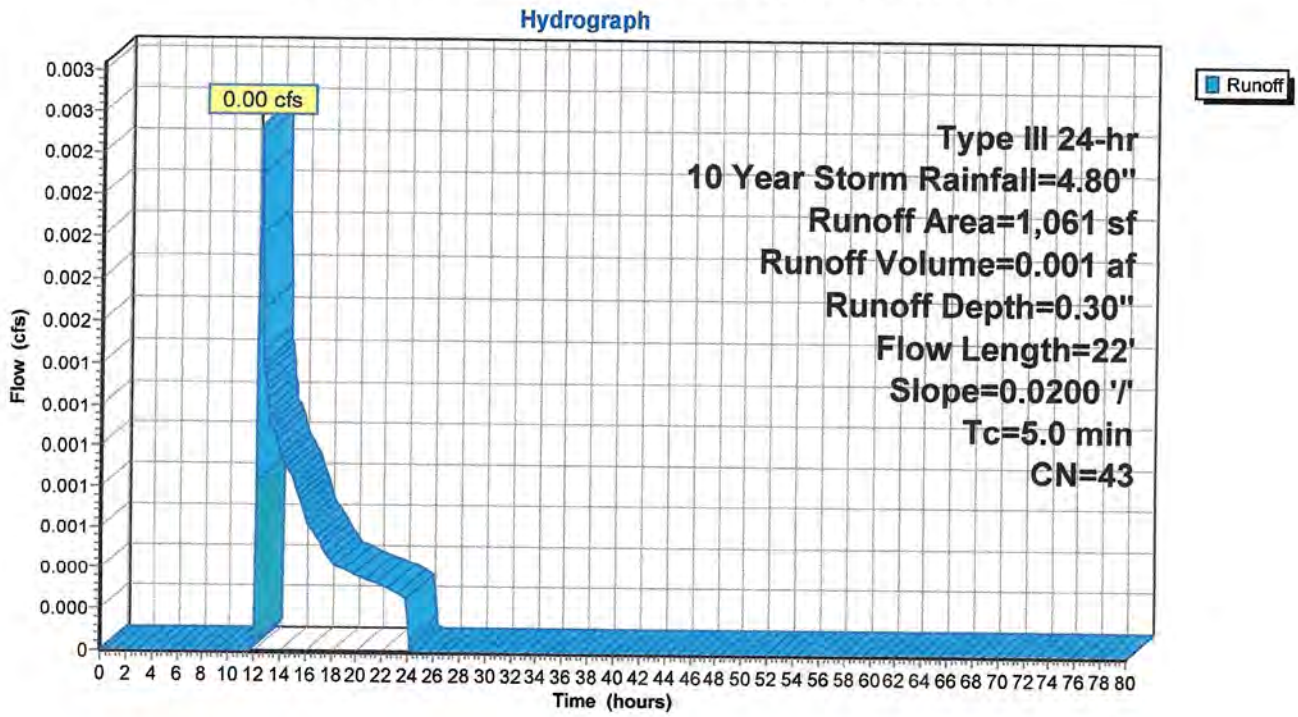
Runoff = 0.00 cfs @ 12.36 hrs, Volume= 0.001 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Storm Rainfall=4.80"

	Area (sf)	CN	Description
	989	39	>75% Grass cover, Good, HSG A
*	72	98	Walls, HSG A
	1,061	43	Weighted Average
	989		93.21% Pervious Area
	72		6.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	22	0.0200	0.09		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
4.1	22	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 8S: DA8 TO 114 ALDEN STREET



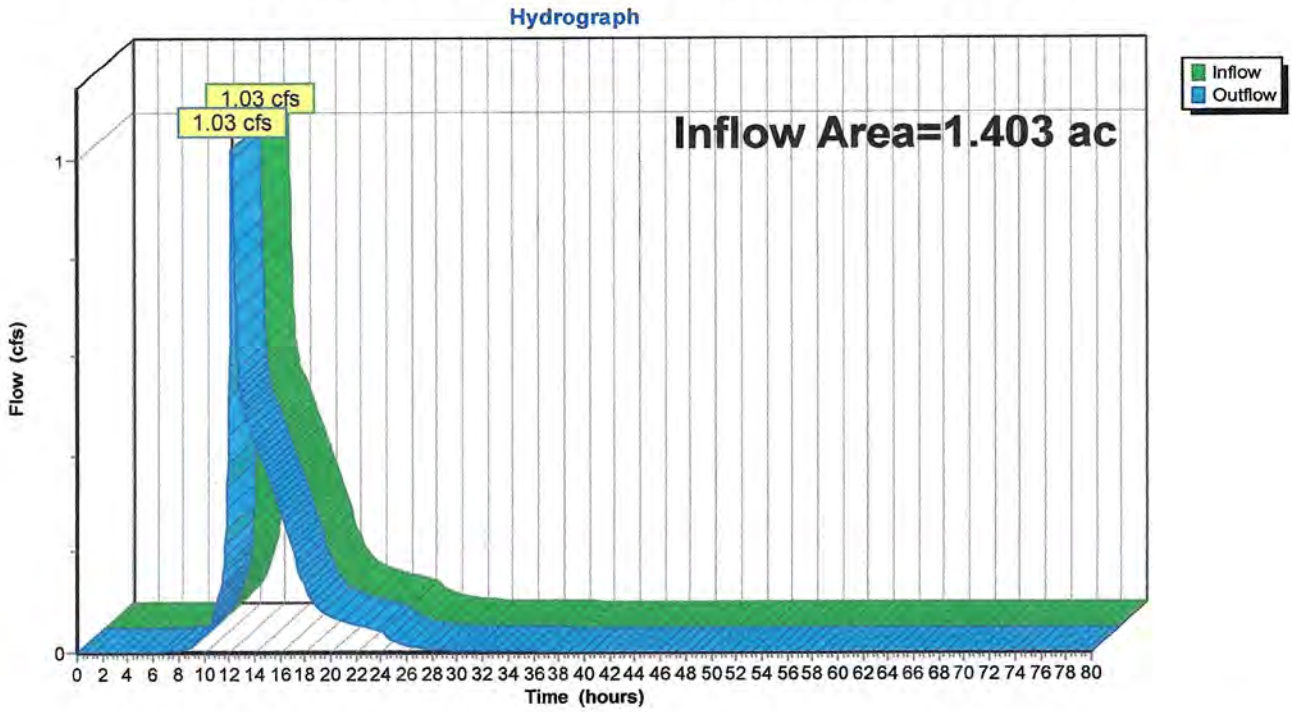
Summary for Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS

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

Inflow Area = 1.403 ac, 58.83% Impervious, Inflow Depth = 2.22" for 10 Year Storm event
Inflow = 1.03 cfs @ 12.22 hrs, Volume= 0.259 af
Outflow = 1.03 cfs @ 12.22 hrs, Volume= 0.259 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS



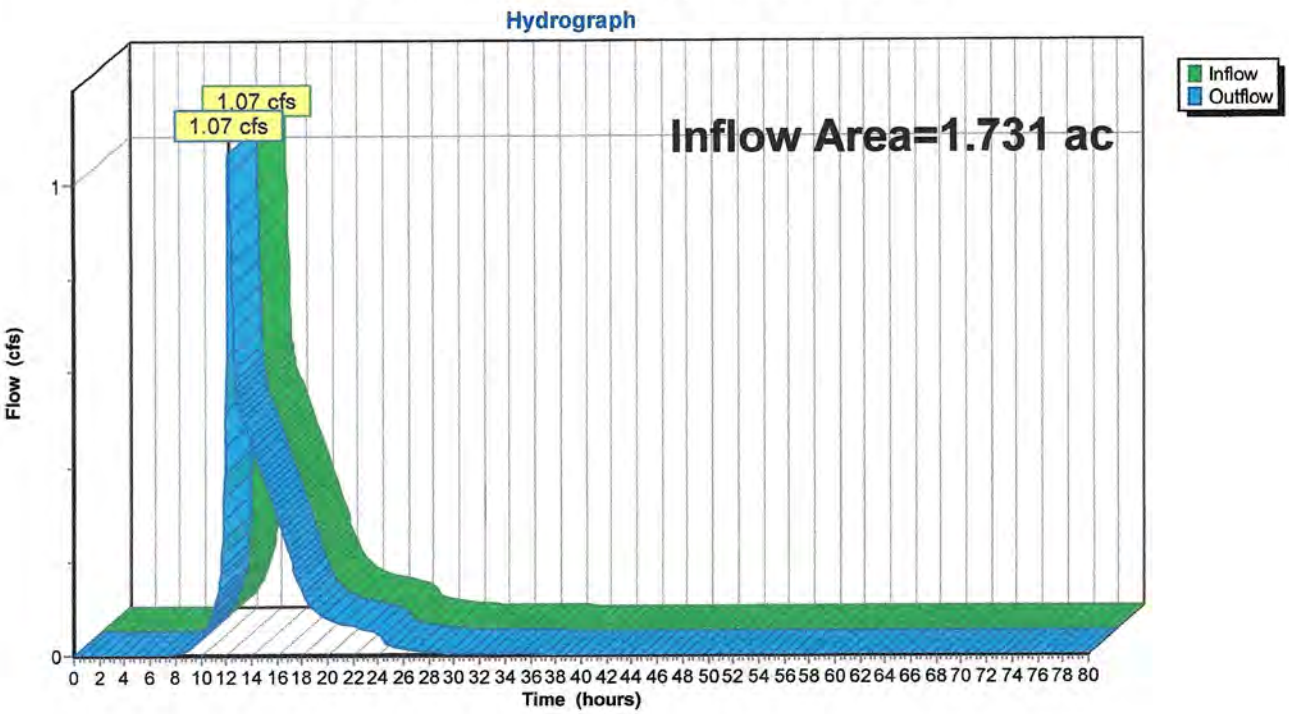
Summary for Reach 2R: TOTAL RUNOFF FROM SITE

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

Inflow Area = 1.731 ac, 49.88% Impervious, Inflow Depth = 1.88" for 10 Year Storm event
Inflow = 1.07 cfs @ 12.22 hrs, Volume= 0.271 af
Outflow = 1.07 cfs @ 12.22 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 2R: TOTAL RUNOFF FROM SITE



Summary for Reach 3R: 8" PVC DRAIN PIPE

[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 8P Primary device # 1 INLET by 0.05'

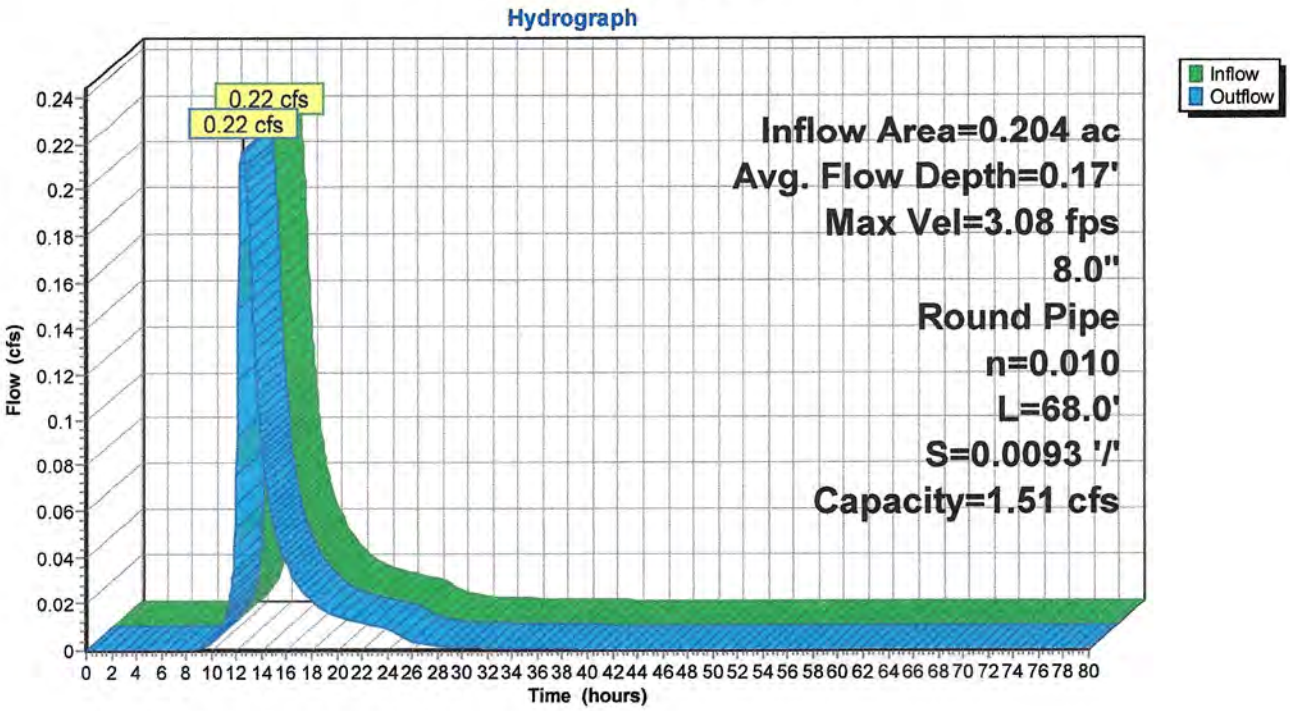
Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 3.09" for 10 Year Storm event
Inflow = 0.22 cfs @ 12.50 hrs, Volume= 0.053 af
Outflow = 0.22 cfs @ 12.52 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.08 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 1.3 min

Peak Storage= 5 cf @ 12.51 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 0.58'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 68.0' Slope= 0.0093 '/'
Inlet Invert= 14.38', Outlet Invert= 13.75'

Reach 3R: 8" PVC DRAIN PIPE



Summary for Pond 1P: CATCH BASIN 1

[57] Hint: Peaked at 16.74' (Flood elevation advised)

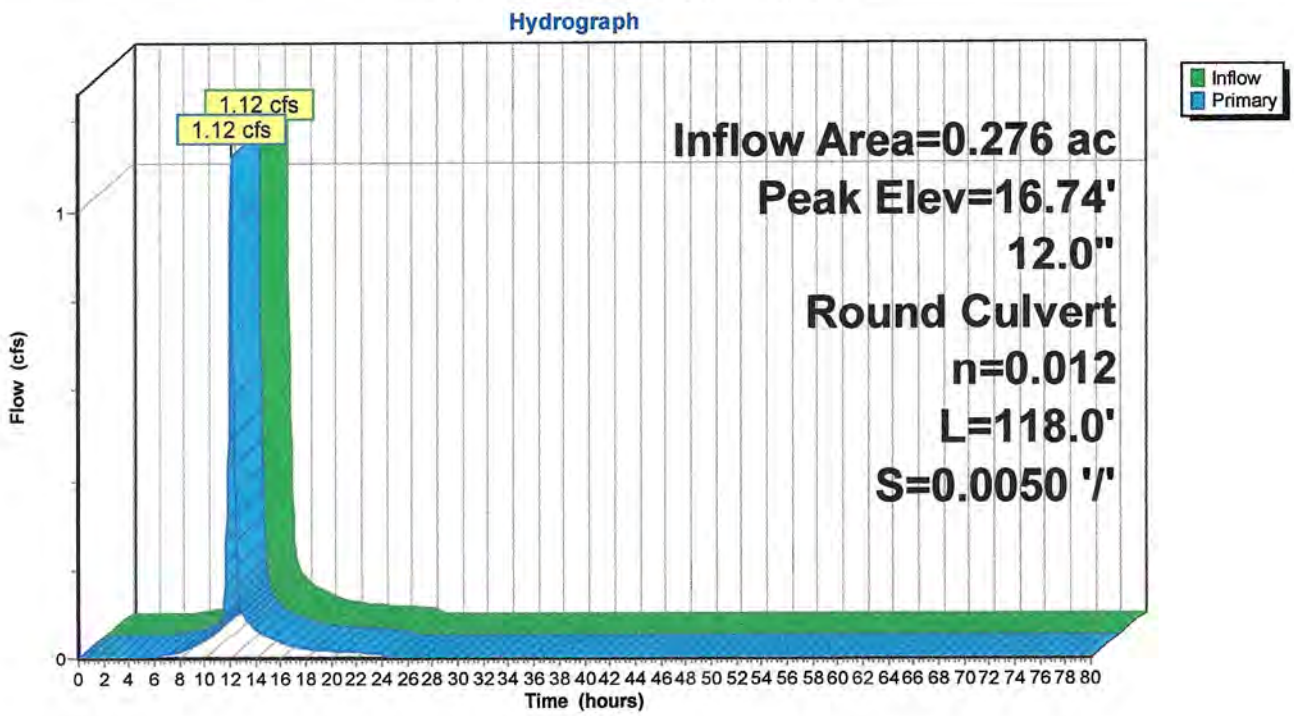
Inflow Area = 0.276 ac, 84.98% Impervious, Inflow Depth = 3.79" for 10 Year Storm event
Inflow = 1.12 cfs @ 12.10 hrs, Volume= 0.087 af
Outflow = 1.12 cfs @ 12.10 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min
Primary = 1.12 cfs @ 12.10 hrs, Volume= 0.087 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.74' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.12'	**12.0" Round CPP_Round 12"** L= 118.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.12' / 15.53' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.12 cfs @ 12.10 hrs HW=16.74' (Free Discharge)
↑—1=CPP_Round 12" (Barrel Controls 1.12 cfs @ 3.14 fps)

Pond 1P: CATCH BASIN 1



Summary for Pond 2P: CATCH BASIN 2

[57] Hint: Peaked at 16.92' (Flood elevation advised)

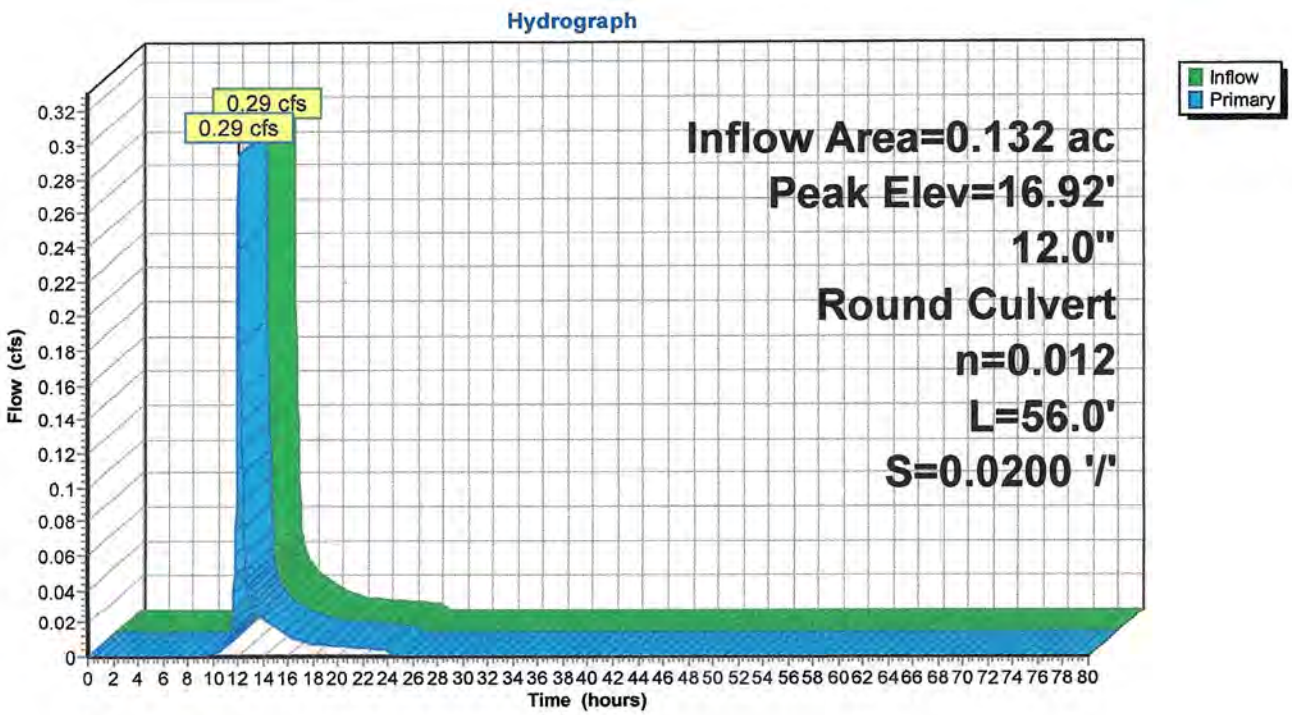
Inflow Area = 0.132 ac, 53.83% Impervious, Inflow Depth = 1.97" for 10 Year Storm event
Inflow = 0.29 cfs @ 12.09 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.09 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.09 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.92' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.65'	**12.0" Round CPP_Round 12"** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.65' / 15.53' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.09 hrs HW=16.91' (Free Discharge)
↑—1=CPP_Round 12" (Inlet Controls 0.29 cfs @ 1.75 fps)

Pond 2P: CATCH BASIN 2



Summary for Pond 3P: STORMCEPTOR 1 / DMH

[57] Hint: Peaked at 15.97' (Flood elevation advised)
[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.44'
[79] Warning: Submerged Pond 2P Primary device # 1 OUTLET by 0.44'

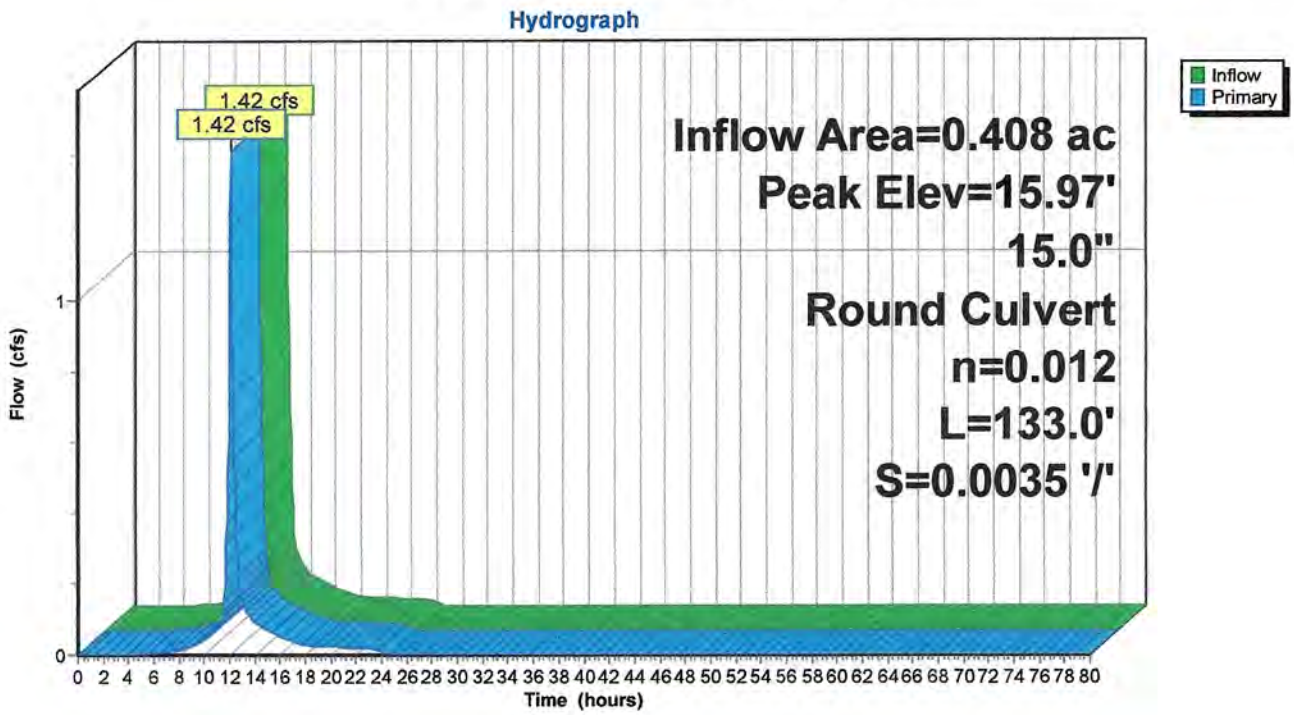
Inflow Area = 0.408 ac, 74.94% Impervious, Inflow Depth = 3.20" for 10 Year Storm event
Inflow = 1.42 cfs @ 12.10 hrs, Volume= 0.109 af
Outflow = 1.42 cfs @ 12.10 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min
Primary = 1.42 cfs @ 12.10 hrs, Volume= 0.109 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.97' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.28'	**15.0" Round CPP_Round 15"** L= 133.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.28' / 14.81' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.41 cfs @ 12.10 hrs HW=15.96' (Free Discharge)
↑—**1=CPP_Round 15"** (Barrel Controls 1.41 cfs @ 2.97 fps)

Pond 3P: STORMCEPTOR 1 / DMH



Summary for Pond 4P: DRAIN MANHOLE 1

[57] Hint: Peaked at 15.54' (Flood elevation advised)
[79] Warning: Submerged Pond 3P Primary device # 1 INLET by 0.26'

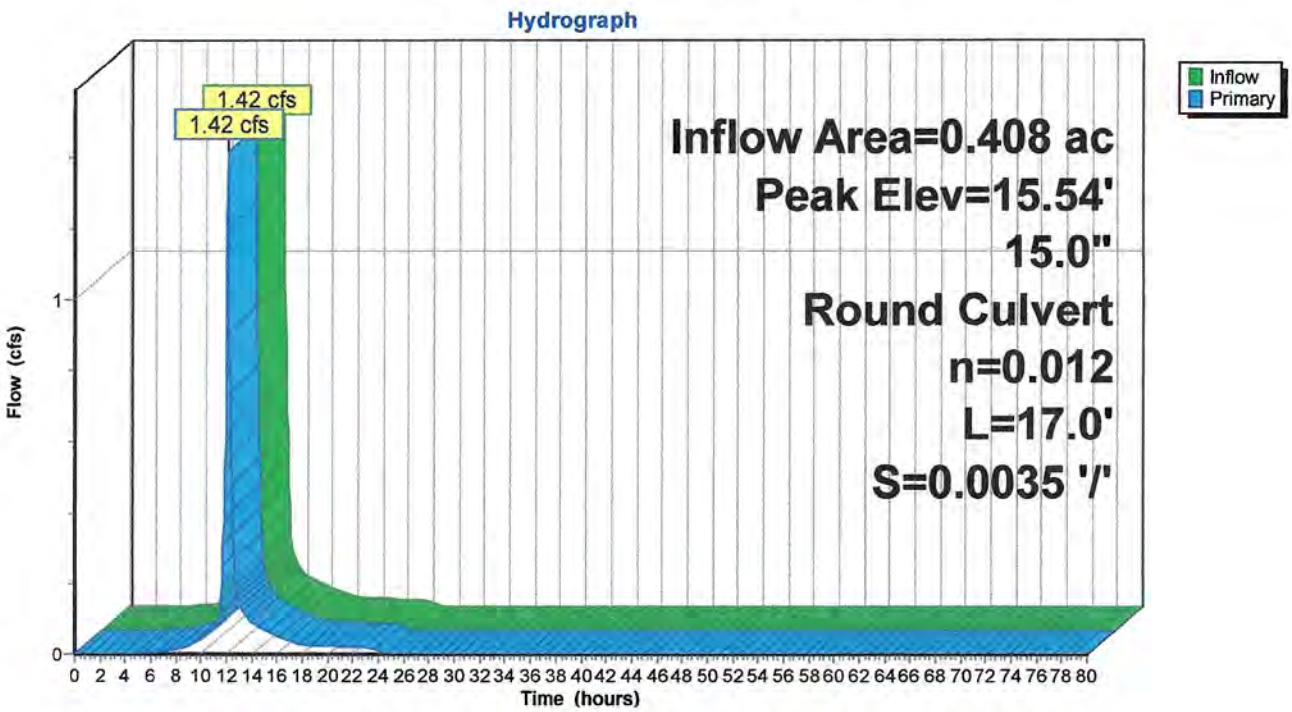
Inflow Area =	0.408 ac, 74.94% Impervious, Inflow Depth = 3.20"	for 10 Year Storm event		
Inflow =	1.42 cfs @ 12.10 hrs, Volume=	0.109 af		
Outflow =	1.42 cfs @ 12.10 hrs, Volume=	0.109 af, Atten= 0%, Lag= 0.0 min		
Primary =	1.42 cfs @ 12.10 hrs, Volume=	0.109 af		

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.54' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.81'	**15.0" Round CPP_Round 15"** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 14.81' / 14.75' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.41 cfs @ 12.10 hrs HW=15.54' (Free Discharge)
↑**1=CPP_Round 15"** (Barrel Controls 1.41 cfs @ 2.74 fps)

Pond 4P: DRAIN MANHOLE 1



Summary for Pond 5P: DETENTION BASIN 1

[63] Warning: Exceeded Reach 3R INLET depth by 0.36' @ 13.00 hrs
[79] Warning: Submerged Pond 4P Primary device # 1 INLET by 0.09'

Inflow Area = 1.092 ac, 71.19% Impervious, Inflow Depth = 2.15" for 10 Year Storm event
Inflow = 2.00 cfs @ 12.10 hrs, Volume= 0.196 af
Outflow = 0.40 cfs @ 12.88 hrs, Volume= 0.196 af, Atten= 80%, Lag= 47.3 min
Primary = 0.40 cfs @ 12.88 hrs, Volume= 0.196 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 14.90' @ 12.88 hrs Surf.Area= 2,841 sf Storage= 2,917 cf

Plug-Flow detention time= 112.2 min calculated for 0.196 af (100% of inflow)
Center-of-Mass det. time= 112.1 min (945.5 - 833.4)

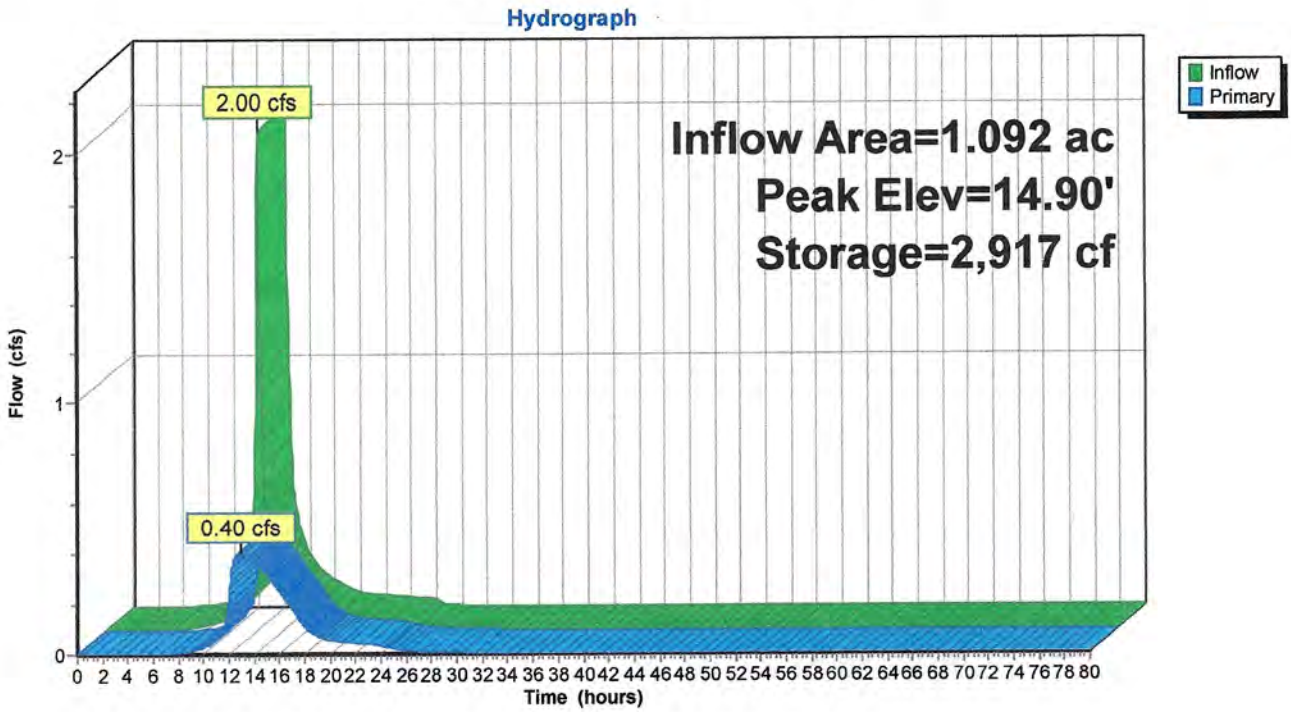
Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	11,218 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
13.75	2,256	0	0	2,256
14.00	2,367	578	578	2,375
15.00	2,897	2,628	3,205	2,935
16.00	3,450	3,169	6,375	3,523
17.00	4,137	3,788	10,163	4,244
17.25	4,302	1,055	11,218	4,419

Device	Routing	Invert	Outlet Devices
#1	Primary	13.75'	**4.0" Round 4" PVC Culvert** L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 13.75' / 13.55' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	15.95'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.40 cfs @ 12.88 hrs HW=14.90' (Free Discharge)
↑—**1=4" PVC Culvert** (Barrel Controls 0.40 cfs @ 4.59 fps)
└—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: DETENTION BASIN 1



Summary for Pond 6P: STORMCEPTOR 2 / CB

[57] Hint: Peaked at 17.69' (Flood elevation advised)

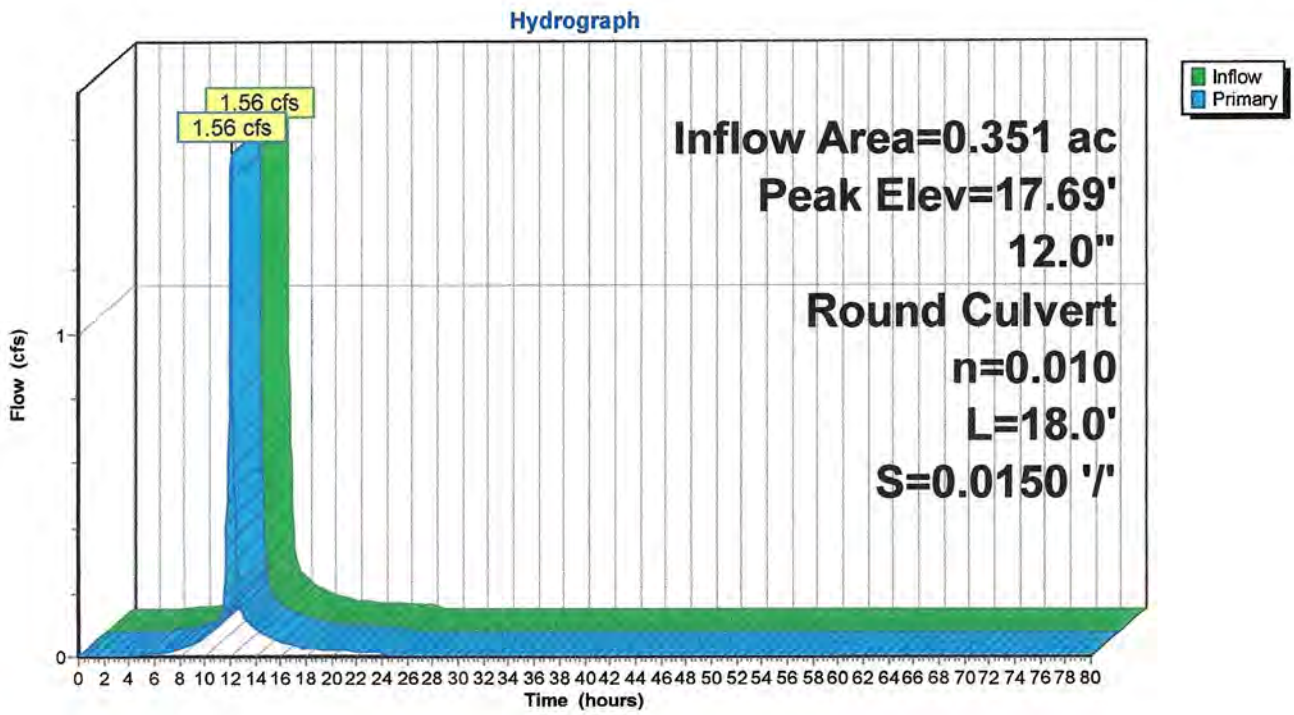
Inflow Area = 0.351 ac, 83.57% Impervious, Inflow Depth = 4.00" for 10 Year Storm event
Inflow = 1.56 cfs @ 12.07 hrs, Volume= 0.117 af
Outflow = 1.56 cfs @ 12.07 hrs, Volume= 0.117 af, Atten= 0%, Lag= 0.0 min
Primary = 1.56 cfs @ 12.07 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 17.69' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.02'	**12.0" Round CMP_Round 12"** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.02' / 16.75' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.50 cfs @ 12.07 hrs HW=17.68' (Free Discharge)
↑—**1=CMP_Round 12"** (Barrel Controls 1.50 cfs @ 3.90 fps)

Pond 6P: STORMCEPTOR 2 / CB



Summary for Pond 7P: INFILTRATION SYSTEM

[81] Warning: Exceeded Pond 6P by 0.31' @ 17.60 hrs

Inflow Area = 0.351 ac, 83.57% Impervious, Inflow Depth = 4.00" for 10 Year Storm event
Inflow = 1.56 cfs @ 12.07 hrs, Volume= 0.117 af
Outflow = 0.04 cfs @ 16.89 hrs, Volume= 0.117 af, Atten= 98%, Lag= 289.1 min
Discarded = 0.04 cfs @ 16.89 hrs, Volume= 0.117 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 17.42' @ 16.89 hrs Surf.Area= 2,673 sf Storage= 3,296 cf

Plug-Flow detention time= 849.6 min calculated for 0.117 af (100% of inflow)
Center-of-Mass det. time= 850.0 min (1,628.6 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1	15.50'	1,595 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 7,137 cf Overall - 3,149 cf Embedded = 3,988 cf x 40.0% Voids
#2	15.83'	2,683 cf	**24.0" Round CMP_Round 24"** Inside #1 L= 854.0' 3,149 cf Overall - 1.0" Wall Thickness = 2,683 cf
		4,278 cf	Total Available Storage

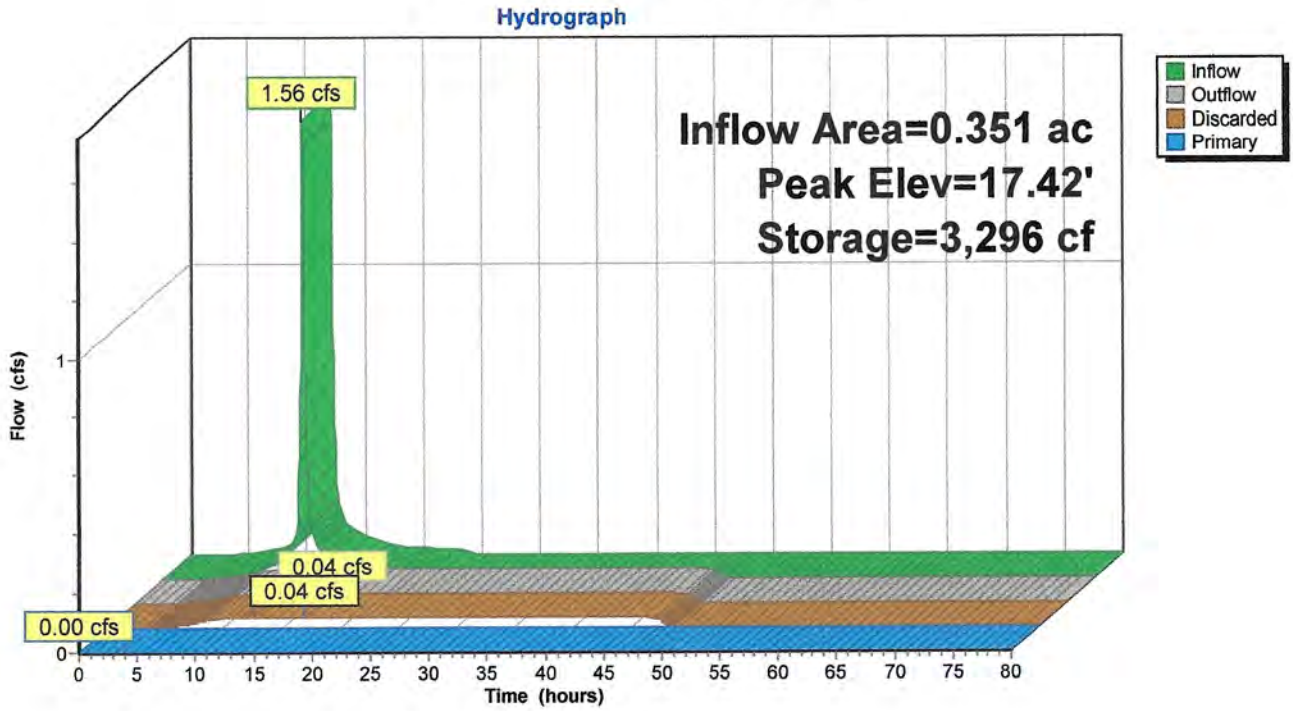
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
15.50	2,673	0	0	2,673
15.83	2,673	882	882	2,733
16.00	2,673	454	1,337	2,765
17.00	2,673	2,673	4,010	2,948
17.83	2,673	2,219	6,228	3,100
18.00	2,673	454	6,683	3,131
18.17	2,673	454	7,137	3,162

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.50'	**0.520 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	17.68'	**6.0" Round PVC_Round 6"** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.68' / 15.95' S= 0.0577 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 16.89 hrs HW=17.42' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.50' (Free Discharge)
↑—**2=PVC_Round 6"** (Controls 0.00 cfs)

Pond 7P: INFILTRATION SYSTEM



Summary for Pond 8P: DETENTION BASIN 2

Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 3.09" for 10 Year Storm event
Inflow = 0.63 cfs @ 12.15 hrs, Volume= 0.053 af
Outflow = 0.22 cfs @ 12.50 hrs, Volume= 0.053 af, Atten= 65%, Lag= 21.3 min
Primary = 0.22 cfs @ 12.50 hrs, Volume= 0.053 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 14.94' @ 12.50 hrs Surf.Area= 1,881 sf Storage= 794 cf

Plug-Flow detention time= 100.5 min calculated for 0.053 af (100% of inflow)
Center-of-Mass det. time= 100.2 min (916.6 - 816.4)

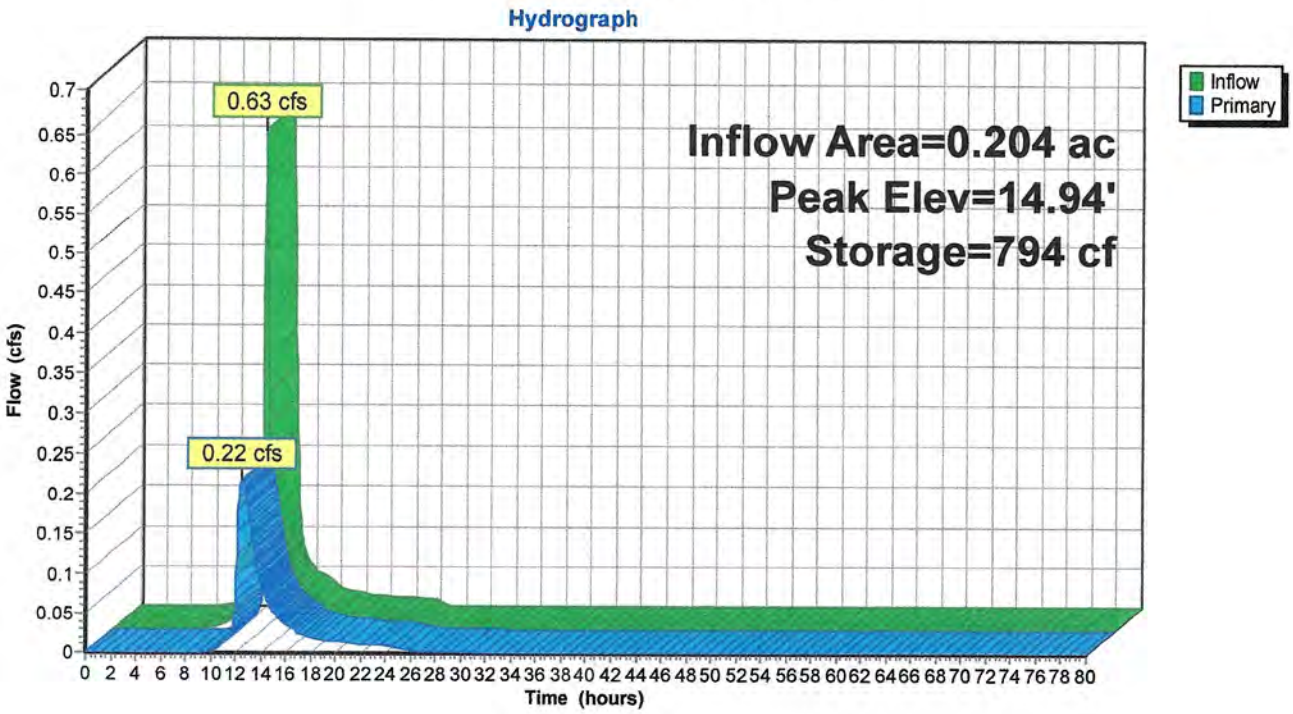
Volume	Invert	Avail.Storage	Storage Description
#1	14.50'	6,448 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
14.50	1,712	0	0	1,712
15.00	1,904	904	904	1,918
16.00	2,370	2,133	3,036	2,412
17.00	2,952	2,656	5,692	3,022
17.25	3,098	756	6,448	3,176

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**4.0" Round 4" PVC Culvert** L= 12.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 14.38' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	16.25'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.22 cfs @ 12.50 hrs HW=14.94' (Free Discharge)
↑—**1=4" PVC Culvert** (Barrel Controls 0.22 cfs @ 2.48 fps)
└—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: DETENTION BASIN 2



Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 TO RAILROAD AVE Runoff Area=12,039 sf 84.98% Impervious Runoff Depth=4.66"
Flow Length=157' Tc=7.0 min CN=91 Runoff=1.37 cfs 0.107 af

Subcatchment 2S: DA2 TO RAILROAD AVE Runoff Area=5,729 sf 53.83% Impervious Runoff Depth=2.66"
Flow Length=100' Tc=5.7 min CN=71 Runoff=0.40 cfs 0.029 af

Subcatchment 3S: DA3 Runoff Area=5,613 sf 46.59% Impervious Runoff Depth=4.02"
Tc=5.0 min CN=85 Runoff=0.60 cfs 0.043 af

Subcatchment 4S: DA4 Runoff Area=15,291 sf 83.57% Impervious Runoff Depth=4.89"
Flow Length=225' Slope=0.0050 '/' Tc=5.0 min CN=93 Runoff=1.89 cfs 0.143 af

Subcatchment 5S: DA5 Runoff Area=8,903 sf 57.97% Impervious Runoff Depth=3.92"
Flow Length=151' Tc=10.6 min CN=84 Runoff=0.79 cfs 0.067 af

Subcatchment 6S: DA6 TO WETLANDS Runoff Area=13,540 sf 15.41% Impervious Runoff Depth=3.22"
Flow Length=440' Tc=14.6 min CN=77 Runoff=0.89 cfs 0.083 af

Subcatchment 7S: DA7 TO RAILROAD Runoff Area=13,232 sf 11.99% Impervious Runoff Depth=0.74"
Flow Length=105' Tc=10.7 min CN=46 Runoff=0.13 cfs 0.019 af

Subcatchment 8S: DA8 TO 114 ALDEN STREET Runoff Area=1,061 sf 6.79% Impervious Runoff Depth=0.57"
Flow Length=22' Slope=0.0200 '/' Tc=5.0 min CN=43 Runoff=0.01 cfs 0.001 af

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS Inflow=1.29 cfs 0.340 af
Outflow=1.29 cfs 0.340 af

Reach 2R: TOTAL RUNOFF FROM SITE Inflow=1.43 cfs 0.360 af
Outflow=1.43 cfs 0.360 af

Reach 3R: 8" PVC DRAIN PIPE Avg. Flow Depth=0.19' Max Vel=3.24 fps Inflow=0.26 cfs 0.067 af
8.0" Round Pipe n=0.010 L=68.0' S=0.0093 '/' Capacity=1.51 cfs Outflow=0.26 cfs 0.067 af

Pond 1P: CATCH BASIN 1 Peak Elev=16.82' Inflow=1.37 cfs 0.107 af
12.0" Round Culvert n=0.012 L=118.0' S=0.0050 '/' Outflow=1.37 cfs 0.107 af

Pond 2P: CATCH BASIN 2 Peak Elev=16.96' Inflow=0.40 cfs 0.029 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0200 '/' Outflow=0.40 cfs 0.029 af

Pond 3P: STORMCEPTOR 1 / DMH Peak Elev=16.06' Inflow=1.77 cfs 0.137 af
15.0" Round Culvert n=0.012 L=133.0' S=0.0035 '/' Outflow=1.77 cfs 0.137 af

Pond 4P: DRAIN MANHOLE 1 Peak Elev=15.64' Inflow=1.77 cfs 0.137 af
15.0" Round Culvert n=0.012 L=17.0' S=0.0035 '/' Outflow=1.77 cfs 0.137 af

Pond 5P: DETENTION BASIN 1 Peak Elev=15.20' Storage=3,783 cf Inflow=2.51 cfs 0.256 af
Outflow=0.46 cfs 0.256 af

Pond 6P: STORMCEPTOR 2 / CB Peak Elev=17.78' Inflow=1.89 cfs 0.143 af
12.0" Round Culvert n=0.010 L=18.0' S=0.0150 '/' Outflow=1.89 cfs 0.143 af

Pond 7P: INFILTRATION SYSTEM Peak Elev=17.81' Storage=3,912 cf Inflow=1.89 cfs 0.143 af
Discarded=0.04 cfs 0.133 af Primary=0.05 cfs 0.010 af Outflow=0.08 cfs 0.143 af

Pond 8P: DETENTION BASIN 2 Peak Elev=15.05' Storage=1,008 cf Inflow=0.79 cfs 0.067 af
Outflow=0.26 cfs 0.067 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.493 af Average Runoff Depth = 3.42"
50.12% Pervious = 0.868 ac 49.88% Impervious = 0.864 ac

Summary for Subcatchment 1S: DA1 TO RAILROAD AVE

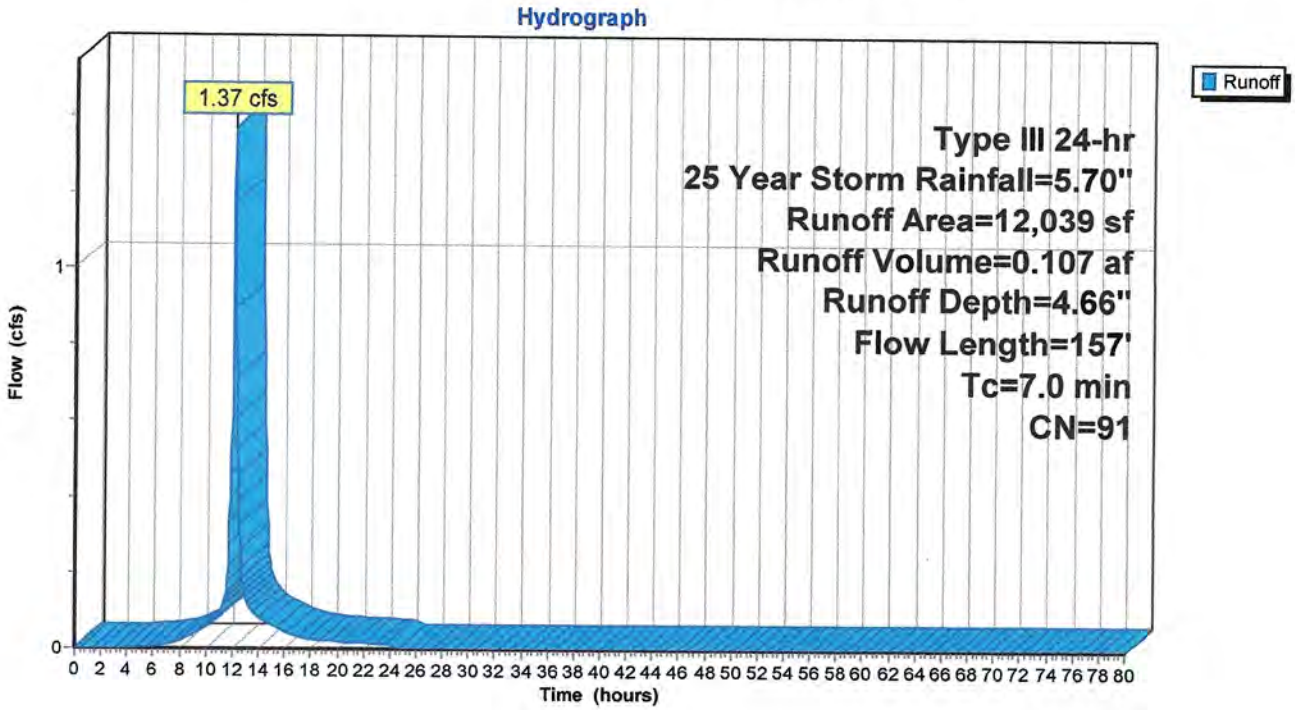
Runoff = 1.37 cfs @ 12.10 hrs, Volume= 0.107 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	1,270	39	>75% Grass cover, Good, HSG A
	538	74	>75% Grass cover, Good, HSG C
*	7,805	98	Paved street, dwys, parking, curbs HSG A
	449	98	Paved parking, HSG C
*	292	98	Sidewalks, HSG A
*	146	98	Sidewalks, HSG C
	1,028	98	Roofs, HSG A
	511	98	Roofs, HSG C
	12,039	91	Weighted Average
	1,808		15.02% Pervious Area
	10,231		84.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	28	0.0150	0.08		**Sheet Flow, GRASS**
					Grass: Dense n= 0.240 P2= 3.40"
0.5	24	0.0100	0.81		**Sheet Flow, PAVED**
					Smooth surfaces n= 0.011 P2= 3.40"
0.9	105	0.0090	1.93		**Shallow Concentrated Flow, PAVED**
					Paved Kv= 20.3 fps
7.0	157	Total			

Subcatchment 1S: DA1 TO RAILROAD AVE



Summary for Subcatchment 2S: DA2 TO RAILROAD AVE

[49] Hint: Tc<2dt may require smaller dt

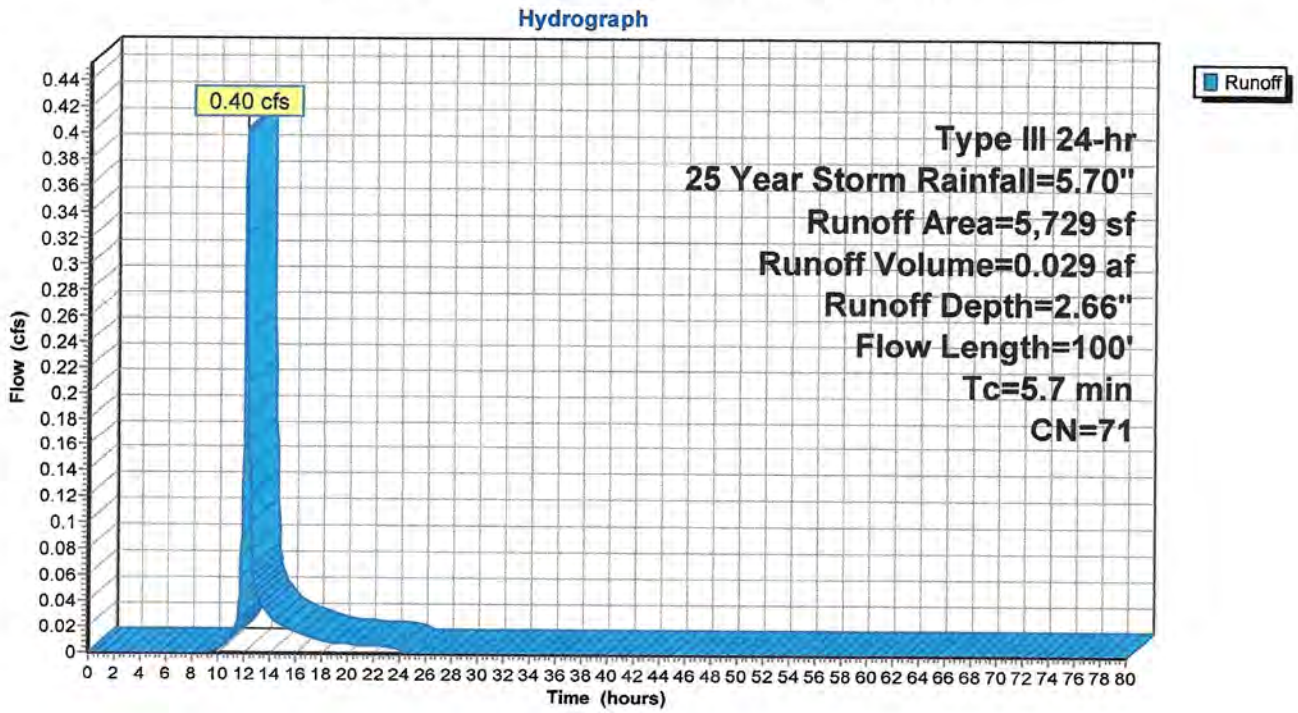
Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	2,645	39	>75% Grass cover, Good, HSG A
*	3,084	98	Paved sreet, driveway, HSG A
	5,729	71	Weighted Average
	2,645		46.17% Pervious Area
	3,084		53.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	28	0.0250	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
0.5	22	0.0100	0.79		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
0.6	50	0.0050	1.44		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
5.7	100	Total			

Subcatchment 2S: DA2 TO RAILROAD AVE



Summary for Subcatchment 3S: DA3

[49] Hint: Tc<2dt may require smaller dt

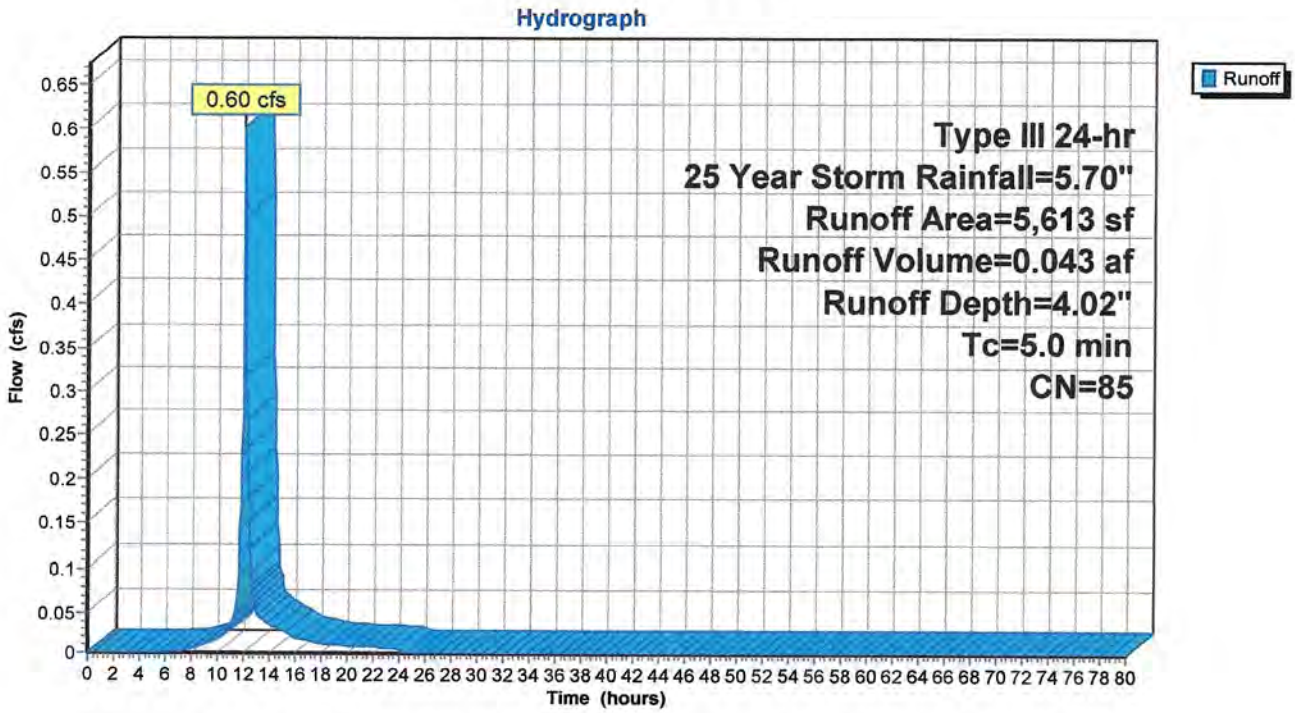
Runoff = 0.60 cfs @ 12.07 hrs, Volume= 0.043 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	2,998	74	>75% Grass cover, Good, HSG C
*	2,615	98	Detention Basin 1, Water Surface, HSG C
	5,613	85	Weighted Average
	2,998		53.41% Pervious Area
	2,615		46.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DETENTION BASIN 1**

Subcatchment 3S: DA3



Summary for Subcatchment 4S: DA4

[49] Hint: Tc<2dt may require smaller dt

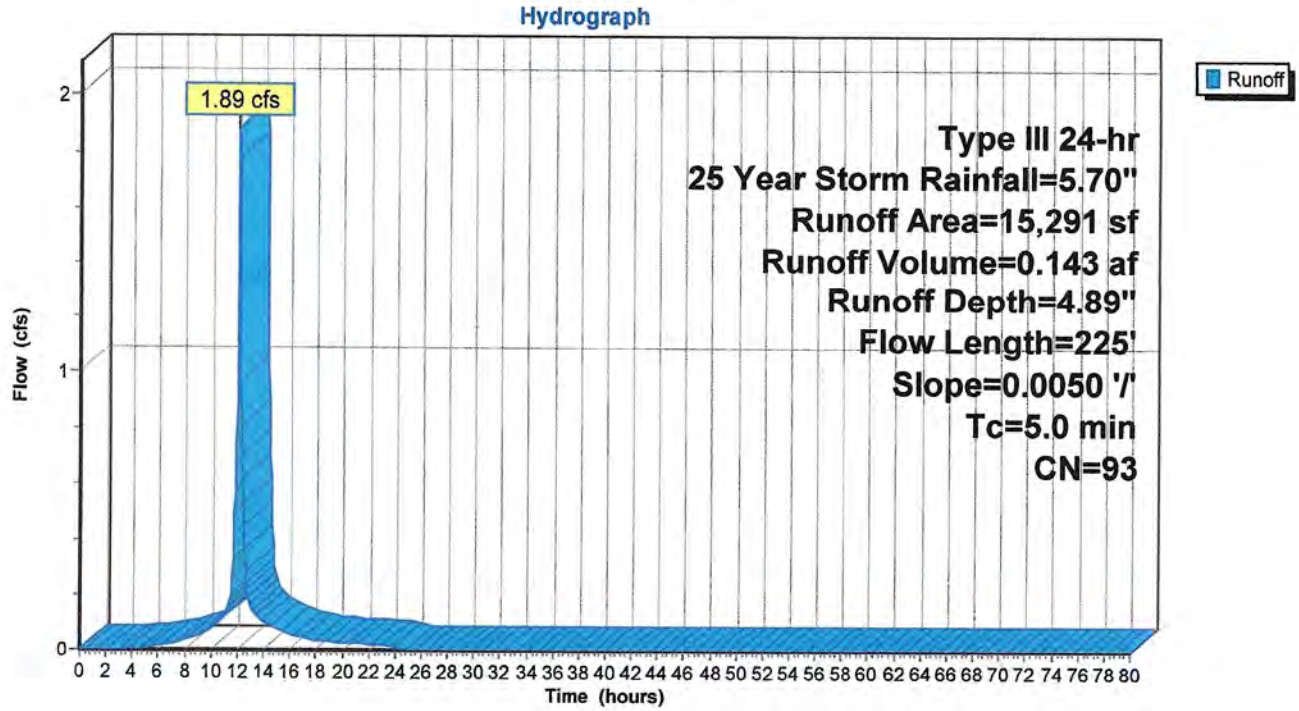
Runoff = 1.89 cfs @ 12.07 hrs, Volume= 0.143 af, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	250	39	>75% Grass cover, Good, HSG A
	2,262	74	>75% Grass cover, Good, HSG C
	490	98	Roofs, HSG A
	4,174	98	Roofs, HSG C
*	149	98	Paved parking, dwy, curbs, HSG A
*	6,878	98	Paved parking, dwy, curbs, HSG C
*	97	98	Sidewalks, HSG A
*	991	98	Sidewalks, HSG C
	15,291	93	Weighted Average
	2,512		16.43% Pervious Area
	12,779		83.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.71		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
2.0	175	0.0050	1.44		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
3.2	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: DA4



Summary for Subcatchment 5S: DA5

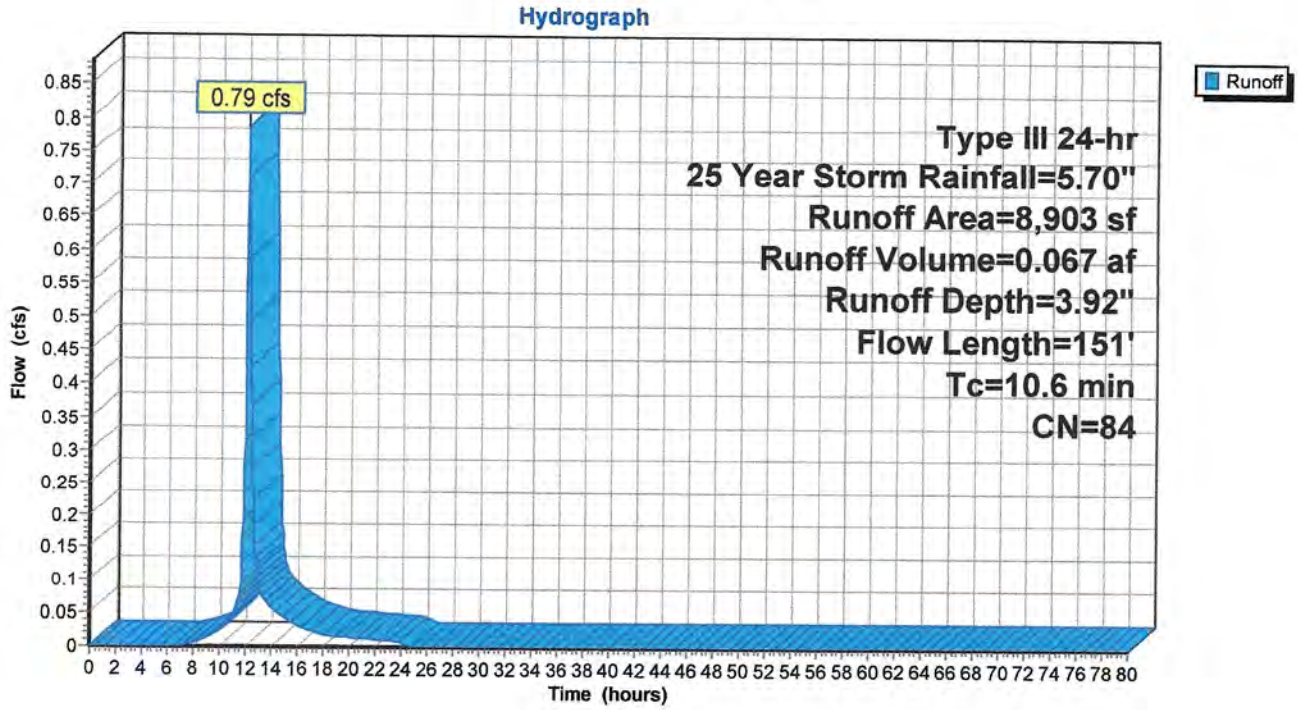
Runoff = 0.79 cfs @ 12.15 hrs, Volume= 0.067 af, Depth= 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	1,113	39	>75% Grass cover, Good, HSG A
	2,629	74	>75% Grass cover, Good, HSG C
*	1,982	98	Detention Basin 2, Water Surface, HSG C
	1,807	98	Roofs, HSG A
	1,050	98	Roofs, HSG C
*	292	98	Walls, HSG A
*	30	98	Walls, HSG C
	8,903	84	Weighted Average
	3,742		42.03% Pervious Area
	5,161		57.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0050	0.09		**Sheet Flow, grass**
					Grass: Short n= 0.150 P2= 3.40"
1.0	65	0.0050	1.14		**Shallow Concentrated Flow, Grass**
					Unpaved Kv= 16.1 fps
0.1	36	0.1400	6.02		**Shallow Concentrated Flow, Grass**
					Unpaved Kv= 16.1 fps
10.6	151	Total			

Subcatchment 5S: DA5



Summary for Subcatchment 6S: DA6 TO WETLANDS

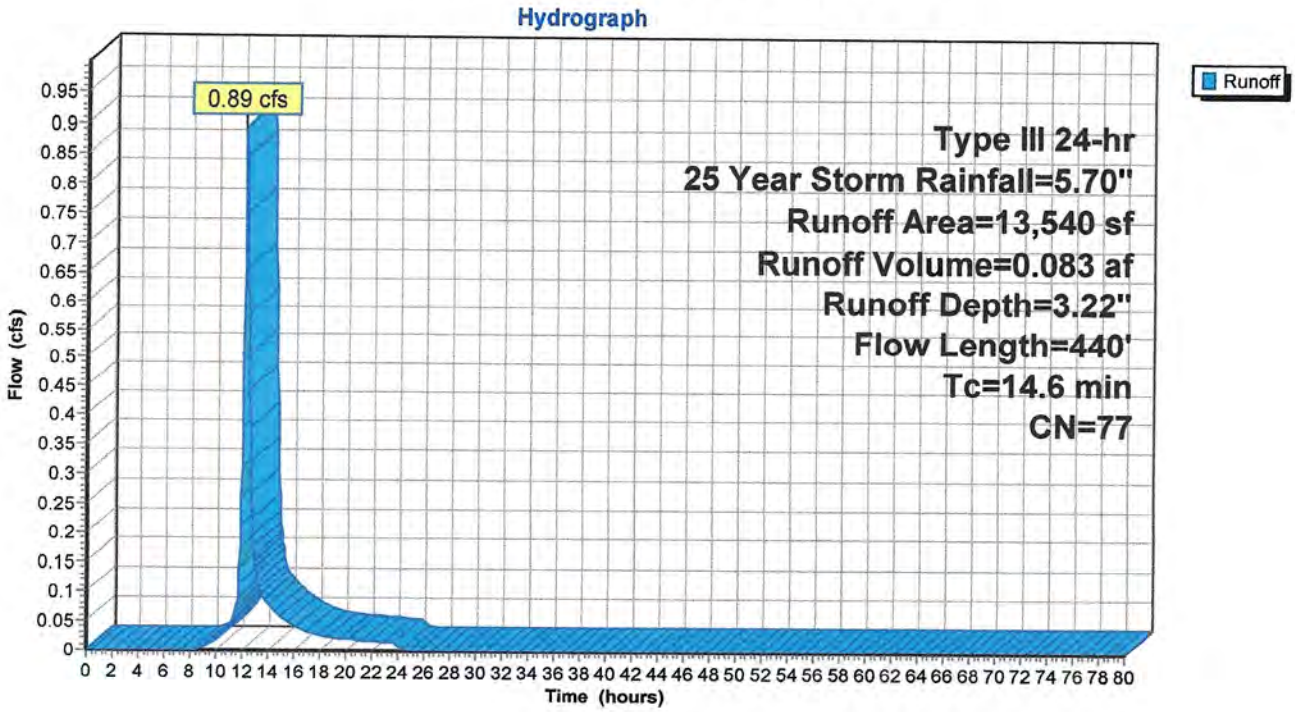
Runoff = 0.89 cfs @ 12.20 hrs, Volume= 0.083 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	353	70	Woods, Good, HSG C
*	4,694	77	Woods-wetland, Good, HSG D
	463	39	>75% Grass cover, Good, HSG A
	5,944	74	>75% Grass cover, Good, HSG C
	1,922	98	Roofs, HSG C
*	164	98	Conc Culvert, HSG D
	13,540	77	Weighted Average
	11,454		84.59% Pervious Area
	2,086		15.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	30	0.0200	0.09		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.40"
0.6	100	0.0180	2.72		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
0.5	90	0.0220	3.01		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
8.2	220	0.0080	0.45		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
14.6	440	Total			

Subcatchment 6S: DA6 TO WETLANDS



Summary for Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET

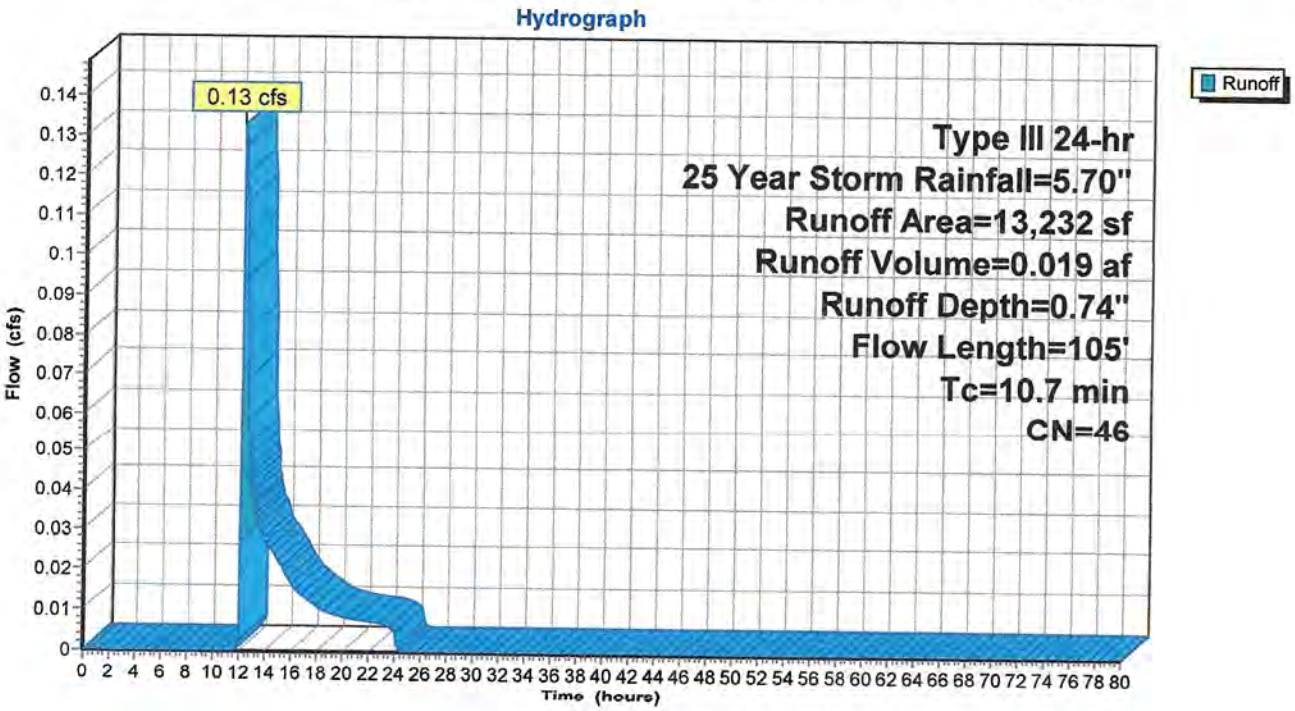
Runoff = 0.13 cfs @ 12.22 hrs, Volume= 0.019 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	11,645	39	>75% Grass cover, Good, HSG A
	959	98	Roofs, HSG A
*	165	98	Walks, HSG A
*	463	98	Walls, HSG A
	13,232	46	Weighted Average
	11,645		88.01% Pervious Area
	1,587		11.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	35	0.0200	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
3.6	15	0.0130	0.07		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
1.1	55	0.0130	0.80		**Shallow Concentrated Flow, GRASS** Short Grass Pasture Kv= 7.0 fps
10.7	105	Total			

Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 8S: DA8 TO 114 ALDEN STREET

[49] Hint: Tc<2dt may require smaller dt

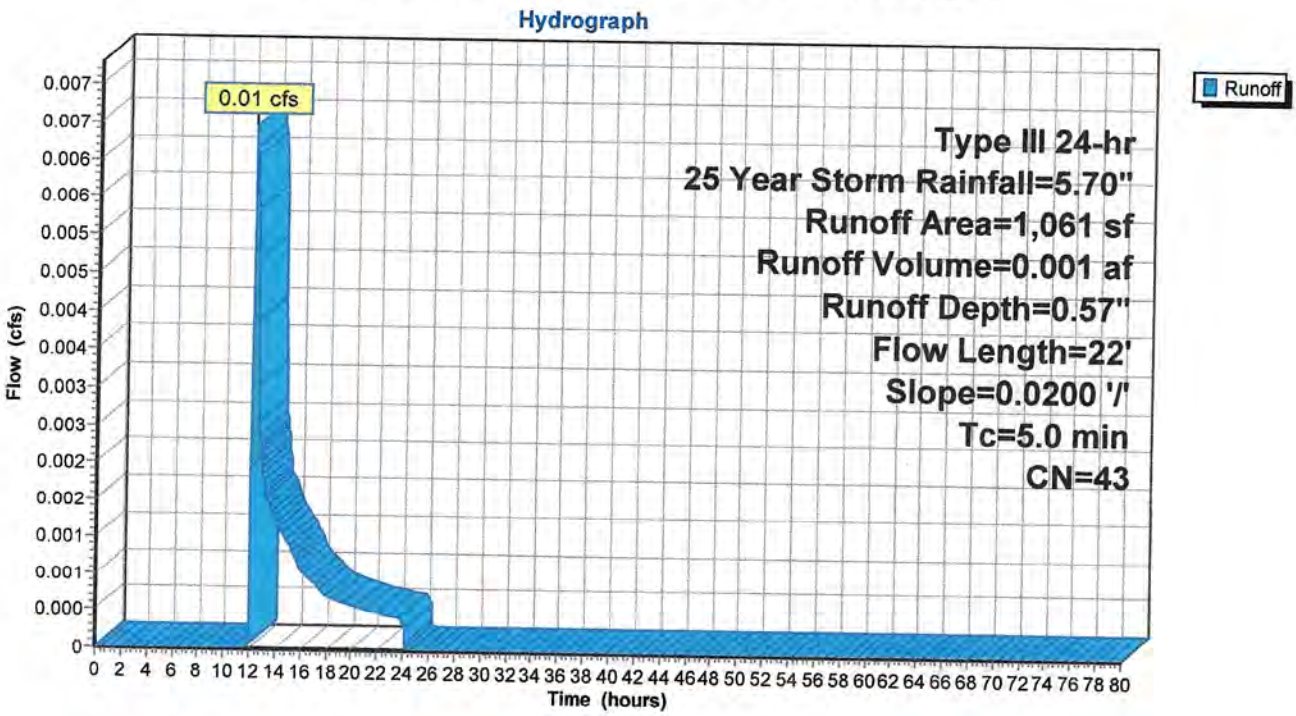
Runoff = 0.01 cfs @ 12.16 hrs, Volume= 0.001 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Storm Rainfall=5.70"

	Area (sf)	CN	Description
	989	39	>75% Grass cover, Good, HSG A
*	72	98	Walls, HSG A
	1,061	43	Weighted Average
	989		93.21% Pervious Area
	72		6.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	22	0.0200	0.09		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
4.1	22	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 8S: DA8 TO 114 ALDEN STREET



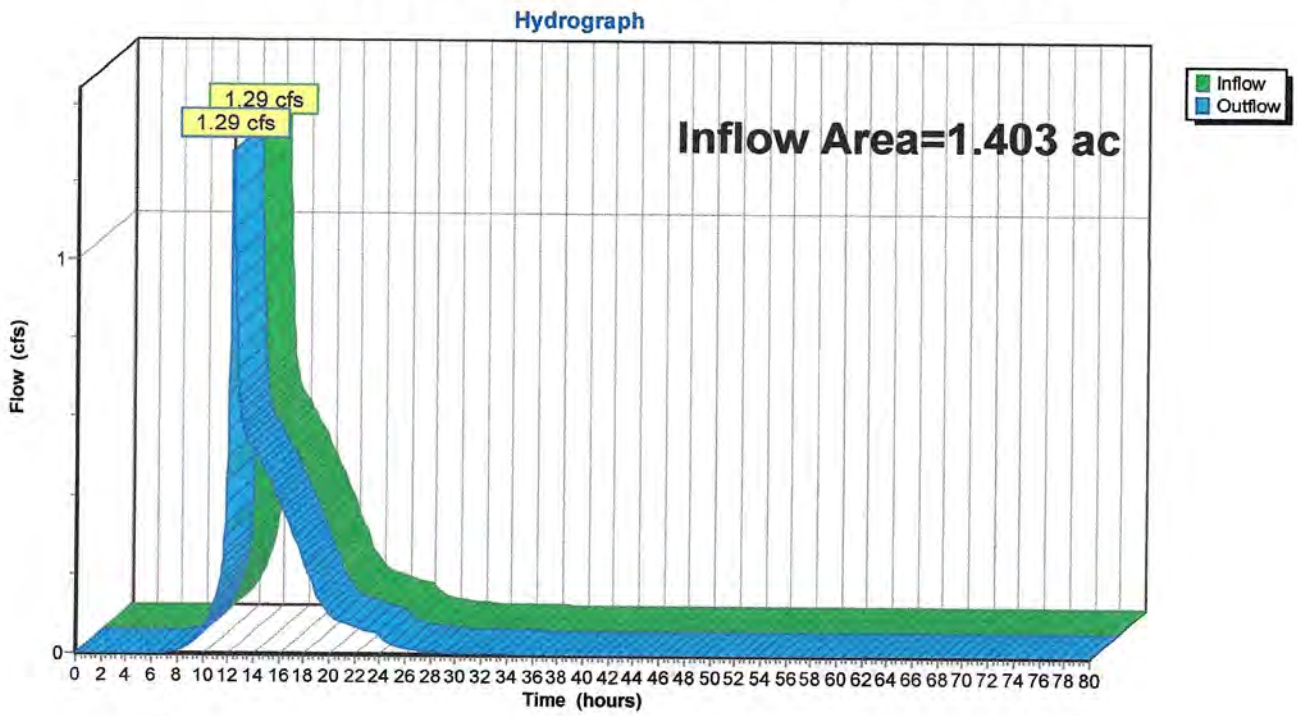
Summary for Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS

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

Inflow Area = 1.403 ac, 58.83% Impervious, Inflow Depth = 2.90" for 25 Year Storm event
Inflow = 1.29 cfs @ 12.21 hrs, Volume= 0.340 af
Outflow = 1.29 cfs @ 12.21 hrs, Volume= 0.340 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS



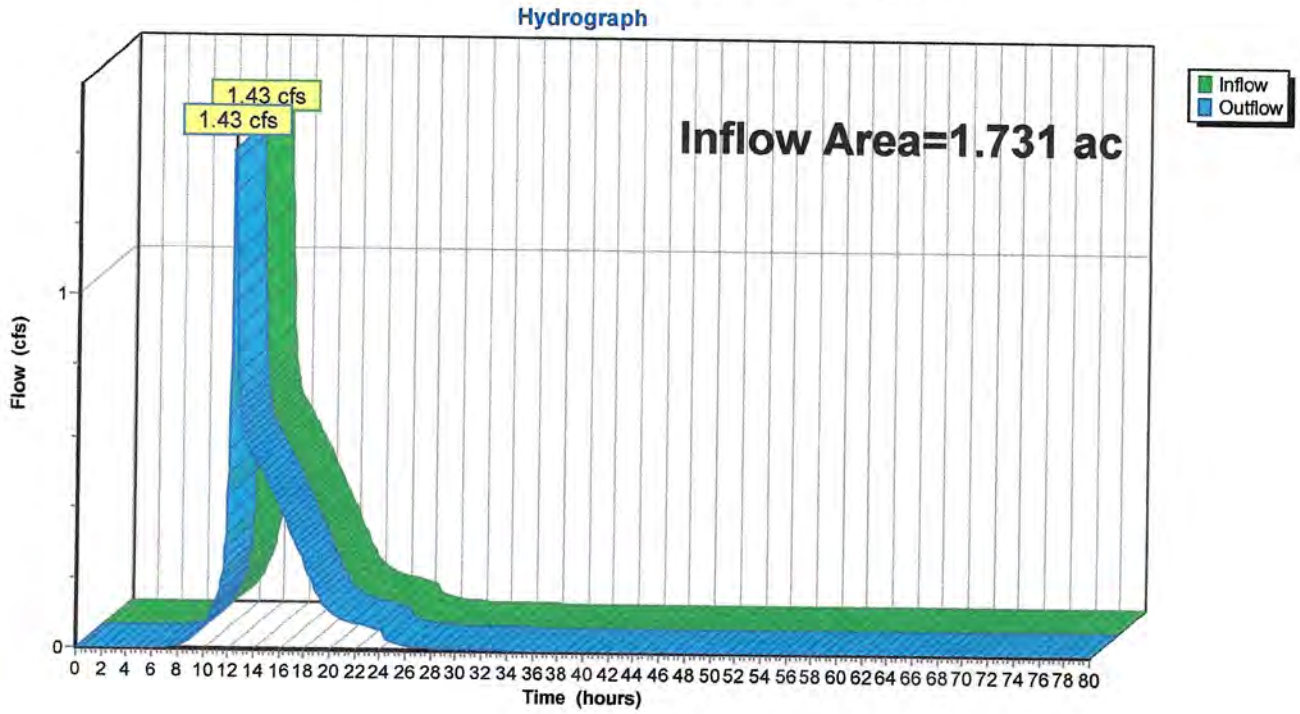
Summary for Reach 2R: TOTAL RUNOFF FROM SITE

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

Inflow Area = 1.731 ac, 49.88% Impervious, Inflow Depth = 2.49" for 25 Year Storm event
Inflow = 1.43 cfs @ 12.21 hrs, Volume= 0.360 af
Outflow = 1.43 cfs @ 12.21 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 2R: TOTAL RUNOFF FROM SITE



Summary for Reach 3R: 8" PVC DRAIN PIPE

[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 8P Primary device # 1 INLET by 0.07'

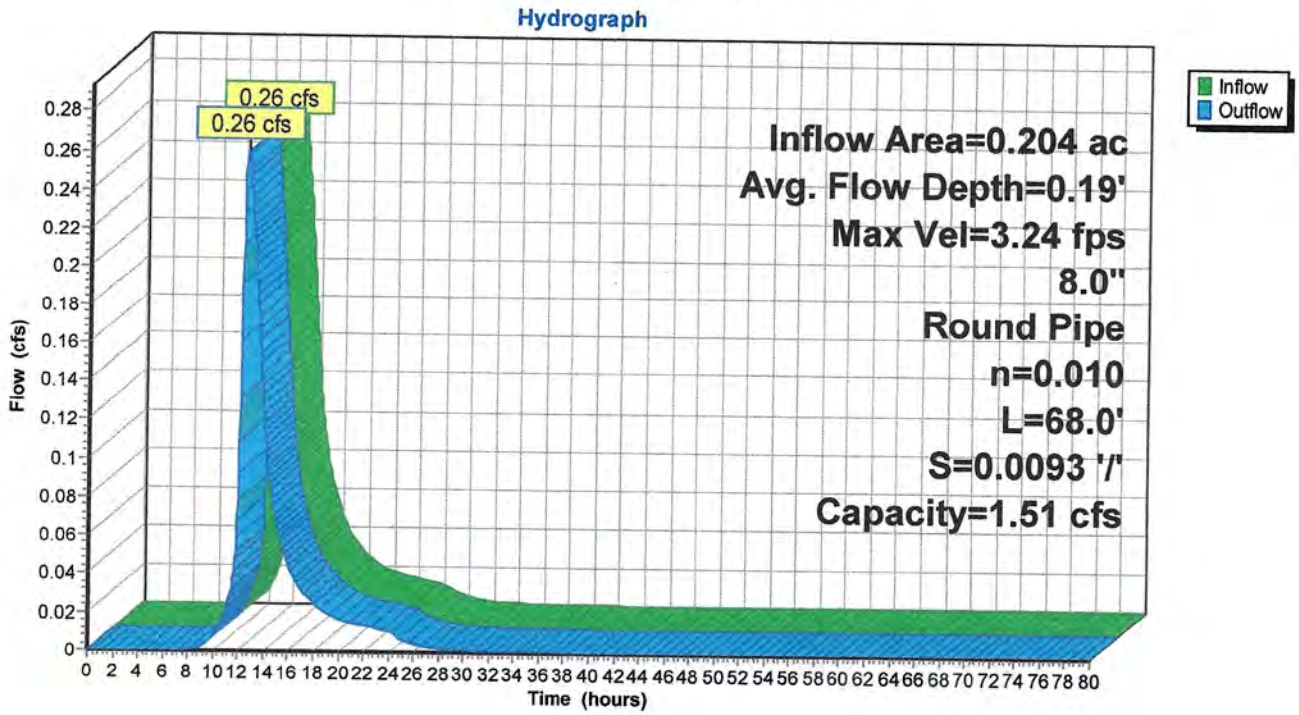
Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 3.92" for 25 Year Storm event
Inflow = 0.26 cfs @ 12.51 hrs, Volume= 0.067 af
Outflow = 0.26 cfs @ 12.53 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.24 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 1.2 min

Peak Storage= 5 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.60'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 68.0' Slope= 0.0093 '/'
Inlet Invert= 14.38', Outlet Invert= 13.75'

Reach 3R: 8" PVC DRAIN PIPE



Summary for Pond 1P: CATCH BASIN 1

[57] Hint: Peaked at 16.82' (Flood elevation advised)

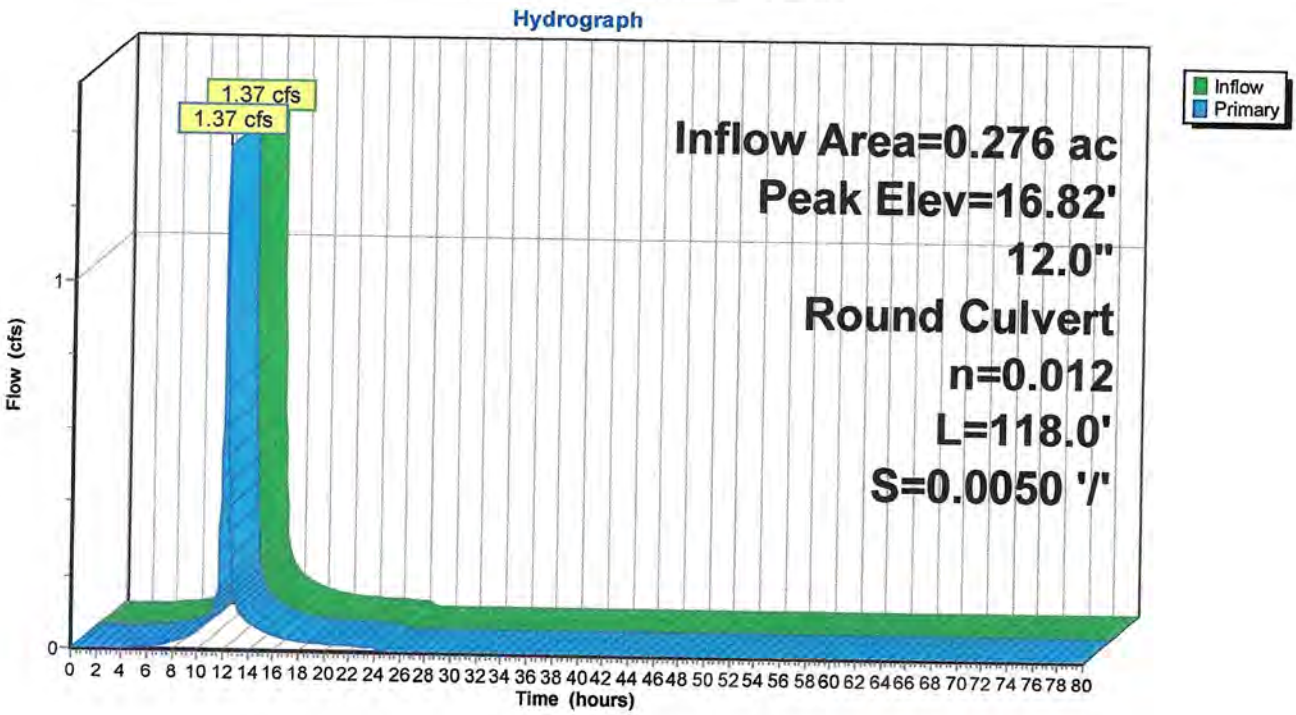
Inflow Area =	0.276 ac, 84.98% Impervious,	Inflow Depth =	4.66"	for 25 Year Storm event
Inflow =	1.37 cfs @ 12.10 hrs,	Volume=	0.107 af	
Outflow =	1.37 cfs @ 12.10 hrs,	Volume=	0.107 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.37 cfs @ 12.10 hrs,	Volume=	0.107 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.82' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.12'	**12.0" Round CPP_Round 12"** L= 118.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.12' / 15.53' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.37 cfs @ 12.10 hrs HW=16.82' (Free Discharge)
1=CPP_Round 12" (Barrel Controls 1.37 cfs @ 3.29 fps)

Pond 1P: CATCH BASIN 1



Summary for Pond 2P: CATCH BASIN 2

[57] Hint: Peaked at 16.96' (Flood elevation advised)

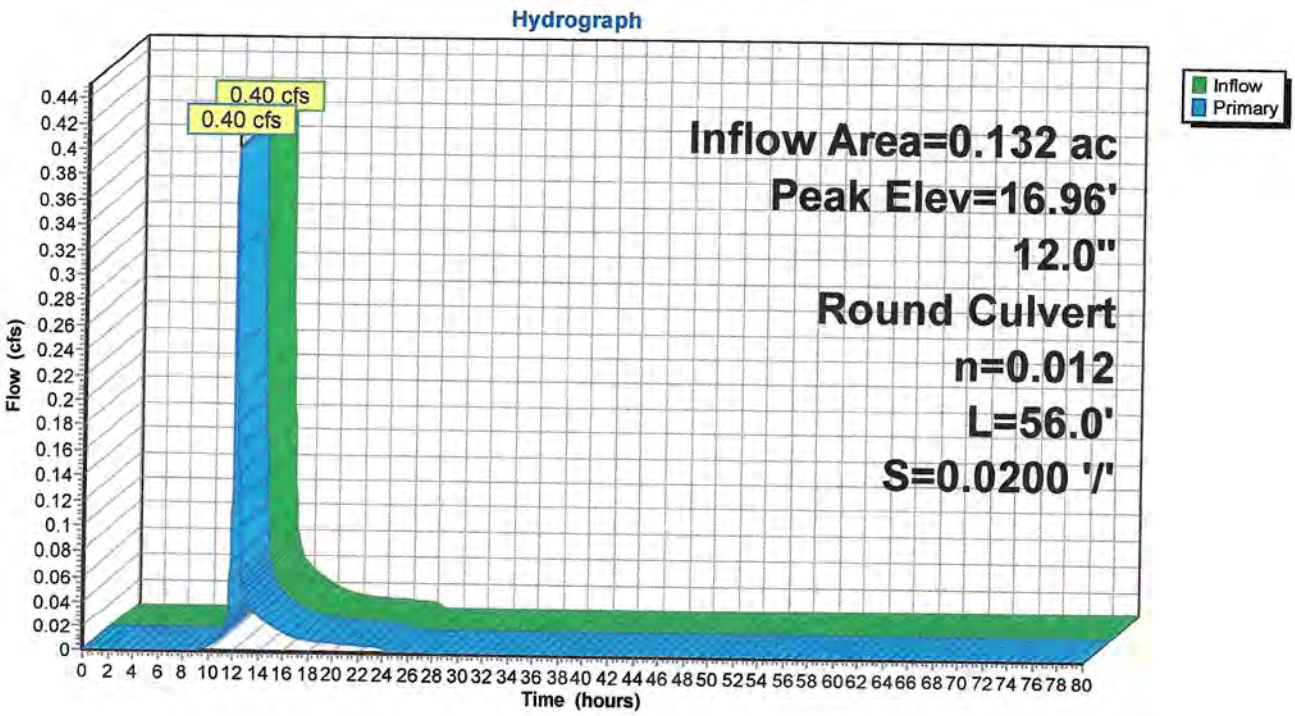
Inflow Area = 0.132 ac, 53.83% Impervious, Inflow Depth = 2.66" for 25 Year Storm event
Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
Primary = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.96' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.65'	**12.0" Round CPP_Round 12"** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.65' / 15.53' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.09 hrs HW=16.96' (Free Discharge)
↑—1=CPP_Round 12" (Inlet Controls 0.39 cfs @ 1.90 fps)

Pond 2P: CATCH BASIN 2



Summary for Pond 3P: STORMCEPTOR 1 / DMH

[57] Hint: Peaked at 16.06' (Flood elevation advised)
[79] Warning: Submerged Pond 1P Primary device # 1 OUTLET by 0.53'
[79] Warning: Submerged Pond 2P Primary device # 1 OUTLET by 0.53'

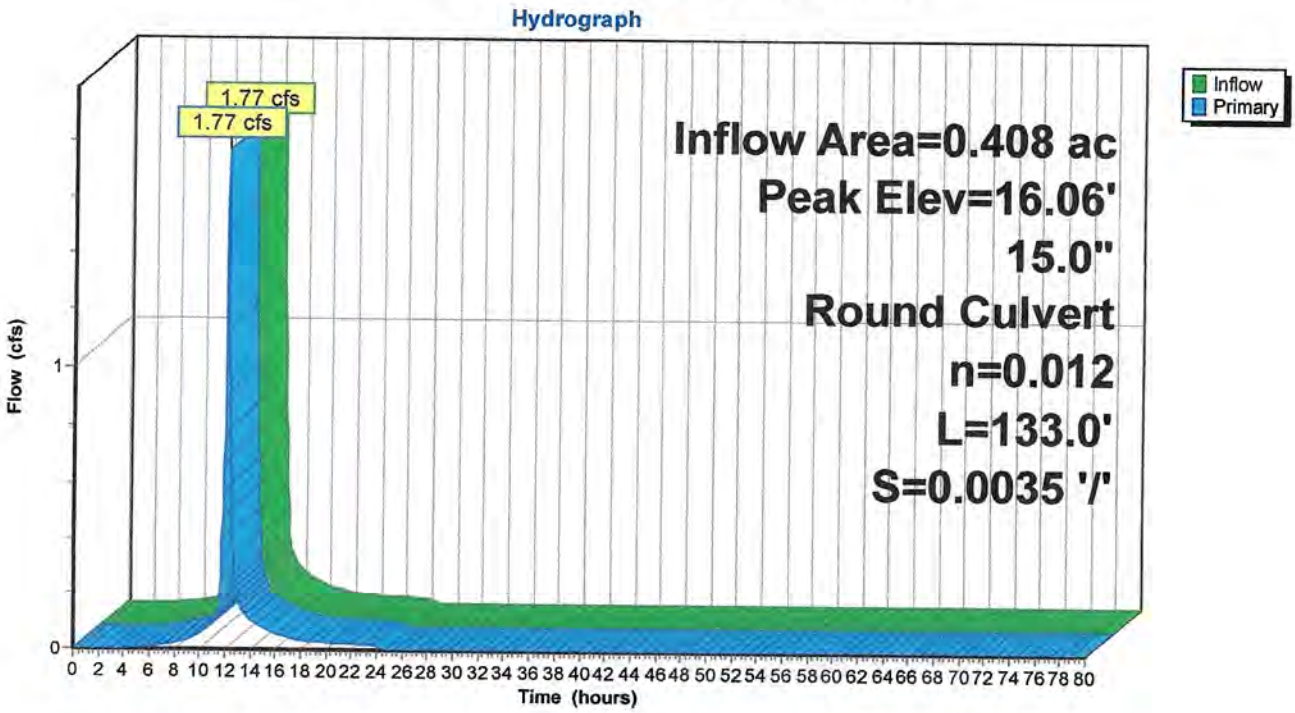
Inflow Area = 0.408 ac, 74.94% Impervious, Inflow Depth = 4.02" for 25 Year Storm event
Inflow = 1.77 cfs @ 12.10 hrs, Volume= 0.137 af
Outflow = 1.77 cfs @ 12.10 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
Primary = 1.77 cfs @ 12.10 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.06' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.28'	**15.0" Round CPP_Round 15"** L= 133.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.28' / 14.81' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.76 cfs @ 12.10 hrs HW=16.05' (Free Discharge)
↑—**1=CPP_Round 15"** (Barrel Controls 1.76 cfs @ 3.15 fps)

Pond 3P: STORMCEPTOR 1 / DMH



Summary for Pond 4P: DRAIN MANHOLE 1

[57] Hint: Peaked at 15.64' (Flood elevation advised)
[79] Warning: Submerged Pond 3P Primary device # 1 INLET by 0.36'

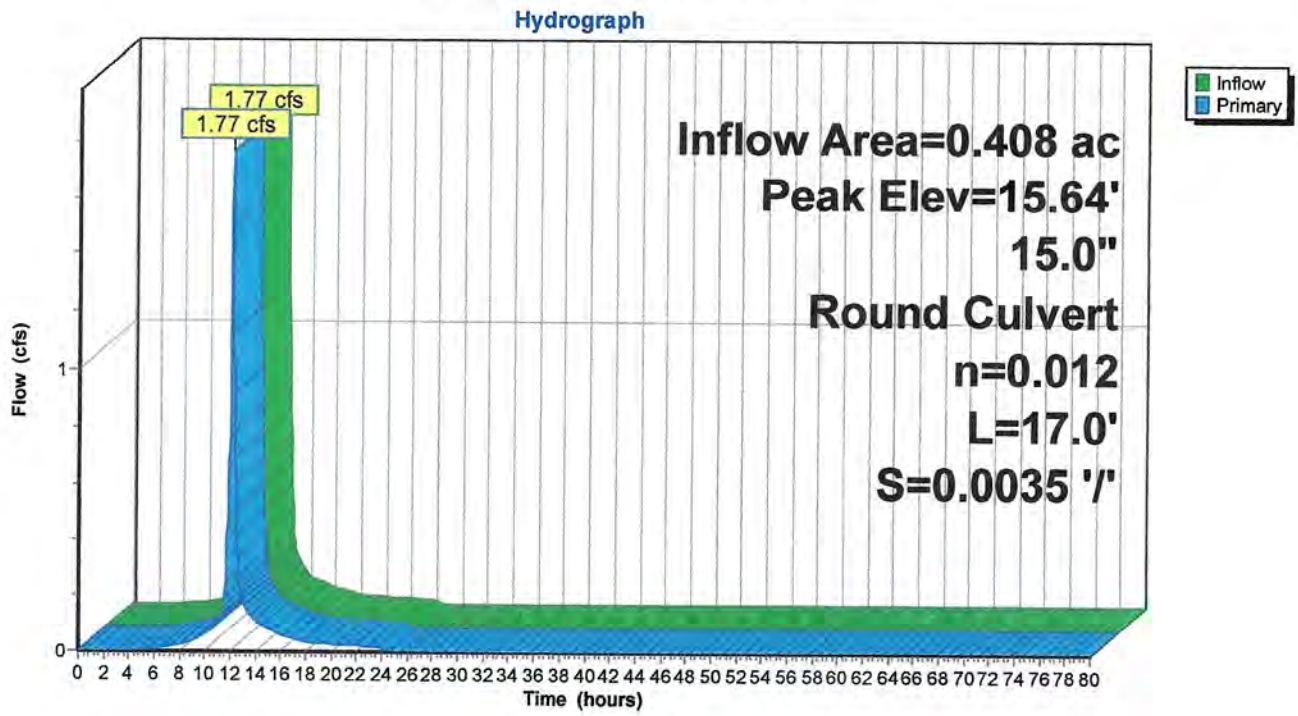
Inflow Area =	0.408 ac,	74.94% Impervious,	Inflow Depth =	4.02"	for 25 Year Storm event
Inflow =	1.77 cfs @	12.10 hrs,	Volume=	0.137 af	
Outflow =	1.77 cfs @	12.10 hrs,	Volume=	0.137 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.77 cfs @	12.10 hrs,	Volume=	0.137 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.64' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.81'	**15.0" Round CPP_Round 15"** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 14.81' / 14.75' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.76 cfs @ 12.10 hrs HW=15.64' (Free Discharge)
↑—1=CPP_Round 15" (Barrel Controls 1.76 cfs @ 2.90 fps)

Pond 4P: DRAIN MANHOLE 1



Summary for Pond 5P: DETENTION BASIN 1

[63] Warning: Exceeded Reach 3R INLET depth by 0.64' @ 13.05 hrs
[81] Warning: Exceeded Pond 4P by 0.16' @ 13.15 hrs

Inflow Area = 1.092 ac, 71.19% Impervious, Inflow Depth = 2.82" for 25 Year Storm event
Inflow = 2.51 cfs @ 12.09 hrs, Volume= 0.256 af
Outflow = 0.46 cfs @ 12.97 hrs, Volume= 0.256 af, Atten= 82%, Lag= 52.7 min
Primary = 0.46 cfs @ 12.97 hrs, Volume= 0.256 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.20' @ 12.97 hrs Surf.Area= 3,001 sf Storage= 3,783 cf

Plug-Flow detention time= 117.9 min calculated for 0.256 af (100% of inflow)
Center-of-Mass det. time= 118.3 min (948.2 - 829.8)

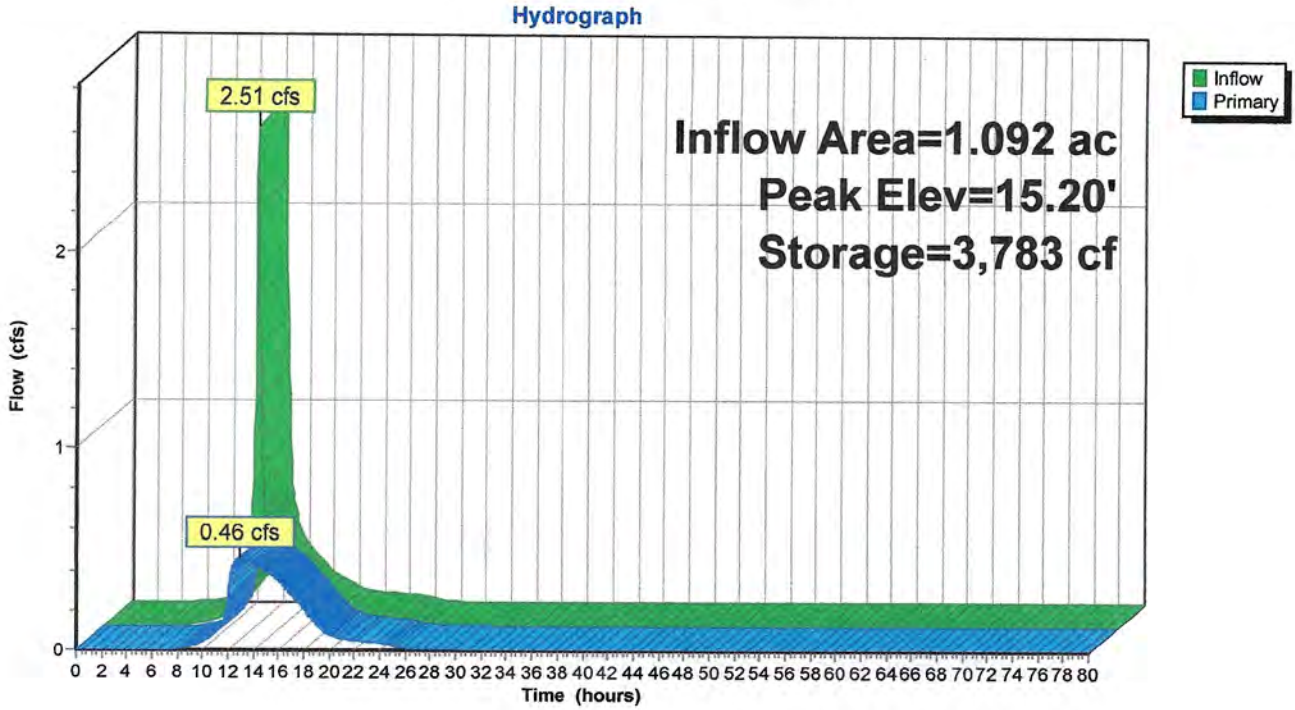
Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	11,218 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
13.75	2,256	0	0	2,256
14.00	2,367	578	578	2,375
15.00	2,897	2,628	3,205	2,935
16.00	3,450	3,169	6,375	3,523
17.00	4,137	3,788	10,163	4,244
17.25	4,302	1,055	11,218	4,419

Device	Routing	Invert	Outlet Devices
#1	Primary	13.75'	**4.0" Round 4" PVC Culvert** L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 13.75' / 13.55' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	15.95'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.46 cfs @ 12.97 hrs HW=15.20' (Free Discharge)
1=4" PVC Culvert (Barrel Controls 0.46 cfs @ 5.22 fps)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: DETENTION BASIN 1



Summary for Pond 6P: STORMCEPTOR 2 / CB

[57] Hint: Peaked at 17.78' (Flood elevation advised)

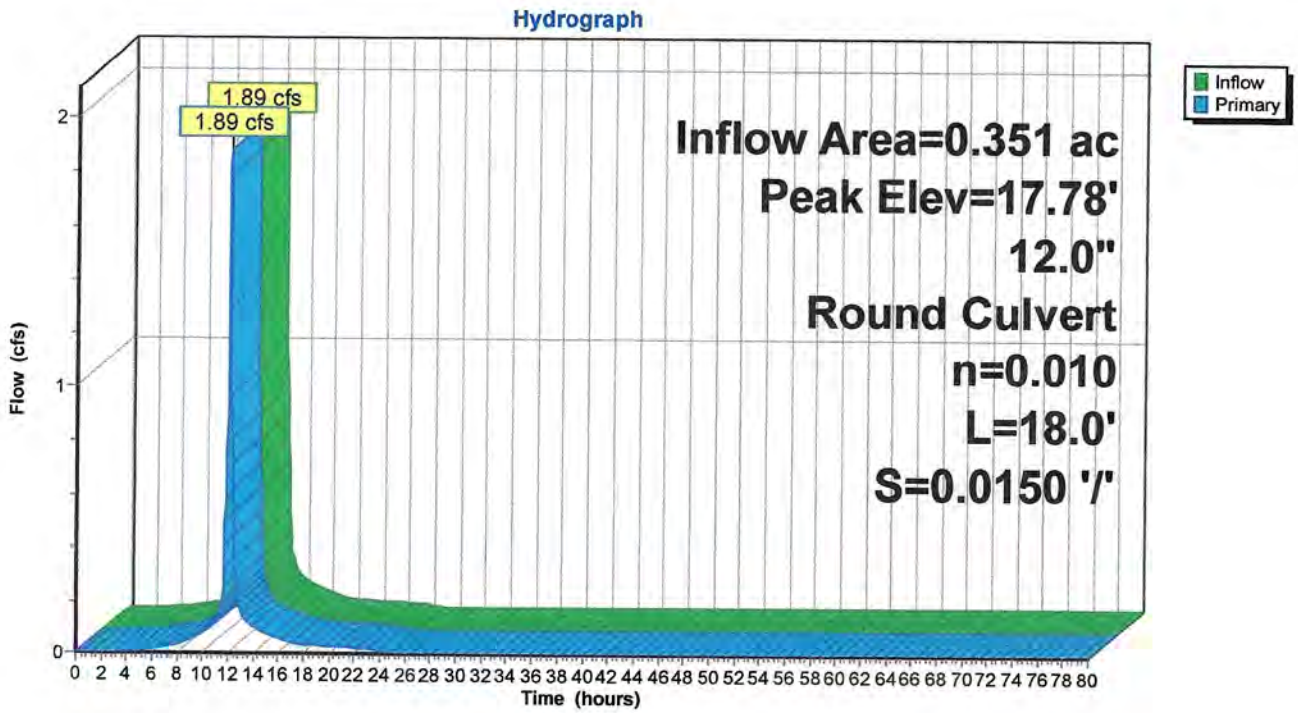
Inflow Area =	0.351 ac, 83.57% Impervious,	Inflow Depth =	4.89"	for 25 Year Storm event
Inflow =	1.89 cfs @ 12.07 hrs,	Volume=	0.143 af	
Outflow =	1.89 cfs @ 12.07 hrs,	Volume=	0.143 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.89 cfs @ 12.07 hrs,	Volume=	0.143 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 17.78' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.02'	**12.0" Round CMP_Round 12"** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.02' / 16.75' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.82 cfs @ 12.07 hrs HW=17.76' (Free Discharge)
1=CMP_Round 12" (Barrel Controls 1.82 cfs @ 4.03 fps)

Pond 6P: STORMCEPTOR 2 / CB



Summary for Pond 7P: INFILTRATION SYSTEM

[81] Warning: Exceeded Pond 6P by 0.66' @ 15.15 hrs

Inflow Area = 0.351 ac, 83.57% Impervious, Inflow Depth = 4.89" for 25 Year Storm event
Inflow = 1.89 cfs @ 12.07 hrs, Volume= 0.143 af
Outflow = 0.08 cfs @ 14.72 hrs, Volume= 0.143 af, Atten= 96%, Lag= 158.7 min
Discarded = 0.04 cfs @ 14.72 hrs, Volume= 0.133 af
Primary = 0.05 cfs @ 14.72 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 17.81' @ 14.72 hrs Surf.Area= 2,673 sf Storage= 3,912 cf

Plug-Flow detention time= 907.2 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 907.7 min (1,681.2 - 773.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.50'	1,595 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 7,137 cf Overall - 3,149 cf Embedded = 3,988 cf x 40.0% Voids
#2	15.83'	2,683 cf	**24.0" Round CMP_Round 24"** Inside #1 L= 854.0' 3,149 cf Overall - 1.0" Wall Thickness = 2,683 cf
		4,278 cf	Total Available Storage

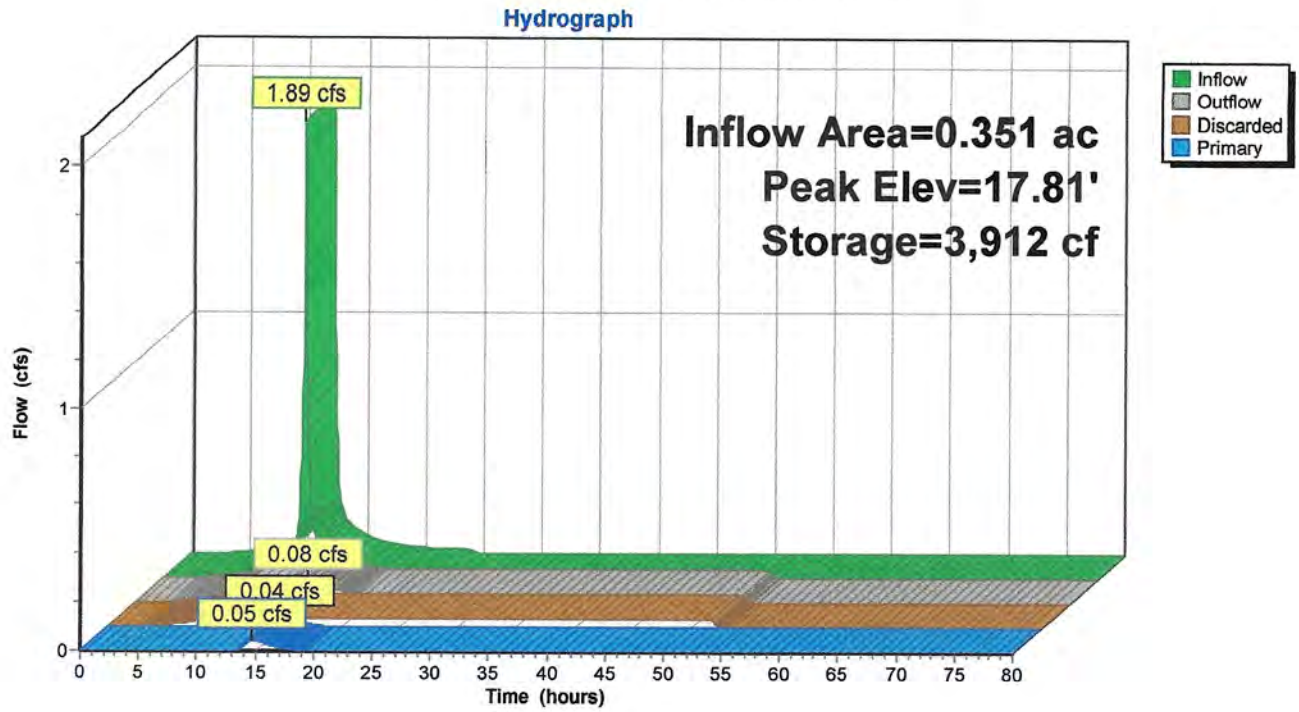
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
15.50	2,673	0	0	2,673
15.83	2,673	882	882	2,733
16.00	2,673	454	1,337	2,765
17.00	2,673	2,673	4,010	2,948
17.83	2,673	2,219	6,228	3,100
18.00	2,673	454	6,683	3,131
18.17	2,673	454	7,137	3,162

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.50'	**0.520 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	17.68'	**6.0" Round PVC_Round 6"** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.68' / 15.95' S= 0.0577 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 14.72 hrs HW=17.81' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.04 cfs @ 14.72 hrs HW=17.81' (Free Discharge)
↑**2=PVC_Round 6"** (Inlet Controls 0.04 cfs @ 1.09 fps)

Pond 7P: INFILTRATION SYSTEM



Summary for Pond 8P: DETENTION BASIN 2

Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 3.92" for 25 Year Storm event
Inflow = 0.79 cfs @ 12.15 hrs, Volume= 0.067 af
Outflow = 0.26 cfs @ 12.51 hrs, Volume= 0.067 af, Atten= 67%, Lag= 21.9 min
Primary = 0.26 cfs @ 12.51 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.05' @ 12.51 hrs Surf.Area= 1,928 sf Storage= 1,008 cf

Plug-Flow detention time= 92.5 min calculated for 0.067 af (100% of inflow)
Center-of-Mass det. time= 93.7 min (903.4 - 809.7)

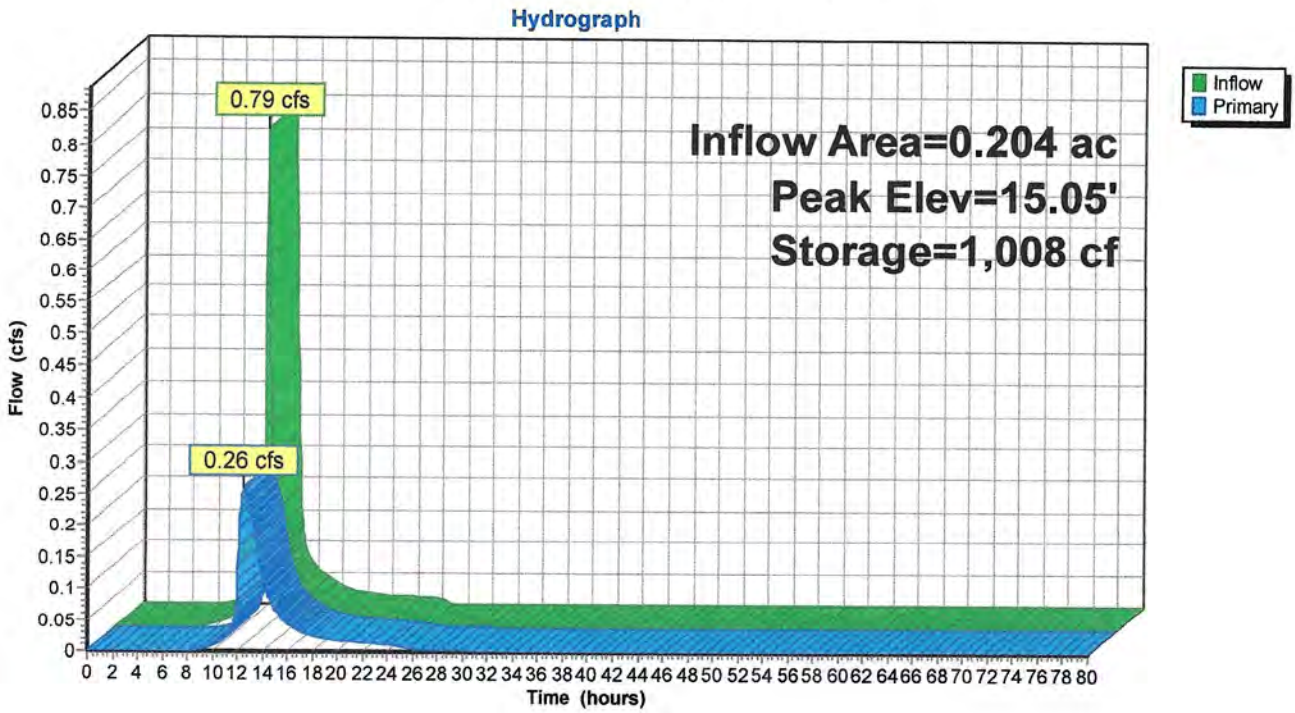
Volume	Invert	Avail.Storage	Storage Description
#1	14.50'	6,448 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
14.50	1,712	0	0	1,712
15.00	1,904	904	904	1,918
16.00	2,370	2,133	3,036	2,412
17.00	2,952	2,656	5,692	3,022
17.25	3,098	756	6,448	3,176

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**4.0" Round 4" PVC Culvert** L= 12.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 14.38' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	16.25'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.26 cfs @ 12.51 hrs HW=15.05' (Free Discharge)
↑—**1=4" PVC Culvert** (Barrel Controls 0.26 cfs @ 2.98 fps)
└—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: DETENTION BASIN 2



Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA1 TO RAILROAD AVE Runoff Area=12,039 sf 84.98% Impervious Runoff Depth=5.94"
Flow Length=157' Tc=7.0 min CN=91 Runoff=1.72 cfs 0.137 af

Subcatchment 2S: DA2 TO RAILROAD AVE Runoff Area=5,729 sf 53.83% Impervious Runoff Depth=3.72"
Flow Length=100' Tc=5.7 min CN=71 Runoff=0.57 cfs 0.041 af

Subcatchment 3S: DA3 Runoff Area=5,613 sf 46.59% Impervious Runoff Depth=5.25"
Tc=5.0 min CN=85 Runoff=0.78 cfs 0.056 af

Subcatchment 4S: DA4 Runoff Area=15,291 sf 83.57% Impervious Runoff Depth=6.17"
Flow Length=225' Slope=0.0050 '/' Tc=5.0 min CN=93 Runoff=2.35 cfs 0.181 af

Subcatchment 5S: DA5 Runoff Area=8,903 sf 57.97% Impervious Runoff Depth=5.14"
Flow Length=151' Tc=10.6 min CN=84 Runoff=1.02 cfs 0.088 af

Subcatchment 6S: DA6 TO WETLANDS Runoff Area=13,540 sf 15.41% Impervious Runoff Depth=4.37"
Flow Length=440' Tc=14.6 min CN=77 Runoff=1.21 cfs 0.113 af

Subcatchment 7S: DA7 TO RAILROAD Runoff Area=13,232 sf 11.99% Impervious Runoff Depth=1.32"
Flow Length=105' Tc=10.7 min CN=46 Runoff=0.31 cfs 0.033 af

Subcatchment 8S: DA8 TO 114 ALDEN STREET Runoff Area=1,061 sf 6.79% Impervious Runoff Depth=1.07"
Flow Length=22' Slope=0.0200 '/' Tc=5.0 min CN=43 Runoff=0.02 cfs 0.002 af

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS Inflow=1.66 cfs 0.477 af
Outflow=1.66 cfs 0.477 af

Reach 2R: TOTAL RUNOFF FROM SITE Inflow=1.98 cfs 0.512 af
Outflow=1.98 cfs 0.512 af

Reach 3R: 8" PVC DRAIN PIPE Avg. Flow Depth=0.21' Max Vel=3.41 fps Inflow=0.31 cfs 0.088 af
8.0" Round Pipe n=0.010 L=68.0' S=0.0093 '/' Capacity=1.51 cfs Outflow=0.31 cfs 0.088 af

Pond 1P: CATCH BASIN 1 Peak Elev=16.92' Inflow=1.72 cfs 0.137 af
12.0" Round Culvert n=0.012 L=118.0' S=0.0050 '/' Outflow=1.72 cfs 0.137 af

Pond 2P: CATCH BASIN 2 Peak Elev=17.03' Inflow=0.57 cfs 0.041 af
12.0" Round Culvert n=0.012 L=56.0' S=0.0200 '/' Outflow=0.57 cfs 0.041 af

Pond 3P: STORMCEPTOR 1 / DMH Peak Elev=16.18' Inflow=2.28 cfs 0.178 af
15.0" Round Culvert n=0.012 L=133.0' S=0.0035 '/' Outflow=2.28 cfs 0.178 af

Pond 4P: DRAIN MANHOLE 1 Peak Elev=15.77' Inflow=2.28 cfs 0.178 af
15.0" Round Culvert n=0.012 L=17.0' S=0.0035 '/' Outflow=2.28 cfs 0.178 af

Pond 5P: DETENTION BASIN 1 Peak Elev=15.85' Storage=5,875 cf Inflow=3.24 cfs 0.364 af
Outflow=0.56 cfs 0.364 af

Pond 6P: STORMCEPTOR 2 / CB Peak Elev=17.91' Inflow=2.35 cfs 0.181 af
12.0" Round Culvert n=0.010 L=18.0' S=0.0150 '/' Outflow=2.35 cfs 0.181 af

Pond 7P: INFILTRATION SYSTEM Peak Elev=18.07' Storage=4,166 cf Inflow=2.35 cfs 0.181 af
Discarded=0.04 cfs 0.138 af Primary=0.30 cfs 0.042 af Outflow=0.34 cfs 0.181 af

Pond 8P: DETENTION BASIN 2 Peak Elev=15.22' Storage=1,329 cf Inflow=1.02 cfs 0.088 af
Outflow=0.31 cfs 0.088 af

Total Runoff Area = 1.731 ac Runoff Volume = 0.651 af Average Runoff Depth = 4.51"
50.12% Pervious = 0.868 ac 49.88% Impervious = 0.864 ac

Summary for Subcatchment 1S: DA1 TO RAILROAD AVE

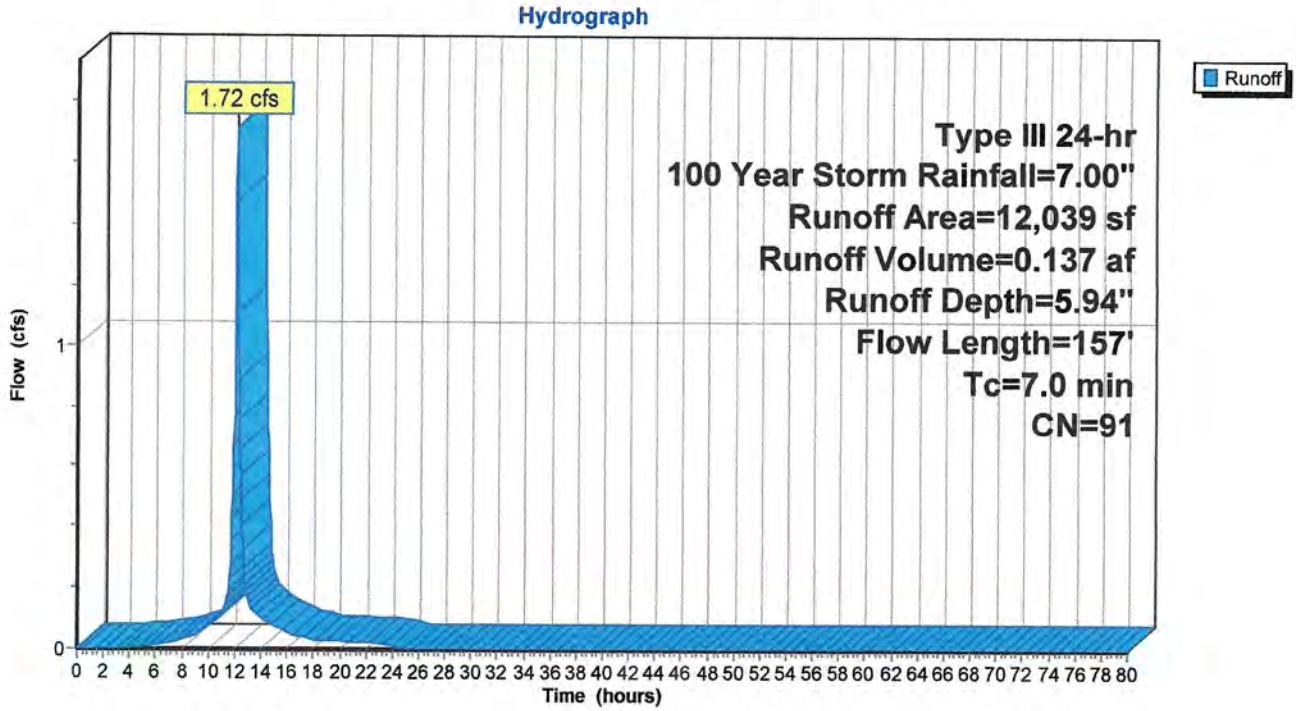
Runoff = 1.72 cfs @ 12.10 hrs, Volume= 0.137 af, Depth= 5.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	1,270	39	>75% Grass cover, Good, HSG A
	538	74	>75% Grass cover, Good, HSG C
*	7,805	98	Paved street, dwys, parking, curbs HSG A
	449	98	Paved parking, HSG C
*	292	98	Sidewalks, HSG A
*	146	98	Sidewalks, HSG C
	1,028	98	Roofs, HSG A
	511	98	Roofs, HSG C
	12,039	91	Weighted Average
	1,808		15.02% Pervious Area
	10,231		84.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	28	0.0150	0.08		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
0.5	24	0.0100	0.81		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
0.9	105	0.0090	1.93		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
7.0	157	Total			

Subcatchment 1S: DA1 TO RAILROAD AVE



Summary for Subcatchment 2S: DA2 TO RAILROAD AVE

[49] Hint: Tc<2dt may require smaller dt

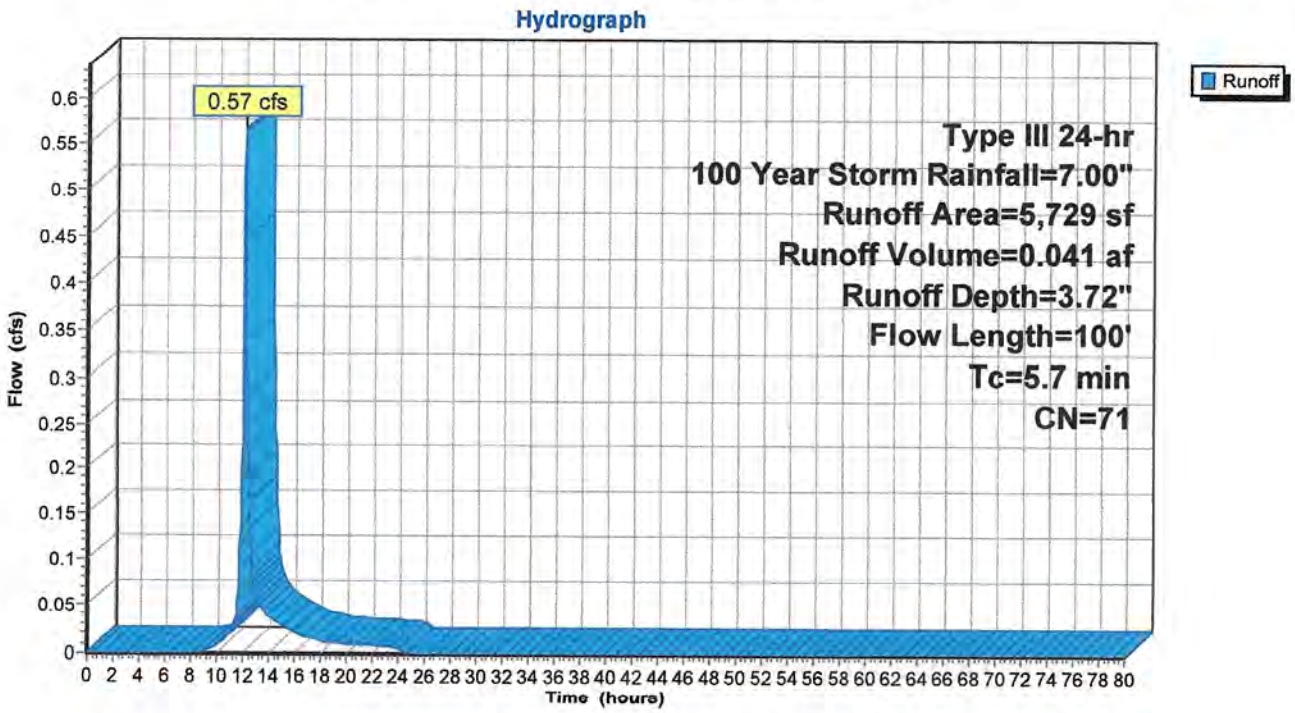
Runoff = 0.57 cfs @ 12.09 hrs, Volume= 0.041 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	2,645	39	>75% Grass cover, Good, HSG A
*	3,084	98	Paved sreet, driveway, HSG A
	5,729	71	Weighted Average
	2,645		46.17% Pervious Area
	3,084		53.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	28	0.0250	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
0.5	22	0.0100	0.79		**Sheet Flow, PAVED** Smooth surfaces n= 0.011 P2= 3.40"
0.6	50	0.0050	1.44		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
5.7	100	Total			

Subcatchment 2S: DA2 TO RAILROAD AVE



Summary for Subcatchment 3S: DA3

[49] Hint: Tc<2dt may require smaller dt

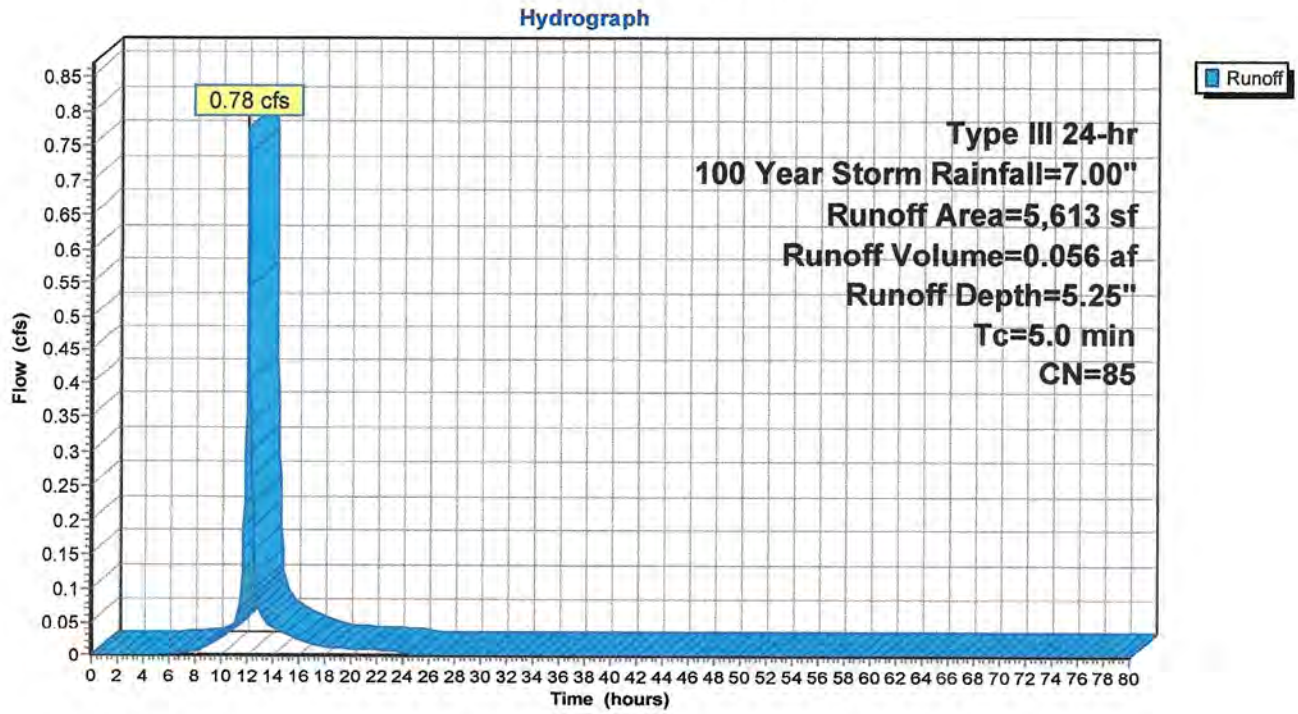
Runoff = 0.78 cfs @ 12.07 hrs, Volume= 0.056 af, Depth= 5.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	2,998	74	>75% Grass cover, Good, HSG C
*	2,615	98	Detention Basin 1, Water Surface, HSG C
	5,613	85	Weighted Average
	2,998		53.41% Pervious Area
	2,615		46.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DETENTION BASIN 1**

Subcatchment 3S: DA3



Summary for Subcatchment 4S: DA4

[49] Hint: Tc<2dt may require smaller dt

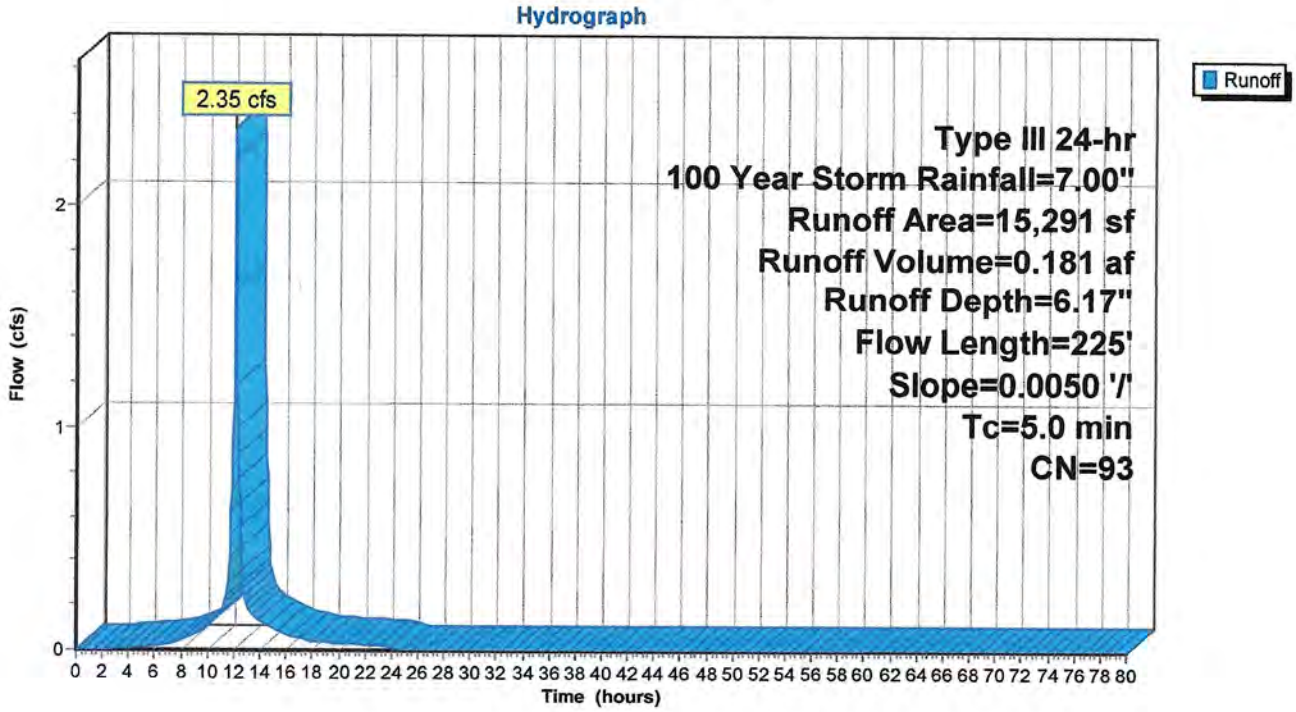
Runoff = 2.35 cfs @ 12.07 hrs, Volume= 0.181 af, Depth= 6.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	250	39	>75% Grass cover, Good, HSG A
	2,262	74	>75% Grass cover, Good, HSG C
	490	98	Roofs, HSG A
	4,174	98	Roofs, HSG C
*	149	98	Paved parking, dwy, curbs, HSG A
*	6,878	98	Paved parking, dwy, curbs, HSG C
*	97	98	Sidewalks, HSG A
*	991	98	Sidewalks, HSG C
	15,291	93	Weighted Average
	2,512		16.43% Pervious Area
	12,779		83.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.71		**Sheet Flow, PAVED**
					Smooth surfaces n= 0.011 P2= 3.40"
2.0	175	0.0050	1.44		**Shallow Concentrated Flow, PAVED**
					Paved Kv= 20.3 fps
3.2	225	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 4S: DA4



Summary for Subcatchment 5S: DA5

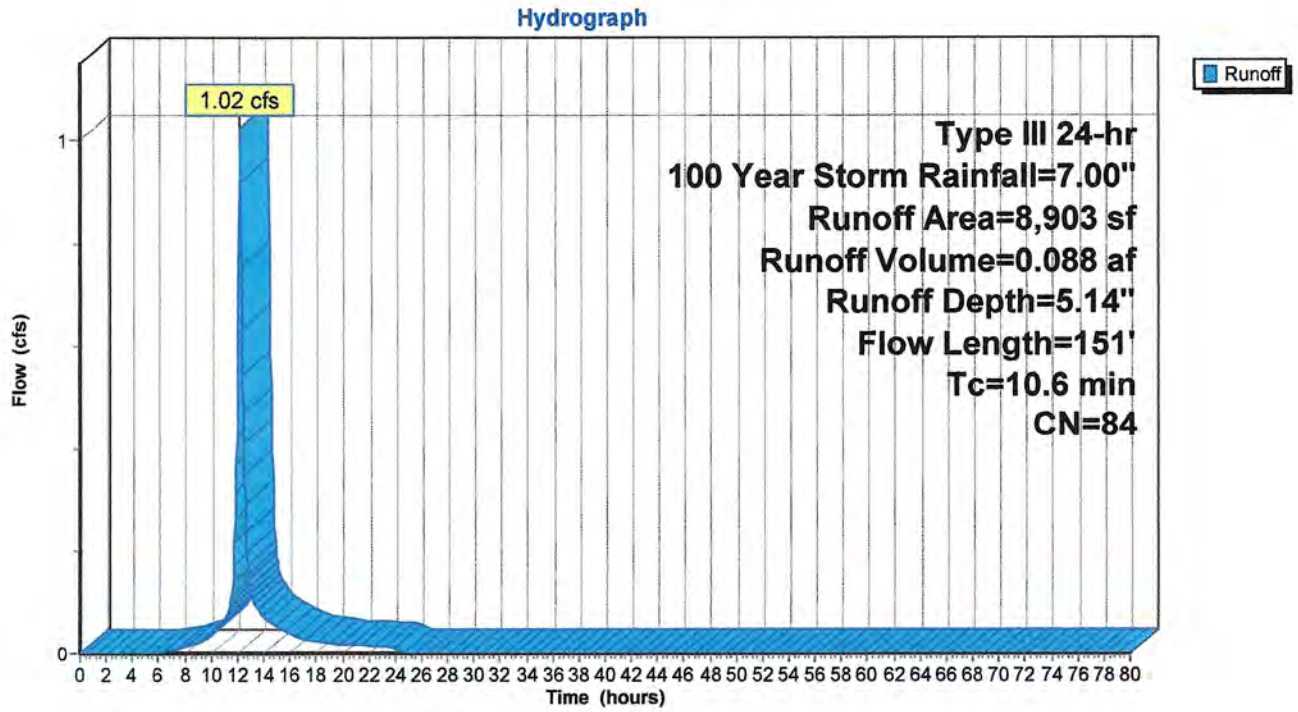
Runoff = 1.02 cfs @ 12.15 hrs, Volume= 0.088 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	1,113	39	>75% Grass cover, Good, HSG A
	2,629	74	>75% Grass cover, Good, HSG C
*	1,982	98	Detention Basin 2, Water Surface, HSG C
	1,807	98	Roofs, HSG A
	1,050	98	Roofs, HSG C
*	292	98	Walls, HSG A
*	30	98	Walls, HSG C
	8,903	84	Weighted Average
	3,742		42.03% Pervious Area
	5,161		57.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0050	0.09		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.40"
1.0	65	0.0050	1.14		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1	36	0.1400	6.02		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
10.6	151	Total			

Subcatchment 5S: DA5



Summary for Subcatchment 6S: DA6 TO WETLANDS

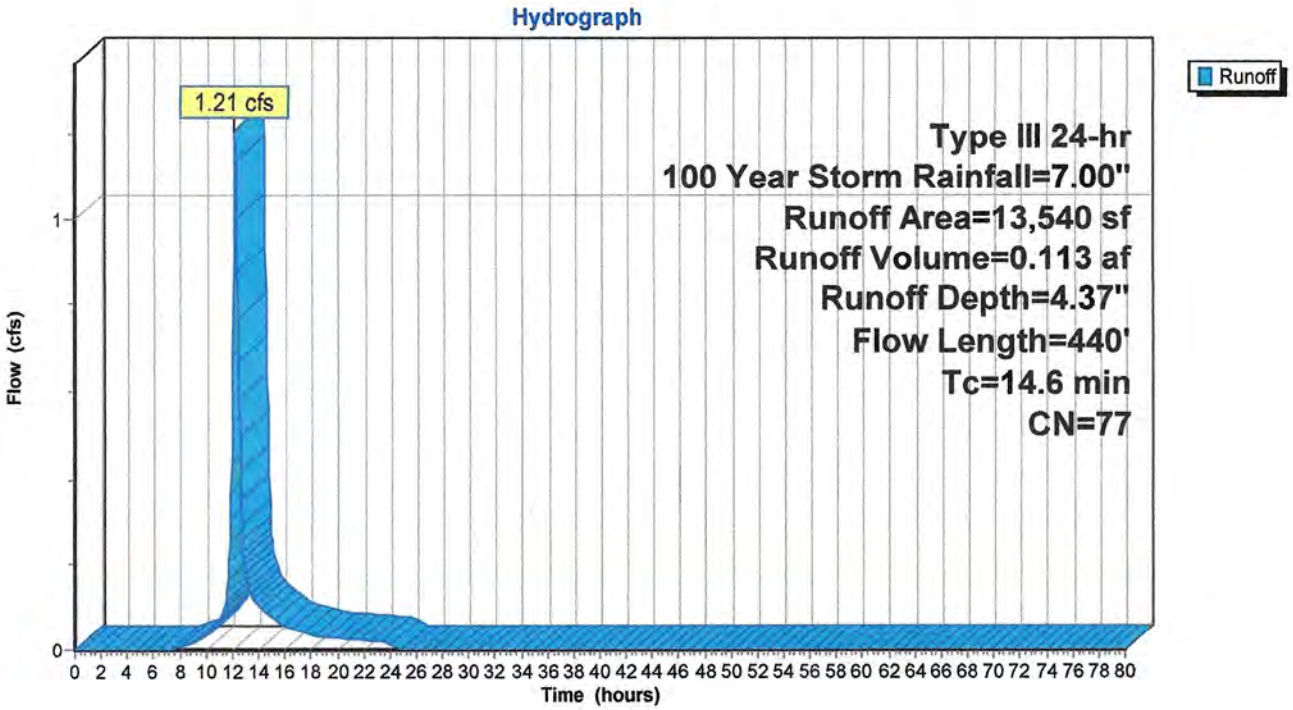
Runoff = 1.21 cfs @ 12.20 hrs, Volume= 0.113 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	353	70	Woods, Good, HSG C
*	4,694	77	Woods-wetland, Good, HSG D
	463	39	>75% Grass cover, Good, HSG A
	5,944	74	>75% Grass cover, Good, HSG C
	1,922	98	Roofs, HSG C
*	164	98	Conc Culvert, HSG D
	13,540	77	Weighted Average
	11,454		84.59% Pervious Area
	2,086		15.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	30	0.0200	0.09		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 3.40"
0.6	100	0.0180	2.72		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
0.5	90	0.0220	3.01		**Shallow Concentrated Flow, PAVED** Paved Kv= 20.3 fps
8.2	220	0.0080	0.45		**Shallow Concentrated Flow, WOODS** Woodland Kv= 5.0 fps
14.6	440	Total			

Subcatchment 6S: DA6 TO WETLANDS



Summary for Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET

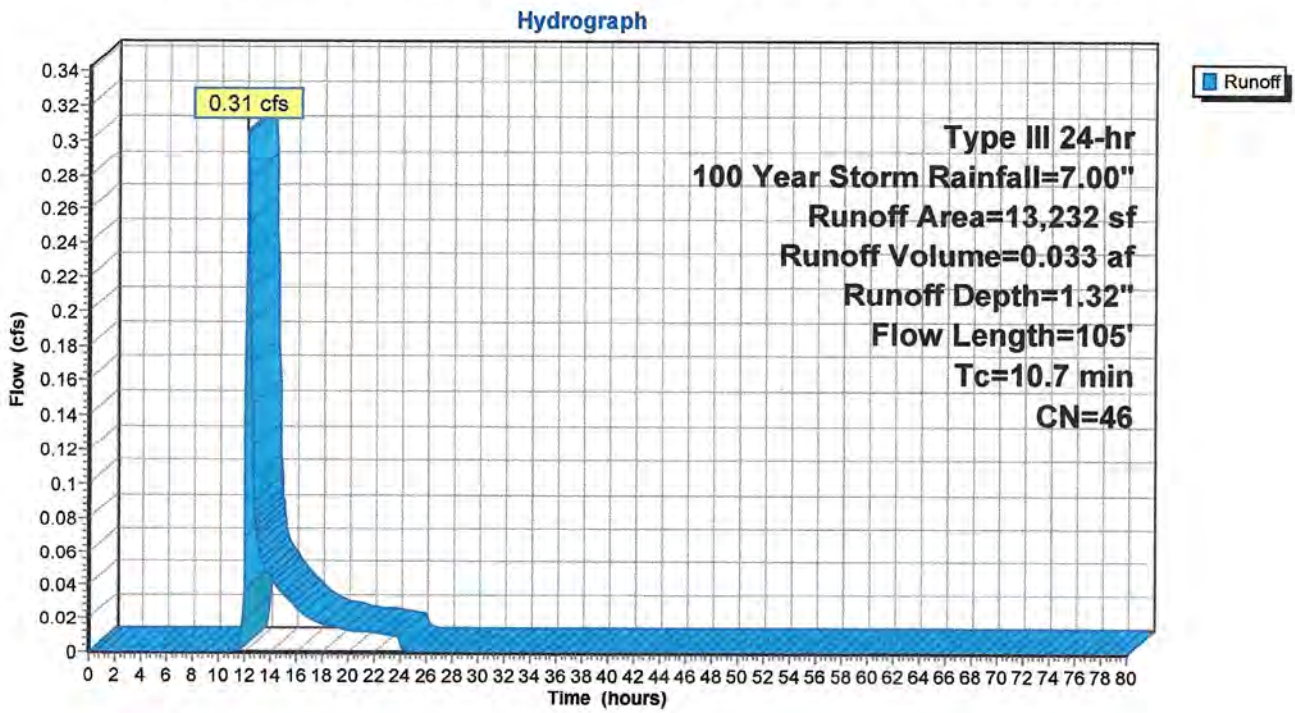
Runoff = 0.31 cfs @ 12.19 hrs, Volume= 0.033 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	11,645	39	>75% Grass cover, Good, HSG A
	959	98	Roofs, HSG A
*	165	98	Walks, HSG A
*	463	98	Walls, HSG A
	13,232	46	Weighted Average
	11,645		88.01% Pervious Area
	1,587		11.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	35	0.0200	0.10		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
3.6	15	0.0130	0.07		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
1.1	55	0.0130	0.80		**Shallow Concentrated Flow, GRASS** Short Grass Pasture Kv= 7.0 fps
10.7	105	Total			

Subcatchment 7S: DA7 TO RAILROAD AVENUE & ALDEN STREET



Summary for Subcatchment 8S: DA8 TO 114 ALDEN STREET

[49] Hint: Tc<2dt may require smaller dt

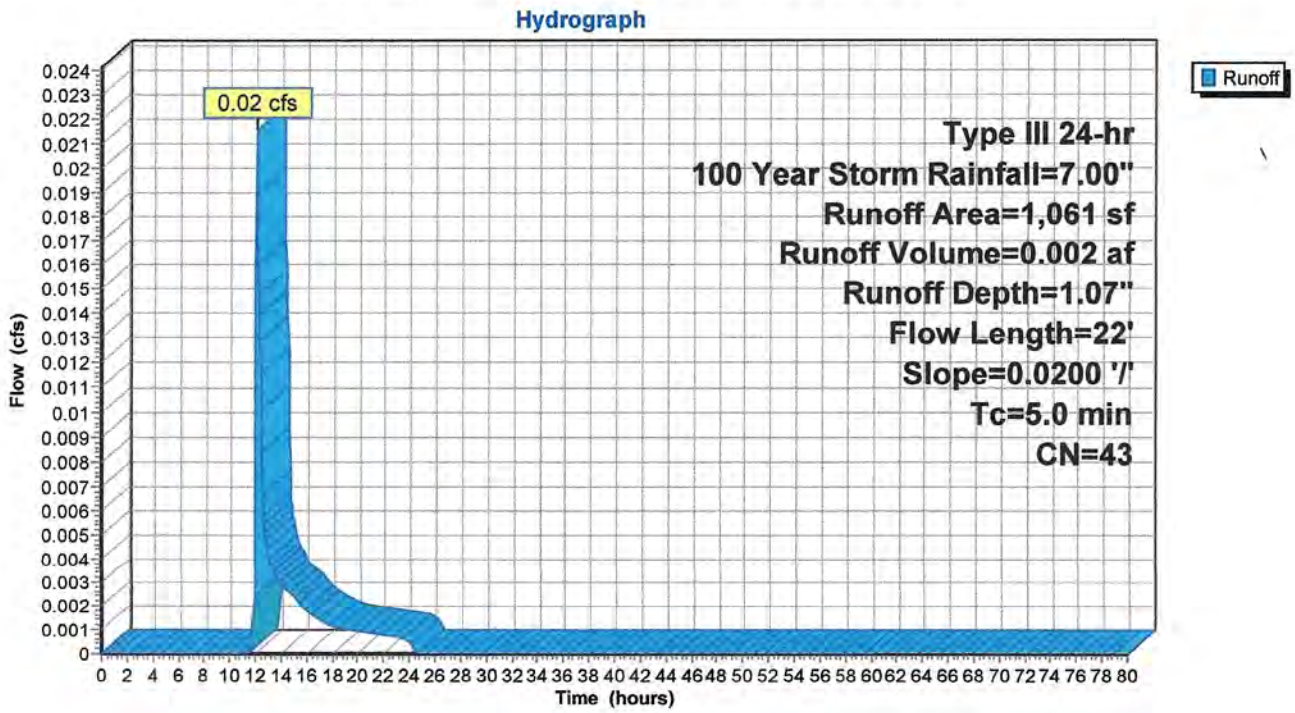
Runoff = 0.02 cfs @ 12.11 hrs, Volume= 0.002 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Storm Rainfall=7.00"

	Area (sf)	CN	Description
	989	39	>75% Grass cover, Good, HSG A
*	72	98	Walls, HSG A
	1,061	43	Weighted Average
	989		93.21% Pervious Area
	72		6.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	22	0.0200	0.09		**Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 3.40"
4.1	22	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 8S: DA8 TO 114 ALDEN STREET



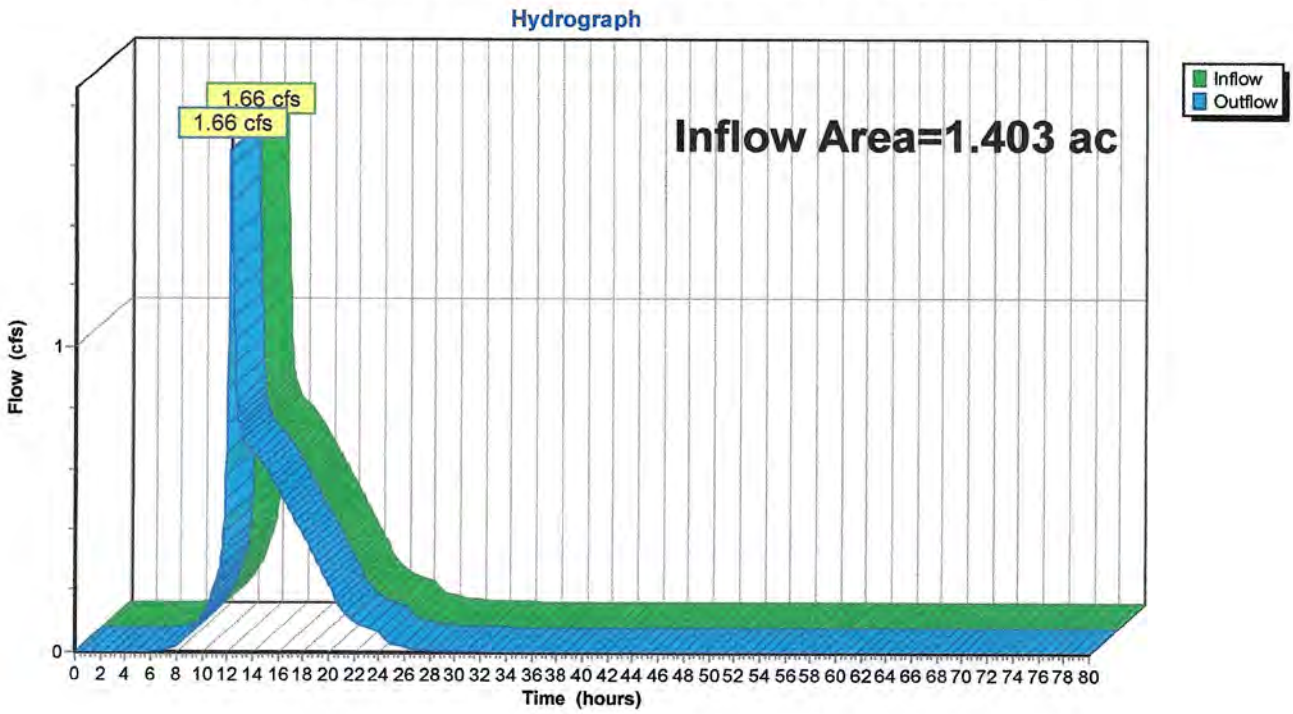
Summary for Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS

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

Inflow Area = 1.403 ac, 58.83% Impervious, Inflow Depth = 4.08" for 100 Year Storm event
Inflow = 1.66 cfs @ 12.21 hrs, Volume= 0.477 af
Outflow = 1.66 cfs @ 12.21 hrs, Volume= 0.477 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 1R: TOTAL RUNOFF FROM SITE AT WETLANDS



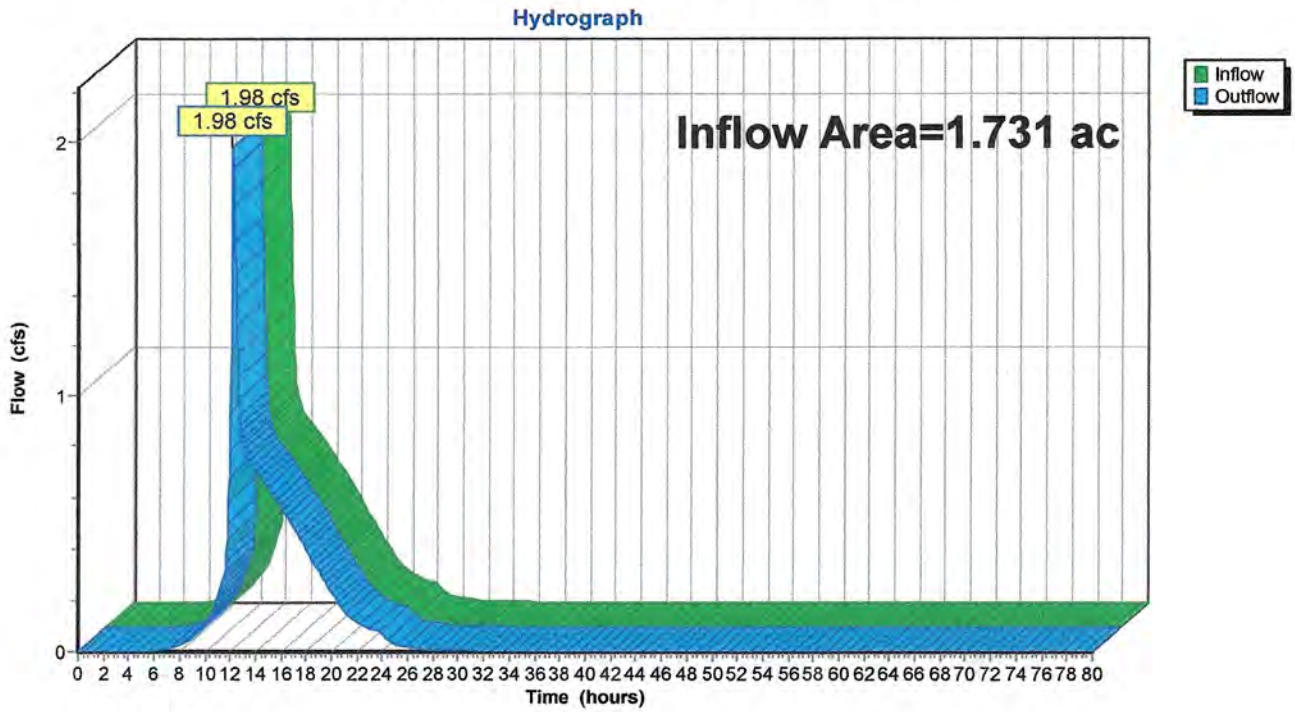
Summary for Reach 2R: TOTAL RUNOFF FROM SITE

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

Inflow Area = 1.731 ac, 49.88% Impervious, Inflow Depth = 3.55" for 100 Year Storm event
Inflow = 1.98 cfs @ 12.20 hrs, Volume= 0.512 af
Outflow = 1.98 cfs @ 12.20 hrs, Volume= 0.512 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Reach 2R: TOTAL RUNOFF FROM SITE



Summary for Reach 3R: 8" PVC DRAIN PIPE

[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 8P Primary device # 1 INLET by 0.09'

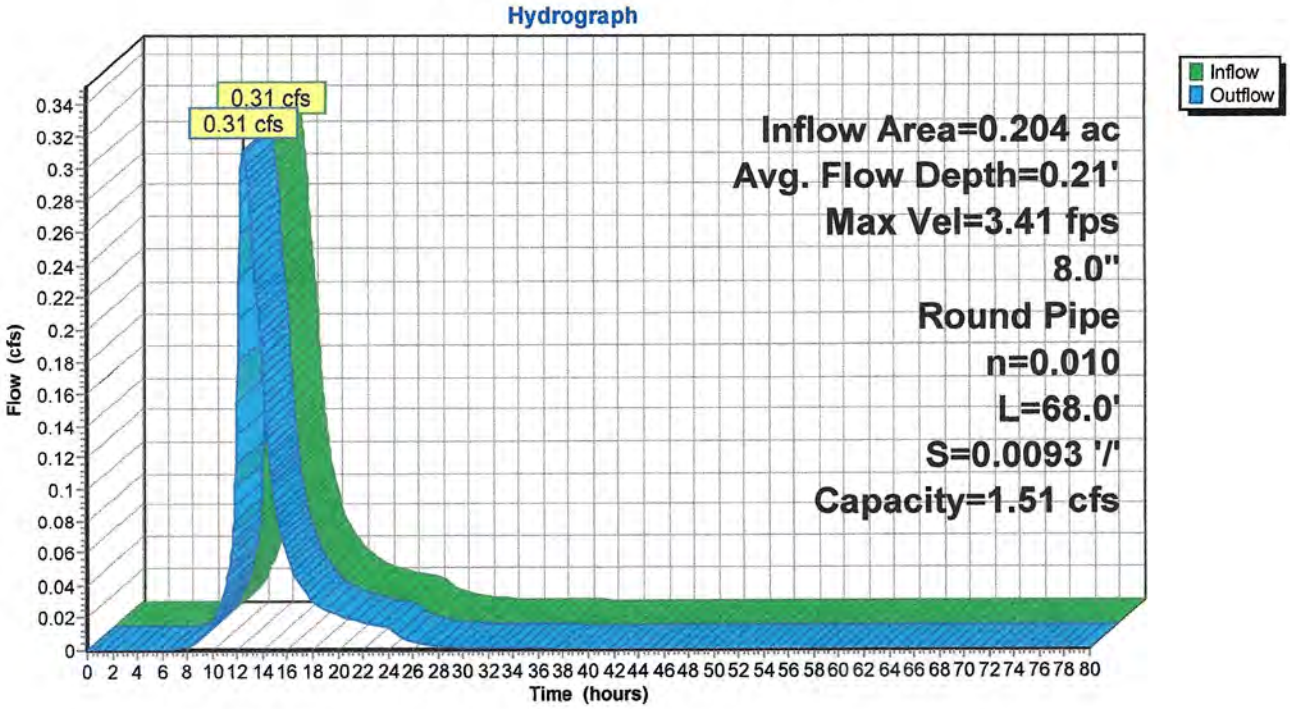
Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 5.14" for 100 Year Storm event
Inflow = 0.31 cfs @ 12.53 hrs, Volume= 0.088 af
Outflow = 0.31 cfs @ 12.54 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.41 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 1.2 min

Peak Storage= 6 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.62'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 68.0' Slope= 0.0093 '/'
Inlet Invert= 14.38', Outlet Invert= 13.75'

Reach 3R: 8" PVC DRAIN PIPE



Summary for Pond 1P: CATCH BASIN 1

[57] Hint: Peaked at 16.92' (Flood elevation advised)

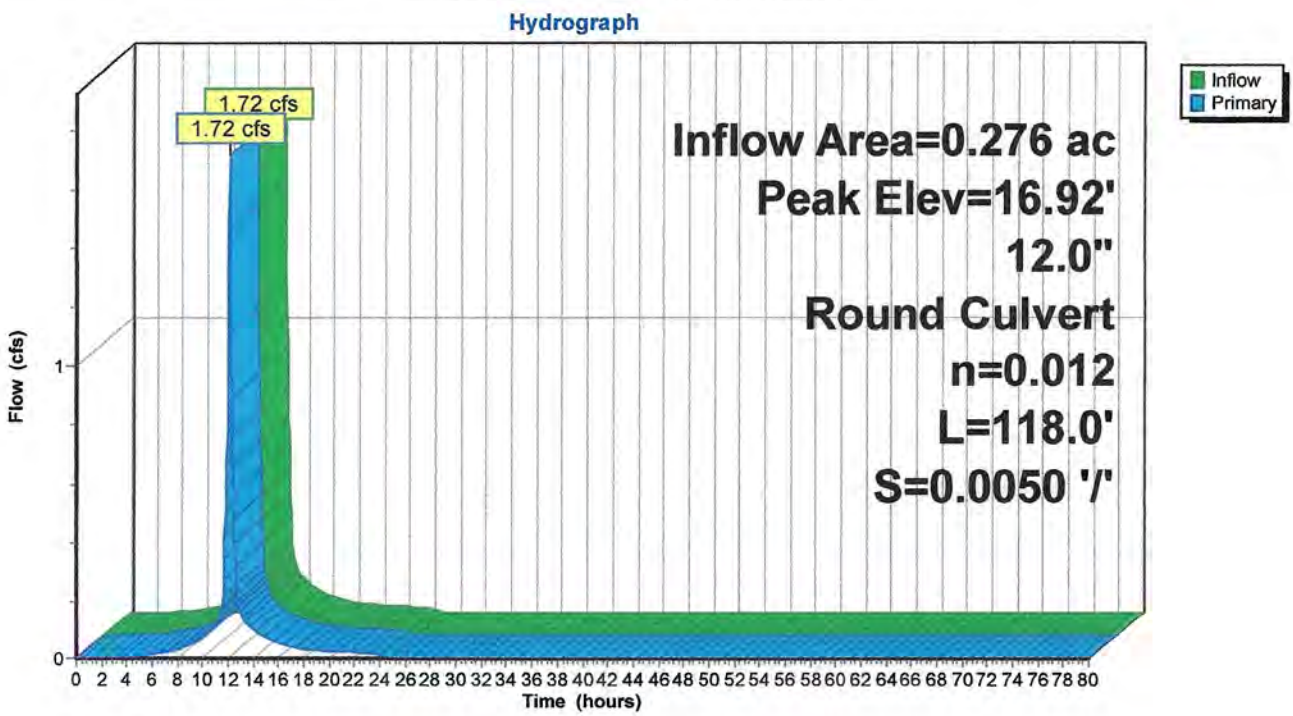
Inflow Area = 0.276 ac, 84.98% Impervious, Inflow Depth = 5.94" for 100 Year Storm event
Inflow = 1.72 cfs @ 12.10 hrs, Volume= 0.137 af
Outflow = 1.72 cfs @ 12.10 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
Primary = 1.72 cfs @ 12.10 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.92' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.12'	**12.0" Round CPP_Round 12"** L= 118.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.12' / 15.53' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.71 cfs @ 12.10 hrs HW=16.92' (Free Discharge)
↑—1=CPP_Round 12" (Barrel Controls 1.71 cfs @ 3.47 fps)

Pond 1P: CATCH BASIN 1



Summary for Pond 2P: CATCH BASIN 2

[57] Hint: Peaked at 17.03' (Flood elevation advised)

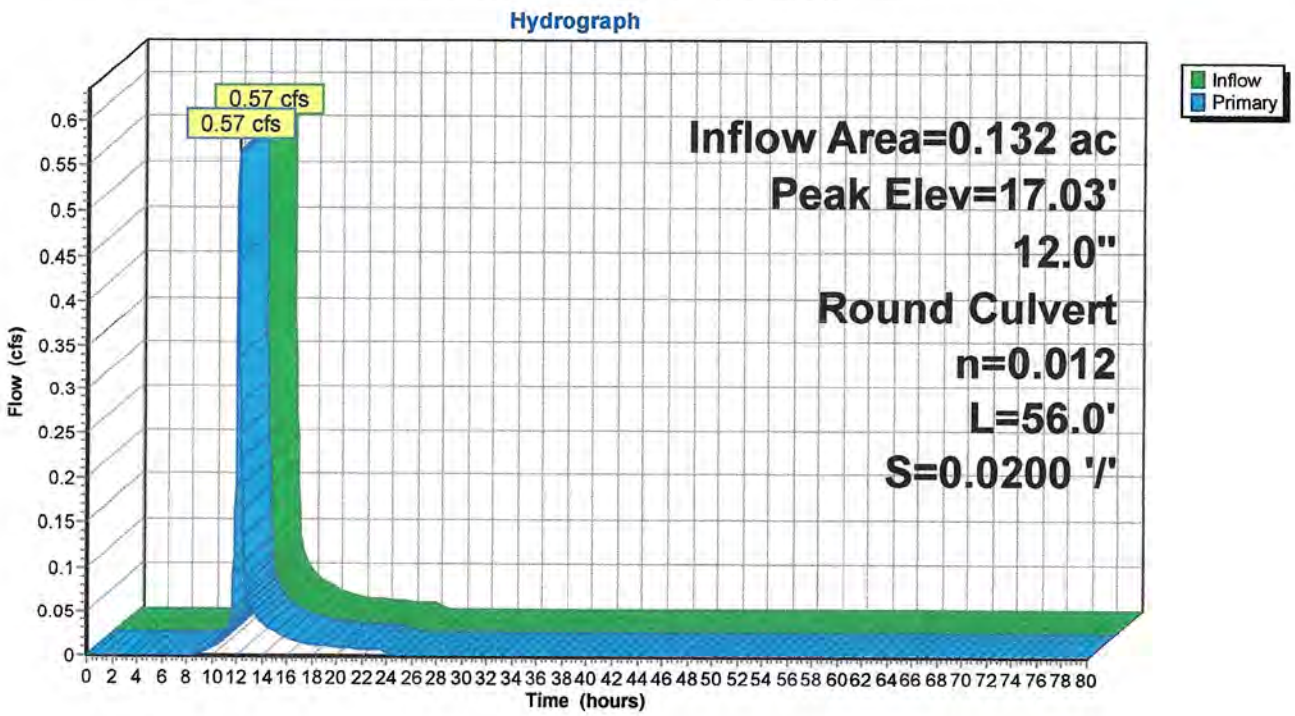
Inflow Area =	0.132 ac,	53.83% Impervious,	Inflow Depth =	3.72" for 100 Year Storm event
Inflow =	0.57 cfs @	12.09 hrs, Volume=	0.041 af	
Outflow =	0.57 cfs @	12.09 hrs, Volume=	0.041 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.57 cfs @	12.09 hrs, Volume=	0.041 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 17.03' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.65'	**12.0" Round CPP_Round 12"** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 16.65' / 15.53' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.55 cfs @ 12.09 hrs HW=17.02' (Free Discharge)
↑—1=CPP_Round 12" (Inlet Controls 0.55 cfs @ 2.08 fps)

Pond 2P: CATCH BASIN 2



Summary for Pond 3P: STORMCEPTOR 1 / DMH

[57] Hint: Peaked at 16.18' (Flood elevation advised)
[79] Warning: Submerged Pond 1P Primary device # 1 INLET by 0.06'
[79] Warning: Submerged Pond 2P Primary device # 1 OUTLET by 0.65'

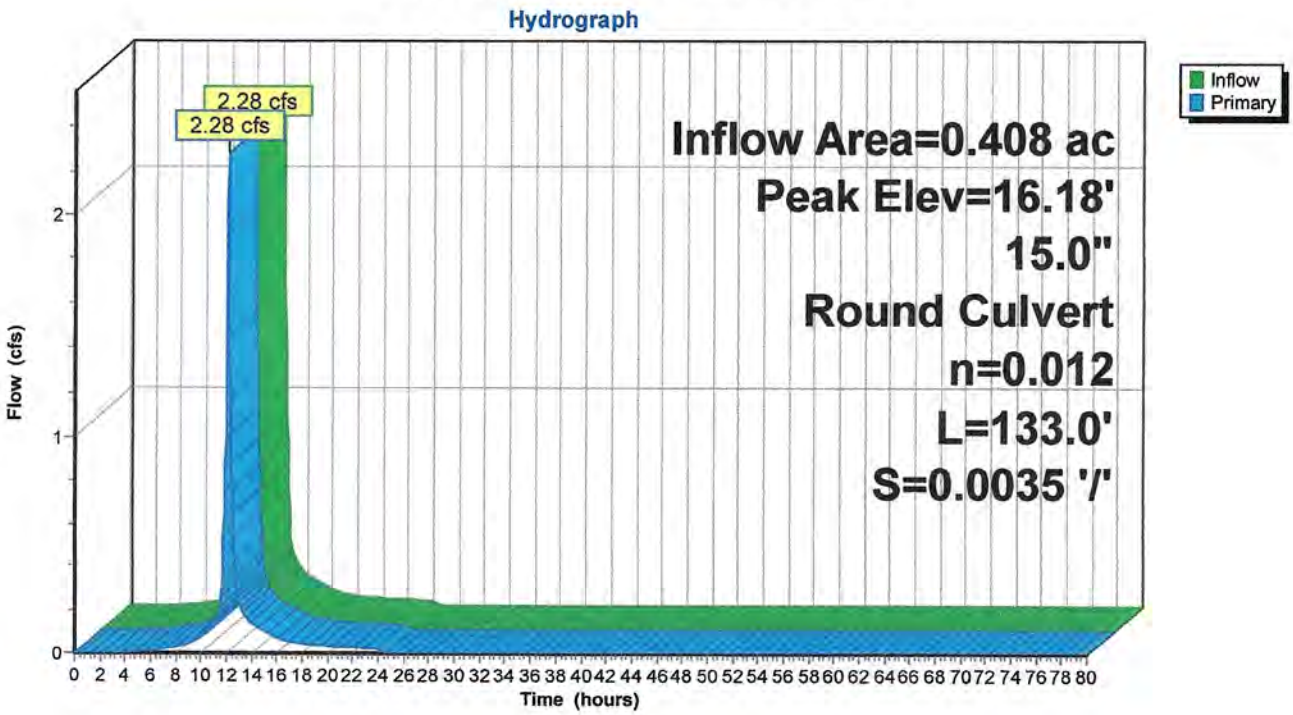
Inflow Area = 0.408 ac, 74.94% Impervious, Inflow Depth = 5.22" for 100 Year Storm event
Inflow = 2.28 cfs @ 12.10 hrs, Volume= 0.178 af
Outflow = 2.28 cfs @ 12.10 hrs, Volume= 0.178 af, Atten= 0%, Lag= 0.0 min
Primary = 2.28 cfs @ 12.10 hrs, Volume= 0.178 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 16.18' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.28'	**15.0" Round CPP_Round 15"** L= 133.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.28' / 14.81' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.26 cfs @ 12.10 hrs HW=16.18' (Free Discharge)
↑—**1=CPP_Round 15"** (Barrel Controls 2.26 cfs @ 3.35 fps)

Pond 3P: STORMCEPTOR 1 / DMH



Summary for Pond 4P: DRAIN MANHOLE 1

[57] Hint: Peaked at 15.77' (Flood elevation advised)
[79] Warning: Submerged Pond 3P Primary device # 1 INLET by 0.49'

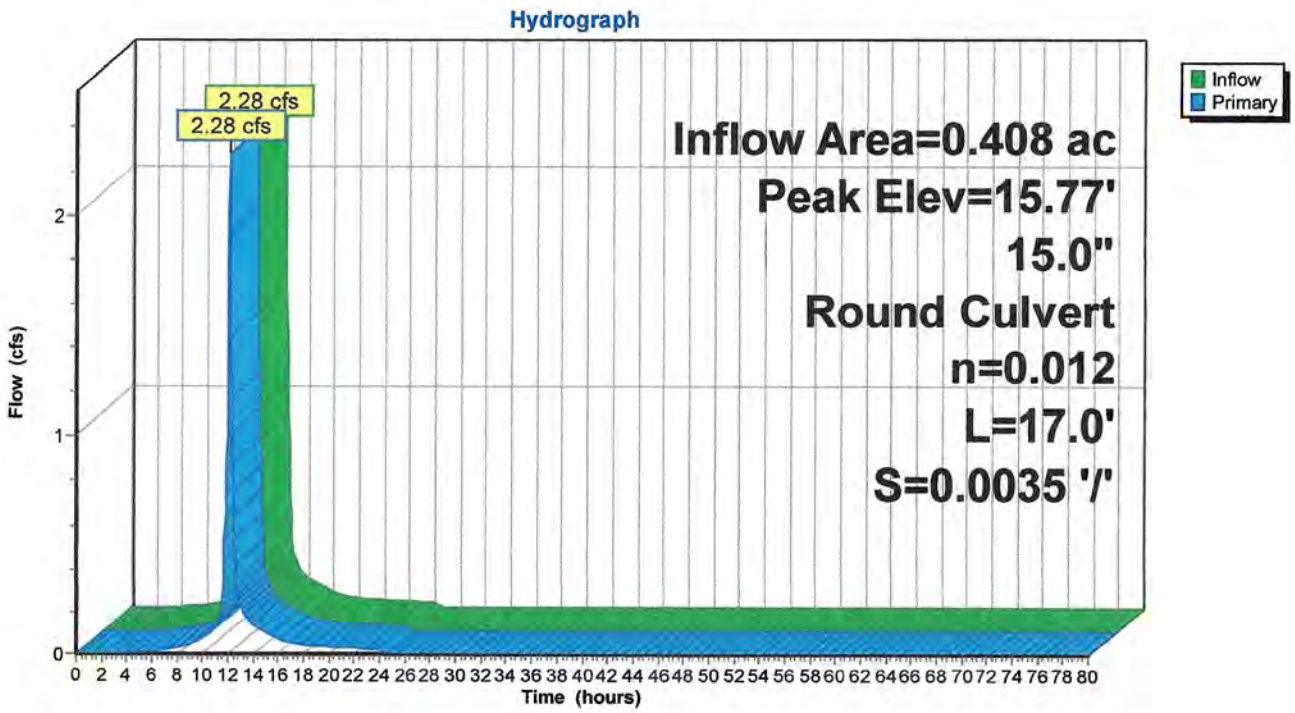
Inflow Area =	0.408 ac,	74.94% Impervious,	Inflow Depth =	5.22" for 100 Year Storm event
Inflow =	2.28 cfs @	12.10 hrs, Volume=	0.178 af	
Outflow =	2.28 cfs @	12.10 hrs, Volume=	0.178 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.28 cfs @	12.10 hrs, Volume=	0.178 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.77' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	14.81'	**15.0" Round CPP_Round 15"** L= 17.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 14.81' / 14.75' S= 0.0035 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.26 cfs @ 12.10 hrs HW=15.77' (Free Discharge)
↑—**1=CPP_Round 15"** (Barrel Controls 2.26 cfs @ 3.10 fps)

Pond 4P: DRAIN MANHOLE 1



Summary for Pond 5P: DETENTION BASIN 1

[63] Warning: Exceeded Reach 3R INLET depth by 1.31' @ 13.80 hrs
[81] Warning: Exceeded Pond 4P by 0.82' @ 13.80 hrs

Inflow Area = 1.092 ac, 71.19% Impervious, Inflow Depth = 4.00" for 100 Year Storm event
Inflow = 3.24 cfs @ 12.09 hrs, Volume= 0.364 af
Outflow = 0.56 cfs @ 13.62 hrs, Volume= 0.364 af, Atten= 83%, Lag= 91.5 min
Primary = 0.56 cfs @ 13.62 hrs, Volume= 0.364 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.85' @ 13.62 hrs Surf.Area= 3,366 sf Storage= 5,875 cf

Plug-Flow detention time= 138.0 min calculated for 0.364 af (100% of inflow)
Center-of-Mass det. time= 137.9 min (958.7 - 820.7)

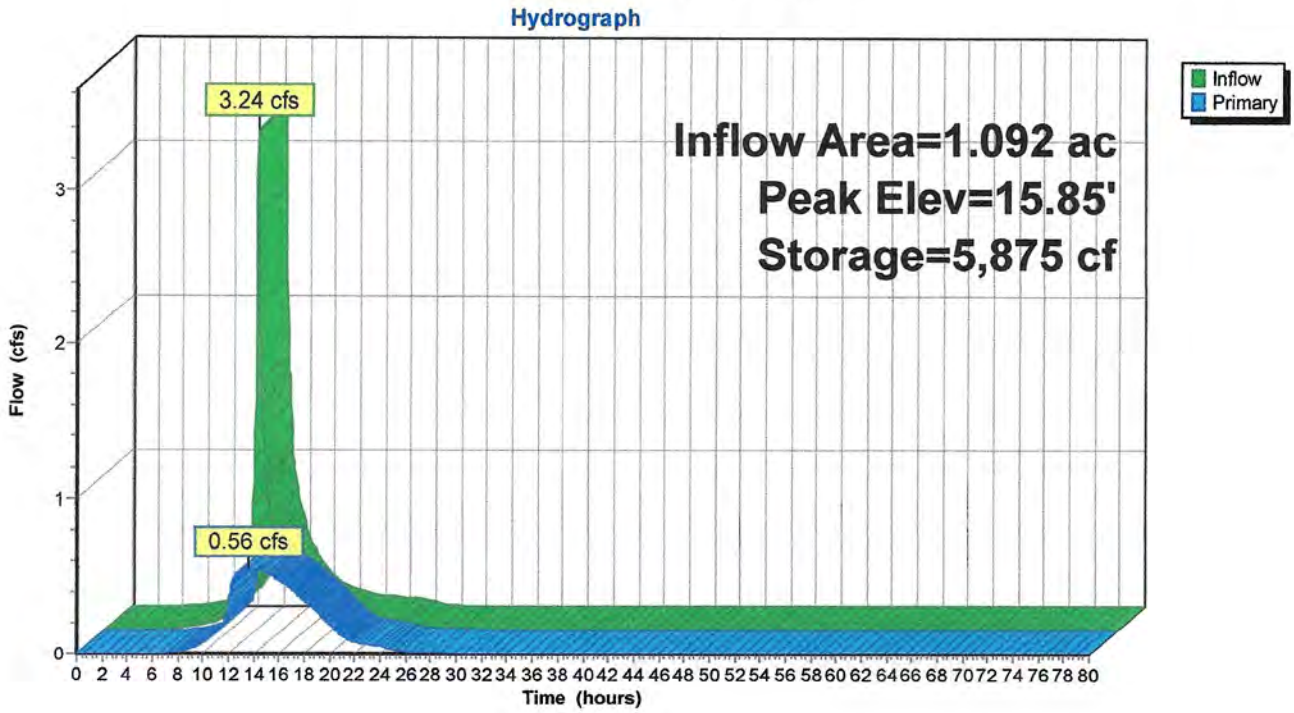
Volume	Invert	Avail.Storage	Storage Description
#1	13.75'	11,218 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
13.75	2,256	0	0	2,256
14.00	2,367	578	578	2,375
15.00	2,897	2,628	3,205	2,935
16.00	3,450	3,169	6,375	3,523
17.00	4,137	3,788	10,163	4,244
17.25	4,302	1,055	11,218	4,419

Device	Routing	Invert	Outlet Devices
#1	Primary	13.75'	**4.0" Round 4" PVC Culvert** L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 13.75' / 13.55' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	15.95'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.56 cfs @ 13.62 hrs HW=15.85' (Free Discharge)
↑—**1=4" PVC Culvert** (Barrel Controls 0.56 cfs @ 6.39 fps)
└—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: DETENTION BASIN 1



Summary for Pond 6P: STORMCEPTOR 2 / CB

[57] Hint: Peaked at 17.91' (Flood elevation advised)

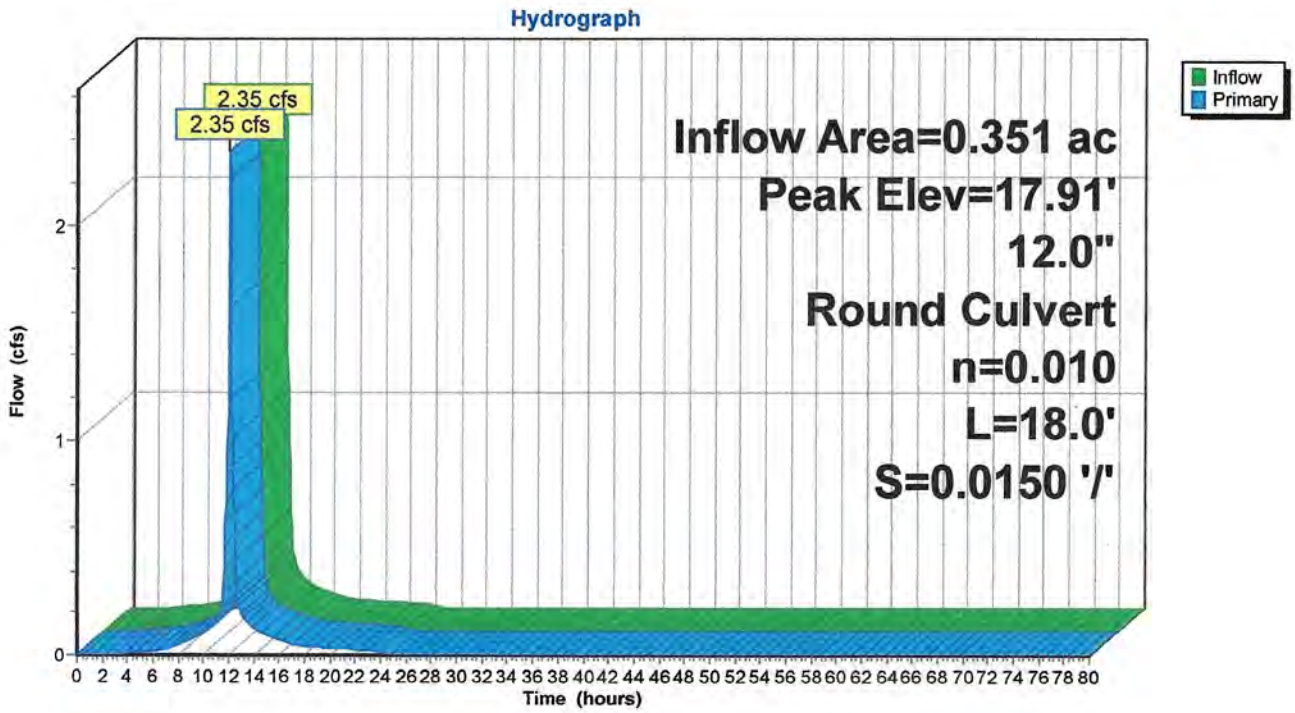
Inflow Area = 0.351 ac, 83.57% Impervious, Inflow Depth = 6.17" for 100 Year Storm event
Inflow = 2.35 cfs @ 12.07 hrs, Volume= 0.181 af
Outflow = 2.35 cfs @ 12.07 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Primary = 2.35 cfs @ 12.07 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 17.91' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.02'	**12.0" Round CMP_Round 12"** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 17.02' / 16.75' S= 0.0150 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.26 cfs @ 12.07 hrs HW=17.88' (Free Discharge)
↑—1=CMP_Round 12" (Barrel Controls 2.26 cfs @ 4.20 fps)

Pond 6P: STORMCEPTOR 2 / CB



Summary for Pond 7P: INFILTRATION SYSTEM

[81] Warning: Exceeded Pond 6P by 0.78' @ 12.65 hrs

Inflow Area = 0.351 ac, 83.57% Impervious, Inflow Depth = 6.17" for 100 Year Storm event
Inflow = 2.35 cfs @ 12.07 hrs, Volume= 0.181 af
Outflow = 0.34 cfs @ 12.57 hrs, Volume= 0.181 af, Atten= 86%, Lag= 29.9 min
Discarded = 0.04 cfs @ 12.57 hrs, Volume= 0.138 af
Primary = 0.30 cfs @ 12.57 hrs, Volume= 0.042 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 18.07' @ 12.57 hrs Surf.Area= 2,673 sf Storage= 4,166 cf

Plug-Flow detention time= 758.7 min calculated for 0.180 af (100% of inflow)
Center-of-Mass det. time= 759.4 min (1,527.2 - 767.9)

Volume	Invert	Avail.Storage	Storage Description
#1	15.50'	1,595 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 7,137 cf Overall - 3,149 cf Embedded = 3,988 cf x 40.0% Voids
#2	15.83'	2,683 cf	**24.0" Round CMP_Round 24"** Inside #1 L= 854.0' 3,149 cf Overall - 1.0" Wall Thickness = 2,683 cf
		4,278 cf	Total Available Storage

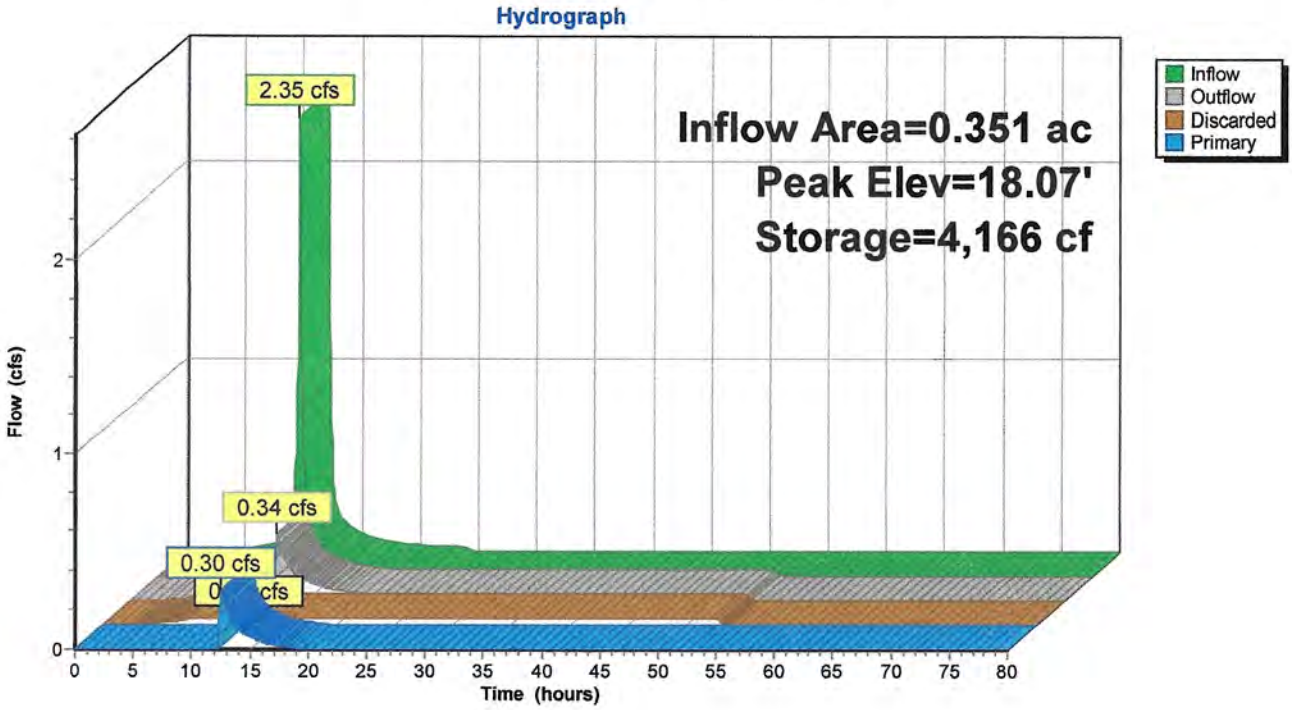
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
15.50	2,673	0	0	2,673
15.83	2,673	882	882	2,733
16.00	2,673	454	1,337	2,765
17.00	2,673	2,673	4,010	2,948
17.83	2,673	2,219	6,228	3,100
18.00	2,673	454	6,683	3,131
18.17	2,673	454	7,137	3,162

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.50'	**0.520 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	17.68'	**6.0" Round PVC_Round 6"** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 17.68' / 15.95' S= 0.0577 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.04 cfs @ 12.57 hrs HW=18.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.30 cfs @ 12.57 hrs HW=18.06' (Free Discharge)
↑—**2=PVC_Round 6"** (Inlet Controls 0.30 cfs @ 1.86 fps)

Pond 7P: INFILTRATION SYSTEM



Summary for Pond 8P: DETENTION BASIN 2

Inflow Area = 0.204 ac, 57.97% Impervious, Inflow Depth = 5.14" for 100 Year Storm event
Inflow = 1.02 cfs @ 12.15 hrs, Volume= 0.088 af
Outflow = 0.31 cfs @ 12.53 hrs, Volume= 0.088 af, Atten= 70%, Lag= 23.0 min
Primary = 0.31 cfs @ 12.53 hrs, Volume= 0.088 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 15.22' @ 12.53 hrs Surf.Area= 2,001 sf Storage= 1,329 cf

Plug-Flow detention time= 88.8 min calculated for 0.088 af (100% of inflow)
Center-of-Mass det. time= 88.5 min (890.6 - 802.1)

Volume	Invert	Avail.Storage	Storage Description
#1	14.50'	6,448 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
14.50	1,712	0	0	1,712
15.00	1,904	904	904	1,918
16.00	2,370	2,133	3,036	2,412
17.00	2,952	2,656	5,692	3,022
17.25	3,098	756	6,448	3,176

Device	Routing	Invert	Outlet Devices
#1	Primary	14.50'	**4.0" Round 4" PVC Culvert** L= 12.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 14.50' / 14.38' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Primary	16.25'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.31 cfs @ 12.53 hrs HW=15.22' (Free Discharge)
↑—**1=4" PVC Culvert** (Inlet Controls 0.31 cfs @ 3.57 fps)
└—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: DETENTION BASIN 2